Headquarters, Air Combat Command
Langley Air Force Base,
Virginia

Final Construction Work Plan
for the
German Air Force Tornado Crash Sites Cleanup

Holloman Air Force Base, New Mexico

March 2000

49 CES/CEV
Holloman Air Force Base
New Mexico

USAF Project No:
FINAL CONSTRUCTION WORK PLAN
FOR THE
GERMAN AIR FORCE TORNADO CRASH SITES CLEANUP

Prepared for:
49 CES/CEVR
Holloman Air Force Base, NM
and
HQ ACC CES/ESV
Langley Air Force Base, VA

Prepared by:
Foster Wheeler Environmental Corporation
143 Union Boulevard, Suite 1010
Lakewood, Colorado 80228-1824

Under Contract No. DACW45-94-D-0003
Delivery Order 27, Work Authorization Directive 1
U.S. Army Corps of Engineers
Omaha District
Omaha, Nebraska

March 2000

USAF Project Number:
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF FIGURES</td>
<td>v</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF ACRONYMS</td>
<td>vii</td>
</tr>
<tr>
<td>1.0 INTRODUCTION</td>
<td>1-1</td>
</tr>
<tr>
<td>1.1 PROJECT OBJECTIVES</td>
<td>1-1</td>
</tr>
<tr>
<td>1.2 WORK PLAN OVERVIEW</td>
<td>1-2</td>
</tr>
<tr>
<td>2.0 SITE DESCRIPTION</td>
<td>2-1</td>
</tr>
<tr>
<td>3.0 SCOPE OF WORK/PROJECT IMPLEMENTATION PLAN</td>
<td>3-1</td>
</tr>
<tr>
<td>3.1 ON-SITE ACTIVITIES</td>
<td>3-1</td>
</tr>
<tr>
<td>3.1.1 Site Access and Security</td>
<td>3-1</td>
</tr>
<tr>
<td>3.1.2 Preconstruction Meeting</td>
<td>3-2</td>
</tr>
<tr>
<td>3.1.3 Initial OEW/UXO/Low-level Radiation Screening</td>
<td>3-3</td>
</tr>
<tr>
<td>3.1.4 Mobilization</td>
<td>3-4</td>
</tr>
<tr>
<td>3.1.5 Construction Activities</td>
<td>3-4</td>
</tr>
<tr>
<td>3.1.6 Sampling Activities</td>
<td>3-5</td>
</tr>
<tr>
<td>3.1.7 Demobilization</td>
<td>3-6</td>
</tr>
<tr>
<td>3.1.8 Field Engineering and Quality Control</td>
<td>3-6</td>
</tr>
<tr>
<td>3.1.9 Health and Safety</td>
<td>3-6</td>
</tr>
<tr>
<td>3.1.10 Community Relations</td>
<td>3-6</td>
</tr>
<tr>
<td>3.2 TECHNICAL SPECIFICATIONS AND CONSTRUCTION DRAWINGS</td>
<td>3-7</td>
</tr>
<tr>
<td>3.3 OFF-SITE ACTIVITIES</td>
<td>3-7</td>
</tr>
<tr>
<td>4.0 REGULATORY COMPLIANCE PLAN</td>
<td>4-1</td>
</tr>
<tr>
<td>4.1 REGULATORY FRAMEWORK</td>
<td>4-1</td>
</tr>
<tr>
<td>4.1.1 Regulated Site Activities</td>
<td>4-1</td>
</tr>
<tr>
<td>4.1.2 Regulatory Requirements</td>
<td>4-1</td>
</tr>
<tr>
<td>4.1.3 Waste Minimization</td>
<td>4-3</td>
</tr>
<tr>
<td>4.2 PROJECT WASTE DESCRIPTION</td>
<td>4-4</td>
</tr>
<tr>
<td>4.3 WASTE MANAGEMENT ACTIVITIES</td>
<td>4-4</td>
</tr>
<tr>
<td>4.3.1 Waste Characterization/Classification</td>
<td>4-4</td>
</tr>
<tr>
<td>4.3.2 New Mexico Special Waste Management</td>
<td>4-8</td>
</tr>
<tr>
<td>4.3.3 Waste Containerization and Storage</td>
<td>4-9</td>
</tr>
<tr>
<td>4.4 REPORTING SPILLS AND RELEASES</td>
<td>4-11</td>
</tr>
<tr>
<td>4.4.1 Emergency Response</td>
<td>4-11</td>
</tr>
<tr>
<td>4.4.2 Client Notification</td>
<td>4-11</td>
</tr>
<tr>
<td>4.5 TRAINING/CERTIFICATION REQUIREMENTS</td>
<td>4-12</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS (Continued)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6 INSPECTION PROCEDURES</td>
<td>4-12</td>
</tr>
<tr>
<td>4.6.1 Inspections by Regulatory Agencies</td>
<td>4-12</td>
</tr>
<tr>
<td>4.6.2 Inspections by Third Parties</td>
<td>4-13</td>
</tr>
<tr>
<td>4.7 DOCUMENTATION AND RECORDS RETENTION</td>
<td>4-13</td>
</tr>
<tr>
<td>4.7.1 Transportation</td>
<td>4-14</td>
</tr>
<tr>
<td>4.7.2 Special Waste Manifests</td>
<td>4-14</td>
</tr>
<tr>
<td>4.8 UPDATING THE REGULATORY COMPLIANCE PLAN</td>
<td>4-15</td>
</tr>
<tr>
<td>5.0 CONTRACTOR QUALITY CONTROL PLAN</td>
<td>5-1</td>
</tr>
<tr>
<td>5.1 PURPOSE AND SCOPE</td>
<td>5-1</td>
</tr>
<tr>
<td>5.2 ORGANIZATION AND RESPONSIBILITIES</td>
<td>5-1</td>
</tr>
<tr>
<td>5.2.1 Task Manager</td>
<td>5-1</td>
</tr>
<tr>
<td>5.2.2 Contractor Quality Control Systems Manager</td>
<td>5-2</td>
</tr>
<tr>
<td>5.2.3 Site Construction Manager/Site Superintendent</td>
<td>5-3</td>
</tr>
<tr>
<td>5.2.4 Environmental Safety Specialist</td>
<td>5-3</td>
</tr>
<tr>
<td>5.2.5 Senior UXO Supervisor</td>
<td>5-4</td>
</tr>
<tr>
<td>5.2.6 Heavy Equipment Operators</td>
<td>5-4</td>
</tr>
<tr>
<td>5.2.7 Subcontractors and Vendors</td>
<td>5-4</td>
</tr>
<tr>
<td>5.3 CONSTRUCTION INSPECTION PLAN</td>
<td>5-5</td>
</tr>
<tr>
<td>5.3.1 Preparatory Phase Inspections</td>
<td>5-5</td>
</tr>
<tr>
<td>5.3.2 Initial Phase Inspection</td>
<td>5-6</td>
</tr>
<tr>
<td>5.3.3 Completion Phase Inspection</td>
<td>5-12</td>
</tr>
<tr>
<td>5.3.4 Inspection Documentation</td>
<td>5-12</td>
</tr>
<tr>
<td>5.4 TESTING</td>
<td>5-13</td>
</tr>
<tr>
<td>5.4.1 Testing Procedures (Other Than Chemical Sampling and Analysis)</td>
<td>5-13</td>
</tr>
<tr>
<td>5.4.2 Documentation</td>
<td>5-13</td>
</tr>
<tr>
<td>5.4.3 Laboratory Services</td>
<td>5-13</td>
</tr>
<tr>
<td>5.5 DOCUMENT CONTROL</td>
<td>5-14</td>
</tr>
<tr>
<td>5.5.1 Daily Quality Control Report</td>
<td>5-14</td>
</tr>
<tr>
<td>5.5.2 Conference Notes and Confirmation Notes</td>
<td>5-15</td>
</tr>
<tr>
<td>5.6 SUBMITTALS</td>
<td>5-16</td>
</tr>
<tr>
<td>5.6.1 Preparation and Maintenance of Submittals</td>
<td>5-16</td>
</tr>
<tr>
<td>5.6.2 Review of Submittals</td>
<td>5-16</td>
</tr>
<tr>
<td>5.6.3 Execution</td>
<td>5-17</td>
</tr>
<tr>
<td>5.6.4 Scheduling</td>
<td>5-17</td>
</tr>
<tr>
<td>5.7 NONCONFORMANCES</td>
<td>5-17</td>
</tr>
<tr>
<td>5.7.1 Control and Segregation</td>
<td>5-17</td>
</tr>
<tr>
<td>5.7.2 Nonconformance Report</td>
<td>5-18</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS (Concluded)

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.7.3 Disposition</td>
<td>5-18</td>
</tr>
<tr>
<td>5.7.4 Corrective Actions</td>
<td>5-18</td>
</tr>
<tr>
<td>5.8 MANAGEMENT INSPECTIONS</td>
<td>5-21</td>
</tr>
<tr>
<td>6.0 PROJECT MANAGEMENT PLAN</td>
<td>6-1</td>
</tr>
<tr>
<td>6.1 PROJECT SCHEDULE</td>
<td>6-1</td>
</tr>
<tr>
<td>6.2 PROJECT PERSONNEL</td>
<td>6-1</td>
</tr>
<tr>
<td>6.3 PROJECT MEETINGS</td>
<td>6-3</td>
</tr>
<tr>
<td>6.4 DATA MANAGEMENT</td>
<td>6-3</td>
</tr>
<tr>
<td>6.5 DOCUMENT CONTROL</td>
<td>6-4</td>
</tr>
<tr>
<td>6.6 REPORTS</td>
<td>6-4</td>
</tr>
<tr>
<td>7.0 REFERENCES</td>
<td>7-1</td>
</tr>
</tbody>
</table>

APPENDICES

A Site Location and Construction Drawing
B Letter from German Air Force and Holloman Air Force Base
C Right-of-Entry Permit
D Health and Safety Plan Addendum
E Sampling and Analysis Plan Addendum
<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-1</td>
<td>Inspection Checklist</td>
<td>5-7</td>
</tr>
<tr>
<td>5-2</td>
<td>Daily Quality Control Report</td>
<td>5-9</td>
</tr>
<tr>
<td>5-3</td>
<td>Nonconformance Report</td>
<td>5-19</td>
</tr>
<tr>
<td>5-4</td>
<td>Field Change Request</td>
<td>5-20</td>
</tr>
<tr>
<td>6-1</td>
<td>Tornado Crash Sites Project Organization Chart</td>
<td>6-2</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>4-1</td>
<td>Waste Management Summary</td>
<td>4-5</td>
</tr>
</tbody>
</table>
**LIST OF ACRONYMS**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFB</td>
<td>Air Force Base</td>
</tr>
<tr>
<td>BTEX</td>
<td>benzene, toluene, ethylbenzene, and xylenes</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>CQC</td>
<td>Contractor Quality Control</td>
</tr>
<tr>
<td>DOM</td>
<td>Delivery Order Manager</td>
</tr>
<tr>
<td>DOT</td>
<td>Department of Transportation</td>
</tr>
<tr>
<td>DQCR</td>
<td>daily quality control report</td>
</tr>
<tr>
<td>DRMO</td>
<td>Defense Reutilization and Marketing Office</td>
</tr>
<tr>
<td>EOD</td>
<td>Explosive Ordnance Disposal</td>
</tr>
<tr>
<td>EPA</td>
<td>United States Environmental Protection Agency</td>
</tr>
<tr>
<td>ESQ</td>
<td>Environmental, Safety, and Quality</td>
</tr>
<tr>
<td>ESS</td>
<td>Environmental Safety Specialist</td>
</tr>
<tr>
<td>GAF</td>
<td>German Air Force</td>
</tr>
<tr>
<td>GPS</td>
<td>global positioning system</td>
</tr>
<tr>
<td>FCR</td>
<td>field change request</td>
</tr>
<tr>
<td>Foster Wheeler</td>
<td>Foster Wheeler Environmental Corporation</td>
</tr>
<tr>
<td>ft</td>
<td>feet/foot</td>
</tr>
<tr>
<td>HSPA</td>
<td>Health and Safety Plan Addendum</td>
</tr>
<tr>
<td>lbs/acre</td>
<td>pounds per acre</td>
</tr>
<tr>
<td>mg/kg</td>
<td>milligrams per kilogram</td>
</tr>
<tr>
<td>NMAC</td>
<td>New Mexico Administrative Code</td>
</tr>
<tr>
<td>NMED</td>
<td>New Mexico Environment Department</td>
</tr>
<tr>
<td>OEW</td>
<td>ordnance explosives waste</td>
</tr>
<tr>
<td>PCS</td>
<td>petroleum-contaminated soil</td>
</tr>
<tr>
<td>PPE</td>
<td>personal protective equipment</td>
</tr>
<tr>
<td>ppm</td>
<td>parts per million</td>
</tr>
<tr>
<td>QA</td>
<td>quality assurance</td>
</tr>
<tr>
<td>QC</td>
<td>quality control</td>
</tr>
</tbody>
</table>
### LIST OF ACRONYMS (Concluded)

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCP</td>
<td>Regulatory Compliance Plan</td>
</tr>
<tr>
<td>RCRA</td>
<td>Resource Conservation and Recovery Act</td>
</tr>
<tr>
<td>RPM</td>
<td>Restoration Project Manager</td>
</tr>
<tr>
<td>SAP</td>
<td>Sampling and Analysis Plan Addendum</td>
</tr>
<tr>
<td>SUXOSUP</td>
<td>Senior OEW/UXO Supervisor</td>
</tr>
<tr>
<td>TERC</td>
<td>Total Environmental Restoration Contract</td>
</tr>
<tr>
<td>TPH</td>
<td>total petroleum hydrocarbons</td>
</tr>
<tr>
<td>TRPH</td>
<td>total recoverable petroleum hydrocarbons</td>
</tr>
<tr>
<td>TSDF</td>
<td>treatment, storage, and disposal facility</td>
</tr>
<tr>
<td>USACE</td>
<td>United States Army Corps of Engineers</td>
</tr>
<tr>
<td>UXO</td>
<td>unexploded ordnance</td>
</tr>
</tbody>
</table>
1.0 INTRODUCTION
The United States Army Corps of Engineers (USACE)-Omaha District contracted Foster Wheeler Environmental Corporation (Foster Wheeler) to complete cleanup at the German Air Force (GAF) Tornado Crash Sites in New Mexico. On September 24, 1999, at approximately 1620 hours, two GAF Tornado aircraft from Holloman Air Force Base (AFB) collided and subsequently impacted a remote area on state-owned land approximately 25 miles west of Carlsbad, New Mexico. Each aircraft contained approximately 750 gallons of JP-8 jet fuel at the time of impact. The majority of the JP-8 was consumed in the ensuing fire. However, the JP-8 spill resulted in petroleum-contaminated soil (PCS) that remained in the area surrounding the crash craters.

This Construction Work Plan (Work Plan) addresses all aspects of the proposed cleanup activities at the GAF Tornado Crash Sites including project objectives, site descriptions, a construction drawing, technical specifications, field procedures, and related activities. It will also address removal of F4-E debris stockpiled at Holloman AFB. The following Work Plan meets the requirements stipulated within the Total Environmental Restoration Contract (TERC) No. DACW45-94-D-0003, Delivery Order 27, Work Authorization Directive 1. All field activities will be performed in accordance with the Holloman AFB Basewide Health and Safety Plan (Foster Wheeler, 1995) and the Health and Safety Plan Addendum (HSPA) (Appendix D of this document).

1.1 PROJECT OBJECTIVES
The overall goal of the project is to remove aircraft debris and remediate PCS from the GAF Tornado Crash Sites. To meet this goal, the following project objectives will be achieved:

- A map of existing conditions will be created before any site activities take place (including the crater area, charred and stained (assumed) PCS, areas of debris, and materials used to prevent further contamination).
- Tornado aircraft debris will be removed and recycled or disposed of off-site.
- Contaminated soil will be excavated to the point of clean closure, the site will be backfilled with clean soil, and the sites will be revegetated.
- Any threat to human health and the environment will be minimized.
• The escape of any special wastes (as defined in the New Mexico Administrative Code, i.e.,
solid wastes that have unique handling, transportation, or disposal requirements to ensure
protection of the environment and the public’s health and safety, potentially include PCS),
contaminated runoff, or decomposition products will be controlled or eliminated.

• Debris from the F4-E Crash Compliance Site will be removed and disposed of and/or
recycled.

1.2 WORK PLAN OVERVIEW
The Work Plan is divided into seven sections and five appendices. Section 1 contains the
introduction and project objectives. Section 2 presents site description information. Section 3
details the scope of work, including on-site and off-site activities and the Project Implementation
Plan, which describes all site activities from mobilization through demobilization. Section 4
includes the Regulatory Compliance Plan (RCP), which outlines pertinent environmental
procedures, permitting and approval requirements, and regulatory procedural and training
requirements. Section 5 contains the Contractor Quality Control (CQC) Plan. Section 6 presents
the Project Management Plan including staffing, scheduling, reporting, data management,
document control, and meetings. References are provided in Section 7.

Supporting information is contained in the appendices. Appendix A includes the site location
and construction drawings that illustrate the work zones. Appendix B presents letters from the
GAF and Holloman AFB stating that no hazardous materials, ordnance explosives
waste/unexploded ordnance (OEW/UXO), or radioactive materials are associated with the
aircraft or crash sites. Appendix C includes the Right-of-Entry Permit granted by the State of
New Mexico. Appendix D presents the HSPA. Finally, Appendix E contains the Sampling and
Analysis Plan Addendum (SAP).
2.0 SITE DESCRIPTION

The GAF Tornado Crash Sites are located approximately 25 miles west of Carlsbad, New Mexico. The exact location of Crash Site #1 is N 32 20 42.82 and W 104 38 19.36. Crash Site #2 is located at N 32 23 18.52 and W 104 36 0.82. Both sites are located in an undeveloped semi-arid region 25 miles west of Carlsbad, New Mexico. Each aircraft contained approximately 750 gallons of JP-8 jet fuel at the time of impact and the bulk of the fuel was consumed in the fire. Components that remained in the area of each crash crater include JP-8-contaminated soil and small debris. The original size of the crater from Crash Site #1 was approximately 20 feet (ft) in diameter and the crater from Crash Site #2 was approximately 15 ft in diameter. The anticipated cleanup area for Crash Site #1 will be approximately 120 ft by 50 ft, with an approximate excavation depth of 3 ft. The cleanup area for Crash Site #2 will be approximately 250 ft by 85 ft, with an approximate excavation depth of 3 ft. The estimated excavation volume is 770 cubic yards.

Crash Site #1 is situated on a relatively flat area, while Crash Site #2 is situated on a rocky hillside. A dry creek bed is located near Crash Site #2. A site investigation took place on October 13, 1999. At that time, five sets of absorbent socks and two hay bail fences were positioned in and around Crash Site #2 and the creek bed to prevent further migration of JP-8 jet fuel downslope.

The GAF and Holloman AFB have provided information stating that no hazardous materials, OEW/UXO, or radioactive materials are associated with the Tornado aircraft and are not expected to be encountered at the crash sites. Foster Wheeler will proceed with the soil cleanup under the assumption that no radioactive or OEW/UXO materials are present at the crash sites. However, as a precautionary measure, Foster Wheeler will provide a properly trained and experienced Senior UXO Supervisor (SUXOSUP). The SUXOSUP will perform an initial screen for radioactive material and OEW/UXO prior to removal of the aircraft debris and PCS. The United States Air Force Explosive Ordnance Disposal (EOD) personnel from Holloman AFB will be responsible for removal and disposal of OEW/UXO material if it is determined to be present at the crash site.
3.0 SCOPE OF WORK/PROJECT IMPLEMENTATION PLAN

This section discusses on-site and off-site project-related activities that will be implemented at the GAF Tornado Crash Sites.

3.1 ON-SITE ACTIVITIES

On-site activities include the following:

- Maintenance of site access and security
- Preconstruction meeting
- Initial OEW/UXO surface investigation/screening of the work zone
- Initial radioactive material screening of the work zone
- Mobilization
- Construction activities
- Sampling activities (field screening and confirmation sampling)
- Demobilization
- Field engineering and quality control
- Health and safety
- Community relations

3.1.1 Site Access and Security

3.1.1.1 Transportation Operations

On-site transportation operations will conform to the following guidelines:

- All vehicles will travel along improved roads and will not enter private lands.
- No off-road vehicle travel will occur, except in the immediate area of the crash sites.
- The Foster Wheeler Site Construction Manager and other required personnel, subcontractors, and vendors will coordinate site entry activities with the State of New Mexico’s Land Office representative.
- The Foster Wheeler Site Construction Manager and other required personnel, subcontractors, and vendors will receive vehicle passes for removal of the F4-E debris from Holloman AFB. A valid driver’s license, proof of vehicle insurance, and valid vehicle registration will be required to obtain a pass.

Particular details for hauling soil to and from the crash sites are described in Section 3.1.5 of this Work Plan.
3.1.1.2 *Field Communications*

Important points of contact for this project are as follows:

<table>
<thead>
<tr>
<th>Location</th>
<th>Point of Contact</th>
<th>Telephone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foster Wheeler</td>
<td>James Morning</td>
<td>(505) 430-2307 (cellular)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(505) 479-2668 (Foster Wheeler Trailer)</td>
</tr>
<tr>
<td>Foster Wheeler</td>
<td>Charley Haddox</td>
<td>(303) 980-3533</td>
</tr>
<tr>
<td>USACE</td>
<td>Tom Zink</td>
<td>(402) 221-7711</td>
</tr>
<tr>
<td>Holloman AFB</td>
<td>Jose Gallegos or Court Fesmire</td>
<td>(505) 572-5395</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(505) 572-5395</td>
</tr>
</tbody>
</table>

A complete list of project-related telephone numbers is also contained in the HSPA (Appendix D of this document).

3.1.1.3 *Site Security*

Foster Wheeler personnel will maintain site security and all personnel will operate in accordance with security requirements. Access to the GAF Tornado Crash Sites will be provided by the state and county roads. The crash sites area will be barricaded and signs stating “Authorized Personnel Only” will be posted. All personnel will keep valid driver’s license in their possession.

3.1.2 *Preconstruction Meeting*

Foster Wheeler will conduct a preconstruction meeting at Holloman AFB prior to mobilization. The agenda for this meeting will include some or all of the following topics:

- Introductions, roles, and responsibilities
- Review of scope of work
- Overview of Safety Programs
- Construction schedule
- Mobilization logistics
- Review of off-site delivery schedules
- Forecast of progress until next scheduled meeting
Coordination of schedules
Review of submittal schedules
Review of quality programs
Pending changes and substitutions
Review of proposed changes for effects on construction, completion date, and other aspects of the project
Other business

The agenda will be formalized prior to the preconstruction meeting.

3.1.3 Initial OEW/UXO/Low-level Radiation Screening

As a precautionary measure, Foster Wheeler UXO personnel will perform an initial screening of the work zone for OEW/UXO and low-level radioactive debris. The initial screening will occur prior to the mobilization and construction activities. The SUXOSUP will review material pertaining to the OEW/UXO hazards associated with the Tornado aircraft and may request a briefing from Holloman AFB EOD personnel. The SUXOSUP will approach the area with a Vallon all-metals locator to locate metallic aircraft debris to identify and delineate any OEW/UXO materials. The SUXOSUP will also use a calibrated radiation counter to locate low-level radioactive debris above background levels.

If any OEW/UXO materials or low-level radioactive debris are found, Holloman AFB EOD personnel will manage the materials as follows:

- Only Holloman AFB EOD personnel will handle and dispose of live UXO. Under no circumstances will Foster Wheeler personnel handle live UXO. Therefore, any live OEW/UXO material encountered by Foster Wheeler personnel during the initial screening or construction activities will result in a stoppage of work in the immediate area of discovery as determined by the SUXOSUP, until Holloman AFB EOD personnel can properly and/or dispose of the materials.

- If encountered, all OEW or low-level radioactive materials will be segregated and stored by Holloman AFB EOD personnel in proper containers. Final disposal of OEW material will be the sole responsibility of Holloman AFB EOD personnel.

The Holloman AFB EOD unit will be responsible for all aspects of the OEW/UXO and radioactive material disposal.
3.1.4 Mobilization

Mobilization activities will include the following:

- Conduct site-specific orientation and health and safety training of workers.
- Deliver equipment, materials, and supplies to the site.
- Establish work zones in accordance with the Health and Safety Plan.
- Set up the stockpile/storage area (see Appendix A of this document) to be used to stockpile material, store equipment and supplies, and perform maintenance operations.
- Install temporary sanitary facilities. After the work is completed, the temporary sanitary facilities will be removed.

3.1.5 Construction Activities

The following bullets summarize the major construction activities to be performed at the GAF Tornado Crash Sites:

- Prior to excavation, Foster Wheeler UXO personnel will screen the PCS located in each crater for OEW/UXO and low-level radioactive debris using an all-metals geophysical instrument and calibrated radiation counter, respectively.
- Extent of burn areas, craters, and aircraft debris will be surveyed using a Global Positioning System (GPS) unit. The accuracy of the GPS unit will be less than one meter. This information will be used to generate a detailed site drawing to be included in the closure report.
- Any OEW/UXO or low-level radioactive material determined to be present at the sites will be the responsibility of Holloman AFB EOD personnel.
- Large items of aircraft debris (assumed greater than approximately 4 inches in diameter) will be transported as nonhazardous waste and disposed or recycled off-site. Loose soil will be removed from the debris before it is removed from the crash sites; however, no other decontamination of the debris is planned.
- Erosion controls installed at the Site #2 ditch during the initial site visit will be maintained during remediation only. This includes replacement hay bales as needed.
- Up to 770 cubic yards or 1,000 tons of contaminated soil will be excavated using a backhoe. If additional PCS removal is required, Foster Wheeler will obtain approval from UACE before continuing the excavation.
- Excavated soil will be placed into a front-end loader bucket.
- Scraping contaminated soil will continue until field test kits confirm that total petroleum hydrocarbons (TPH) levels in on-site soil are below 100 milligrams per kilogram (mg/kg).
- JP-8 contaminated soil material will be placed in a stockpile/storage area (lined with 40-mil high density polyethylene).
• Confirmation samples will be collected from the bottom and sides of the excavation for off-site analysis.
• Clean fill material will be delivered to the sites to backfill the excavated crater areas.
• The excavated area will be backfilled, compacted by rolling over with heavy equipment, and graded to allow for proper drainage of the sites.
• Contaminated soil will be removed for off-site treatment or disposal.
• Construction and aircraft debris will be disposed of or recycled.
• As requested by USACE and Holloman AFB, aircraft debris from the F4-E Compliance Crash Site will be collected from Holloman AFB and disposed of or recycled with the Tornado Crash Sites debris.
• Decontamination of personnel and equipment will be performed in accordance with the HSPA (Appendix D) of this document.
• The site will be restored by removal of construction debris and regrading any wheel ruts.
• The two sites will be mulched and reseeded after the backfill is in place. Approximately 5 acres, including the crash sites and access and staging areas, will be revegetated. The seed mixture will consist of 0.5 pounds per acre (lbs/acre) of Mesa dropseed, 1.0 lbs/acre of Blue grama, and 1.5 lbs/acre of Sideoats grama.

3.1.6 Sampling Activities
Field screening and confirmation samples will be collected during the project. ENSYS® field test kits will be used to screen soil during excavation to verify that TPH concentrations in the soil are less than 100 mg/kg to satisfy the cleanup criteria for the site. Headspace analysis will be performed on soil samples, as needed. Therefore, no post-cleanup monitoring or maintenance will be needed. Up to 20 confirmation samples (approximately one sample for every 1,000 square ft) will be collected after field screening indicates that excavation is complete. These samples shall be sent to an off-site analytical laboratory for verification using the total recoverable petroleum hydrocarbons (TRPH) (United States Environmental Protection Agency [EPA] Method 9071A/418.1) and benzene, toluene, ethylbenzene, and xylenes (BTEX) (EPA Method 5035/8021) analyses in accordance with the SAP (Appendix E). Sample points will be recorded using a GPS unit.
3.1.7 **Demobilization**

Demobilization activities will commence after completion of construction activities and will include the following:

- Removing temporary facilities
- Conducting and completing final punch-list inspections
- Removing equipment and materials from the site.

3.1.8 **Field Engineering and Quality Control**

Field engineering is the primary responsibility of the Site Construction Manager and will be performed under his direction. Field change requests (FCRs) and nonconformance reports will be documented when discrepancies occur between constructed elements and corresponding Technical Specifications (Section 3.2 of this document), HSPA (Appendix D of this document), or the construction drawing (Appendix A of this document).

The CQC Systems Manager will perform quality control (QC) inspections and testing in accordance with the CQC Plan (Section 5 of this document). The CQC Systems Manager will document construction activities on a daily quality control report (DQCR), which is discussed in the CQC Plan. The CQC Systems Manager will also issue and maintain FCRs and nonconformance reports, also included within the CQC Plan.

3.1.9 **Health and Safety**

Health and safety activities will be conducted in accordance with the HSPA for the GAF Tornado Crash Sites (Appendix D of this document); the Basewide Health and Safety Plan (Foster Wheeler, 1995); and Foster Wheeler Environmental Corporate Health and Safety Program (Corporate Reference Library). All employees and subcontractors will be responsible for complying with these documents. The Site Construction Manager and the Site Environmental Safety Specialist (ESS) will ensure implementation of these programs and procedures.

3.1.10 **Community Relations**

Community relations are the responsibility of Holloman AFB. All inquiries regarding the project will be referred to the Base Restoration Project Manager (RPM) or a delegated representative.
3.2 TECHNICAL SPECIFICATIONS AND CONSTRUCTION DRAWINGS
All work shall conform to at least the minimum Standard Specifications for Highway and Bridge Construction, 1994 edition, published by the New Mexico State Highway and Transportation Department. The Site Location and Construction Drawing (Appendix A of this document) was prepared to provide the location and extent of the specific construction activities for the soil removal at the crash sites.

3.3 OFF-SITE ACTIVITIES
The Foster Wheeler home office staff located in Albuquerque, New Mexico and Denver, Colorado, will provide all off-site engineering services and will coordinate engineering efforts in compliance with Foster Wheeler corporate procedures and applicable professional standards. This staff will be responsible for procurement of subcontractors and major work items. The Foster Wheeler Site Construction Manager will furnish a written scope of work and supporting technical information to the designated home office procurement staff member, as specified in the procurement documents. This individual will be the point of contact for all vendor inquiries regarding administrative procedures and concerns. The Site Construction Manager will be the point of contact for all technical inquiries.

Foster Wheeler’s home office staff will furnish the following administrative support functions:

Contract Administration. The Contract Administrator will assist project management with all issues pertaining to contract compliance.

Regulatory Compliance. Designated home office personnel will oversee compliance with permits and regulatory requirements as described in Section 4 of this document, the RCP.

Safety Compliance. Home office compliance officers will monitor the Site Safety and Health Program through the ESS.

Compliance Inspections. Designated corporate representatives from the home office will periodically evaluate all issues regarding corporate, regulatory, health and safety, and project compliance.
4.0 REGULATORY COMPLIANCE PLAN

The RCP was specifically developed to identify necessary regulatory requirements applicable to the cleanup of the GAF Tornado Crash Sites. The RCP details waste management practices and training requirements that are necessary to remediate the sites and store and dispose of the materials that will be generated during the cleanup activities. In addition, the RCP provides guidance regarding waste minimization practices to be followed during the project to reduce the volume of waste generated, stored, and removed from the sites for disposal.

4.1 REGULATORY FRAMEWORK

Holloman AFB is actively conducting a continuing environmental restoration program, which includes the assessment and remediation of on- and off-Base properties affected by the Holloman AFB actions. Remedial activities conducted for Holloman AFB are subject to several environmental regulatory program requirements.

4.1.1 Regulated Site Activities

The following actions are addressed in this Work Plan and are applicable to the GAF Tornado Crash Sites cleanup activities. The anticipated regulated activities are as follows:

- Identifying OEW, UXO, and low-level radioactive materials encountered around the crater areas for subsequent disposal by qualified Air Force EOD personnel. While discovery of these materials is not anticipated, if any of these materials are encountered, the field work will be stopped and the project approach will be reevaluated.
- Excavating PCS.
- Sampling and analyzing excavated crater material and soil for subsequent management and disposal purposes.
- Assisting Holloman AFB with the management, transportation, and disposal of New Mexico-regulated special wastes resulting from the cleanup activities. Due to the nature of the materials involved in this project and in consideration of other projects involving similar circumstances, a "generator determination" can reasonably be made that no Resource Conservation and Recovery Act (RCRA) hazardous wastes are anticipated as part of this remediation project. However, if RCRA hazardous waste is encountered or generated, the field work will be stopped until the project approach can be reevaluated.

4.1.2 Regulatory Requirements

Project activities are expected to generate nonhazardous waste and PCS, which is a New Mexico Environment Department (NMED)-regulated special waste. The generation of RCRA hazardous
waste is not anticipated for this scope of work. As such, the following federal and state regulations are applicable and must be complied with during implementation of planned project activities:

- Title 40 of the Code of Federal Regulations (CFR) Parts 190–256, EPA Regulations for Solid Waste
- 49 CFR Parts 100–178, United States Department of Transportation (DOT) Rules for Hazardous Materials Transport
- New Mexico Solid Waste Management Regulations
- New Mexico Hazardous Waste and Special Waste Management Regulations
- New Mexico Air Quality Control Regulations
- New Mexico Water Quality Control Commission Regulations
- Army Regulations 385-61, USACE Safety Concepts and Basic Considerations for UXO Operations, relating to UXO storage, transportation, and disposal activities
- Applicable Holloman AFB permits, policies, and procedures

A more detailed discussion of the specific remedial activities to be implemented during the project was presented in Section 3 of this Work Plan.

TRPH and BTEX analysis of excavated soils from the crash craters will determine management practices for waste streams anticipated during the remediation process. According to the Groundwater Bureau of the NMED, the New Mexico underground storage regulations of Title 20, Chapter 5, Part 12, Section 1209 shall be used for determination of applicable cleanup criteria for PCS. To paraphrase these requirements, remediation of soil contamination will be considered complete when an analysis of what appears to be the most contaminated soil reveals:

1. The total aromatic hydrocarbon concentration to be less than 50 parts per million (ppm) and the benzene concentration to be less than 10 ppm when measured using an appropriate laboratory test, or the total aromatic hydrocarbon concentration to be less than 100 ppm when measured using an appropriate field instrument, in areas where the underlying groundwater contains 10,000 milligrams per liter or less total dissolved solids and the contaminated soil is 50 ft or less above the seasonal high static ground water level; and
2. If the soil was contaminated by diesel fuel, motor oil, heating oil, kerosene, jet aviation fuel or other heavy petroleum product, the TPH concentration is less than 100 ppm using an appropriate laboratory test in areas where the underlying ground water contains 10,000 milligrams per liter or less total dissolved solids and the contaminated soil is 50 feet or less above the seasonal high static ground water level.

Excavated soil with a TPH concentration exceeding 100 mg/kg will be disposed of off site at an approved New Mexico special waste disposal facility as required under NMED regulatory requirements. Appropriate Holloman AFB representatives will be responsible for signing required waste manifests.

4.1.3 Waste Minimization

To minimize the volume of waste, the following general rules will be applied:

- Do not contaminate materials unnecessarily.
- Plan work ahead, based on the work procedure to be used.
- Take only the material (e.g., chemicals) needed to perform the work activity. Additional material can be brought to the work location if it is found to be necessary.
- Store materials in large containers, but the smallest reasonable container should be used to transport the material to the location where it is needed.
- Maintain cleaning and extra sampling supplies outside any potentially contaminated area to keep them clean and to minimize additional waste generation.
- Maintain or construct prefabricated materials, barriers, support equipment, etc., outside potentially contaminated areas.
- Perform mixing of detergents or decontamination solutions outside potentially contaminated areas.
- Segregate cover material and crater soils.
- Use drop cloths or absorbent material to contain small spills or leaks.
- Avoid a bellows effect when double-bagging contaminated materials.
- Use containers to minimize the spread of contamination.
- Do not place contaminated materials with clean materials.
- Decontaminate and reuse material and equipment when practical.
- Use volume reduction techniques when practicable.
- Verify that waste containers are solidly packed to minimize the number of containers.
4.2 PROJECT WASTE DESCRIPTIONS

The anticipated waste streams associated with the GAF Tornado Crash Sites cleanup activities can be categorized as follows:

- Tornado and F4-E aircraft debris (possibly including OEW/UXO/low-level radioactive materials)
- JP-8-contaminated soil
- Uncontaminated soil
- Equipment used to decontaminate field equipment
- Decontamination water
- Personal protective equipment (PPE)

Table 4-1 summarizes applicable waste management, transportation, and disposal requirements for each of the waste streams that are potentially expected to be generated during construction activities.

4.3 WASTE MANAGEMENT ACTIVITIES

This section describes how waste generated during construction activities will be characterized and classified.

4.3.1 Waste Characterization/Classification

All waste streams will be sampled and characterized in accordance with New Mexico Solid Waste Management Regulations (20 New Mexico Administrative Code [NMAC] 9.1) relating to PCS. These regulations require the generator to determine whether a solid waste is a listed or characteristic hazardous waste or a New Mexico special waste. Due to the nature of the materials involved in the project and in consideration of other projects involving similar circumstances, a "generator determination" can reasonably be made that no RCRA hazardous wastes are...
### Table 4-1. Waste Management Summary

<table>
<thead>
<tr>
<th>WASTE TYPES</th>
<th>CHARACTERIZATION REQUIREMENTS</th>
<th>APPLICABLE REGULATIONS</th>
<th>ALLOWABLE CONTAINMENT</th>
<th>STORAGE REQUIREMENTS</th>
<th>TRANSPORTATION REQUIREMENTS</th>
<th>DISPOSAL REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavated Soil</td>
<td>Need to determine whether excavated soil is non-hazardous, hazardous, or special. Representative sample to be taken from rolloff/stockpile containing soil. If PCS is determined to be a New Mexico special waste, Foster Wheeler will manage in accordance with NMED regulations. Otherwise, soil will be used as backfill material.</td>
<td>20 NMAC 4.1 &quot;Identification &amp; Listing of Hazardous Waste&quot; and &quot;Standards. Applicable to Generators of Hazardous Waste&quot; 20 NMAC 9.1 &quot;Special waste regulations&quot; 40 CTR 262 — Generator STDs</td>
<td>PCS will be stored on a polyethylene liner or within a roll-off bin.</td>
<td>PCS will be stored on polyethylene liners with appropriate runon, runoff, and wind dispersion controls. Maximum on-site storage for PCS special waste is 45 days. NOTE: Storage clock begins when the waste is first put into the container.</td>
<td>PCS shipped off site must be accompanied by an NMED special waste manifest. Containers must be labeled indicating contents and the potential health, safety, and environmental hazards associated with the waste.</td>
<td>Nonhazardous soil will be used for backfilling excavated craters. PCS special waste can be disposed of only in an approved off-site solid waste facility authorized for special wastes. PCS special waste containing free liquid cannot be sent to a landfill and must pass the paint filter test before it can be landfilled. NOTE: Foster Wheeler RCS must approve TSDF and transporter prior to shipment of waste.</td>
</tr>
</tbody>
</table>
### Table 4-1 Waste Management Summary

<table>
<thead>
<tr>
<th>WASTE TYPES</th>
<th>CHARACTERIZATION REQUIREMENTS</th>
<th>APPLICABLE REGULATIONS</th>
<th>ALLOWABLE CONTAINMENT</th>
<th>STORAGE REQUIREMENTS</th>
<th>TRANSPORTATION REQUIREMENTS</th>
<th>DISPOSAL REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decontamination Water</td>
<td>Need to determine whether the decontamination water is a hazardous waste. Representative sample will be taken from accumulation container or portable tanks.</td>
<td>20 NMAC 4.1 “Identification &amp; Listing of Hazardous Waste” and “Standards, Applicable to Generators of Hazardous Waste”</td>
<td>DOT-approved 55-gal (bunghole-type) metal drums (1A1) or DOT-approved portable tanks (DOT 51, 52, 53, 56, 57, and 60).</td>
<td>Containers must be sealed when not being loaded or filled unloaded.</td>
<td>NOTE: Individuals involved in overseeing or shipping hazardous materials must meet HM-181 &amp; HM-126F training requirements.</td>
<td>If not a hazardous waste and meets groundwater discharge standards, can discharge to the ground. Obtain proper documentation (approved characterizations and authorizations to discharge) from NMED and HAFB prior to discharge. Foster Wheeler RCS must approve TSDF and transporter prior to shipment of waste. Nonhazardous solid waste be disposed of at a solid waste landfill or recycled as scrap. Foster Wheeler RCS must approve TSDF and transporter prior to shipment of waste.</td>
</tr>
<tr>
<td>Decon Pad Materials and Wastes</td>
<td>These materials will be characterized based on analysis of decontamination water results. Waste equipment or materials that are steam decontaminated and meet the required alternative treatment standards for debris will be managed as non-hazardous solid waste.</td>
<td>20 NMAC 4.1 “Identification &amp; Listing of Hazardous Waste” and “Standards, Applicable to Generators of Hazardous Waste”</td>
<td>Materials to be temporarily stored in appropriately-sized containers.</td>
<td>Containers must be sealed when not being loaded or filled unloaded.</td>
<td>NOTE: Individuals involved in overseeing or shipping hazardous materials must meet HM-181 &amp; HM-126F training requirements.</td>
<td></td>
</tr>
</tbody>
</table>
Table 4-1 Waste Management Summary

<table>
<thead>
<tr>
<th>WASTE TYPES</th>
<th>CHARACTERIZATION REQUIREMENTS</th>
<th>APPLICABLE REGULATIONS</th>
<th>ALLOWABLE CONTAINMENT</th>
<th>STORAGE REQUIREMENTS</th>
<th>TRANSPORTATION REQUIREMENTS</th>
<th>DISPOSAL REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposable Personal Protective Equipment (PPE)</td>
<td>Decontaminated PPE will be handled as solid waste; no analysis is required.</td>
<td>20 NMAC 9.1 Solid Waste Management Regulations</td>
<td>Double-bagged in plastic bags.</td>
<td>N/A</td>
<td>N/A</td>
<td>Nonhazardous solid waste to be disposed of at an approved solid waste landfill. Foster Wheeler RCS must approve TSDF and transporter prior to shipment of waste.</td>
</tr>
</tbody>
</table>

**APPLICABLE REGULATIONS**
- 20 NMAC 9.1 Solid Waste Management Regulations
- 20 NMAC 4.1 "Identification & Listing of Hazardous Waste" and "Standards Applicable to Generators of Hazardous Waste"
- 40 CFR 268.48 - LDR-UTS
- 40 CFR 262 - Generator STDs

**STORAGE REQUIREMENTS**
- Universal Treatment Standards
- Semiconductor Organic Compound
- Unexploded Ordnance
- Volatile Organic Compound
- White Sands Missile Range

**TRANSPORTATION REQUIREMENTS**
- Land Disposal Restriction
- New Mexico Administrative Code
- New Mexico Environment Department
- Ordnance Explosive Waste
- Petroleum-Contaminated Soils
- Personal Protective Equipment
- Regulatory Compliance Specialist
- Resource Conservation and Recovery Act

**DISPOSAL REQUIREMENTS**
- Nonhazardous solid waste to be disposed of at an approved solid waste landfill.
- Foster Wheeler RCS must approve TSDF and transporter prior to shipment of waste.
anticipated as part of this remediation project. Waste streams including soils will be sampled and/or characterized in accordance with sampling and analytical requirements as presented and discussed in the SAP (Appendix E of this document).

Documentation of all proposed waste classifications will be provided to appropriate Holloman AFB personnel for final waste stream characterizations. The Base is responsible for making all final waste characterizations and for signing waste manifests.

4.3.2 New Mexico Special Waste Management

New Mexico Special Waste Regulations are found in 20 NMAC 9.1. Management of special wastes is under the control of the NMED Solid Waste Bureau. For this project, New Mexico special wastes, i.e., solid wastes that have unique handling, transportation, or disposal requirements to ensure protection of the environment and the public’s health and safety, potentially include PCS.

In New Mexico, PCS is a special waste if the TPH concentration is greater than 100 mg/kg and/or benzene concentration is greater than 10 mg/kg. Special wastes must comply with the following requirements:

- Special wastes must be treated prior to disposal and/or isolated in their disposal to ensure a minimum of exposure to the public.
- All special wastes must be disposed of only at solid waste facilities permitted for disposal of special wastes.
- All special wastes must be manifested in accordance with Section 712 of the New Mexico Special Waste Requirements Regulations.
- Storage of special wastes will occur only at an approved special wastes storage area in a rolloff or bermed area containing an impermeable membrane liner. Special wastes will not be stored longer than 45 days, unless approved in advance by NMED.
- All containers of special wastes to be stored or disposed of will be clearly labeled, indicating the contents and potential health, safety, and environmental hazards associated with the waste.
- The physical and chemical characteristics of all special wastes will be documented prior to storage, transportation, or disposal, by means of the following:
  - Records of the results of analysis performed in accordance with Section 704 of the New Mexico Special Waste Requirements Regulations as applicable
- Detailed descriptions of the generator’s knowledge of specific wastes

Transports of any type of regulated special waste must be registered with the NMED Solid Waste Bureau.

4.3.3 Waste Containerization and Storage

Container selection will be determined by DOT-trained personnel based on type and quantity of waste to be generated. Containers may include either DOT specification drums or roll-offs for regulated hazardous material. DOT specification containers are not required for material that does not meet a DOT hazard class (such as PCS, which may be transported in a dump truck).

Prior to starting cleanup activities, the Foster Wheeler Site Construction Manager will, in conjunction with Holloman AFB personnel, select areas for the temporary staging and storage of excavated soil, debris, and PPE. PCS may be stored on site for up to 45 days. Waste material must be classified according to EPA and DOT criteria before the labels are applied. Upon classification, the Regulatory Compliance Specialist will direct the application of appropriate hazardous/nonhazardous waste and DOT labels, complete with proper information specific to each waste stream. Each container will be marked and labeled as required by EPA and DOT, if applicable. Trained personnel will conduct all DOT functions as required by 49 CFR Part 172, Subpart H. A label will be placed on or adjacent to the liner on PCS stockpiles.

At the time of generation, all waste containers will be labeled, using indelible ink, with the following information:

- Source and location
- Contents and quantity of material in the container
- Potential health, safety, and environmental hazards
- Accumulation start date (the date the first drop of material was put in the container)
- Date container sampled
- Parameters analyzed
Excavated soil stockpiles containing confirmed PCS will be labeled using the following format:

**Petroleum-Contaminated Soil**

**Origin:** Crater Cuttings—Petroleum Hydrocarbons

**Contaminated Soils—Jet Fuel**

**Concentration:** ____ parts per million TRPH

All waste materials will be staged on site pending final characterization and analysis. All containerized waste materials will be stored on wooden pallets and labeled as “Potentially Contaminated Soil (or PPE, etc.) - Pending Analysis” until such time as the contents are characterized. Stockpiled soil and debris will be placed on a liner, covered, and surrounded by a berm to prevent surface water runon and runoff until the material is readied for disposal. An inventory of waste containers and stockpiles of soil and debris will be maintained for later submittal to and inspection by both USACE and Holloman AFB personnel.

Containers of waste will be inspected and logged while the field work is in progress. Inspection will encompass evaluation for proper labeling, secure closure, the condition of each container, number of containers, and condition of the storage area. Any signs of deterioration, leaking, or dents will be noted, and containers will be immediately overpacked, if necessary. Inspection results will be provided to USACE and Holloman AFB. Stockpiles will also be inspected and logged.

Disposal of waste materials and decontamination liquids and materials will be as follows (Holloman AFB is responsible for making final waste characterizations and for signing manifests):

- Soil determined to be NMED-regulated PCS will be transported off site by a registered special waste hauler to an approved special waste landfill for disposal.
- Nonhazardous excavated soil with TPH concentrations less than 100 mg/kg may be used as backfill in the crater.
- Potentially live OEW/UXO material will be the sole responsibility of Holloman AFB EOD personnel.
- OEW material will be segregated and containerized by Holloman AFB EOD personnel and properly disposed of by Holloman AFB EOD personnel.
Holloman Air Force Base
Tornado Crash Sites Construction Work Plan

Section 4—Regulatory Compliance Plan

- Decontamination pad materials will be characterized based on decontamination water characterization. If determined to be nonhazardous, the materials will be managed as nonhazardous solid waste, with ultimate disposal at a solid waste landfill.
- PPE will be decontaminated by shaking off loose dirt. The decontaminated PPE, unless soaked or saturated with a hazardous material, will be double bagged (plastic) and managed as nonhazardous solid waste.

4.4 REPORTING SPILLS AND RELEASES
Precautions will be taken to prevent oil and hazardous material spills and will include daily inspection by the site personnel of equipment and containers. Personnel using hazardous materials will inspect the container before and after use. In the event of a spill/release, Jose Gallegos Holloman (AFB Project Manager), Carlsbad Hazardous Materials team ((505) 885-3125), and USACE will be immediately notified. Spill response will be in accordance with federal, state, local, and Holloman AFB regulations.

4.4.1 Emergency Response
Emergency response procedures are specified in the Holloman Basewide Health and Safety Plan (Foster Wheeler, 1995).

4.4.2 Client Notification
The following chain of communications should be used in case of a spill:

- Mr. James Morning has been designated as the Foster Wheeler Spill and Release Reporting Site Representative. In the event of a spill or release, Mr. Morning will immediately notify Jose Gallegos, Holloman AFB (505-475-5395); and Tom Zink, the USACE Project Manager (402 221-7711).
- Site personnel must contact the Foster Wheeler Task Manager:
  Foster Wheeler Task Manager: Charley Haddox
     Phone: (303) 980-3533
     Fax: (303) 980-3539
The Task Manager must immediately contact the following Environmental, Safety, and Quality (ESQ) representatives:

Foster Wheeler Regional Regulatory Compliance Specialist: Craig O’Rourke
Phone: (714) 444-5511
Fax: (714) 444-5560

Foster Wheeler Regional ESQ Manager: Jayne Fitzgerald
Phone: (714) 444-5534
Fax: (714) 444-5560

4.5 TRAINING/CERTIFICATION REQUIREMENTS
This section presents the DOT training and certification requirements for personnel involved in the remediation project. In addition, all supervisors will be trained in Foster Wheeler’s waste management training program, which meets the requirements of 40 CFR, Part 265.16, and Foster Wheeler’s Compliance policies and procedures to ensure that they are familiar with the program. These policies and procedures meet Department of Justice requirements for a sound environmental management program.

All personnel who perform or oversee DOT-related activities will be DOT trained. DOT training records will be maintained in project files on site. A copy of the DOT training records will also be sent to the Foster Wheeler Regional Regulatory Compliance Specialist for the regulatory compliance files.

4.6 INSPECTION PROCEDURES
The following section describes inspection procedures field personnel will follow in the event that a regulatory agency or third party conducts an on-site inspection.

4.6.1 Inspections by Regulatory Agencies
Foster Wheeler personnel will respond to inspections by regulatory agencies in accordance with the company’s environmental compliance procedures pertaining to Environmental Inspection by Regulatory Agencies. Mr. James Morning has been designated as the Foster Wheeler on-site representative for inspections by regulatory agencies. Mr. Morning has received training on this procedure and is familiar with its implementation. In the event that Holloman AFB is notified of an impending regulatory inspection, Mr. Morning will be notified as soon as possible by the Base.
personnel. During any inspection, both Holloman AFB and USACE representatives should be present. These procedures require that Mr. Morning contact the Task Manager, who must notify Foster Wheeler ESQ Manager, Jayne Fitzgerald (714) 444-5534, who in turn will notify Karen Raffa, Director, Environmental Programs, at (425) 688-3768.

4.6.2 Inspections by Third Parties
Any outside party requesting access to inspect the site must be referred to Jose Gallegos, Holloman AFB. Foster Wheeler personnel will not grant access or answer the questions of unauthorized personnel. Individuals requesting access will be directed to contact the Holloman AFB Public Affairs Office at (505) 475-5406.

If members of the media pose questions or attempt to enter the site, Foster Wheeler personnel will direct those individuals not to enter the construction site, refer them to the Base Public Affairs Office, and then notify Karen Raffa, Foster Wheeler’s Director, Environmental Programs, at (425) 688-3768.

4.7 DOCUMENTATION AND RECORDS RETENTION
The information contained in this section applies to all waste managed during environmental data collection activities. Field records will be kept in a bound, numbered field notebook. All pages of the field data record log must be signed and dated by the Site Construction Manager who is entering the data. In addition, the following information will be recorded in the log:

- Description of generating activities
- Location of generation (including depth, if applicable)
- Type of waste
- Date and time of generation
- Date and time of disposal of each type
- Disposal location of each type
- Disposal method
- Description of any waste sampling, including type of test, laboratory where sample is to be sent, sampling method, and name of sampler
- Name of person recording information
- Name of field manager at time of generation and at time of disposal
The following materials will also be maintained in the project files:

- Test results
- Inspection logs
- Waste documentation, including:
  - Waste profile sheets
  - Trip tickets or bills of lading
  - Copies of any state or local permits or approvals

4.7.1 **Transportation**

Transportation documentation will comply with DOT regulations 49 CFR Parts 100-178 and will be prepared by Foster Wheeler personnel trained according to the requirements of HM-181 and HM-126F for Holloman AFB signature. Containers will be marked, labeled, and/or placarded prior to off-site transport. Foster Wheeler will prepare treatment, storage, and disposal facility (TSDF) waste profile sheets, waste manifests, and shipping documents for Holloman AFB officials to review and sign. All waste transporters used for Holloman AFB projects will be registered with NMED and approved by the Base and in accordance with Foster Wheeler procedures for TSDF and transporter approvals. All PCS waste will be containerized and disposed of at an approved facility.

4.7.2 **Special Waste Manifests**

Holloman AFB personnel will be responsible for reviewing and signing all waste documentation, including waste profiles and manifests (manifest packages). Prior to signing the manifest, the designated Holloman AFB official will ensure that pretransport requirements of packaging, labeling, marking, and placarding are met according to 40 CFR 262.30–262.33 and 49 CFR Parts 100–177.

For special waste, a manifest containing the following information will accompany each load of special waste originating from or to be disposed of in New Mexico, as specified in Section 702.C of the New Mexico Special Waste Requirements Regulations:

- Name, address, and telephone number of the generator
- Name, address, and telephone number of any and all transporters in the order each will be transporting the waste
- Name, site address, telephone number, and identification number of the solid waste facility to which the waste is to be delivered
- Type and proper name of waste being shipped
- Total weight or volume of waste prior to shipment from generator
- Total weight or volume of waste received at solid waste facility
- Type and number of containers in shipment
- Any special handling instructions
- Date and location the waste was delivered
- Date of receipt from the generator and total weight or volume of the special wastes (provided by the transporter)

If more than one transporter is used, each transporter will provide the date of receipt and total weight or volume of waste received from the previous transporter. The manifest will be signed by the Holloman AFB personnel, each transporter of the special waste, and the solid waste facility operator. All signatories will be duly authorized agents of their organizations. Significant discrepancies will be reported to the NMED Solid Waste Bureau within 24 hours of discovery.

Holloman AFB will receive one copy of the manifest at the point of origin; the remaining copies will be given to the transporter. After receipt of the waste by the treatment or disposal facility, the completed manifest will be returned to the Holloman AFB signatory official to be placed on file. Copies of all manifests for waste generated at the site will also be kept in a central project file.

4.8 UPDATING THE REGULATORY COMPLIANCE PLAN
The RCP will be updated as changes in site activities or changes in applicable regulations occur.
5.0 CONTRACTOR QUALITY CONTROL PLAN
This CQC Plan establishes the QC procedures and methods Foster Wheeler will implement during this project. It combines the quality assurance/quality control (QA/QC) requirements from the USACE-Omaha District with the Foster Wheeler QC system requirements to form a set of common requirements commensurate with the scope and nature of services outlined in this Work Plan.

5.1 PURPOSE AND SCOPE
This CQC Plan describes the specific organization, personnel, procedures, controls, instructions, tests, records, submittals, and forms to be used to ensure that all work products comply with the contract requirements. This plan is applicable to all on-site construction operations, including inspections and testing activities performed for this project. All work activities as listed in the Scope of Work/Project Implementation Plan, Section 3 of this Work Plan, will be conducted in accordance with this plan.

5.2 ORGANIZATION AND RESPONSIBILITIES
This section describes the organizational structure, functional responsibilities, personnel qualifications, levels of authority, and lines of communication that will be used to ensure the quality for this project. These descriptions apply to all project personnel performing on-site construction operations, including subcontractors, vendors, fabricators, suppliers, and purchasing agents.

The qualifications, duties, responsibilities, and authority for project personnel are described in the following paragraphs. These positions and names are included on a project organization chart in the Project Management Plan, Section 6 of this Work Plan.

5.2.1 Task Manager
The Task Manager is responsible for the direction, execution, and successful completion of project tasks to meet the overall project goals. Responsibilities relating specifically to this task are to:

- Monitor and report the progress of work and ensure that project deliverables are completed on time and within budget
• Ensure adherence to the quality requirements of the contract, specifications of the delivery order, and the CQC Plan
• Ensure that all task activities are conducted in a safe manner in accordance with the HSPA (Appendix D) and Section 3.1 of this Work Plan.
• Serve as the primary contact between Holloman AFB and Foster Wheeler for actions and information related to the task
• Communicate with USACE regarding task status and monitoring.

5.2.2 Contractor Quality Control Systems Manager
The CQC Systems Manager reports to the Delivery Order Manager (DOM) and is responsible for overall management of contractor quality control. Normally, the CQC Systems Manager will be on site at all times during construction; in the event of this individual’s absence, a qualified individual will be appointed to serve as his/her replacement for periods of time not to exceed 2 weeks at any one time and not to exceed 30 work days during the project. The requirements for the alternate will be the same as for the designated CQC Systems Manager.

The CQC Systems Manager will maintain current records of QC operation, activities, and tests performed, including subcontractors’ and suppliers’ work. Specific duties of the CQC Systems Manager as they apply to this project are to:

• Provide and maintain an effective QC system for all construction activities
• Perform QC activities to ensure conformance with authorized policies, project drawings, technical and contract specifications, and sound practices
• Inspect the work performed and materials used each day for compliance with the standard operating procedures, Work Plan, and specifications and prepare the DQCR
• Ensure that required phases of inspection (preparatory, initial, and completion) are implemented for all definable phases of construction
• Provide oversight of all subcontractors’ work and testing
• Provide document control as discussed in Section 5.5 of this Work Plan, Document Control
• Keep as-constructed project drawing continuously updated
• Photograph work activities daily
• Schedule and manage all submittals, including those of subcontractors (see Section 5.6 of this Work Plan, Submittals)
• Ensure that all required tests and inspections are performed and the results reported (recommend retesting when necessary)
Attend required meetings, including field review meetings

Review all submittals in detail and verify that they are correct and in strict compliance with contract documents

Review and issue FCRs

Stop work that is not in compliance with the contract

Document quantity of earthwork performed, quantities of segregated materials, soil delivered, and debris disposed of on a daily basis

Confirm elevation of the final cover, the quantity of placement material, and the total number of truck deliveries

5.2.3 Site Construction Manager

The primary responsibility of the Site Construction Manager is the timely completion of all field activities. The duties of the Site Construction Manager as they apply to the project include the following:

- Establishing a field base for operations and mobilizing subcontractors and Foster Wheeler personnel
- Coordinating work activities of subcontractors and Foster Wheeler personnel and ensuring that all personnel adhere to the administrative and technical requirements of the project
- Procuring equipment for work crews and health and safety personnel
- Coordinating logistics of all components of on-site tasks, including all personnel and equipment
- Coordinating all personnel involved in task activities, including obtaining support services
- Administering site access
- Maintaining work site, vehicles, and equipment
- Evaluating relevant documents and permits for validity and current status
- Acquiring necessary permits, licenses, and rights-of-way
- Preparing weekly status reports and estimating future scheduling needs
- Coordinating, preparing, and completing all required field reports

5.2.4 Environmental Safety Specialist

The ESS is responsible for overall management of contractor health and safety on this project, and is also the Site Construction Manager. Normally, the ESS will be on site at all times during construction. In the event of this individual’s absence, a qualified individual will be appointed to
serve as his/her replacement, for periods of time not to exceed 2 weeks at any one time and not to exceed 30 work days during the project. The requirements for the alternate will be the same as for the designated ESS.

The duties of the ESS as they apply to this project include the following:

- Conducting site-specific health and safety training
- Ensuring daily health and safety meetings are conducted
- Investigating all accidents and incidents
- Maintaining site health and safety records
- Conducting site audits

5.2.5 **Senior UXO Supervisor**

The SUXOSUP will have extensive UXO/EOD experience. The SUXOSUP is responsible for the successful early detection and identification of potential problem areas and for instituting corrective measures to accomplish the scope of work. The SUXOSUP reports to the Site Construction Manager. The SUXOSUP has stop work authority and is responsible for all explosive safety matters. Qualification certificates are maintained on file at the corporate office and on site.

5.2.6 **Heavy Equipment Operators**

Equipment operators are trained in the use of backhoes and front-end loaders. Operators need not be UXO Specialists. Prior to beginning work efforts, they will be briefed on UXO safety procedures and basic UXO recognition features. During excavation and screening operations, the operators will be under the direct control of the SUXOSUP.

5.2.7 **Subcontractors and Vendors**

Subcontractors and vendors, if required, shall conform to the Foster Wheeler CQC Plan and any other approved procedures or contract provisions. Subcontractors are responsible for field inspection of their construction and operating activities. Foster Wheeler will monitor, oversee, and make on-site observations and inspections of work in progress to determine whether subcontractor’s work is in accordance with the CQC Plan. Subcontractor personnel are
responsible for maintaining a daily log of their project activities and for providing information to
the CQC Systems Manager that is needed to complete the DQCR.

5.3 CONSTRUCTION INSPECTION PLAN
Contractor QC ensures that all construction, including construction completed by subcontractors
and suppliers, complies with the requirements of the contract. The Construction Inspection Plan
establishes the measures required to verify both the quality of work performed and compliance
with specified requirements, including the inspection of materials and workmanship before,
during, and after each definable feature of work. Definable features for this project are listed in
Section 3, Scope of Work/Project Implementation Plan, and are detailed in the Technical
Specifications (Section 3.2 of this document) and the SAP (Appendix E of this document).

Inspection requirements defined in the following subsections are adequate to cover all
construction operations, including on-site and off-site fabrication, and are keyed to the proposed
construction sequence. Contractor QC includes implementation of the following three control
phases for all aspects of the work specified:

- Preparatory phase
- Initial phase
- Completion phase

5.3.1 Preparatory Phase Inspections
The CQC Systems Manager will conduct preparatory phase inspections prior to starting the
definable features of work. At a minimum, these inspections will include the following:

- A review of each paragraph of applicable specifications
- A review of the construction documents
- A check to ensure that all materials and/or equipment have been tested, submitted, and
  approved
- A check to ensure that provisions have been made for required control inspection and testing
- An examination of the work area to ensure that all required preliminary work has been
  completed and is in compliance with the contract
Holloman Air Force Base
Tornado Crash Sites Construction Work Plan

Section 5—Contractor Quality Control Plan

- A physical examination of required materials, equipment, and sample work to ensure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored
- A review of the appropriate Activity Hazard Analysis to ensure that safety requirements are met
- A discussion of procedures for constructing the work, including repetitive deficiencies
- Documentation of construction tolerances and workmanship standards for that phase of work
- A check to ensure that the portion of the CQC Plan for the work to be performed has been accepted by USACE or its designee

The Base RPM and USACE Project Engineer will be notified at least 48 hours in advance of any preparatory phase activity. This phase will include a meeting the CQC Systems Manager conducts that will be attended by other responsible construction personnel.

The preparatory phase meetings will be documented by item on the Inspection Checklist, as shown on Figure 5-1. Preparatory inspections will be reported on the DQCR with the checklist included as an attachment. An example of the DQCR is included as Figure 5-2.

5.3.2 Initial Phase Inspection
An initial inspection will be performed at the beginning of a definable feature of work and will include the following:
- A check of preliminary work to ensure that it is in compliance with contract requirements
- Review of the Inspection Checklist documenting results of the preparatory meeting
- Verification of full contract compliance, including required control inspection and testing
- Establishment of the required level of workmanship and verification that it meets required standards
- Resolution of all differences
- A check of safety requirements to include compliance with, and upgrading of, the safety plan and activity hazard analysis
- A review of the activity analysis with project personnel

The Base RPM and the USACE Project Engineer will be notified at least 48 hours in advance of any initial phase activity. The CQC Systems Manager will document initial inspections for each item using the Inspection Checklist (Figure 5-1) and attach this documentation to the DQCR. The
Figure 5-1
Inspection Checklist

<table>
<thead>
<tr>
<th>ITEM: Contract Specifications:</th>
<th>DATE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATERIAL</td>
<td>QTY</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>STORAGE CONDITIONS:</td>
<td></td>
</tr>
<tr>
<td>SUBMITTALS:</td>
<td></td>
</tr>
</tbody>
</table>
Figure 5-1 (Concluded)

Inspection Checklist

MATERIAL/EQUIPMENT CERTIFICATIONS:

PREPARATORY SITE CONDITIONS:

CONTRACT VARIANCE:

COMMENTS:

ATTENDEES:

QC REPRESENTATIVE DATE

QCSM DATE

 PROJECTS/HOL/TORNADO/TORNADO_WORKPLAN_FINAL03/09/00  5-8  March 2000
Daily Quality Control Report

Figure 5-2

1. Contract/Subcontractors and Area of Responsibility:

<table>
<thead>
<tr>
<th>NUMBER</th>
<th>TRADE</th>
<th>HOURS</th>
<th>EMPLOYER</th>
<th>LOCATION/DESCRIPTION OF WORK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Operating Plant or Equipment (not hand tools):

<table>
<thead>
<tr>
<th>Plant/Equipment</th>
<th>Date of Arrival/Departure</th>
<th>Date of Safety Check</th>
<th>Hours Used</th>
<th>Hours Idle</th>
<th>Hours Repair</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 5-2 (Continued)
Daily Quality Control Report

3. Work Performed Today: (Indicate location and description of work performed by prime and/or subcontractors. When network analysis is used, identify work by NAS activity number).

4. Control Activities Performed:
   - Preparatory Inspections: Identify feature of work and attach minutes.
   - Initial Inspections: Identify feature of work and attach minutes.
   - Follow-up Inspections: List inspections performed, results of inspection compared to specification requirements, and corrective actions taken when deficiencies are noted.

5. Tests Performed and Test Results: Identify test requirement by paragraph number in specifications and/or sheet number in plans.

6. Material Received: Note inspection results and storage provided.
Holloman Air Force Base
Tornado Crash Sites Construction Work Plan
Section 5—Contractor Quality Control Plan

Figure 5-2 (Continued)
Daily Quality Control Report

Page 3 of 3

7. Submittals Reviewed:

<table>
<thead>
<tr>
<th>(a) Submittal No.</th>
<th>(b) Spec/Plan Reference</th>
<th>(c) By Whom</th>
<th>(d) Action</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Off-Site Surveillance Activities, Including Action Taken:


10. Remarks: Instructions received or given. Conflict(s) in plans and/or specifications. Delays encountered.

Contractor's Verification: On behalf of the Contractor, I certify this report is complete and correct, and all materials and equipment used and work performed during this reporting period are in compliance with the contract plans and specifications, to the best of my knowledge, except as may be noted above.

CQC SYSTEMS MANAGER                     DATE
exact location of the initial phase inspection will be indicated for future reference and to allow for comparison with completion inspections. An initial phase inspection will be conducted each time a new crew arrives on site or any time specified quality standards are not being met.

5.3.3 Completion Phase Inspection
The CQC Systems Manager will conduct a detailed inspection when all of the work or an increment of work is deemed to be substantially complete. The Base RPM and the USACE Project Engineer may also participate and will be notified in advance of the inspection date. The work will be inspected for conformance to plans, specifications, quality, workmanship, and completeness. If required, the CQC Systems Manager will prepare an itemized list of work not properly completed, inferior workmanship, or work that does not conform to plans and specifications. The punch list will also include outstanding administrative items, such as (as-constructed) drawings and the Operations and Maintenance manual (if applicable). The list will be included in the QC documentation and submitted to the Base RPM or designee and the USACE Project Engineer. An estimated date for correction of each deficiency, which will be scheduled within 5 working days after the conduct of the inspection, will be included. The completion inspection will be documented on the Inspection Checklist, shown in Figure 5-1, and attached to the DQCR.

5.3.4 Inspection Documentation
The CQC Systems Manager is responsible for maintaining the inspection records. Inspection records will be legible and clear and will provide all necessary information to verify that the items or activities inspected conform to the specified requirements. In the case of nonconforming conditions, the inspection records will provide evidence that the conditions were brought into conformance or otherwise accepted by Foster Wheeler and the USACE Project Engineer.

All inspection records will be made available to Holloman AFB and USACE through the Foster Wheeler Site Construction Manager. Inspection records, including inspection reports and deficiency reports and re-inspections of corrective actions, will be documented.
5.4 TESTING

General requirements for testing to be implemented for this project are included in the Technical Specifications (Section 3.2 of this Work Plan) and the SAP (Appendix E of this document).

5.4.1 Testing Procedures (Other Than Chemical Sampling and Analysis)

The CQC Systems Manager shall verify that all tests specified or required in the Technical Specifications are performed. These tests ensure that control measures are adequate to provide a product conforming to contract specifications. The following test preparation and performance activities are the responsibility of the CQC Systems Manager:

- Verifying that testing procedures comply with contract requirements
- Verifying that facilities and testing equipment are available and comply with testing standards
- Checking test instrument calibration data against certified standards
- Verifying that recording forms and test identification control number systems have been prepared

5.4.2 Documentation

All test results, both passing and failing, will be recorded on the DQCR for that particular day. Specification paragraph reference, location where tests were taken, and sequential control number identifying the test will be given. The actual test reports may be submitted later to the USACE Project Engineer. An information copy of tests performed by off-site facilities will be provided directly to the USACE Project Engineer.

5.4.3 Laboratory Services

Laboratory services will be provided by an independent, USACE-approved, testing laboratory, which will be selected and qualified in accordance with recognized industry and applicable project requirements.
5.5 DOCUMENT CONTROL

Preparation, review, approval, and issuance of documents affecting quality will be controlled to the extent necessary to ensure that the documents meet specified requirements. Project documents to be controlled include the following:

- Inspection documentation
- DQCRs
- Test results
- Nonconformance reports
- FCRs
- Survey documentation

All of these documents are discussed in this Work Plan. Inspection documentation is discussed in Section 5.3, the Construction Inspection Plan; the DQCR is discussed in Section 5.5.1 below. Section 5.4—Testing, includes test results, and Section 5.7—Nonconformances, discusses Nonconformance Reports.

5.5.1 Daily Quality Control Report

The CQC Systems Manager will complete a DQCR to document construction activities covered by the CQC Plan. The DQCR will include the following information:

- Contractor/subcontractor(s) and their areas of responsibility
- Operating equipment with hours worked, idle, or down for repair
- Work performed that day, giving location, description, and by whom
- Test and/or control activities performed, with results and references to specifications/plan requirements, including the control phase (preparatory, initial, completion) and deficiencies (along with corrective action)
- Material received with statement as to its acceptability and storage
- Quantities of materials excavated, segregated, reused as backfill, and disposed of
- Submittals reviewed, with contract reference, by whom, and action taken
- Off-site surveillance activities, including actions taken
- Job safety evaluations stating what was checked, results, and instructions or corrective actions
- A list of instructions given/received and conflicts in plans and/or specifications
• Contractor’s verification statement
• Site visitors/purpose, deviations from plans, difficulties/resolution

The records will indicate a description of trades working on the project, the number of personnel working, weather conditions encountered, and any delays encountered. Both conforming and nonconforming features will be discussed. The report shall be furnished to the USACE Project Engineer and to Holloman AFB Managers, upon request, on the first work-day (or reasonably thereafter) following the date covered by the report, although reports need not be submitted for days on which no work is performed. At a minimum, one report shall be prepared and submitted for every 7 days of no work and on the last day of a no-work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work will summarize work for that day only. Reports will be signed and dated by the CQC Systems Manager and other appropriate personnel, including subcontractors responsible for completion of activities. The report from the CQC Systems Manager will include copies of test reports and copies of reports prepared by all subordinate QC personnel. A sample of the DQCR is included as Figure 5-2.

5.5.2 Conference Notes and Confirmation Notes
The Site Construction Manager, or designee, is responsible for preparing the reports of all conferences. Conference notes will be typed and the original report furnished to USACE within 5 days after the date of the conference for concurrence and subsequent distribution to all attendees. At a minimum, this report will include the following items:
• Date and place the conference was held
• List of attendees, including name, organization, and telephone number
• Written comments presented by attendees attached to each report
• Comments made during the conference and decisions affecting criteria changes
• Conference notes that augment the written comments

The Site Construction Manager or his designee will provide a record of all discussions, verbal directions, telephone conversations, etc., in which Foster Wheeler personnel or their representatives participated on matters relating to this contract and work. These records, entitled confirmation notices, will fully identify participating personnel, subject discussed, and any
conclusions reached. The DOM or designee will forward a reproducible copy of the confirmation notices to the USACE Project Engineer within 5 working days.

5.6 SUBMITTALS

Submittals will be scheduled, reviewed, and managed in accordance with this section.

Required submittals shall consist of the following types:

• Data—submittals that provide calculations, descriptions, or documentation of the work

• Instructions—preprinted material that describes the installation of a product, system, or material, including special notices and material safety data sheets concerning impedances, hazards, and safety precautions

• Schedules—tabular lists that show the location, features, or other pertinent information regarding products, materials, equipment, or components to be used in the work

• Statements—a required document to confirm the quality or orderly progression of a portion of the work by documenting procedures, acceptability of methods or personnel, qualifications, or other verifications of quality

• Reports—reports of inspections or tests, each properly identified, and an interpretation of results that includes a description of test methods and all results

• Certificates—a statement signed by an official authorized to certify on behalf of the manufacturer of a product, system, or material, attesting that the product, system, or material meets specified requirements. The statement must be dated after the award of this contract, must state the contractor's name and address, must name the project and location, and must list the specific requirements that are being certified

• Samples—samples, including both fabricated and unfabricated physical examples of materials, products, and units of work as complete units or as portions of units of work

• Records—documentation to record compliance with technical or administrative requirements

5.6.1 Preparation and Maintenance of Submittals

The CQC Systems Manager is responsible for preparing and maintaining all required project submittals.

5.6.2 Review of Submittals

The Task Manager is responsible for submittal reviews to ensure completeness, accuracy, and contract compliance. Any submittals requiring modifications or changes will be returned to the originating organization for correction and then resubmitted for review and approval by the Task Manager prior to acceptance. The Task Manager and the CQC Systems Manager will ensure that
all materials and equipment have been tested, submitted, and approved during the preparatory phase of the QC inspections; no construction activities will be performed prior to required approval of applicable submittals.

5.6.3 Execution
All required submittals must conform to the following guidelines:

- Units of weights and measures will match those used in the construction drawings
- Each submittal will be complete and in sufficient detail to allow determination of contract compliance
- The Task Manager and CQC Systems Manager will ensure that all items are checked prior to submittal
- Each submittal will be accompanied by a transmittal form certifying compliance with all contract requirements
- Proposed deviation from the contract requirements, plans, and specifications will be clearly identified
- Submittals will include items such as applicable drawings, descriptive literature, test reports, samples, Operations and Maintenance manuals, certifications, and warranties

5.6.4 Scheduling
Submittals of interrelated items or items forming a system are to be scheduled for coordination and submitted concurrently for review and approval. Certifications to be submitted with the pertinent drawings will be scheduled accordingly.

5.7 NONCONFORMANCES
Any work or materials not conforming to the Technical Specifications or contract requirements will constitute a nonconformance and will be identified, documented, and corrected. Documentation associated with all nonconformances will be included in the final closure report.

5.7.1 Control and Segregation
Any nonconforming equipment or materials will be controlled to prevent inadvertent use. These items will be clearly identified and segregated from acceptable items when practical.
5.7.2 Nonconformance Report

A Nonconformance Report, shown in Figure 5-3, will be completed for detected nonconformances, whether identified by USACE or by Foster Wheeler personnel. The report details the nonconforming condition, recommended corrective action(s), and disposition of the corrective action(s). The report will remain open until the nonconforming condition has been satisfactorily resolved and verified by the CQC Systems Manager.

Specific information included on the Nonconformance Report is as follows:

- Description of nonconforming item or activity
- Detailed description of nonconformance
- Referenced criteria
- Recommended disposition and corrective action to prevent recurrence (as applicable)
- Affected organization

5.7.3 Disposition

The disposition of Nonconformance Reports will include the necessary actions required to transform the nonconforming condition into an acceptable condition and may include reworking, replacing, retesting, or reinspecting. Implementation of the disposition may be done in accordance with the original procedural requirements, a specific instruction, or an FCR (Figure 5-4).

5.7.4 Corrective Actions

Upon detection of a nonconforming condition, the CQC Systems Manager will immediately take corrective action. Corrective action records will include ways to resolve the identified nonconforming conditions, the initial cause of adverse conditions, and methods and controls to prevent recurrence of the same or similar types of nonconformances. The CQC Systems Manager will monitor the corrective actions to verify that they have been properly implemented and accepted and that the Nonconformance Report has been closed.
**Figure 5-3**

Nonconformance Report

FOSTER WHEELER ENVIRONMENTAL CORPORATION
QUALITY ASSURANCE

**NONCONFORMANCE REPORT**

<table>
<thead>
<tr>
<th>REPORT NO. (1)</th>
<th>CLIENT OR PROJECT (2)</th>
<th>SUPPLIER, CONSTRUCTION QC OR CONTRACTOR (4)</th>
<th>P. O. NO. (5)</th>
<th>DRAWING NO/SPEC NO (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**I. DESCRIPTION OF NONCONFORMANCE** (7) (Items involved, Specifications, Code or Standard to Which Items Do Not Comply, Submit Sketch (If Applicable))

<table>
<thead>
<tr>
<th>NAME AND SIGNATURE OF PERSON REPORTING NONCONFORMANCE (8)</th>
<th>TITLE/COMPANY</th>
<th>DATE (9)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**II. RECOMMENDED DISPOSITION** (10) (Submit Sketch If Applicable)

<table>
<thead>
<tr>
<th>NAME AND SIGNATURE OF PERSON RECOMMENDING DISPOSITION (11)</th>
<th>TITLE/COMPANY</th>
<th>DATE (12)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**III. EVALUATION OF DISPOSITION BY FOSTER WHEELER ENVIRONMENTAL**

<table>
<thead>
<tr>
<th>REASON OF DISPOSITION (13)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**IV. CORRECTIVE ACTION** (14)  □ Required □ Not Required

<table>
<thead>
<tr>
<th>ENGINEERING</th>
<th>QUALITY ASSURANCE</th>
<th>CONSTRUCTION</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME (SIGNATURE)</td>
<td>NAME (SIGNATURE)</td>
<td>NAME (SIGNATURE)</td>
<td>NAME (SIGNATURE)</td>
</tr>
<tr>
<td>DATE</td>
<td>DATE</td>
<td>DATE</td>
<td>DATE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REJECTED</th>
<th>ACCEPTED</th>
<th>ACCEPTED WITH COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REJECTED</th>
<th>ACCEPTED</th>
<th>ACCEPTED WITH COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**V. VERIFICATION OF DISPOSITION**  □ REQUIRED □ NOT REQUIRED (16)

<table>
<thead>
<tr>
<th>(17) BY</th>
<th>SIGNATURE</th>
<th>TITLE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

PROJECTS/HOL/TORNADO/TORNADO_WORKPLAN_FINAL03/09/00  5-19  March 2000
FIGURE 5-4
Field Change Request

FOSTER WHEELER ENVIRONMENTAL CORPORATION
ENGINEERING PROCEDURES
DEVELOPING AND ISSUING ENGINEERING DOCUMENTS

<table>
<thead>
<tr>
<th>Project</th>
<th>Proj. No.</th>
<th>Field Change No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TO</td>
<td>DEPT</td>
<td>LOCATION</td>
</tr>
<tr>
<td>RE:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Drawing No……………………………Title………………………………………</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Spec No…………………………..Title………………………………………</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Other………………………………</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Description (Items involved, submit sketch if applicable)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

2. Reasons for Change (If from disposition of nonconformance report, list report number)

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

3. Recommended Disposition
   ? Minor Change
   ? Major Change

________________________________________________________________________
________________________________________________________________________

4. Resident Engineer (Signature) Date

________________________________________________________________________
________________________________________________________________________

5. Disposition
   • NOT APPROVED (Give Reason)
     • CONSIDERED MINOR CHANGE – Approved per Recommended Disposition-Design.
       Documents will not be normally revised; field to maintain as-built records
     • CONSIDERED MAJOR CHANGE – Action will be taken as prescribed on DCN

<table>
<thead>
<tr>
<th>Lead Discipline Engineer or Designee (Signature)</th>
<th>Date</th>
<th>Project Engineer or Designee (Signature)</th>
<th>Date</th>
</tr>
</thead>
</table>

Project Engineer signs and returns LDE for transmittal to Resident Engineer with copies to:

Project Manager

Project Supt.

Project Files

March 2000
5.8 MANAGEMENT INSPECTIONS

In addition to the required QC field inspections, an internal management inspection may be performed and will check for the following:

- Possession and use of approved procedures, standards, and Technical Specifications
- Conformance with appropriate procedures, standards, and instructions
- Thoroughness of performance
- Identification and completeness of documentation generated during performance

All internal management inspections will be coordinated through the Site Construction Manager.
6.0 PROJECT MANAGEMENT PLAN
This section presents the project schedule and identifies key personnel involved in the construction phase of the project.

6.1 PROJECT SCHEDULE
The GAF Tornado Crash Sites Construction Schedule is a separate submittal and will be finalized and submitted to USACE, Holloman AFB, and appropriate personnel during the preconstruction meeting.

6.2 PROJECT PERSONNEL
An organization chart for this project is presented in Figure 6-1. A brief summary of key Foster Wheeler project team members and their responsibilities is as follows:

- Derek Johnson, P.E. Mr. Johnson is the DOM for Holloman AFB. He is responsible for overseeing Foster Wheeler's performance of all tasks for Holloman AFB.
- Charley Haddox—Mr. Haddox is the Task Manager. He is responsible for the direction, execution, and successful completion of project tasks.
- Scott Jones—Mr. Jones is the Contract Administrator for the Southwest TERC Program. In this role, he is responsible for addressing program contractual issues.
- James Morning—Mr. Morning is the Site Construction Manager, the CQC Systems Manager, and ESS for this project. He is responsible for the implementation of the work in accordance with performance, cost, and schedule goals, as well as the overall coordination of the project. He is also responsible for assisting site personnel in implementation of the HSPA (Appendix D of this Work Plan) and performing health and safety-related duties. As the CQC Systems Manager, Mr. Morning is responsible for the following:
  - Implementing the QC system during the remedial activities
  - Overall management of project QC
- George Bridgeman—Mr. Bridgeman is the SUXOSUP. His responsibilities include the following:
  - Ensuring successful performance of the field team and the early detection and identification of potential UXO problem areas
  - Assisting with the location and identification of UXO
  - Performing UXO safety and escort duties
Figure 6-1
Tornado Crash Sites Project Organization Chart

Holloman AFB
49 CES/CEVR Project Manager
Jose Gallegos

USACE
Omaha District Project Manager-HAFB
Tom Zink, P.G.

Delivery Order Manager
Derek Johnson, P.E.

Task Manager
Charley Haddox

Home Office Engineering Staff

Site Construction Manager/Site Environmental Safety Specialist/
CQC Systems Manager
James Morning

Regional ESQ* Manager

Senior UXO Specialist
George Bridgeman
Craft / Operators
Subcontractors
Sample Coordinator
Dave Rizzuto
Procurement Home Office Staff

*Environmental, Safety, and Quality Group: includes
Regulatory Compliance, Health and Safety, and Quality Control
• Dave Rizzuto—Mr. Rizzuto is the Indian Fire and Safety sample coordinator responsible for supporting the ESS and organizing the sampling events.

• Craig O’Rourke—As Regional Regulatory Compliance Specialist, Mr. O’Rourke is responsible for addressing regulatory compliance issues, should they arise.

• Roger Margotto, Certified Industrial Hygienist—Mr. Margotto is the Project Environmental Safety Manager and will assist site personnel in resolving health and safety issues that may arise during the course of the project, review and approve changes to the HSPA, and conduct site health and safety inspections as necessary.

6.3 PROJECT MEETINGS

Project meetings will be held at the site and will be supplemented by biweekly (or less frequent) teleconferences. The agenda for these meetings may include the following items:

• Review of work progress
• Field observations, problems, and conflicts
• Problems that affect the construction schedule and proposed corrective actions
• Review of off-site delivery schedules
• Revisions to construction schedule
• Forecast of progress for the following week
• Review of submittal schedule
• Review of quality control/health and safety programs
• Pending changes and substitutions
• Review of proposed changes for effects on construction, construction completion date, and other construction activities
• Any other business

6.4 DATA MANAGEMENT

The types of data to be managed for this project include field and laboratory data. All data collected during field operations will be documented and maintained in the project files. Field data will be reviewed to ensure that proper procedures were implemented and appropriate documentation is available.

Data generated by the analytical laboratory will be documented and provided in hardcopy data package deliverables. The analytical data will be validated for data quality and usability by the
Project Chemist, or designee, and will be provided in the final report. The analytical data will be maintained in the project files.

6.5 DOCUMENT CONTROL
Document control is addressed in detail in Section 5.5 of this Work Plan.

6.6 REPORTS
Reports and submittals are discussed in Section 5.6 of this Work Plan.
7.0 REFERENCES

Foster Wheeler (Foster Wheeler Environmental Corporation)

New Mexico State Highway and Transportation Department.
1994 Standard Specifications for Highway and Bridge Construction.
Appendix A

Site Location and Construction Drawing
Figure A-1
Tornado Crash Site 1

Date: 1-27-00
Project No: 5155-0027

Drawn By: L.Gamble
File Name: E489108122.dwg

NOT TO SCALE
Figure A-2
Tornado Crash Site 2

Date: 1-27-00
Project No: S155.0027
Drawn By: L. Gamble
File Name: ENC15001.dwg
Appendix B

Letter From German Air Force

and Holloman Air Force Base
To: Jose Gallegos
From: Yasmin Dennig
Re: Materials in the Tornado Aircrafts

Per your request, the following information is being provided for your, and your contractor's, use. To the best of our knowledge here at the German Air Force, the tornadoes that crashed recently near Carlsbad, did not contain any of the following:

- Hazardous Materials
- Explosives
- Chaf

We do not expect the above information to change, but should we learn anything different, we will notify you immediately. Should you require any further information, please do not hesitate to call me.

cc: Lt. Col. Freundenfeld
DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 49TH FIGHTER WING (ACC)
HOLLOMAN AIR FORCE BASE, NEW MEXICO

1 Nov 99

MEMORANDUM FOR 49 CES/CFV
ATTENTION: MR GALLEGOS

FROM: 49 ADOS/SGGFB

SUBJECT: Radioactive Material in German Air Force Tornado Aircraft Crash Debris

1. As requested by your office, this letter is verification that the German Air Force (GAF) Tornado aircraft does not contain any significant radioactive materials. Therefore the recovery and disposal of the crash debris from the two GAF Tornado aircraft that crashed on 24 Sep 99 near Carlsbad NM will not pose any problems due to the presence of radioactive material.

2. Historical information provided by the GAF during a Tornado aircraft crash in Jun/Jul 1997 to Capt Randy Smith (Bioenvironmental Engineering Element Chief, 1995-1999) confirms that absence of any significant radioactive material on the Tornado aircraft.

3. Please call me at extension 7938 if you have any questions or require further assistance with any issues concerning the recovery and disposal of the Tornado aircraft crash debris. Thank you.

DONALD S. JOHNSTON, Capt, USAF, BSC
Bioenvironmental Engineering Element Chief

Golden legacy, Boundless Future... Your Nation's Air Force
Appendix C

Right-of-Entry Permit
NEW MEXICO STATE LAND OFFICE
Ray B. Powell, Commissioner of Public Lands
New Mexico State Land Office Building
P.O. Box 1148, Santa Fe, NM 87504-1148

RIGHT OF ENTRY PERMIT
CONTRACT NO. 348

1. RIGHT OF ENTRY PERMIT.
This permit is hereby issued under the authority established by Section 19-1-2 NMSA (1985).
Therefore, and in consideration of and subject to the terms, covenants, conditions, agreements,
obligations and reservations contained in the permit and all other existing rights, the
Commissioner of Public Lands, New Mexico State Land Office, State of New Mexico,
hereinafter called "COMMISSIONER," grants to Department of the Air Force of
Headquarter 49th Fighter Wing (ACC) Holloman Air Force Base, New
Mexico Attn: Howard E. Moffitt hereinafter called "PERMITTEE," authorized use
of a specific tract(s) of state trust land described in this permit.

2. TERM AND LAND DESCRIPTION.
Right of entry is granted for a term of 7 months commencing November 5, 1999 to May 31,
2000 to the following state lands: 2 Crash Sites: Site 1 SW4NW4SE4 of Section 31,
Township 22 South, Range 23 East. Site 2 SW4NE4SE4 of Section 16, Township 22
South, Range 23 East.

3. FEE.
Five Hundred Dollars ($500.00)

4. PERMITTED USE.
Permitted use is for the purpose of: Clean up and site restoration of two German Air Force
Crash Sites. STIPULATIONS: 1. Any new roads established due to the clean up process
will be reclaimed. 2. Grazing lessee will be contacted prior to disturbing any
improvements. (Grazing Lessee for Section 31 is Daniel B. Murray of P. O. Box 129,
Carlsbad, NM 88221, Section 16 is Hugh M. Kincaid of Queen Route, Carlsbad, NM
88220) 3. Area will be restored to its original state as near as possible prior to the crash.
4. Please contact our Land Use Specialist, Jim Carr at (505) 885-1323 and our
Environmental Specialist Mike Matush at (505) 827-5096 upon completion of the clean up
so they may view the results. The granting of this permit does not allow access
across private lands.

5. IMPROVEMENTS.
No improvements shall be placed on the premises without the prior written consent of the
Commissioner.

6. RESERVATIONS.
Commissioner reserves the right to execute permits on the land granted by this permit for mining purposes and for the extraction of oil, gas, salt, geothermal resources, and other mineral deposits therefrom and the right to go upon, explore for, mine, remove and sell same. Commissioner further reserves the right to sell or dispose of natural surface products of said lands and to grant such other right-of-way and easements as provided for by law.

7. COMPLIANCE WITH LAWS.
Permittee shall at its own expense comply fully with and be subject to all regulations, rules, ordinances, and requirements of the Commissioner including, but not limited to the Cultural Properties Act, NMSA 1978 as amended. It is illegal for any person or his agent to appropriate, excavate, injure, or destroy any historic, prehistoric ruin or monument, or any object of historical, archaeological, architectural, or scientific value situated on lands owned or controlled by the State Land Office without a valid permit issued by the Cultural Properties Review Committee and approved by the Commissioner of Public Lands.

8. HOLD HARMLESS.
Permittee shall have, save, and hold harmless, indemnify and defend Commissioner and the State of New Mexico, and their agent or agents, in their official and individual capacities, of and from any and all liability, losses, or damages arising out of or alleged to arise out of or indirectly connected with the operations of Permittee under this permit or on the Commissioner's premises or arising out of the presence on the Commissioner's premises of any agent, contractor or subcontractor of Permittee.

9. AMENDMENT.
This permit shall not be altered, changed or amended except by an instrument in writing executed by Commissioner and Permittee.

10. WITHDRAWAL.
Commissioner reserves the right to withdraw any or all of the land authorized for use under this permit. If applicable, Permittee shall vacate the acreage specified within 30 days after receipt of written notification of withdrawal from the Commissioner.

11. CANCELLATION.
The violation by Permittee of any of the terms, conditions or covenants of this permit or the nonpayment by Permittee of the fees due under this permit shall at the option of the Commissioner be considered a default and shall cause the cancellation of this permit 30 days after Permittee has been sent written notice of such.

12. PRESERVE AND PROTECT.
The Permittee agrees to preserve and protect the natural environmental conditions of the land
encompassed in this permit, and to take those reclamation or corrective actions that are accepted soil and water conservation practices and that are deemed necessary by the Commissioner to protect the land from pollution, erosion, or other environmental degradation.

13. RECLAMATION.
The Permittee agrees to reclaim those areas that may be damaged by activities conducted thereon.

14. SPECIAL INSTRUCTIONS AND OR RESTRICTIONS.
1. No off road traffic allowed
2. No wood collection or tree cutting allowed.
3. Disturbing, dislodging, damaging, defacing, destroying or removing historical archaeological, paleontological or cultural sites or artifacts is prohibited.
4. Disturbing, dislodging, damaging, defacing, destroying any improvement, fixture, item, object or thing placed or located in, under or upon the land is prohibited.
5. Entries to lands are limited to those State Lands with public access.
6. Any other activities not listed are not allowed unless prior written approval from the Commissioner of Public Lands is granted.

WITNESS the hands and seals of PERMITTEE and COMMISSIONER on the day and year first above written.

[Signatures]

PERMITTEE

[Signature]

COMMISSIONER OF PUBLIC LANDS

Telephone (35) 675-3071

DEC 14 1995 08:20
ACKNOWLEDGMENTS

INDIVIDUAL

STATE OF NEW MEXICO

COUNTY OF Otero

The foregoing instrument was acknowledged before me this 10th day of November 1994.

My Commission Expires: Feb 2003

NOTARY PUBLIC

CORPORATION

STATE OF NEW MEXICO

COUNTY OF

The foregoing instrument was acknowledged before me this __________ day of __________, 19 by ________________, whose title is ________________, a ________________ corporation, on behalf of said corporation.

My Commission Expires: ________________

NOTARY PUBLIC

Re: Right-of-Entry No. ROE-348
Appendix D
Health And Safety Plan Addendum
SITE-SPECIFIC SAFETY AND HEALTH ADDENDUM
FOR
GERMAN AIR FORCE TORNADO CRASH SITES CLEANUP
HOLLOMAN AIR FORCE BASE, NEW MEXICO

Prepared for:
49 CES/CEVR
Holloman Air Force Base, NM
and
HQ ACC/CEV
Langley Air Force Base, VA

Prepared by:
Foster Wheeler Environmental Corporation
143 Union Boulevard, Suite 1010
Lakewood, Colorado 80028-1824

Under Contract No. DACW45-94-D-0003
Delivery Order 27, Work Authorization Directive 1
U.S. Army Corps of Engineers
Omaha District
Omaha, Nebraska

February 2000
TABLE OF CONTENTS

1.0 INTRODUCTION .................................................................................................................. 1
2.0 KEY PERSONNEL AND RESPONSIBILITIES ................................................................. 1
3.0 PROJECT DESCRIPTION ..................................................................................................... 1
4.0 HAZARD ANALYSIS .......................................................................................................... 2
5.0 TRAINING .......................................................................................................................... 3
6.0 WORK ZONES, PERSONNEL PROTECTION, AND COMMUNICATIONS .................. 4
7.0 MONITORING AND MEDICAL SURVEILLANCE ............................................................ 4
8.0 SAFETY CONSIDERATIONS FOR SITE OPERATIONS .................................................. 4
9.0 DECONTAMINATION ......................................................................................................... 4
10.0 EMERGENCY RESPONSE PLAN ..................................................................................... 5
11.0 REFERENCES .................................................................................................................... 6

Attachment 1 Activity Hazard Analysis
Attachment 2 Foster Wheeler Hydrogen Sulfide Gas Awareness Training Program
   (Indian Fire and Safety Manual)
Attachment 3 Hospital Route Maps
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFB</td>
<td>Air Force Base</td>
</tr>
<tr>
<td>CPR</td>
<td>Cardiovascular Pulmonary Resuscitation</td>
</tr>
<tr>
<td>CIH</td>
<td>Certified Industrial Hygienist</td>
</tr>
<tr>
<td>EOD</td>
<td>Explosive Ordnance Disposal</td>
</tr>
<tr>
<td>EMR</td>
<td>Emergency Medical Response</td>
</tr>
<tr>
<td>ESS</td>
<td>Environmental Safety Specialist</td>
</tr>
<tr>
<td>GAF</td>
<td>German Air Force</td>
</tr>
<tr>
<td>H₂S</td>
<td>hydrogen sulfide gas</td>
</tr>
<tr>
<td>OHST</td>
<td>Occupational Health and Safety Technician</td>
</tr>
<tr>
<td>PCS</td>
<td>petroleum-contaminated soil</td>
</tr>
<tr>
<td>PPE</td>
<td>personal protective equipment</td>
</tr>
<tr>
<td>SAP</td>
<td>Sampling and Analysis Plan</td>
</tr>
<tr>
<td>SOP</td>
<td>standard operating procedure</td>
</tr>
<tr>
<td>UXO</td>
<td>unexploded ordnance</td>
</tr>
</tbody>
</table>
1.0 INTRODUCTION
This Site-Specific Safety and Health Addendum addresses potential health and safety hazards for the Tornado Crash Sites Cleanup project and closure sampling in southeastern New Mexico, near Carlsbad. The sites are located on state-owned land leased to local ranchers and oil companies. This Addendum should be used in conjunction with the Final Basewide Health and Safety Plan (Foster Wheeler Environmental Corporation 1995) to provide the health and safety requirements and procedures applicable to this project. This Addendum has been prepared using information contained in the Holloman AFB F-4E Crash Site Health and Safety Plan Addendum and Work Plan (Foster Wheeler Environmental Corporation 1999).

2.0 KEY PERSONNEL AND RESPONSIBILITIES

<table>
<thead>
<tr>
<th>Name</th>
<th>Responsibility</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Derek Johnson, P.E.</td>
<td>Delivery Order Manager</td>
<td>505-878-8905</td>
</tr>
<tr>
<td>James Morning, OHST</td>
<td>Site Construction Manager/Environmental Safety Specialist (ESS)</td>
<td>505-479-2668 (cellular)</td>
</tr>
<tr>
<td>Charley Haddox</td>
<td>Task Manager</td>
<td>303-980-3533</td>
</tr>
<tr>
<td>Roger Margotto, CIH</td>
<td>Project Environmental Safety Manager</td>
<td>714-444-5534</td>
</tr>
<tr>
<td>Pat Saveall</td>
<td>Unexploded Ordnance (UXO) Supervisor/ESS</td>
<td>TBD</td>
</tr>
<tr>
<td>Dave Rizzuto</td>
<td>Indian Fire Safety Sample Coordinator</td>
<td>505-479-0576</td>
</tr>
<tr>
<td>Jose Gallegos</td>
<td>Holloman Air Force Base (AFB) Project Manager</td>
<td>505-572-5395</td>
</tr>
<tr>
<td>Tom Zink</td>
<td>USACE</td>
<td>402-221-7711</td>
</tr>
</tbody>
</table>

3.0 PROJECT DESCRIPTION
The Tornado Crash Sites cleanup requires aircraft debris removal and off-site disposal, excavation and off-site disposal of petroleum-contaminated soil (PCS), and confirmation sampling. On 24 September 1999, at approximately 1820 hours, two German Air Force (GAF) Tornado aircraft collided approximately 25 miles west of Carlsbad, New Mexico. This area
consists of open rangeland used for cattle grazing and oil field production. The aircraft each had approximately 4,125 pounds (750 gallons) of JP-8 jet fuel on board.

The affected area consists of two debris sites. At Site 1 the fuel-contaminated soil and burn area is approximately 120 ft by 50 ft wide and 4–6 inches deep; the depth of contamination in the crater is unknown. At Site 2 the contaminated soil and burn area is approximately 250 ft by 85 ft wide and 6–10 inches deep. Site 2 is located on a rocky hillside next to a dry ditch where a small pool of fuel appears to have collected before burning. As at Site 1, the depth of contamination is unknown. The crash sites are in an isolated semi-desert area, approximately 145 miles from Holloman AFB.

4.0 HAZARD ANALYSIS

In addition to the chemical, physical, and biological hazards discussed in Attachment 1, Activity Hazard Analysis, field team members must be aware of the following:

**Hillsides/Slopes** – Site 2, located on a rocky hillside with an approximate 3:1 slope, poses an additional hazard for heavy equipment operations and increased risk of slips, trips, and falls for personnel. These hazards are addressed in the Activity Hazard Analysis, Attachment 1.

**Unexploded Ordnance (UXO)** – The sites have been cleared by Holloman AFB Explosive Ordnance Disposal (EOD) teams. The sites will also be inspected by Foster Wheeler UXO personnel prior to conducting sampling activities. In the event that UXO are discovered on site, the field crew will stop work, evacuate the area, and contact the Holloman AFB EOD unit for removal.

**Hydrogen Sulfide Gas (H₂S)** – Both sites are within close proximity to oil producing wells and are subject to release of hydrogen sulfide (H₂S) gas. Therefore, H₂S monitoring and training of workers in the hazards associated with H₂S gas will be conducted.

**Radioactive Metal Debris** – The GAF and the Holloman AFB have verified in two separate letters that neither GAF Tornado aircraft contained any significant radioactive
material. Therefore, no radiation hazards are anticipated at the sites. However, a field screening instrument such as a Geiger Mueller counter will be used to screen any remaining surface debris prior to soil sampling. The Construction Manager/ESS will perform a radiation safety survey to obtain the background level and determine if action levels are exceeded. In the event that radiation levels exceeding above background levels are measured, additional health and safety measures will be necessary including an addendum to this plan, training, and monitoring.

**Equipment** – Heavy equipment including an excavator, backhoes, and road vehicles will be used on site. Field equipment will be refueled daily using a 110-gallon tank mounted on a trailer. The fueling vehicle is placarded and equipped with static lines, drip pans, and a spill kit capable of containing small spills that may occur during refueling. Site access roads will be improved prior to site activities to ensure safe access for all vehicles and equipment. In addition, a water truck will be used for dust control along access roads and compaction at the site. Additional information is included in the Activity Hazard Analysis, Attachment 1.

### 5.0 TRAINING

All field personnel working on the Tornado Crash Sites will be experienced general construction workers and will not be required to have Occupational Safety and Health Administration (OSHA) 40-Hour Hazardous Waste Worker training. The PCS does not qualify as hazardous waste; therefore, nontrained personnel may conduct site activities. However, there will be at least two persons trained in first aid and cardiovascular pulmonary resuscitation (CPR) present on site. If two or more work crews are split geographically, then each team must have at least two first aid and CPR trained personnel.

Field personnel shall attend site-specific training prior to the start of field activities. In addition, the UXO supervisor will provide specific training to personnel.

Attachment 2 to this Addendum includes the H₂S Awareness Training Manual provided by Indian Fire and Safety, Inc. Per this manual, all personnel shall be trained on the following:
• Odor Recognition – Rotten Eggs
• Avoidance – Avoid low lying areas (gases stay in low areas during cooler weather)
• Action Levels
• Biological Effects
• Postings
• Personnel Monitoring
• Exposure Limits
• Site and Project Related Activities

6.0 WORK ZONES, PERSONNEL PROTECTION, AND COMMUNICATIONS
Field operations may require more than one field crew working simultaneously. All work zones will be kept clear of slip, trip, and fall hazards by practicing good housekeeping procedures. Each work crew will have appropriate first aid kits, fire extinguishers, and emergency medical information included in this plan located on site. At least one cellular telephone will be provided for each crew. All cellular telephones have been tested prior to work activities to ensure they provide proper coverage in the area to contact emergency personnel. Work crews will be provided with both analog and digital cellular telephones to provide the most complete coverage available. In the event that cellular communications are erratic or inadequate, an alternative communication plan must be established immediately. All site personnel will be familiar with hand signals used during heavy equipment operations.

7.0 MONITORING AND MEDICAL SURVEILLANCE
All personnel are involved in medical surveillance programs and will have current medical clearance to work on site.

8.0 SAFETY CONSIDERATIONS FOR SITE OPERATIONS
Equipment hazards associated with test pit excavation on rocky, sloped hillsides and potential slip, trip, and fall hazards to personnel working at Site 2 pose the greatest hazards for this project. Personnel will clear all work areas of potential impalement objects. Heavy equipment will
operate up and down slopes and not across them, to avoid tipping hazards. Additional information related to these anticipated hazards is presented in the Activity Hazard Analysis, Attachment 1.

9.0 DECONTAMINATION
Decontamination procedures will include dry decontamination of boots and clothing to remove any soot or PCS. This will be accomplished with brushes and pre-wetted towletts.

10.0 EMERGENCY RESPONSE PLAN
The Carlsbad Emergency Medical Response (EMR) personnel and/or the Eddy County EMR shall be notified of the location of field personnel prior to daily mobilization. A map to the nearest medical facility located in Carlsbad, New Mexico, is included as Attachment 3 to this Addendum. The following are the emergency response telephone numbers for this area. All other pertinent telephone numbers are located in The Final Basewide Health and Safety Plan (Ebasco 1995).

Carlsbad Police Department 505-885-2111 or 911
Eddy County Sheriff Department 505-887-7551
Carlsbad Fire Department 505-885-3125 or 911
New Mexico State Police 505-885-3137
Columbia Medical Center 505-887-4100
11.0 REFERENCES


ATTACHMENT 1

Activity Hazard Analysis
## ACTIVITY HAZARD ANALYSIS

### Project: Tornado Crash Sites  
### Activity: Soil Sampling  
### Location: Carlsbad, NM

<table>
<thead>
<tr>
<th>MAJOR STEPS</th>
<th>POTENTIAL HAZARDS</th>
<th>PROTECTIVE MEASURES/CONTROLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mobilization of equipment and supplies</td>
<td>1. General Construction Hazards</td>
<td>1. Workers will be required to wear a minimum of hard hat (ANSI Z89.1), safety glasses (ANSI Z87), and steel toe boots (ANSI Z41) (UXO operations exempt); hearing protection required for activities that may generate greater than 85dBA (i.e., heavy equipment), and protective gloves shall be used for general material handling. Personnel will be instructed on proper handling techniques. Team lifting shall be used for loads greater than 50 lbs. GFCI's must be used on power hand tools and for other electric-powered apparatus (lighting). Practice good housekeeping during all tasks to prevent tripping hazards. Take necessary precautions to delineate work area to keep nonessential personnel from entering work area.</td>
</tr>
<tr>
<td>2. Delineation of work zones and set up of work areas</td>
<td>2. Slip, Trip, and Falls; Temperature Extremes (heat exhaustion or frost bite depending on season); Biological Hazards (snakes, spiders, poisonous plants); Poisonous Gases ($H_2S$); Scrapes, Cuts, Bruises; Detonation of UXO; Impalement</td>
<td>2. UXO personnel will approach area and visually inspect the debris for components that may pose a threat to site workers. All other site personnel will remain at a safe distance, but within verbal/eye contact at all times. A magnetic-type survey instrument will be on site to locate, identify, and delineate any surface UXO material. All &quot;HITS&quot; will be marked, and the Base EOD unit will be contacted for removal. Site will be cleared before any other employee enters the area to set up zones. Only Base EOD personnel will handle and dispose of live UXO materials. Under no circumstances will any Foster Wheeler personnel handle any live UXO. Therefore, any live UXO material encountered by Foster Wheeler UXO personnel during the screening or sampling activities will result in a stoppage of work until Holloman AFB EOD personnel have properly removed the material from the site. Crews will clear area of protruding objects on the hillside to prevent impaling in the event of any falls. $H_2S$ training will be conducted and monitoring will be ongoing. Crews will be briefed on local poisonous plants, animals, and insects during site-specific training and daily safety briefings. All site personnel will be within eye/verbal contact at all times.</td>
</tr>
<tr>
<td>3. Excavation of contaminated soil</td>
<td>3a. General Construction Hazards (damage to equipment and/or personnel through harmful contact with the swinging cab, boom, or bucket of the excavator and accidental dumping of excavated material on equipment and/or personnel below the bucket)</td>
<td>3a. Workers will be required to wear the appropriate PPE (i.e., hard hat, eye protection, etc.) during all construction activities. Personnel will be required to stay clear of the turning radius of the cab, boom, and bucket. All workers shall maintain eye contact with the equipment operator when working around the excavation/crater area. ABC type fire extinguishers will be readily available. No smoking will be allowed in the work area.</td>
</tr>
<tr>
<td></td>
<td>3b. Heavy Equipment (Backhoe, Excavator, Vehicles)</td>
<td>3b. Equipment will have proper rollover protective structures, as necessary, and seat belts. Operators shall wear seat belts when operating equipment. Equipment will be operated in a vertical direction on slopes rather than horizontal direction to avoid tipping hazards. Do not operate equipment on grades that exceed manufacturer’s recommendations. Equipment will have guards, canopies, or grills to protect from flying objects. Ground personnel will stay clear of all suspended loads. Eye contact with operator shall be made prior to approaching equipment. Equipment will not be approached on blind sides, avoid equipment swing areas, and know all hand signals. All equipment will be equipped with backup alarms; no loose clothing, rings, or watches will be worn. All equipment will be equipped with manufacturer's mufflers to reduce noise.</td>
</tr>
</tbody>
</table>
# ACTIVITY HAZARD ANALYSIS

**Project:** Tornado Crash Sites  
**Activity:** Soil Sampling  
**Location:** Carlsbad, NM

## MAJOR STEPS

<table>
<thead>
<tr>
<th>Steps</th>
<th>POTENTIAL HAZARDS</th>
<th>PROTECTIVE MEASURES/CONTROLS</th>
</tr>
</thead>
</table>
| 4. Soil sampling | 4. See hazards included in #2, Back Strains; Blisters | 4. See #2 above  
UXO personnel will scan the immediate area to be sampled for UXO. Air monitoring equipment including a PID and PDM will monitor for chemical and dust exposures. Personnel will wear work gloves while performing manual tasks such as hand auguring or shoveling. |
| 5. Excavation/excavator crater | 5. See hazards included in #3 | 5. See #3 above |
| 6. Handling of UXO or Dangerous Materials if located | 6. Detonation, explosions, burns, impalement, all of #2 above | 6. UXO items will be marked and Base EOD unit will be notified ASAP. |
| 7. Return to Base, Hotels | 7. Automobile accidents due to sleepiness/long drive | 7. Assistant driver/another crewmember will remain awake to observe driving operations. Switch drivers at halfway point if needed. |
| 8. All phases of work | 8.  | 8. SHSO shall determine upgrades/downgrades of PPE based on the requirements of this Activity Hazard Analysis, site conditions, and professional judgement. Team must comply with training requirements listed below. |

## EQUIPMENT USED

<table>
<thead>
<tr>
<th>Equipment</th>
<th>INSPECTION REQUIREMENTS</th>
<th>TRAINING REQUIREMENTS</th>
</tr>
</thead>
</table>
| Cars/trucks/trailers | 1. Inspections of fire extinguishers, first aid kits, and eyewash stations  
2. Daily inspection of all instruments to ensure they are calibrated and properly maintained  
3. Inspection of PPE prior to use  
4. Safety inspection of vehicles  
5. Inspect sampling equipment for broken containers  
6. Typical earth moving inspections including fire extinguishers, first aid kits, oil/fluid leaks, working horns/lights/warning signals, and overall condition of equipment | 1. Site-specific training  
2. UXO personnel qualified per Foster Wheeler protocols  
3. Hydrogen Sulfide Gas Training  
4. Sampling Protocols  
5. Current medical clearance/training to wear respiratory protection  
6. Instruction in the use of fire extinguishers, eyewash stations, and monitoring equipment  
7. Equipment-specific training |
| Level D PPE |  |  |
| Fire extinguishers, first aid kits, eyewash stations, caution tape |  |  |
| Magnetic survey instruments |  |  |
| Sampling equipment |  |  |
| PID, PDM, and H₂S Meter |  |  |
| Decon station |  |  |
| Backhoe/excavator |  |  |

**Notes:**  
ANSI American National Standards Institute  
dBA Decibels  
EOD Explosive Ordnance Directive  
GFCI Ground Fault Circuit Interrupter  
H₂S Hydrogen Sulfide  
lbs pounds  
PDM Particulate Dust Monitor  
PPE Personal Protective Equipment  
PID Photoionization Detector  
SHSO Site Health and Safety officer  
UXO Unexploded Ordnance
ATTACHMENT 2

Foster Wheeler Hydrogen Sulphide Gas Awareness Training

(Provided By Indian Fire and Safety)
A Special Thanks To
JAMES SPURGEON
and
THE 'INDIAN FIRE AND SAFETY'
HAZARDOUS MATERIAL TEAM
For Their Technical
Assistance And Contributions
To This Manual
**SUPERVISORY RESPONSIBILITY**

The supervisor has the primary responsibility for the protection of his employees and any service company (outside contracting) employees working in his area or location of responsibility.

1. Know your company's policy on H₂S and **enforce it**.
2. Know the Contingency Plan (emergency procedures) you are working under and keep a copy of it handy at all times so that immediate and appropriate action can be taken if necessary.
3. Know that every employee clearly understands the hazards of H₂S gas, and the safe work practices which will be necessary to prevent injury or death.
4. Know that safety meetings and drills are held for employees and service company (outside contractors) employees. These safety meetings and drills will be used to instruct, review and discuss normal operating procedures as well as emergency contingency procedures; to familiarize everyone with the proper usage, care, maintenance and limitation of all respiratory protection equipment, detection and alarm equipment.
5. Thoroughly know how to operate all life saving and other related H₂S emergency equipment on location.

**EMPLOYEE RESPONSIBILITY**

1. The employee shall make himself available to all H₂S and related safety training and drills outlined in this handbook and his company safety operating procedures and instructions.
2. The employee shall use the provided respiratory protection in accordance with manufacturer's instructions.
3. The employee shall not play with or misuse the breathing apparatus as it is life saving equipment.
4. The employee shall assist in seeing that the units are kept clean and sanitary as well as in their designated location.
5. The employee shall not attempt to replace components or to make adjustments or repairs beyond the manufacturer's recommendation on any breathing equipment.
6. The employee shall go immediately to an area having respirable air, if his breathing apparatus fails to provide proper protection.
7. The employee shall report any breathing equipment malfunction to his supervisor.
8. The employee shall know and understand the safety procedures and how to properly and efficiently use all the available safety equipment along with the limitations, capabilities, care and maintenance of such.
HYDROGEN SULFIDE PRINCIPLES

Chemical Name: Hydrogen Sulfide
Synonyms: CAS Registry number: 7783-06-4
H₂S PIN (UN / NA number): 1053
Hydrosulfuric acid’ RTECS number: mx1225000
Sour gas Chemical family: Sulfides
Sewer gas Molecular structure: H₂S
Stink damp Structural formula: H-S-H
Sulfur hydride
Sour crude

H₂S is one of the leading causes of death in the workplace, yet it can be handled safely in producing, storing, drilling, processing, or transporting oil and natural gas. The components needed for safety are:
Engineering controls
Personal protective equipment
Training and regular drills
Continuous air monitoring
The Buddy system
Contingency plans
Process safety management
Safe work practices

The need for these cannot be over emphasized because H₂S has poor warning properties since the sense of smell is paralyzed at 100 ppm (parts per million) or higher.

H₂S is labeled as: FLAMMABLE GAS - (OSHA)
H₂S NFPA Ratings: Health 3 Flamm: 4 React: 0
Appearance: colorless gas
Odor: smell of rotten eggs at low concentrations, loss of sense of smell at or above 100 ppm

Summary; H₂S is a highly toxic gas which occurs in a variety of natural and industrial settings and is found in decaying organic matter. The places most common to the oil and gas industry are;

Drilling rigs - at the wellhead, mud and reserve pits and out of the drill pipe.
Pulling units - at the wellhead, tubing, production line, and pits or storage tanks if present.
Plants and refineries - at most vessels and lines and in proximity based on radius of exposure calculations.
 Pipelines - near valves and in proximity based on ROE calculations.
 Clothiing and equipment - in a confining space (such as a vehicle) and may be released rapidly under heat.

WARNING: sense of smell cannot be RELIED upon to detect H₂S
1. Colorless Gas at Room Temperature
2. Boiling Point = -76° F (-60° C)
3. Soluble in Liquid
   Dissolves in water to form acid-ph of 3
4. Density = 1.19 X Air (Heavier Than Air)
5. Ignition Temperature = 500° F (260° C)
6. Flame is Practically invisible
7. One Combustion By-Product is SO₂ which is Also Toxic
   Sulfur Dioxide is also a colorless gas but, has an irritating, pungent odor.
   It’s TLB is 2 ppm for an 8 hour day. This gas causes irritation to the eyes nose and throat and causes bronchiocstriction.
8. Explosive at Mixtures Between 4.3% and 46%
9. Noxious at Low concentrations (Smells Similar to Rotten Eggs)
10. Corrosive to High Carbon Steel
    Sulfide Stress cracking
    (A) HIGHER GRADES OF METALS ARE MORE SUSCEPTIBLE TO H₂S STRESS CRACKING.
    (B) HIGHER TEMPERATURES REDUCE CORROSIVE EFFECT.
    (C) HIGHER PRESSURES INCREASE CORROSIVE EFFECT.
    (D) H₂S STRESS CRACKING NORMALLY DOES NOT OCCUR AT PRESSURES BELOW 65 PSI.
    (E) METALS WITH A ROCKWELL HARDNESS OF 22 OR LESS ARE NORMALLY NOT SUSCEPTIBLE TO H₂S STRESS CRACKING.
    (F) DRILL PIPE WITH A YIELD STRENGTH OF 95,000 PSI OR LESS ARE NORMALLY NOT SUSCEPTIBLE TO H₂S STRESS CRACKING.

H₂S AWARENESS TEST
(circle the correct answer)
1. H₂S CAUSES A LOSS OF SENSE OF_____ AT OR ABOVE 100 ppm.
   a) HEARING   b) DIRECTION   c) SMELL   d) LEARNING
2. WHEN FLARING OR BURNING H₂S IT PRODUCES A BLUE FLAME AND IT ALSO PRODUCES_____.
   a) CO₂   b) HBO   c) SO₂   d) H₂O
3. H₂S IS ONE OF THE LEADING CAUSES OF_____ IN THE WORKPLACE.
   a) DEATH   b) HAPPINESS   c) PRODUCTIVITY   d) IGNORANCE
4. BEFORE ATTEMPTING TO RESCUE SOMEONE YOU SHOULD PUT ON YOUR_____.
   a) MONITOR   b) SCBA   c) PANTS   d) HARD HAT
5. BEFORE WORKING IN AN H₂S ENVIRONMENT YOU SHOULD BE:
   a) CURRENTLY H₂S CERTIFIED   b) CLEAN SHaven
   c) TRAINED IN THE USE OF SCBA’s   d) ALL OF THE ABOVE
   circle the correct answer on the following:
6. H₂S IS A COLORLESS GAS, HEAVIER THAN AIR, AND HAS A ROTTEN EGG ODOR IN VERY LOW CONCENTRATIONS. TRUE  FALSE
7. BEARDS, CONTACT LENSES, RESPIRATORYAILMENTS AND LACK OF TRAINING ARE SPECIAL HAZARDS TO PERSONAL SAFETY IN AN H₂S ENVIRONMENT. TRUE  FALSE
8. IT IS IMPORTANT TO NOTICE THE WIND DIRECTION AND PEOPLE MOVEMENT ON LOCATION BEFORE ENTERING. TRUE  FALSE
9. THE BUDDY SYSTEM IS A MUST IN A POTENTIAL H₂S ATMOSPHERE. TRUE  FALSE
10. SULFUR DIOXIDE (SO₂) IS ALSO A HIGHLY TOXIC AND LETHAL AND, GAS. TRUE  FALSE

YOUR COMPANY_____________________________________________
DATE __/____/___  SIGNATURE ________________________________

by signing I signify that I have read the "H₂S Handbook" and have answered all statements on the test, and will in no way hold Indian Fire and Safety Inc. responsible for my actions or deeds in any H₂S condition.
Safety Precautions which should be followed:

(a) Everyone needs to know how to approach the jobsite taking into consideration:
   1. Wind direction,
   2. Any movement of personnel,
   3. "Condition" signs and alarms

(b) Availability of at least two (2) escape routes (roads.)

(c) Continuous air monitoring or detection equipment is necessary, along with appropriate alarm system. (Fixed and portable detectors and explosion meters).

(d) It is a necessity to eliminate all sources of ignition because H₂S is extremely flammable. No smoking needs to be strictly enforced.

(e) Adequate spark-proof ventilation equipment is one of the basic engineering principles in order to control H₂S exposure. It also aids against eye irritation from H₂S. These need to be strategically positioned at various locations of potential sources of H₂S.

(f) Training and regular drills are necessary. Constant practice is one of the best safety precautions.

(g) Avoid low lying areas because H₂S is heavier than air.

(h) Make it a habit to note wind direction by use of windsocks and streamers. Move upwind from source or cross wind, not downwind.

(i) Use the "Buddy System" for mutual safety.

(j) Observe warning signs.

(k) Use reliable communications - (telephone, radio, intercoms and voice box on breathing apparatus, etc.) Also emergency telephone numbers need to be conspicuously posted.

(l) Know the location of the "emergency stations" (minimum of 250 feet from source) and check to see that all personnel on location are accounted for and use voice gun, chalkboards, etc. to brief workers and know refill procedures.

(m) Discharge of H₂S through flare stacks with automatic ignition can also be used effectively to dispose of hazardous concentrations of H₂S.

Note: SO₂ is produced when burning H₂S and although it tends to rise while hot it is normally heavier than air!

Effects of short-term (acute) exposure

The way H₂S affects you depends on three (3) things:

1. How much (dosage or concentration) you are exposed to
2. How long you are exposed to it
3. How much you can take (tolerate)

Inhalation:

At concentrations of:

Less than 10 ppm - can be safely worked in for 8 hours.

0.13 to 30 ppm - the odor is obvious and unpleasant, begins eye irritation.

50 ppm - marked dryness and irritation of the nose and throat. Prolonged exposure may cause a runny nose, cough, hoarseness, shortness of breath and pneumonia.

100 to 150 ppm - there is a temporary loss of smell.

200 to 250 ppm - severe irritation as well as symptoms such as headache, nausea, vomiting and dizziness. Prolonged exposure may cause lung damage (build up of fluids in the lungs). Exposure for 4 to 8 hours can cause death.

300 to 500 ppm - causes these same effects sooner and more severely.

500 ppm - and above - rapid unconsciousness and death.

Note: Severe exposures which do not result in death may cause long-term symptoms such as memory loss, paralysis of facial muscles or nerve tissue damage.

Symptoms tend to disappear shortly after removal from area exposed to low to moderate concentrations.

H₂S kills by respiratory paralysis - can't hold breath

Long-term exposure:

Whether or not long-term poisoning by H₂S occurs is controversial. The disagreement centers on the nature of the symptoms, which include fatigue, headache, dizziness, hoarseness, cough and irritability. These symptoms are not specific to H₂S exposure and could be due to a number of other causes.

Carcinogenicity:

No data
THEY IS A WAY WE CAN PROTECT OURSELVES AGAINST UNDETECTED H2S AND BE WARNED WHEN CONCENTRATIONS BECOME TOO HIGH TO SAFELY WORK IN:

AIR MONITORING

RESCUE BREATHING CHECKSHEET

TAP AND SHOUT
IF NO RESPONSE, ACTIVATE EMERGENCY PLAN AND EMS

OPEN AIRWAY (PROTECT SPINE)
CHIN LIFT WITH HEAD TILT AS NEEDED

LOOK, LISTEN AND FEEL (BREATHING ABSENT)

GIVE 2 SLOW, FULL BREATHS

CHECK CAROTID PULSE FOR 5 - 10 SECONDS (PULSE IS PRESENT)

GIVE 1 SLOW, FULL BREATH EVERY 5 SECONDS

CHECK PULSE AND BREATHING FREQUENTLY

CONTACT WITH OR HANDLING OF BLOOD OR BODY FLUIDS MAY BE HAZARDOUS TO YOUR HEALTH. WEAR GLOVES, USE BARRIERS.

MOUTH-TO-MOUTH BARRIER
REScue and First Aid

Do Not Panic!

Remain Calm - Think

Get Help (Call EMS System)

Put On Breathing Apparatus

Enter Hazardous Zone with a Buddy Also Wearing Breathing Apparatus

Remove Victim to Fresh Air; Use Collar Drag If Too Heavy to Carry

Prepare Victim to Give CPR If Necessary, By Removing Clothing That Has Been Saturated With H₂S Containing Fluids

Remove Your SCBA Provided That You Are Upwind of the H₂S Zone

Apply Mouth to Mouth Barrier If Not Breathing and Give CPR

Must Be Trained To Preform CPR Other Than Rescue Breathing

Make Sure All Personnel Have Returned to Briefing Area and Take Head Count

Do Not Use Oxygen Resuscitator Unless You Are a Trained EMT

* Remember the Victim Has Only 4 to 6 Minutes Before His Brain Becomes Oxygen Starved

Always Run Upwind or Crosswind, Never Downwind!!!

See Rescue Breathing Checksheet

Safety Equipment

The monitoring and detection equipment on the previous page can aid us in the everyday aspect of working around H₂S as well as in the measuring of concentrations and entering hazardous atmospheres containing potentially large amounts of H₂S.

Personal Monitors:

- Can be worn on the outside of clothing or carried with you to be placed between you and the potential source of H₂S.

Stationary Monitors:

- Can be placed permanently at a location where the sensors can detect any H₂S that might escape at given points in the system.

Detector Tubes:

- Can measure the amounts or the concentrations in parts per million of an H₂S source.

Tutweiler Apparatus:

- Used in determining accurate measurements of H₂S for compliance and regulatory agencies such as the Texas Railroad Commission.

  * Most Monitoring Systems Are Set to Give a Visual, Alarm at 10 ppm
  * And a Siren or Audible Alarm at 15 ppm

It may become necessary to provide breathing equipment to a location where H₂S is known or suspected to be present. Here are some of the various types used in the potential H₂S atmospheres:

SCBA - Self Contained Breathing Apparatus, sometimes called a 30 minute unit (which may or may not hold true, given each persons breathing rate may be different). This unit can be used for rescuing victims overcome by H₂S, hence it can be called the rescue unit.

Work Unit - This is a supplied air respirator that is dependent on a bank of high pressure cylinders and a hose connected between the two. There is also an escape cylinder that goes with it and is independent of the cascade system. The hose must be disconnected before the escape cylinder is opened and it must only be opened for escaping the hazardous atmosphere and not to be used otherwise.

Escape Unit - Used only for its namesake and will supply approximately 5 minutes of air depending on the persons breathing rate.

  * These cylinders are to be filled only with grade D breathing air

- 5 -
TYPE OF RESPIRATORS

- Powered air-purifying respirators are for use against gases or particles. But, should not be used in high H₂S areas because they do not supply air.

AIR-LINE OR SUPPLIED-AIR RESPIRATORS:
These units can be used against oxygen deficiency or contaminants in concentrations that are not immediately dangerous to life or health.
- The air for these respirators usually comes from either a bank of compressed-air cylinders or a compressor.
- The compressed air reaches the respirator through a high-pressure hose.
- The respirator can use a half-mask, full facepiece, or hood.

Three types of air flow are used.
- **Continuous flow** keeps the facepiece under positive pressure. With positive pressure, any leaks will be from the inside outward, so contaminants won’t enter the facepiece.
- **Demand air flow** supplies air only when the user inhales.
- **Pressure-demand flow** keeps the mask under positive pressure during both inhalation and exhalation.

EMERGENCY USE OF RESPIRATORS

Respirators may be required either during normal work activities or in emergencies. The most frequent use of respirators is in emergencies.
- Self-contained breathing apparatuses for emergency use are usually stored outside the area of potential danger.
- During an emergency, the user escapes the danger area to put on the respirator, then returns for rescue work or repairs.

- Many respirators are designed only for escape.
  - These units are often stored inside the danger area.
  - Employees must sometimes carry escape respirators while working, for a safe and quick exit.
INSPECTIONS

- Respirators for normal, non-emergency work must be inspected before and after each use.
- Emergency respirators must be inspected after each use and at least once a month.

Inspect for:
- Loss of elasticity or tears in straps and hoses.
- Broken or loose connectors and fittings.
- Cracks or scratches on the facepieces.
- Detergent residue or dirt on valves.
- General cleanliness.
- For self-contained breathing apparatuses, make sure the unit has a sufficient charge.

The person who is to use the respirator is responsible for inspecting it.
- Do not accept faulty equipment.
- Do not attempt repairs yourself unless you are properly trained.

SELF-CONTAINED BREATHING APPARATUSES:
These respirators give the user an independent air supply that is not mixed with the outside air. They can be used against either oxygen deficiency or contamination.

There are two kinds of self-contained breathing apparatuses.
- Closed-circuit rebreathing units protect the user for up to four hours in situations like mining rescue.
  - In these units, the user's exhaled air is recycled.
  - Carbon dioxide is removed from the exhaled air.
  - Oxygen from a small cylinder is added to the exhaled air, which is then returned to the user.
- Pressure-demand open-circuit respirators give the most protection for emergency response personnel.
  - The user carries 30 to 60 minutes worth of compressed air or oxygen in a self-contained cylinder.
  - Air is exhaled directly into the outside atmosphere.
  - Positive pressure is maintained inside the facepiece.

Remember that no respirator of any type will guard you against toxins that may be absorbed through the skin. Be sure to wear the proper protective clothing along with your breathing unit.
There are some health hazards associated with wearing these breathing apparatuses. General health, lung or heart problems, caustrophobia, asthma, hypertension or any type of seizures may make it difficult or impossible to wear them. If you have any of these or other conditions which may prevent the wearing of a respirator please report them to your supervisor.

THE TYPE AND AMOUNT OF FACIAL HAIR WORN BY AN INDIVIDUAL CAN AFFECT THE SEALING QUALITY OF THE MASK WORN. HERE ARE SOME EXAMPLES OF WHAT IS AND IS NOT ACCEPTABLE WHEN WORKING AROUND H₂S.

UNACCEPTABLE:

Employees requiring respiratory protection will be required to be clean shaved. Mustaches and sideburns are acceptable as long as the mustache does not extend beyond the corners of the upper lip and the sideburns do not extend below the ear lobes. No hair may extend into the respirator seal area. Refer to the drawings which illustrate facial hair limits in accordance with this policy.

ACCEPTABLE:

Any respirator that doesn’t fit properly can allow contaminants to slip through cracks between the facepiece and the skin.

- You may have to try on and test several respirators in order to find one that fits your face.
- Beards, hair and glasses can interfere with a good facepiece seal.
- The qualitative test is also called the odor or irritant test.
  - The respirator wearer is exposed to a chemical that has an odor or irritating effect.
  - If the odor or irritation is noticed, the unit must be refitted or another one used.
  - This test is only as accurate as the user’s sense of smell or sensitivity to irritation.
- The quantitative-fit test is necessary before entering a highly toxic atmosphere.
  - The respirator user is exposed to a test agent in the air inside a sealed booth.
  - The respirator is tested by smoke to determine the effect of how much of the test agent gets into the facepiece.

FITTING A RESPIRATOR
ATTACHMENT 3

HOSPITAL ROUTE MAPS
HOSPITAL ROUTE

Columbia Medical Center
2430 W. Pierce St.
Carlsbad, NM 88220
505-887-4100

Starting From:
Highway 137 and 285
Carlsbad, NM

Distance: 9.2 Miles

Arriving At:
2430 W. Pierce St
Carlsbad, NM 88220

Travel Time: 16 Min.

Directions: Start out travelling southeast on US-285 towards NM 524 for approximately 9.2 miles.
Appendix E

Sampling And Analysis Plan Addendum
APPENDIX E

SAMPLING AND ANALYSIS PLAN ADDENDUM
FOR THE GERMAN AIR FORCE TORNADO CRASH SITES

HOLLOMAN AFB, NEW MEXICO
TABLE OF CONTENTS

LIST OF ACRONYMS .................................................................................................................. ii
1.0 INTRODUCTION ................................................................................................................... 1
2.0 OBJECTIVE ............................................................................................................................. 1
3.0 SAMPLING PROCEDURES AND METHODOLOGY ............................................................. 1
4.0 DECONTAMINATION PROCEDURES ................................................................................ 2
5.0 SAMPLE HANDLING AND CUSTODY REQUIREMENTS .................................................... 2
6.0 SAMPLE CONTAINER AND PRESERVATION REQUIREMENTS ......................................... 2
7.0 SAMPLE COLLECTION DOCUMENTATION ....................................................................... 2
8.0 LABORATORY ANALYSIS .................................................................................................... 2
9.0 REFERENCES ......................................................................................................................... 3

ATTACHMENTS

1 Standard Operating Procedures For Surface Soil Sampling
2 Standard Operating Procedures For Decontamination Methods
3 Standard Operating Procedures For Sample Handling And Documentation
### LIST OF ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFB</td>
<td>Air Force Base</td>
</tr>
<tr>
<td>BTEX</td>
<td>benzene, toluene, ethylbenzene, and xylenes</td>
</tr>
<tr>
<td>EPA</td>
<td>United States Environmental Protection Agency</td>
</tr>
<tr>
<td>Foster Wheeler</td>
<td>Foster Wheeler Environmental Corporation</td>
</tr>
<tr>
<td>GAF</td>
<td>German Air Force</td>
</tr>
<tr>
<td>mg/kg</td>
<td>milligrams per kilogram</td>
</tr>
<tr>
<td>SAP</td>
<td>Sampling and Analysis Plan Addendum</td>
</tr>
<tr>
<td>SOP</td>
<td>Standard Operating Procedures</td>
</tr>
<tr>
<td>TPH</td>
<td>total petroleum hydrocarbons</td>
</tr>
<tr>
<td>TRPH</td>
<td>total recoverable petroleum hydrocarbons</td>
</tr>
</tbody>
</table>
1.0 INTRODUCTION
This Sampling and Analysis Plan Addendum (SAP) to the Sampling and Analysis Plan for Compliance Monitoring Activities (Foster Wheeler, 1997) outlines the procedures and methodologies to support construction and cleanup at the German Air Force (GAF) Tornado Crash Sites for Holloman Air Force Base (AFB). This addendum is intended to be used in conjunction with the Holloman Air Force Base German Air Force Tornado Crash Performance Work Statement.

2.0 OBJECTIVE
Sampling and analysis will be performed at the GAF Tornado Crash Sites to determine the vertical and horizontal extent of JP-8 fuel contamination that exceed the 100 milligrams per kilogram (mg/kg) cleanup standard. This will be performed in accordance with United States Air Force operational procedures and Foster Wheeler Environmental Corporation (Foster Wheeler) standard operating procedures (SOPs). Sampling and analysis will include on-site soil sample screening for total petroleum hydrocarbons and (TPH), off-site laboratory confirmation analysis for total recoverable petroleum hydrocarbons (TRPH) and benzene, toluene, ethylbenzene, and xylenes (BTEX).

3.0 SAMPLING PROCEDURES AND METHODOLOGY
Surface soil samples will be collected at two sites identified for cleanup. Sampling will be performed using a stainless steel scoop or trowel. All sampling activities will be conducted in accordance with the SOPs (Attachments 1 and 2 to this Addendum) and guidelines for representative sampling.

On-site analysis for TPH fuel will be performed on the soil samples using the United States Environmental Protection Agency (EPA)-approved ENSYS® Test Kit, Method 4030. Based on the soil screening results, a maximum of 20 samples per site with TPH concentrations exceeding 100 mg/kg will be sent to the off-site laboratory for confirmation analysis (TRPH and BTEX).
4.0 DECONTAMINATION PROCEDURES
Sampling equipment will be decontaminated in accordance with the Decontamination Methods SOP, Attachment 2 to this Addendum.

5.0 SAMPLE HANDLING AND CUSTODY REQUIREMENTS
Sample handling and custody will be in accordance with the Addendum to the Sampling and Analysis Plan for Compliance Monitoring Activities (Foster Wheeler, 1997).

6.0 SAMPLE CONTAINER AND PRESERVATION REQUIREMENTS
Soil samples for verification analysis by the subcontractor laboratory will be collected in EPA-approved containers provided by the laboratory, and stored on ice prior to shipment to the off-site laboratory (see Attachment 1 to this Addendum). No additional sample preservation is required. Soil samples for BTEX will be collected in accordance with EPA Method 5035, if possible.

7.0 SAMPLE COLLECTION DOCUMENTATION
Sample documentation will be in accordance with the Sample Handling and Documentation SOP (Attachment 3 to this Addendum).

8.0 LABORATORY ANALYSIS
Confirmation soil samples will be submitted for analysis to the subcontractor laboratory. Analytical methods for chemical analysis will be in accordance with EPA SW-846, Test Methods for Evaluating Solid Waste. Third Edition (EPA, 1986) and updates. Confirmation soil samples will be analyzed for TRPH using Method 9071A/418.1 and BTEX using Method 5035/8021.

The quality assurance/quality control requirements and the data deliverables will be in accordance with the requirements for Compliance Monitoring Activities.
9.0 REFERENCES

Foster Wheeler (Foster Wheeler Environmental Corporation)

EPA (United States Environmental Agency)
ATTACHMENT 1
STANDARD OPERATING PROCEDURES
FOR
SURFACE SOIL SAMPLING
SOP—Surface Soil Sampling

Surface soil sampling will be performed by the following procedure:

1. Wear appropriate personal protective equipment (PPE) as specified in the HSPA, Appendix D to this Work Plan. In addition, samplers will don new sampling gloves at each location.
2. Use a decontaminated stainless steel scoop or trowel to scrape away surficial organic material (grass, leaves, etc.).
3. Obtain soil sample using a scoop/trowel after organic materials have been scraped away by scooping soil from the surface to 3 inches below surface or to the depth specified in the project-specific addendum.
4. Record appropriate air monitoring results.
5. Samples for VOC and total organic carbon analysis will be obtained as discrete grab samples. Empty remaining contents of the scoop into a decontaminated stainless steel pan.
6. Homogenization of soil samples will be conducted by first removing rocks, twigs, leaves, and other debris if they are not considered part of the sample. The soil should be removed from the sampling device and placed in a stainless steel pan, then thoroughly mixed using a stainless steel spoon. The soil in the pan should be scraped from the sides, corners and bottom of the pan, rolled to the middle of the pan and initially mixed. The sample should then be quartered and moved to the four corners of the pan. Each quarter of the sample should be mixed individually, then rolled to the center of the container and the entire sample mixed again. Fill jars with soil using stainless steel spatulas or spoons.
7. Place analytical samples in cooler and chill to 4 degrees Celsius (°C). Samples will be shipped within 24 hours to an appropriate laboratory.
9. Fill out field logbook, sample log sheet, custody seals, labels, and Chain-of-Custody (C-O-C) forms.
ATTACHMENT 2
STANDARD OPERATING PROCEDURES
FOR
DECONTAMINATION METHODS
SOP—Decontamination Methods
Decontamination methods will consist of high-pressure steam cleaning or of an alconox wash followed by a potable water rinse. All equipment coming in contact with the excavation or the well materials will be decontaminated between holes. All visible dirt, grease, oil, and foreign particles will be removed during decontamination.

The subcontractor will construct a temporary decontamination pad at a site location approved by the Contractor’s Field Representative. The decontamination pad will be bermed and sloped to a sump for water and sludge collection. The decontamination pad will be lined with 40-mil plastic sheeting. Any holes in the plastic sheeting will be repaired to water-tight conditions before use. The plastic sheeting will be secured to prevent fluttering or blowing away by high winds.

All equipment and tools will be decontaminated both upon arrival, and prior to departure from the site. All decontaminated equipment will be stored in a clean condition. Residuals from decontamination activities will be managed in accordance with this Work Plan.
ATTACHMENT 3
STANDARD OPERATING PROCEDURES
FOR
SAMPLE HANDLING AND DOCUMENTATION
**SOP—Sample Handling and Documentation**

Sample handling and documentation procedures will be used to ensure the integrity of the sample from sample collection to receipt at the laboratory. Documentation of sample handling will be implemented to ensure the traceability and integrity of the sample.

**Labeling**

All sample containers will be labeled. Labels may be partially completed prior to sample collection. The date, time, and sampler's name should NOT be completed until the time of sample collection. Pre-printed, self-adhesive sample labels containing all appropriate sample information including sample identification, field sample number, sample type, and analyses requested will be used. Sample labels will be completed with waterproof ink. Sample labels should be completed and attached prior to sample collection for soil samples collected in jars and all decontamination samples collected in bottles.

At a minimum, each numbered label will contain the following information:
- Project/facility
- Sample type (e.g., grab, composite)
- Sampler's company affiliation
- Date and time of sample collection
- Analyses required
- Preservation used
- Sampler's initials
- Identification if sample is collected for the USACE laboratory
- Sample identification (see below)
- LIMS number

**Sampling Containers**

Certified, commercially clean sample containers will be obtained from the contract analytical laboratory. If appropriate, the bottles will be labeled by the laboratory to indicate the type of sample to be collected. Surface soil samples will typically be collected wide-mouth sample jars or in stainless steel liners.

**Sample Preservation**

All samples will be stored on ice in an insulated cooler immediately following sample collection. Soil samples do not require additional preservation. Sample containers for aqueous samples will be sent by the laboratory containing the appropriate preservatives.

**Sample Handling and Shipping**

Sample containers will be placed in resealable plastic storage bags and wrapped in protective packing material (if appropriate). Ice (double bagged using plastic trash bags) will be placed on top of the samples in a cooler for shipment to the laboratory. The drain on the cooler will be taped shut. Samples collected in glass containers will be packed in foam liners and bubble packing or styrofoam peanuts to ensure that no breakage occurs during shipment. Samples will be shipped by
overnight express carrier for delivery to the analytical laboratory and to the USACE laboratory. The USACE laboratory will be notified prior to the arrival of the first shipment, after the final shipment, and prior to any Saturday delivery.

A completed chain-of-custody form for each cooler will be placed in a ziplock bag and taped to the inside of the cooler lid. Coolers will be wrapped with strapping tape at two locations to secure lids. Signed custody seals will be placed on the outside of each cooler. In addition, "Fragile" labels and "This Side Up" labels will be placed on the outside of each cooler containing glass bottles. Put "This Side Up" labels on all four sides and "Fragile" labels on at least two sides. Note that each cooler cannot exceed the weight limit set by the shipper.

**Holding Times and Analyses**

The holding time is specified as the maximum allowable time between sample collection and analysis and/or extraction, based on the analyte of interest, stability factors, and preservation methods. Samples should be sent by overnight courier service to the laboratory daily after collection.

**Sample Documentation and Tracking**

This section describes documentation required in the field notes, DQCRs, and sample C-O-C requirements.

**Field Notes**—Documentation of observations and data acquired in the field will provide information on the acquisition of samples and also provide a permanent record of field activities. The observations and data will be recorded with waterproof ink in a permanently bound weatherproof field book with consecutively numbered pages and, if applicable, on field sampling data sheets.

The information in the field book will include the following as a minimum:

- Project name
- Location of sample
- Sampler's signature
- Date and time of sample collection
- Sample identification numbers
- Description of samples matrix, composite or grab sample
- Analysis to be performed
- Number and volume of samples
- Description of QA/QC samples
- Sample methods or reference to the appropriate SOP
- Sample handling as appropriate for samples
- Field observations
- Personnel present

Changes or deletions in the field book should be lined out with a single strike mark, initialed and
dated by person making change, and remain legible. Sufficient information should be recorded to allow the sampling event to be reconstructed without relying on the collector's memory.

Each page of the field book will be signed by the person making the entry. Anyone making entries in another person's field book will sign and date those entries.

**Daily Quality Control Report**—To supplement the information recorded in the field book, DQCRs will also be maintained to document daily field activities and will note any nonconformances and corrective actions taken at every sampling location. DQCRs will be maintained by each field sampling team and cross-checked for completeness at the end of each day by a sampling team member. They will be signed and dated by the individual making entries and initialed by the reviewer upon completion. Copies of the DQCR will be forwarded to the USACE Resident Engineer by noon of the following day. Copies of the DQCR will be forwarded to the Foster Wheeler Environmental SQ Manager for review on a weekly basis.

**Sample Chain-of-Custody**—During field sampling activities, traceability of the sample must be maintained from the time the samples are collected until laboratory data are issued. Information on the custody, transfer, handling, and shipping of samples will be recorded on a C-O-C form. C-O-Cs will include site identification, field sample number, sample type, and analysis requested.

The sample handler will be responsible for completing the C-O-C form. The C-O-C will be signed by the sampler when the sampler relinquishes the samples to anyone else. It is not necessary for Federal Express to sign C-O-Cs; however, the airbill will be retained by the sample handler for tracking purposes. A C-O-C form will be completed for each set of samples collected daily, and will contain the following information:

- Sampler's signature and affiliation
- Project number
- Date and time of collection
- Sample identification number
- Sample type/matrix
- Grab or composite sample
- Preservative used
- Analyses requested
- Number of containers
- Signature of persons relinquishing custody, dates, and times
- Signature of persons accepting custody, dates, and times (laboratory)
- Method of shipment (e.g., Federal Express)

The person responsible for delivery of the samples to the air carrier will sign the C-O-C form, retain the last copy of the three-part C-O-C form, document the method shipment, and send the original and the second copy of the C-O-C form with the sample (taped in a ziplock bag to inner cooler lid). Upon receipt at the laboratory, the person receiving the samples will sign the C-O-C form and return the second copy to the Project Manager. Copies of the C-O-C forms and all custody documentation will be received and kept in the central files. The original C-O-C forms will remain...
with the samples until final disposition of the samples by the laboratory. The analytical laboratory will dispose of the samples in an appropriate manner 60 to 90 days after data reporting. After sample disposal, a copy of the original C-O-C will be sent to the Project Manager by the analytical laboratory to be incorporated into the central files.