WOODBRIDGE RESEARCH FACILITY
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

HEALTH AND SAFETY PLAN

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FINAL DOCUMENT

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SEPTEMBER 1995
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# HEALTH AND SAFETY ADDENDUM
## WOODBRIDGE RESEARCH FACILITY RI/FS
### CONTRACT NUMBER DACA31-94-D-0064

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patricia Thompson</td>
<td>Project Manager</td>
</tr>
<tr>
<td>Gary McKown</td>
<td>Program Manager</td>
</tr>
<tr>
<td>Jan Naugh</td>
<td>USAEC Project Officer</td>
</tr>
<tr>
<td>William Houser</td>
<td>USAEC</td>
</tr>
<tr>
<td>Gerald Joy</td>
<td>ICF KE Director</td>
</tr>
<tr>
<td></td>
<td>Industrial Hygiene</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accesion For</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>NTIS</td>
<td>CRA&amp;I</td>
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<tr>
<td>DTIC</td>
<td>TAB</td>
</tr>
<tr>
<td>Unannounced</td>
<td></td>
</tr>
</tbody>
</table>

Justification

By

Distribution

Availability Codes

<table>
<thead>
<tr>
<th>Dist</th>
<th>Avail and/or Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td></td>
</tr>
</tbody>
</table>
This Addendum modifies the existing Health and Safety Plan for the Woodbridge Research Facility prepared by the Earth Technology Corporation under Contract Number DAAA15-91-D-0009, Delivery Order 0001, dated November, 1994; and the initial Addendum to that Plan, dated December, 1994; prepared by the Earth Technology under Delivery Order DA0014.

This Addendum has been prepared to incorporate the current scope of work, and additional information about site contaminants identified during the Preliminary, and Phase I Supplemental Site Investigations. Material in the original Plan, and the initial Addendum, not replaced or modified by this Addendum will remain in effect, with the exception of Earth Technology Corporation standard procedures and policies, which are superseded in all cases by ICF Kaiser Engineers, Inc. policies and procedures.

Approved:

[Signature]

Gerald J. Joy, CIH, CSP
Director, Industrial Hygiene

FINAL
REPLACE HASP SECTION 3 WITH THE FOLLOWING
3.0 SCOPE OF WORK

The Scope of Work for the Woodbridge Army Research Laboratory RI/FS includes the following hazardous waste-related operations:

3.1 Site Reconnaissance

3.2 Field Investigation

3.2.1 Install 29 shallow (35'bgs) groundwater monitoring wells
3.2.2 Install 2 deep (75'bgs) groundwater monitoring wells
3.2.2 Complete 18 soil borings to 25' bgs or water table
3.2.3 Excavate 12 test pits to 6' bgs or water table
3.2.4 Convert 10 borings to piezometers

3.3 Sampling

3.3.1 Sample 45 groundwater wells twice at 2 month interval
3.3.2 Collect 62 surface water and 12 surface water runoff samples
3.3.3 Collect 50 sediment samples associated with surface water samples
3.3.4 Collect 3 subsurface soil samples from 35 monitoring wells, 20 borings, and 2 samples from 12 test pits
3.3.5 Collect 65 surface soil samples
3.3.6 Analyze 120 biota tissue samples

3.4 Ecological Assessment

3.4.1 Site walkover
3.4.2 Bioassessment sampling at approximately 25 locations
3.4.3 Measure water quality parameters at the 25 sampling locations

3.5 Hydrologic Assessment

3.5.1 Install 10 staff gauges
3.5.2 Determine groundwater elevations at 60 locations during groundwater sampling

3.6 Survey

3.6.1 Survey all monitoring well, soil boring and piezometer locations.
REPLACE HASP SECTION 4 WITH THE FOLLOWING
MEDICAL SURVEILLANCE

The requirements set forth in 29 CFR 1910.120(f), shall be met for all employees performing or supervising hazardous waste operations. Medical exams shall be conducted as soon as possible upon notification by an employee that he/she has developed signs or symptoms indicating possible health hazards or overexposure to hazardous substances. Subcontractor personnel shall provide documentation of current status of participation in a medical surveillance program as required by 29 CFR 1910.120(f). Subcontractors unable to provide such documentation shall have successfully completed a medical examination as described in the above referenced OSHA standard prior to beginning work in a contaminated zone.

Specific protocols for medical examinations are designed by an occupational physician. Common components include:

- a. medical history and physical examination
- b. dipstick urinalysis, vision screen and vital signs
- c. spirometry
- d. audiometry
- e. blood chemistry (complete blood count, liver function, kidney function, lipid metabolism, carbohydrate metabolism)
- f. resting EKG (with approval)
- g. chest radiograph (P/A).

No project-specific medical examinations, or biological monitoring is required for this project.

TRAINING

All ICF Kaiser staff working onsite have completed the OSHA mandatory 40-hours hazardous waste operations training and are trained annually in accordance with 29 CFR 1910.120. ICF Kaiser staff are also trained and receive annual training in CPR and first-aid (every 3 years), Hazard Communication, and Bloodborne Pathogens.

Bloodborne Pathogens

ICF Kaiser personnel trained in CPR and first-aid have the potential for exposure to bloodborne pathogens therefore they are trained annually in accordance with 29 CFR 1910.1030. Exposure to bloodborne pathogens is prevented through the use of universal precautions, engineering and work practice controls, and personal protective equipment. Each ICF Kaiser work area shall be equipped with an industrial first-aid kit supplemented by a bloodborne pathogen exposure control kit. Personnel will follow appropriate decontamination and disposal procedures in the event of
a potential exposure to bodily fluids potentially infected with bloodborne pathogens. All incidents must be immediately reported to the SSO and corporate health and safety director.

**Hazard Communication**

ICF Kaiser trains employees in accordance with the Hazard Communication Standard (29 CFR 1910.1200) in the law, material safety data sheets (MSDSs) and labeling requirements. As part of the hazard communication standard, ICF Kaiser is required to provide MSDSs of chemicals brought to the WRF and have them readily accessible to ICF Kaiser personnel as well as to WRF, and USAEC representatives, and subcontractors.

Table 4-1 below lists the training and compliance status of field personnel working on this project. Training documentation for all personnel can be found in Appendix I of this document.

**TABLE 4-1**

**HEALTH AND SAFETY COMPLIANCE STATUS**

<table>
<thead>
<tr>
<th>NAME</th>
<th>MEDICAL CURRENT</th>
<th>FIT TEST CURRENT</th>
<th>CERTIFICATION LEVEL A B C D</th>
<th>TRAINING CURRENT 40HR</th>
<th>8HR</th>
<th>CPR</th>
<th>BBP</th>
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<tbody>
<tr>
<td>Jack Choynowski</td>
<td>✓</td>
<td>✓</td>
<td>B</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Margaret Ehlers</td>
<td>✓</td>
<td>✓</td>
<td>B</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Mike Elias</td>
<td>✓</td>
<td>✓</td>
<td>B</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Marilyn Garcia</td>
<td>✓</td>
<td>✓</td>
<td>B</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Carol Henry</td>
<td>✓</td>
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<tr>
<td>Joe Neubauer</td>
<td>✓</td>
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<td>✓</td>
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<tr>
<td>Debbie Romano</td>
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<td>B</td>
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<tr>
<td>Larry Thebeau</td>
<td>✓</td>
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<tr>
<td>Patricia Thompson</td>
<td>✓</td>
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<tr>
<td>Tammy Williams</td>
<td>✓</td>
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<td>✓</td>
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<tr>
<td>Diane Wisbeck</td>
<td>✓</td>
<td>✓</td>
<td>B</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

✓ Indicates compliance
N/A Not applicable; recently completed 40-hour training
ADD THE FOLLOWING TO HASP SECTION 5
HAZARD ANALYSIS

A hazard analysis and recommended control measures for each task are presented below.

<table>
<thead>
<tr>
<th>TASK</th>
<th>HAZARD</th>
<th>CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hollow-stem auger, mud rotary drilling,</td>
<td>Physical hazards:</td>
<td>Establish work zones</td>
</tr>
<tr>
<td>and Soil Sampling</td>
<td>- Heavy equipment</td>
<td>Site coordination/control</td>
</tr>
<tr>
<td></td>
<td>- Overhead hazard</td>
<td>hardhats, steel-toed boots</td>
</tr>
<tr>
<td></td>
<td>- Noise</td>
<td>Appropriate placement of rig</td>
</tr>
<tr>
<td></td>
<td>- Heat/stress</td>
<td>Hearing protective devices</td>
</tr>
<tr>
<td></td>
<td>- Uneven terrain</td>
<td>Personnel monitoring and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>adequate hydration</td>
</tr>
<tr>
<td></td>
<td>Biological hazards</td>
<td>Appropriate placement of rig; use outriggers</td>
</tr>
<tr>
<td></td>
<td>- Copperhead Snakes</td>
<td>Monitoring of breathing zone;</td>
</tr>
<tr>
<td></td>
<td>- Poison</td>
<td>personal protective equipment</td>
</tr>
<tr>
<td></td>
<td>- Spiders, ticks</td>
<td>Personal protective equipment (coverall), personnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>awareness of animal behavior,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>insect repellant</td>
</tr>
<tr>
<td>TASK</td>
<td>HAZARD</td>
<td>CONTROL</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>Groundwater Well installation</td>
<td>Physical hazards:</td>
<td>Establish work zones</td>
</tr>
<tr>
<td></td>
<td>- Heavy equipment</td>
<td>Site coordination/control</td>
</tr>
<tr>
<td></td>
<td>- Overhead hazard</td>
<td>hardhats, steel-toed boots (vests)</td>
</tr>
<tr>
<td></td>
<td>- Noise</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Heat/stress</td>
<td>Appropriate placement of rig</td>
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<tr>
<td></td>
<td>- Uneven terrain</td>
<td>Hearing protective devices</td>
</tr>
<tr>
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<td>Personnel monitoring and</td>
</tr>
<tr>
<td></td>
<td>- Copperhead Snakes</td>
<td>adequate hydration</td>
</tr>
<tr>
<td></td>
<td>- Poison</td>
<td>Appropriate placement of rig; use outriggers</td>
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<tr>
<td></td>
<td>- Spiders, ticks</td>
<td>Monitoring of breathing zone;</td>
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<tr>
<td></td>
<td></td>
<td>personal protective equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Personal protective equipment (coverall),</td>
</tr>
<tr>
<td></td>
<td></td>
<td>personnel awareness of animal behavior,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>insect repellant</td>
</tr>
<tr>
<td>Ecological Assessment</td>
<td>Physical:</td>
<td>Steel toed boots</td>
</tr>
<tr>
<td></td>
<td>- Rough terrain</td>
<td>Personnel monitoring,</td>
</tr>
<tr>
<td></td>
<td>- Heat stress</td>
<td>adequate hydration</td>
</tr>
<tr>
<td></td>
<td>Biological</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Copperhead Snakes</td>
<td>PPE coverall &amp; gloves</td>
</tr>
<tr>
<td></td>
<td>- Spiders, ticks, etc.</td>
<td>personnel awareness of animal behavior,</td>
</tr>
<tr>
<td></td>
<td>- Poison Ivy/Oak</td>
<td>insect repellant</td>
</tr>
<tr>
<td>Hydrologic Assessment</td>
<td>Physical:</td>
<td>Steel toed boots</td>
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<tr>
<td></td>
<td>- Rough terrain</td>
<td>Personnel monitoring,</td>
</tr>
<tr>
<td></td>
<td>- Heat stress</td>
<td>adequate hydration</td>
</tr>
<tr>
<td></td>
<td>Biological</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Copperhead Snakes</td>
<td>PPE coverall &amp; gloves</td>
</tr>
<tr>
<td></td>
<td>- Spiders, ticks, etc.</td>
<td>personnel awareness of animal behavior,</td>
</tr>
<tr>
<td></td>
<td>- Poison Ivy/Oak</td>
<td>insect repellant</td>
</tr>
</tbody>
</table>
### Survey

**Physical:**
- Rough terrain
- Heat stress

**Biological:**
- Copperhead Snakes
- Spiders, ticks, etc.
- Poison Ivy/Oak

**Control:**
- Steel toed boots
- Personnel monitoring, adequate hydration
- PPE coverall & gloves - personnel awareness of animal behavior, insect repellent

### Chemical Hazards

The following table summarizes chemicals identified during the Site Investigation, or suspected to be present based on reported past use.

**CHEMICALS OF CONCERN AT THE WOODBRIDGE RESEARCH FACILITY**

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>CAS NUMBER</th>
<th>EXPOSURE LIMIT</th>
<th>IDLH LEVEL</th>
<th>ROUTES OF EXPOSURE</th>
<th>SYMPTOMS OF ACUTE EXPOSURE</th>
<th>IONIZATION (ev)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos</td>
<td>1332-21-4</td>
<td>PEL = 0.1 f/cc</td>
<td>N.D.</td>
<td>Inhalation, ingestion</td>
<td>Minimal, asbestosis/cancer on long term exposure</td>
<td>NA</td>
</tr>
<tr>
<td>Polychlorinated</td>
<td></td>
<td>PEL = 0.5-1 mg/m3</td>
<td>5 mg/m3</td>
<td>Inhalation, absorption, ingestion, contact</td>
<td>Irritates eyes, chloracne, liver damage.</td>
<td>NE</td>
</tr>
<tr>
<td>biphenyl (PCB)</td>
<td></td>
<td>REL 10-hr TWA = 1 ug/m3</td>
<td></td>
<td></td>
<td></td>
<td>NE</td>
</tr>
<tr>
<td>Chlorobenzene</td>
<td>106-90-7</td>
<td>PEL = 75 ppm</td>
<td>1000 ppm</td>
<td>Inhalation, ingestion, contact</td>
<td>Eye, nose, &amp; throat irritation; CNS depression, liver, kidney, &amp; lung injury</td>
<td>9.07 ev</td>
</tr>
<tr>
<td>Acetone</td>
<td>67-64-1</td>
<td>PEL = 1,000 ppm</td>
<td>2,500 ppm</td>
<td>Inhalation, ingestion, contact</td>
<td>Eye, nose &amp; throat irritation, headache, CNS depression.</td>
<td>9.69 ev</td>
</tr>
<tr>
<td>Bis Ethylhexyl</td>
<td>117-81-7</td>
<td>PEL = 5 mg/m3</td>
<td>NE</td>
<td>Inhalation, ingestion</td>
<td>Respiratory and skin irritation, nausea.</td>
<td>NE</td>
</tr>
<tr>
<td>phthalate</td>
<td></td>
<td>STEL = 10 mg/m3</td>
<td></td>
<td></td>
<td></td>
<td>NE</td>
</tr>
<tr>
<td>Di Octyl phthalate</td>
<td>117-84-0</td>
<td>NE</td>
<td>NE</td>
<td>Inhalation, ingestion, contact</td>
<td>Severe eye irritation, headache, nausea.</td>
<td>NE</td>
</tr>
</tbody>
</table>

**Final**

5-3
<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS NUMBER</th>
<th>EXPOSURE LIMIT</th>
<th>IDLH LEVEL</th>
<th>ROUTES OF EXPOSURE</th>
<th>SYMPTOMS OF ACUTE EXPOSURE</th>
<th>IONIZATION POTENTIAL (ev)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood Creosote</td>
<td>8021-39-4</td>
<td>PEL = NE, use coal tar pitch volatiles</td>
<td>NE</td>
<td>Inhalation, absorption, skin and eye contact</td>
<td>Skin, eye, respiratory irritation, skin rash and burns, visual effects/sensitivity to light.</td>
<td>NE</td>
</tr>
<tr>
<td>Beryllium</td>
<td>7440-41-7</td>
<td>PEL = .002 mg/m3, Ceiling = .005 mg/m3</td>
<td>10 mg/m3</td>
<td>Inhalation</td>
<td>Respiratory symptoms, weakness, fainting, weight loss (carcinogen).</td>
<td>NA</td>
</tr>
<tr>
<td>Cadmium (dust)</td>
<td>7440-43-9</td>
<td>PEL = .005 mg/m3</td>
<td>9 mg/m3</td>
<td>Inhalation</td>
<td>Pulmonary edema, dyspnea, cough, chills, nausea</td>
<td>NA</td>
</tr>
<tr>
<td>Cobalt</td>
<td>7440-48-4</td>
<td>PEL = 0.05 mg/m3</td>
<td>20 mg/m3</td>
<td>Inhalation, ingestion and skin and eye contact</td>
<td>Cough, decrease in pulmonary function; weight loss; dermatitis; diffuse nodular fibrosis and respiratory hypersensitivity.</td>
<td>NA</td>
</tr>
<tr>
<td>Lead</td>
<td>7439-92-1</td>
<td>PEL = 0.05 mg/m3</td>
<td>N.A.</td>
<td>Inhalation, ingestion, Contact</td>
<td>Lassitude, insomnia, pallor, eye grounds, anorexia, low weight, malnutrition, constipation, abdominal pain, colic, hypotension, anemia, gingival lead line, tremors, paralysis of the wrist.</td>
<td>NA</td>
</tr>
<tr>
<td>Mercury as Hg vapor</td>
<td>7439-97-6</td>
<td>PEL = 0.05 mg/m3, Ceiling = 0.1 mg/m3</td>
<td>10 mg/m3</td>
<td>Inhalation, absorption, contact</td>
<td>Cough, dyspnea, bronchial pneumonia, tremor, insomnia, irritability, indecision, headache, fatigue, weakness, stomatitis, salvation, GI anorexia, low-weight, proteinuria, irritated eyes-skin.</td>
<td>NA</td>
</tr>
</tbody>
</table>

Permissible Exposure Limit, OSHA.
Immediately Dangerous to Life and Health Level, NIOSH Publication # 94-116, June 1994.
Skin - Skin notation, absorption through intact skin can result in appreciable dose.
NA - Not applicable.
NE - Not established.
## DISTRIBUTION OF CONTAMINANTS IDENTIFIED IN OU 1
**DURING THE PRELIMINARY AND PHASE 1 SUPPLEMENTAL SITE INVESTIGATION**

<table>
<thead>
<tr>
<th>AREE</th>
<th>Toluene</th>
<th>PCBs</th>
<th>Chloro-benzene</th>
<th>Acetone</th>
<th>Bis-2-Ethylhexyl Phthalate</th>
<th>Di-n-Octyl Phthalate</th>
<th>Wood Creosote</th>
<th>Total Petroleum Hydrocarbons</th>
<th>Beryllium</th>
<th>Cadmium</th>
<th>Cobalt</th>
<th>Lead</th>
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</tbody>
</table>

Pesticides are not further identified; based on the period of use, organo-chlorine pesticides (DDT, DDE) would be expected.
<table>
<thead>
<tr>
<th>AREE</th>
<th>Toluene</th>
<th>PCBs</th>
<th>Chlorobenzene</th>
<th>Acetone</th>
<th>Bis-2-Ethylhexyl Phthalate</th>
<th>Di-n-Octyl Phthalate</th>
<th>Wood Creosote</th>
<th>Total Petroleum Hydrocarbons</th>
<th>Beryllium</th>
<th>Cadmium</th>
<th>Cobalt</th>
<th>Lead</th>
<th>Mercury</th>
<th>Pesticides</th>
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<td>X</td>
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</tr>
</tbody>
</table>

**DISTRIBUTION OF CONTAMINANTS IDENTIFIED IN OU 2**
**DURING THE PRELIMINARY AND PHASE 1 SUPPLEMENTAL SITE INVESTIGATION**
<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample IDs</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Soil</td>
<td>5</td>
<td>RIBK1-RIBK5</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, PAHs (surface soil and groundwater).</td>
<td>NA</td>
</tr>
<tr>
<td>Subsurface Soil</td>
<td>9</td>
<td>MW-52, 53, 54 (3 samples/boring)</td>
<td>1 sample/boring will be analyzed TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
<td>3 soil borings will be completed as monitored 35 feet below ground on the northwest side of Inner Perimeter Road thereafter until total depth for deep well boring is reached.</td>
</tr>
<tr>
<td>Groundwater</td>
<td>8&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Shallow wells: MW-52, 53, 54 Deep well: MW-63</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
<td>5 background surface samples will be collected</td>
</tr>
<tr>
<td>Subsurface Soil</td>
<td>9</td>
<td>MW-75, 76, and PZ-13 (3 samples/boring)</td>
<td>1 sample/boring will be analyzed TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
<td>Two monitoring wells samples will be collected for well borings, table; and one sample for the facility hydrogeologic properties.</td>
</tr>
<tr>
<td>Piezometers</td>
<td>1</td>
<td>PZ-13</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Groundwater</td>
<td>4&lt;sup&gt;2&lt;/sup&gt;</td>
<td>MW-75, 76</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs and PAHs</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
</tr>
</tbody>
</table>

<sup>1</sup> Forty-five surface water and sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, and PAHs.

<sup>2</sup> Upon collection, groundwater samples shall be preserved as follows: VOCs pH < 2 with HCl; TAL metals pH < 2 with NH<sub>4</sub>Cl; NO<sub>3</sub> - pH > 12 with NaOH.

<sup>3</sup> Total number of samples includes two rounds of groundwater samples collected a minimum of 2 months apart.

FINAL
## Background

<table>
<thead>
<tr>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>sample/boring will be analyzed TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
<td>5 background surface soil samples will be collected from 0 to 6-inches bgs.</td>
</tr>
</tbody>
</table>

3 soil borings will be drilled and completed as monitoring wells to access site background subsurface soil characteristics and groundwater quality. Two soil borings/monitoring wells, MW-53 and MW-81, will be drilled along the northern boundary of WRF. The profile is 35 feet below ground surface and 75 feet below ground surface, respectively. Deep well boring MW-81 will not split-spooned sampled. 1 boring/r on the northwest side of WRF and completed to approximately 35 feet below ground surface. An upgradient background monitoring well (MW-54) inner Perimeter Road to assess background subsurface soil and groundwater conditions in this area. Split-spoon samples will be collected from 0 thereafter until total depth is reached. Total depth will be the water table for soil borings and 7 feet below the water table for shallow well borings and 35 feet below ground surface for deep well boring. 3 samples will be selected and sent to the laboratory as follows: one sample from the 0 to 2 ft below ground surface (bgs); one from the water table; and one sample from each boring will be selected based on obvious soil staining or elevated PID reading. One soil boring will be converted to the facility hydrogeologic model.

## Downgradient Locations From Former Dump Areas

<table>
<thead>
<tr>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>sample/boring will be analyzed TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
<td>Two monitoring wells (MW-75, and MW-76) will be installed in downgradient locations from the former dump areas to evaluate groundwater quality. Samples will be collected from 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until total depth is reached. Total depth will be the water table for soil borings. 3 samples will be selected and sent to the laboratory as follows: one sample from the 0 to 2 ft below ground surface (bgs); one from the water table; and one sample from each boring will be selected based on obvious soil staining or elevated PID reading. One soil boring will be converted to the facility hydrogeologic model.</td>
</tr>
</tbody>
</table>

Sediment samples will also be tested for TOC and Grain size distribution.

Cl; TAL metals pH < 2 with NH₄⁺; CN⁻ pH > 12 with NaOH.

n of 2 months apart.
### Sampling Program

**Rationale**

- Monitoring wells to access site background subsurface soil characteristics and groundwater quality. The background borings will be from 0 to 6-inches bgs.

Deep well boring MW-81 will not split-spoon sampled. 1 boring/monitoring well, MW-52, will be drilled approximately 35 feet below ground surface. An upgradient background monitoring well (MW-54) will be installed on the south side of surface soil and groundwater conditions in this area. Split-spoon samples will be collected from 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until total depth is reached. Total depth will be the water table for soil borings and 7 feet below the water table for shallow well borings. 7 feet below the confining unit and sent to the laboratory as follows: one sample from the 0 to 2 ft below ground surface (bgs); one sample at the top of the water selected based on obvious soil staining or elevated PID reading.

**Imp Areas**

- Be installed in downgradient locations from the former dump areas to evaluate groundwater quality prior to off-site flow. Split-spoon bgs and every 5 ft thereafter until total depth is reached. Total depth will be the water table for soil borings and 7 feet below the water table and sent to the laboratory as follows: one sample from the 0 to 2 ft below ground surface (bgs); one sample at the top of the water selected based on obvious soil staining or elevated PID reading. One soil boring will be converted to a piezometer (PZ-13), for use in and TPH. Sediment samples will also be tested for TOC and Grain size distribution.
<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample IDs</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Soil</td>
<td>4</td>
<td>RISS1-4</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, PCTs and PAHs (groundwater only).</td>
<td>NA</td>
</tr>
<tr>
<td>Test Pits</td>
<td>4</td>
<td>TP1 and TP2 (2 samples/test pit)</td>
<td>NA</td>
<td>4 soil samples will be collected from test pits (TP1 and TP2) to determine the extent of PCB contamination. Two test pits will be used to sample for PCBs.</td>
</tr>
<tr>
<td>Subsurface Soil</td>
<td>12</td>
<td>MW-77,78,79,80 (3 samples/boring)</td>
<td>1 sample/boring will be analyzed for TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
<td>4 soil borings will be drilled and sampled to determine the extent of PCB contamination and are located to the south of the site.</td>
</tr>
<tr>
<td>Groundwater</td>
<td>20³</td>
<td>New Wells: MW-77,78,79,80. Existing Wells: MW-7,8,9,10,11,12</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
<td>Four downgradient soil borings will be collected to determine the extent of PCB contamination and are located to the south of the site.</td>
</tr>
</tbody>
</table>

1 Forty-five surface water and sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, temperature, pH, redox, dissolved oxygen, conductivity, and salinity.

2 Upon collection, groundwater samples shall be preserved as follows: VOCs pH < 2 with HCl; TAL metals pH < 2 with NH₄OH; CN⁻ pH > 12 with 1 M NaOH. 

3 Total number of samples includes two rounds of groundwater samples collected a minimum of 2 months apart.
<table>
<thead>
<tr>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>4 soil samples will be collected from the 0 to 6-inch depth interval for site characterization.</td>
</tr>
<tr>
<td>NA</td>
<td>Two test pits (TP1 and TP2) will be excavated downgradient from the two trenches (Trenches 20 and 21) previously excavated and sampled during the extent of PCB contamination. Two soil samples will be collected from each test pit. Each sample will be selected based on obvious soil staining or P sample reading.</td>
</tr>
<tr>
<td>1 sample/boring will be analyzed for TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
<td>4 soil borings will be drilled and samples collected to further characterize subsurface soil contamination. Split-spoon samples will be collected from 0- total depth is reached. Total depth will be the water table for soil borings and 7 feet below the water table for well borings. 3 samples will be selected per sample from the 0 to 2 ft below ground surface (bgs); one sample at the top of the water table; and one sample from each boring will be selected based on obvious soil staining or P sample reading.</td>
</tr>
<tr>
<td>Temp, pH, redox, D.O., cond. salinity</td>
<td>Four downgradient soil borings completed as monitoring wells will be drilled (MW-78, MW-79, and MW-80). The proposed locations are closer than the existing wells (MW-77 and MW-78) and are located to further characterize and evaluate subsurface soil and groundwater contamination in AREE 1. Existing wells (MW-77 and MW-78) are located 50 and 55 feet downgradient of the main source of PCB contamination. The proposed sampling locations are designed to evaluate the extent of PCB contamination and are located to further characterize and evaluate subsurface soil and groundwater contamination in AREE 1.</td>
</tr>
<tr>
<td>NA</td>
<td>5 soil samples will be collected from the 0 to 6-inch depth interval for site characterization.</td>
</tr>
</tbody>
</table>

These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, PCTs, PAHs and TPH. Sediment samples will also be tested for TOC and Grain size distribution and chlorinity. Metals will be analyzed using HCl acid at pH < 2; TAL metals will be analyzed using NH₄OH at pH > 12 with NaOH. Samples will be collected and analyzed a minimum of 2 months apart.
### Rationale

From the two trenches (Trenches 20 and 21) previously excavated and sampled during the 1993 USAEC SI to determine the downgradient impact from each test pit. Each sample will be selected based on obvious soil staining or PID hit.

Split-spoon samples will be collected from 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until soil borings and 7 feet below the water table for well borings. 3 samples will be selected and sent to the laboratory as follows: one sample at the top of the water table; and one sample from each boring will be selected based on obvious soil staining or elevated PID.

Three wells will be drilled (MW-78, MW-79, and MW-80). The proposed locations are closer than the existing wells to the known area of PCB eluate subsurface soil and groundwater contamination in AREE 1. Existing wells (MW-7 through MW-12) will be sampled for the RI/FS.

Hs and TPH. Sediment samples will also be tested for TOC and Grain size distribution and surface water samples will measured for...
## WRF RI/FS Groundwater

### Medium Sampled

<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample IDs</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Pits</td>
<td>4</td>
<td>TP3 and TP4 (2 samples/test pit)</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, PCTs, and TPH.</td>
<td>NA</td>
</tr>
<tr>
<td>Subsurface Soil</td>
<td>30</td>
<td>MW-66, 69, 70, 71, 72, 73, 74, 81, RISB6, and PZ-12</td>
<td>1 sample/boring will be analyzed for TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
<td>NA</td>
</tr>
<tr>
<td>Piezometers</td>
<td>1</td>
<td>PZ-12.</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Groundwater</td>
<td>30*</td>
<td>New Shallow Wells: MW-66, 69, 70, 71, 72, 73, 74, 81. Deep wells: MW-82, 83 Existing Wells: MW-1, 2, 3, 4, 5</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, PCTs, PAHs and TPH.</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
</tr>
<tr>
<td>Surface Soil</td>
<td>3</td>
<td>RISS10-12</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, PCTs, PAHs (surface soil only) and TPH.</td>
<td>NA</td>
</tr>
<tr>
<td>Test Pit</td>
<td>2</td>
<td>TP13 and TP14 (2 samples/test pit)</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

### Notes

1. Forty-five surface water and sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, metals, and redox for temperature, pH, redox, dissolved oxygen, conductivity, and salinity.

2. Upon collection, groundwater samples shall be preserved as follows: VOCs pH < 2 with HCl; TAL metals pH < 2 with NH₄Cl; CN⁻ pH > 12 with NH₄Cl.

3. Total number of samples includes two rounds of groundwater samples collected a minimum of 2 months apart.

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FINAL
Table 3-1 (Continued)
WRF RI/FS Groundwater, Surface And Subsurface Sampling Program

<table>
<thead>
<tr>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AREE 2 &amp; 5 (Continued)</strong></td>
<td></td>
</tr>
</tbody>
</table>

One test pit (TP3) will be excavated in AREE 2 to delineate the extent of PCB contamination remaining on the site after the 1984 remedial action performed excavated in AREE 5. to characterize the site of a former disposal pit where metal debris is partially buried. Two soil samples will be collected from each test pit. To determine the extent of PCB contamination, soil samples will be collected for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, PCTs, PAHs and TPH. Sediment samples will also be tested for TOC and Grain size distribution and salinity with HCl; TAL metals pH < 2 with NH4OH; CN- pH > 12 with NaOH.

Seven shallow soil boring/monitoring wells (one upgradient and 6 downgradient) located to encompass AREEs 2 and 5, will be drilled to identify potential source areas and pesticide contamination in the soil. These borings will be completed as monitoring wells (MW-68 and MW-70 through MW-74, and MW-81) to investigate additional monitoring well (MW-69) will be installed at the former sediment sample location 02SE02 (SI sample location) to investigate potential subsurface soil and groundwater contamination in this area. Proposed soil boring/monitoring well MW-71 will address the PCB contamination found at 05DP0101, and soil boring/monitoring well MW-68 will serve to identify PCB contamination at 05DP0101. The top of the screen of existing well MW-1 is below the water table, thereby rendering it unable to provide monitoring data useful for assessing the extent of contamination. An additional monitoring well will be installed at the former sediment sample location 02SE02 (SI sample location) to investigate potential subsurface soil and groundwater contamination in this area. Existing monitoring wells MW-1 through MW-3 and MW-5 will be completed adjacent to MW-2 (forming a well cluster with MW-81) to evaluate if PCBs have migrated downward in an area where PCBs have been detected. Deep well MW-83 will form a well cluster with shallow monitoring well MW-71. Soil samples will be collected from the 0 to 2 ft below ground surface (bgs); one sample at the top of the water table; and one sample if there is evidence of soil staining or elevated PID reading. These borings will be completed as monitoring wells (MW-70 through MW-74). An additional monitoring well will be installed adjacent to the SI sample location where PCBs were detected in AREE2. One soil boring will be installed by prior sediment piezometer (PZ-12).

**AREE 3**

3 soil samples will be collected from the 0 to 6 inch depth interval and 2 test pits will be excavated in the disposal area at AREE 3 for site characterization.

<table>
<thead>
<tr>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NA</strong></td>
<td></td>
</tr>
</tbody>
</table>
The extent of PCB contamination remaining on the site after the 1984 remedial action performed by Weston. One test pit (TP4) will be

disposal pit where metal debris is partially buried. Two soil samples will be collected from each test pit.

Two soil samples will be collected from each test pit. Test pits (TP1 and 6 downgradient) located to encompass AREEs 2 and 5, will be drilled to identify potential source areas and the extent of PCB, TPH,

and soil and groundwater contamination in this area. Test pits will be completed as monitoring wells (MW-68 and MW-70 through MW-74, and MW-81) to investigate potential groundwater contamination. An former sediment sample location 02SE02 (SI sample location) to investigate potential subsurface soil and groundwater contamination in this area the PCB contamination found at 050P0101, and soil boring/monitoring well MW-68 will serve as an upgradient well due to the screen existing well MW-1 is below the water table, thereby rendering it unable to provide monitoring data for TPH. MW-81 will be located adjacent such that the screens are placed to intercept light phase compounds, if present. In addition, 2 deep monitoring wells will be installed. Later with MW-81) to evaluate if PCBs have migrated downward in an area where PCBs have been detected in the past. MW-83 will be

were detected. Deep well MW-83 will form a well cluster with shallow monitoring well MW-71. Split-spoon samples will be collected from 0-2 ft reached. Total depth will be the water table for soil borings and 7 feet below the water table for well borings. 3 samples will be selected 0 to 2 ft below ground surface (ftgs); one sample at the top of the water table; and one sample from each boring will be selected based on

tgs will be completed as monitoring wells (MW-70 through MW-74). An additional monitoring well (MW-69) will be installed at the former soil and groundwater contamination in this area. Existing monitoring wells (MW-1 through MW-7) will be resampled for the RI. One soil

experience where PCBs were detected in AREE2. One soil boring will be installed by prior sediment sample location 02SE01 and converted to

interval and 2 test pits will be excavated in the disposal area at AREE 3 for site characterization.

AHS and TPH. Sediment samples will also be tested for TOC and Grain size distribution and surface water samples will measured.
### Medium Sampled

<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample IDs</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Soil</td>
<td>4</td>
<td>RISS13-16</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, PCTs, PAHs (surface soil and groundwater only), TPH.</td>
<td>NA</td>
</tr>
<tr>
<td>Test Pits</td>
<td>16</td>
<td>TP5-12 (2 samples/test pit)</td>
<td>NA</td>
<td>Four soil samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, PCTs, PAHs (surface soil and groundwater only), TPH.</td>
</tr>
<tr>
<td>Subsurface Soil</td>
<td>9</td>
<td>MW-64, 66, 67, (3 samples/boring)</td>
<td>1 sample/boring will be analyzed for TOC, Atterberg limits, USCS, Grain size distribution, percent moisture.</td>
<td>10 geophysical anomalies evaluate the potential PID hit.</td>
</tr>
<tr>
<td>Surface Soil</td>
<td>7</td>
<td>RISS17-23</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL metals and PAHs (surface soil and groundwater only).</td>
<td>NA</td>
</tr>
<tr>
<td>Test Pits</td>
<td>16</td>
<td>TP15, 16, and 17</td>
<td>NA</td>
<td>7 soil samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals and PAHs (surface soil and groundwater only).</td>
</tr>
<tr>
<td>Subsurface Soil</td>
<td>3</td>
<td>MW-65 (3 samples/boring)</td>
<td>1 sample/boring will be analyzed for TOC, Atterberg limits, USCS, Grain size distribution, percent moisture.</td>
<td>Total depth will be the 0 to 2 ft below ground level.</td>
</tr>
<tr>
<td>Groundwater</td>
<td>2</td>
<td>MW-65</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
<td>Total depth will be the 0 to 2 ft below ground level.</td>
</tr>
</tbody>
</table>

---

1. Forty-five surface water and sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, PCTs, PAHs (surface soil and groundwater only), TPH.

2. Upon collection, groundwater samples shall be preserved as follows: VOCs pH < 2 with HCl; TAL metals pH < 2 with NH₄Cl; CN⁻ pH > 12 with NH₄OH.

3. Total number of samples includes two rounds of groundwater samples collected a minimum of 2 months apart.
### Table 3-1 (Continued)

WRF RI/FS Groundwater, Surface And Subsurface Sampling Program

<table>
<thead>
<tr>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**AREE 4**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp, pH, redox, D.O., cond. salinity</td>
<td>Four soil samples will be collected from the 0 to 6-inch depth interval for site characterization.</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 geophysical anomalies previously identified west of AREE 4 will be investigated. Test pits (TP5 through TP12) will be excavated to evaluate the potential for subsurface soil contamination. 2 subsurface soil samples will be collected from each test pit. Each sample will be analyzed for TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture. 5 monitoring wells (MW-64 through MW-68) will be installed around the previously trenched area, one upgradient and four downgradient to the west of the area. Split-spoon samples will be collected from the 0 to 6-inch depth interval. Total depth will be the water table for soil borings and 7 feet below the water table for well borings. 3 samples will be collected at the 0 to 2 ft below ground surface (bgs); one sample at the top of the water table; and one sample from each borehole will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, PCTs, PAHs and TPH. Sediment samples will also be tested for TOC and Grain size distribution.</td>
</tr>
</tbody>
</table>

**AREE 6A**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7 soil samples will be collected from the 0 to 6-inch depth interval for site characterization. In addition, 3 test pits will be excavated to evaluate the potential for subsurface soil contamination. A 5 monitoring well (MW-65) will be installed downgradient of AREE 6A to evaluate downgradient groundwater quality and the extent of subsurface soil and groundwater contamination associated with this AREE. Split-spoon samples will be collected from 0 to 2 ft bgs, 5-7 ft bgs Total depth will be the water table for soil borings and 7 feet below the water table for well borings. 3 samples will be collected at the 0 to 2 ft below ground surface (bgs); one sample at the top of the water table; and one sample from each borehole will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, PCTs, PAHs and TPH. Sediment samples will also be tested for TOC and Grain size distribution.</td>
</tr>
</tbody>
</table>

---

the 0 to 6-inch depth interval for site characterization. Identified west of AREE 4 will be investigated. Test pits (TP5 through TP12) will be excavated at the previously identified geophysical anomalies to soil contamination. 2 subsurface soil samples will be collected from each test pit. Each sample will be selected based on obvious soil staining or

(W-68) will be installed around the previously trenched area, one upgradient and four downgradient. These wells are designed to evaluate the water contamination associated with this AREE. Split-spoon samples will be collected from 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until total depth is reached. Split-spoon samples will be collected from 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until total depth is reached. 3 samples will be selected and sent to the laboratory as follows: one sample at the top of the water table; and one sample from each boring will be selected based on obvious soil staining or elevated PID

0 to 6-inch depth interval for site characterization. In addition, 3 test pits will be excavated to characterize the old landfill. One soil sample will be installed downgradient of AREE 6A to evaluate downgradient groundwater quality and the extent of subsurface soil and groundwater associated with this AREE. Split-spoon samples will be collected from 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until total depth is reached. Split-spoon samples will be collected from 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until total depth is reached. 3 samples will be selected and sent to the laboratory as follows: one sample from the ground surface (bgs); one sample at the top of the water table; and one sample from each boring will be selected based on obvious soil staining or elevated PID

TS, PAHs and TPH. Sediment samples will also be tested for TOC and Grain size distribution.
<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample IDs</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Soil</td>
<td>2</td>
<td>RISS24, RISS25</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, PAHs (surface soil and groundwater only) and TPH.</td>
<td>NA</td>
</tr>
<tr>
<td>Test Pits</td>
<td>3</td>
<td>TP18, 19, 20</td>
<td>NA</td>
<td>2 soil samples will be excavated.</td>
</tr>
<tr>
<td>Subsurface Soil</td>
<td>3</td>
<td>MW-60</td>
<td>1 sample/boring will be analyzed for TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
<td>NA</td>
</tr>
<tr>
<td>Groundwater</td>
<td>2</td>
<td>MW-60</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
<td>Split-sample will be excavated.</td>
</tr>
</tbody>
</table>

| Subsurface Soil | 3                 | MW-59 (3 samples/boring) | TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PAHs (GW only). | 1 sample/boring will be analyzed for TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture. |
| Groundwater    | 2                 | MW-59      | Temp, pH, redox, D.O., cond. salinity | Soil boring/monitoring monitoring well MW-5 contamination downslope collected from 0-2 ft. |

| Subsurface Soil | 3                 | MW-61 (3 samples/boring) | TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, TPH. | 1 sample/boring will be analyzed for TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture. |

---

1. Forty-five surface water and sediment samples will be collected site-wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, temperature, pH, redox, dissolved oxygen, conductivity, and salinity.

2. Upon collection, groundwater samples shall be preserved as follows: VOCs pH < 2 with HCl; TAL metals pH < 2 with NH4Cl; CN- pH > 12 with NaCN.

3. Total number of samples includes two rounds of groundwater samples collected a minimum of 2 months apart.

FINAL
Table 3-1 (Continued)
WRF RI/FS Groundwater, Surface And Subsurface Sampling Program

<table>
<thead>
<tr>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AREE 6B</strong></td>
<td></td>
</tr>
<tr>
<td>2 soil samples will be collected from the 0 to 6-inch depth interval for site characterization. Two test pits (TP18 and TP19) will be excavated to investigate and characterize metal debris found in an area west of Deephole Point Road. Two test pits will be excavated east of Deephole Point Road to investigate a suspected disposal area where TPH was detected during the 1993 SI. Two pit. A soil boring/monitoring well (MW-60) will be installed upgradient of this AREE (which is also upgradient of AREE 7) to evaluate groundwater contamination. MW-75, (also discussed below in AREE 7) will be installed downgradient from AREEs 6B, and 7 to evaluate groundwater contamination. Soil boring/monitoring well (MW-59) will be installed in AREE 6B. Subsurface soil and groundwater data collected from MW-59 will be evaluated. Monitoring well MW-59, monitoring well MW-75 (to be installed downgradient of AREEs 6B and 7) will be used to evaluate groundwater quality downgradient of this AREE (MW-75 will also be used to evaluate groundwater quality downgradient of AREE 6B, as previously discussed above). Samples will be collected from 0-2 ft bgs. 5-7 ft bgs and every 5 ft thereafter until total depth is reached. Total depth will be 10 feet below the water table. Samples will be selected and sent to the laboratory as follows: one sample from the 0 to 2 ft bgs; one sample below the water table; and one sample from each boring will be selected based on obvious soil staining or elevated PID reading. Soil boring/monitoring well (MW-59) will be installed in AREE 7. Subsurface soil and groundwater data collected from MW-59 will be evaluated. Monitoring well MW-59, monitoring well MW-75 (to be installed downgradient of AREEs 6B and 7) will be used to evaluate groundwater quality downgradient of this AREE (MW-75 will also be used to evaluate groundwater quality downgradient of AREE 6B, as previously discussed above). Samples will be collected from 0-2 ft bgs. 5-7 ft bgs and every 5 ft thereafter until total depth is reached. Total depth will be the water table for soil borings. 3 samples will be selected and sent to the laboratory as follows: one sample from the 0 to 2 ft below ground surface (bgs); one sample from each boring will be selected based on obvious soil staining or elevated PID reading. One soil boring/monitoring well (MW-61) will be installed in a downgradient location at the corner of the Bayview Road and Charlie Road. This will be the northeast portion of the compound. This monitoring well will be installed to determine whether groundwater or subsurface soils have been impacted by upgradient sources.</td>
<td></td>
</tr>
</tbody>
</table>

Downgradient Location From Facility Compound

<table>
<thead>
<tr>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, PCTs, PAHs and TPH. Sediment samples will also be tested for TOC and Grain size distribution and sorted with HCl. TAL metals pH < 2 with NH₄OH; CN⁻ pH > 12 with NaOH.

Minimum of 2 months apart.

5-11
Sampling Program

Rationale

Depth interval for site characterization:
* Investigate and characterize metal debris found in an area west of Deephole Point Road in this AREE. An additional test pit (TP20) was used to investigate a suspected disposal area where TPH was detected during the 1995 SI. Two soil samples will be collected from each test installed upgradient of this AREE (which is also upgradient of AREE 7) to evaluate groundwater quality. Downgradient soil samples in AREE 7 will be installed downgradient from AREEs 6B and 7 to evaluate groundwater quality and subsurface soil conditions in on 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until total depth is reached. Total depth will be the water table for soil borings and 7 ftles will be selected and sent to the laboratory as follows: one sample from the 0 to 2 ft below ground surface (bgs); one sample at the boring will be selected based on obvious soil staining or elevated PID reading.

...in AREE 7. Subsurface soil and groundwater data collected from MW-59 will be evaluated to characterize the site. In addition to being installed upgradient of AREEs 6B and 7 will be used to evaluate groundwater quality and the extent of groundwater will also be used to evaluate groundwater quality downgradient of AREE 6B, as previously discussed. Split-spoon samples will be thereafter until total depth is reached. Total depth will be the water table for soil borings and 7 feet below the water table for well laboratory as follows: one sample from the 0 to 2 ft below ground surface (bgs); one sample at the top of the water table; and one obvious soil staining or elevated PID reading.

...and

ailed In a downgradient location at the corner of the Bayview Road and Charlie Road. This area receives surface water runoff from ring well will be installed to determine whether groundwater or subsurface soils have been impacted by run off or other potential

d TPH. Sediment samples will also be tested for TOC and Grain size distribution and surface water samples will measured for
<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample IDs</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
<th>Downgradient Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater</td>
<td>2</td>
<td>MW-61</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PAHs</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
<td>(See Above)</td>
</tr>
<tr>
<td>Test Pits</td>
<td>NA</td>
<td>TP21 and TP22</td>
<td>NA</td>
<td>NA</td>
<td>Four shallow soil boring to characterize and contamination in the subsurface and is also downgradient during the removal activity. Samples collected from this area, wells MW-37, MW-38, a Drum Storage Area (AR) model. In addition, 2 shallow and 2 deep wells will be drilled to intercept the extent of subsurface contamination.</td>
</tr>
<tr>
<td>Subsurface Soil</td>
<td>27</td>
<td>MW-55, 56, 57, 58, and RISB1-RISB5 (3 samples/boring)</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, PCTs, PAHs (groundwater only), TPH.</td>
<td>1 sample/boring will be analyzed for TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
<td></td>
</tr>
</tbody>
</table>

1Forty-five surface water and sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, temperature, pH, redox, dissolved oxygen, conductivity, and salinity.

2Upon collection, groundwater samples shall be preserved as follows: VOCs pH < 2 with HCl; TAL metals pH < 2 with NHO3; CN⁻ pH> 12 with NaOH

3Total number of samples includes two rounds of groundwater samples collected a minimum of 2 months apart.

FINAL
Downgradient Location From Facility Compound (Continued)

<table>
<thead>
<tr>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>imp, pH, redox, D.O., cond.</td>
<td>(See Above)</td>
</tr>
</tbody>
</table>

AREEs In The Vicinity of Building 202 (AREEs 11, 17, 22, 23(b), 24(a), 24(c), And 24(d))

Four shallow soil boring/monitoring wells (MW-55 - MW-58) and a deep monitoring well (MW-62) will be installed in downgradient locations from the extent of subsurface soil and groundwater contamination. MW-55 is located in an area where stressed vegetation has been observed in an area and is also downgradient from the former Oil/Water Separator. As previously discussed, a sand lens, which is believed to trend northwest from the area during the removal action. Shallow monitoring well MW-56 and deep monitoring well MW-62 will be installed in a downgradient location to intercept samples collected from wells MW-56 and MW-62 will be analyzed to evaluate whether upper and lower groundwater zones are contaminated from TAL metals. Shallow monitoring well MW-57 and MW-58 are located adjacent to Ditch 22 to evaluate groundwater quality prior to potential discharge. Water level measurements will be collected from all existing wells in this area to extend the discharge model. In addition, 2 soil borings (RISB1 and RISB2) will be drilled in the paved area west of the oil/water separator to evaluate the extent of subsurface soil and to characterize and delineate the extent of contamination in AREE 17. AREE 17 is also being sampled in the Phase II SSI. Soil borings will be be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, PCTs, PAHs and TPH. Sediment samples will also be tested for TOC and Grain size distribution and surface water.

TAL metals pH < 2 with NH₄OH; CN⁻ pH > 12 with NaOH.

2 months apart.

5-12
MW-58) and a deep monitoring well (MW-62) will be installed in downgradient locations from the suspected source areas to evaluate contamination. MW-55 is located in an area where stressed vegetation has been observed in an area which receives surface water runoff from the Oil/Water Separator. As previously discussed, a sand lens, which is believed to trend northwest from the Oil/Water Separator was encountered during the PCB removal action. One soil boring (RISB3) will be drilled adjacent to the excavated ditch where the sand lens was encountered during the PCB removal action. The suspected trend of the sand lens is toward the northwest toward monitoring wells MW-56 and MW-62. The trend and location will be confirmed along with TP22 perpendicular to the suspected trend. Once the location has been confirmed, 2 additional soil borings (RISB4 and RISB5) will be drilled to evaluate the extent of subsurface lithologic properties and evaluate the extent of contamination in the lens.

TABLE 1 – Rationale

Rationale

id (Continued)

(b), 24(a), 24(c), And 24(d))

Groundwater will be analyzed to evaluate whether upper and lower groundwater zones are contaminated from the migration of PCBs and TPH and MW-58 are located adjacent to Ditch 22 to evaluate groundwater quality prior to potential discharge to Ditch 22. Existing monitoring wells installed as part of a Phase II Site Characterization, will be sampled for this Rl to investigate groundwater quality downgradient of the suspected trend of the sand lens is toward the northwest toward monitoring wells MW-56 and MW-62. The trend and location will be confirmed with TP22 perpendicular to the suspected trend. Once the location has been confirmed, 2 additional soil borings (RISB4 and RISB5) will be drilled to evaluate the extent of subsurface lithologic properties and evaluate the extent of contamination in the lens.

Water level measurements will be collected from all existing wells in this area to extend the data base for the hydrogeologic model and TPH. Sediment samples will also be tested for TOC and Grain size distribution and surface water samples will measured for TOC and Grain size distribution.
<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample IDs</th>
<th>Chemical Analyses²</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater</td>
<td>4²</td>
<td>Existing wells: MW-33 and MW-34</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, PAHs, and TPH.</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
</tr>
<tr>
<td>Groundwater</td>
<td>4²</td>
<td>Existing wells: MW-37 and MW-38</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, PAHs, and TPH.</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
</tr>
<tr>
<td>Groundwater</td>
<td>2²</td>
<td>Existing well: MW-35</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PAHs</td>
<td>NA</td>
</tr>
<tr>
<td>Subsurface Soil</td>
<td>3</td>
<td>RISB13 (3 samples/boring)</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH.</td>
<td>1 sample/boring will be analyzed TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
</tr>
</tbody>
</table>

¹Forty-five surface water and sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs temperature, pH, redox, dissolved oxygen, conductivity, and salinity.

²Upon collection, groundwater samples shall be preserved as follows: VOCs pH < 2 with HCl; TAL metals pH < 2 with NH₄OH; CN⁻ pH > 12 with NaCN.

³Total number of samples includes two rounds of groundwater samples collected a minimum of 2 months apart.

FINAL
<table>
<thead>
<tr>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AREE 8</strong></td>
<td>Existing monitoring wells MW-33 and MW-34 will be sampled during the RI to evaluate groundwater quality downgradient of AREE 8.</td>
</tr>
<tr>
<td><strong>AREE 12</strong></td>
<td>Existing monitoring wells MW-37 and MW-38 will be sampled during the RI to evaluate groundwater quality downgradient of AREE 12.</td>
</tr>
<tr>
<td><strong>AREE 14</strong></td>
<td>Existing monitoring well MW-35 will be sampled to investigate groundwater quality downgradient of AREE 14.</td>
</tr>
<tr>
<td><strong>AREE 23A</strong></td>
<td>One soil boring will be installed at the prior location of an UST adjacent to Building 101. Drilling will proceed through the soil fill and the soil cutt of the prior excavation is reached. A split-spoon sample will be collected from the bottom of the boring.</td>
</tr>
</tbody>
</table>
A surface sampling program is being implemented to evaluate groundwater quality downgradient of AREE 8, AREE 12, and AREE 14. The rationale for sampling at these locations is to investigate groundwater quality downgradient of AREE 14.

Drilling will proceed through the soil fill and the soil cuttings will be monitored until the bottom spoon sample will be collected from the bottom of the boring. 3AHs and TPH. Sediment samples will also be tested for TOC and Grain size distribution and surface water samples will be measured for...
<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample ID</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsurface Soil</td>
<td>6</td>
<td>RISS4, PZ-5 (3 samples/boring)</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH.</td>
<td>1 sample/boring will be analyzed TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
</tr>
<tr>
<td>Piezometers</td>
<td>1</td>
<td>PZ-5</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Surface Soil</td>
<td>25</td>
<td>RISS25-RISS50</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs (optional), PAHs.</td>
<td>NA</td>
</tr>
<tr>
<td>Subsurface Soil</td>
<td>8</td>
<td>PZ-3, 4, 6, 7, 8, 9, 10, 11</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics Samples collected from PZ-3 will also be analyzed for TPH.</td>
<td>1 sample/boring will be analyzed TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
</tr>
<tr>
<td>Piezometers</td>
<td>8</td>
<td>PZ-3, 4, 6, 7, 8, 9, 10, 11</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

1 Forty-five surface water and sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics.

2 Upon collection, groundwater samples shall be preserved as follows: VOCs pH < 2 with HCl; TAL metals pH < 2 with NH₄Cl; CN⁻ pH > 12 with NaOH.
Physical Testing

1 sample/boring will be analyzed TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.

Table 3-1 (Continued)
WRF RI/FS Groundwater, Surface And Subsurface Sampling Program

<table>
<thead>
<tr>
<th>AREE 24 e, f</th>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 sample/boring will be analyzed TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
<td></td>
<td>Two soil borings will be installed downgradient from the USTs to examine subsurface soil conditions in this area (RISB4). One of these soil borings will be groundwater elevation data (PZ-9). Split-spoon samples will be collected from 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until total depth is reached. Soil borings and 7 feet below the water table for well borings. 3 samples will be selected and sent to the laboratory as follows: one sample from the top of the water table; and one sample from each boring will be selected based on obvious soil staining or elevated PID reading.</td>
</tr>
<tr>
<td>NA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Facility-Wide Characterization Which Includes AREEs 25, 26, 27, and 35

<table>
<thead>
<tr>
<th>Facility-Wide Characterization Which Includes AREEs 25, 26, 27, and 35</th>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td></td>
<td>Twenty-five surface soil samples will be collected from 0 to 6-inches bgs throughout these areas to identify potential sources of contamination. If PCTs are found, laboratory will be instructed to analyze for PCTs.</td>
</tr>
</tbody>
</table>

Site Hydrogeologic Evaluation

<table>
<thead>
<tr>
<th>Site Hydrogeologic Evaluation</th>
<th>Physical Testing</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 sample/boring will be analyzed TOC, Atterberg limits, USCS, Grain size distribution, and percent moisture.</td>
<td></td>
<td>Eight soil borings will be installed to further characterize the soil at WRF. These borings will be converted to piezometers to develop the hydrogeologic model. Samples will be collected from 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until total depth is reached. Total depth will be 7 feet below the water table and will be selected and sent to the laboratory as follows: one sample from the 0 to 2 ft below ground surface (bgs); one sample at the top of the water table will be selected based on obvious soil staining or elevated PID reading. In addition, water level measurements will be collected from newly-installed piezometers to use for the facility hydrogeologic model.</td>
</tr>
<tr>
<td>NA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sediment samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, PCTs, PAHs and TPH. Sediment samples will also be tested for TOC and Grain size distribution.

with HCl; TAL metals pH < 2 with NH₄OH; CN⁻ pH > 12 with NaOH.

5-14
And Subsurface Sampling Program

### Rationale

<table>
<thead>
<tr>
<th>Subsurface Sampling Program</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>24 e, f</strong></td>
</tr>
<tr>
<td>Ingradient from the USTs to examine subsurface soil conditions in this area (RISB4). One of these soil borings will be completed as a piezometer for split-spoon samples will be collected from 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until total depth is reached. Total depth will be the water table for well borings. 3 samples will be selected and sent to the laboratory as follows: one sample from the 0 to 2 ft below ground surface (bgs); one and one sample from each boring will be selected based on obvious soil staining or elevated PID reading.</td>
</tr>
</tbody>
</table>

Includes AREAs 25, 26, 27, and 35

**Note:** Samples will be collected from 0 to 6-inches bgs throughout these areas to identify potential sources of contamination. If PCBs are detected in a soil sample then the site will be evaluated for PCTs.

### Evaluation

To characterize the soil at WRF. These borings will be converted to piezometers to develop the hydrogeologic characteristics of the site. Split-spoon samples will be collected from 0-2 ft bgs, 5-7 ft bgs and every 5 ft thereafter until total depth is reached. Total depth will be 7 feet below the water table for piezometer borings. 3 samples will be selected as follows: one sample from the 0 to 2 ft below ground surface (bgs); one sample at the top of the water table; and one sample from each boring will be based on obvious soil staining or elevated PID reading. In addition, water level measurements will be collected from newly-installed and existing monitoring wells, and used to develop a hydrogeologic model.

Sediment samples will also be tested for TOC and Grain size distribution.
<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample ID</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water</td>
<td>5</td>
<td>RIBKSW1 - RIBKSW5</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, PAHs.</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
</tr>
<tr>
<td>Sediment</td>
<td>5</td>
<td>RIBKSED1 - RIBKSED5</td>
<td>All samples will be analyzed for TOC and Grain size distribution.</td>
<td></td>
</tr>
</tbody>
</table>

**Surface Water**

<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample ID</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sediment**

<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample ID</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water</td>
<td>8</td>
<td>RISW1, 2, 5, 6, 13, 19, 20, 21.</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, PAHs.</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
</tr>
<tr>
<td>Sediment</td>
<td>8</td>
<td>RISED1, 2, 5, 6, 13, 19, 20, 21.</td>
<td>TOC &amp; Grain size distribution</td>
<td></td>
</tr>
</tbody>
</table>

**Surface Water**

<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample ID</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water</td>
<td>3</td>
<td>RISW10, 11, 12</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, PAHs.</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
</tr>
<tr>
<td>Sediment</td>
<td>3</td>
<td>RISED10, 11, 12</td>
<td>All samples will be analyzed for TOC and Grain size distribution.</td>
<td></td>
</tr>
</tbody>
</table>

**Surface Water**

<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Sample ID</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water</td>
<td>3</td>
<td>RISW7, 8, 9.</td>
<td>TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, PAHs.</td>
<td>Temp, pH, redox, D.O., cond. salinity</td>
</tr>
<tr>
<td>Sediment</td>
<td>3</td>
<td>RISED7, 8, 9.</td>
<td>TOC &amp; Grain size distribution</td>
<td></td>
</tr>
</tbody>
</table>

1 Forty-five surface water and sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, PAHs.

2 Upon collection, groundwater samples shall be preserved as follows: VOCs pH < 2 with HCl; TAL metals pH < 2 with HNO₃; CN⁻ pH > 12 with NaO

FINAL
### Physical Testing

<table>
<thead>
<tr>
<th>Rationale</th>
</tr>
</thead>
</table>

#### Background

- **emp, pH, redox, D.O., cond. salinity**
- 5 background surface water and sediment samples will be collected from Raccoon Creek on Mason Neck National Wildlife Refuge.

**Marumsco Creek**

- **emp, pH, redox, D.O., cond. salinity**
- Ten surface water and ten sediment samples will be collected in Marumsco Creek to address the potential for contamination from WRF. The AREEs are 1, 2, 3, 4, 5, 6a, and 6b. Other sites in the Marumsco Creek watershed include a pistol range and a sewage sludge injection field.

**Drainage Creek Between the Pond and Marumsco Creek**

- **emp, pH, redox, D.O., cond. salinity**
- Three surface water and three sediment samples will be collected from the creek that drains the area below the pond and leads to Marumsco Creek.

**The Pond**

- **emp, pH, redox, D.O., cond. salinity**
- Three surface water and three sediment samples will be collected from the pond.

samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, PCTs, PAHs and TPH. Sediment samples will also be tested for TOC and Grain size distribution.

2 with HCl; TAL metals pH < 2 with HNO₃; CN⁻ pH > 12 with NaOH.
Sediment samples will also be tested for TOC and Grain size distribution.
<table>
<thead>
<tr>
<th>Medium Sampled</th>
<th>Number of Samples</th>
<th>Chemical Analyses</th>
<th>Physical Testing</th>
<th>\</th>
<th>\</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water</td>
<td>17</td>
<td>TCL VOCs,</td>
<td>Temp, pH, redox, D.O., cond.</td>
<td>Western V</td>
<td>Three surface water and three sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, PAHs.</td>
</tr>
<tr>
<td></td>
<td>RISW25 - RISW38, 40, 41, 42.</td>
<td>SVOCs, pesticides/PCBs,</td>
<td>Salinity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sediment</td>
<td>17</td>
<td>TAL inorganics,</td>
<td>All samples will be analyzed for TOC and Grain size distribution.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RISED25 - RISED38, 40, 41, 42.</td>
<td>TPH, PCTs, PAHs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface Water</td>
<td>8</td>
<td>TCL VOCs,</td>
<td>Temp, pH, redox, D.O., cond.</td>
<td>Ocoqu</td>
<td>Eight surface water and eight sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, PAHs.</td>
</tr>
<tr>
<td></td>
<td>RISW3, 14, 15, 16, 17, 18, 24, 39.</td>
<td>SVOCs, pesticides/PCBs,</td>
<td>Salinity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sediment</td>
<td>8</td>
<td>TAL inorganics,</td>
<td>All samples will be analyzed for TOC and Grain size distribution.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RISED3, 14, 15, 16, 17, 18, 24, 39.</td>
<td>TPH, PCTs, PAHs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface Water</td>
<td>3</td>
<td>TCL VOCs,</td>
<td>Temp, pH, redox, D.O., cond.</td>
<td>Southern Drai</td>
<td>Three surface water and sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, PAHs.</td>
</tr>
<tr>
<td></td>
<td>RISW4, 22, 23.</td>
<td>SVOCs, pesticides/PCBs,</td>
<td>Salinity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sediment</td>
<td>3</td>
<td>TAL inorganics,</td>
<td>All samples will be analyzed for TOC and Grain size distribution.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RISED4, 22, 23.</td>
<td>TPH, PCTs, PAHs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface Water</td>
<td>3</td>
<td>TCL VOCs,</td>
<td>Temp, pH, redox, D.O., cond.</td>
<td>Northern W</td>
<td>Three surface water and three sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, PAHs.</td>
</tr>
<tr>
<td></td>
<td>RISW43, 44, 45</td>
<td>SVOCs, pesticides/PCBs,</td>
<td>Salinity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sediment</td>
<td>3</td>
<td>TAL inorganics,</td>
<td>TOC &amp; Grain size distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RISED43, 44, 45</td>
<td>TPH, PCTs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Forty-five surface water and sediment samples will be collected site wide. These samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL inorganics, TPH, PCTs, PAHs.

2 Upon collection, groundwater samples shall be preserved as follows: VOCs pH < 2 with HCl; TAL metals pH < 2 with HNO₃; CN⁻ pH > 12 with NaOH.

FINAL
### Physical Testing

<table>
<thead>
<tr>
<th>Rationale</th>
<th>Western WRF Creek</th>
<th>Occoquan Bay Sands</th>
<th>Southern Drainage Creeks</th>
<th>Northern WRF Creek</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp, pH, redox, D.O., cond. salinity</td>
<td>Three surface water and three sediment samples will be collected from the creek that runs through the western portion of WRF. This creek exits that drains the western portion of WRF. A field test facility and sewage sludge injection site are within the drainage of this creek.</td>
<td>Eight surface water and eight sediment samples will be collected from Occoquan Bay. The proposed surface water and sediment sample locations from AREEs 1, 6B, and 7.</td>
<td>Three surface water and sediment samples will be collected from the ditches which drain the southern portion of the facility east of AREE 1.</td>
<td>Three surface water and three sediment samples will be collected from the ditch that drains the northern portion of WRF. Two sediment/surface water samples will be collected from Belmont Bay near the mouth of the creek. A field test area and an in situ ditch.</td>
</tr>
<tr>
<td>All samples will be analyzed for TOC and Grain size distribution.</td>
<td>All samples will be analyzed for TOC and Grain size distribution.</td>
<td>All samples will be analyzed for TOC and Grain size distribution.</td>
<td>All samples will be analyzed for TOC and Grain size distribution.</td>
<td>All samples will be analyzed for TOC and Grain size distribution.</td>
</tr>
</tbody>
</table>

Se samples will be analyzed for TCL VOCs, SVOCs, pesticides/PCBs, TAL metals, PCTs, PAHs and TPH. Sediment samples will also be tested for TOC and Grain size distribution.

<2 with HCl; TAL metals pH < 2 with HNO₃; CN⁻ pH > 12 with NaOH.

5-16
Rationale

The creek that runs through the western portion of WRF. This creek exists within an extensive wetland complex and audge injection site are within the drainage of this creek.

Coquan Bay. The proposed surface water and sediment sample locations are upgradient and downgradient of areas which drain the southern portion of the facility east of AREE 1.

e ditch that drains the northern portion of WRF. Two sediment/surface water samples will be collected from the Belmont Bay near the mouth of the creek. A field test area and an ethylene glycol filled hose area drain to this.

iment samples will also be tested for TOC and Grain size distribution.
REPLACE HASP SECTION 6, TABLE 6-2 WITH THE FOLLOWING
ACTION LEVELS

The following instrument-based action levels (consistent readings in the breathing zone for 1 minute) are to be used at all times:

ORGANIC VAPORS - PID or FID (FID Recommended)

Level D  Background levels to 5 ppm above background
Level C  5 - 25 ppm above background unless Drager tubes identify Benzene
Level B  >25 ppm above background levels

(Only the SSO has the authority to downgrade the level of protection).

OXYGEN METER

Level D or C  ≥19.5% and ≤23%
Level B  <19.5% or >23.5%

*Oxygen content is determined first, and is the fundamental criteria for respiratory protection. Deficient or enriched oxygen content is not anticipated during this scope of work. For oxygen deficient atmospheres, Level B protection must include an escape SCBA as part of the respirator. Oxygen enriched atmospheres do not pose health hazards for short exposures, but do increase the likelihood and severity of fires and other oxidation reactions.

In addition to the PID/FID, a Drager pump and indicator tubes will also be used to identify known contaminants in the work area. For this scope of work, Benzene Drager tubes (Drager tube Benzene 2/a) will be used when the PID/FID Level C action level is exceeded.

Personal air sampling will be conducted for chemicals in accordance with the OSHA standards. Personal protective measures will be used during sampling periods to minimize exposure to workers. Sampling results will be made available to personnel and information will be used to determine whether the time weighted average values are being exceeded.
REPLACE SECTION 11, EXCEPT TABLE 11-1 WITH THE FOLLOWING
EMERGENCY ACTION PLAN/EMERGENCY RESPONSE PLAN

General

In order to reduce the impact of an accident related to environmental activities at the WRF, an Emergency Action Plan is necessary. This plan consists of an emergency response system designed to reduce the impact of an accident by rapid containment. The procedure will depend on the exact location of work. Accordingly, this Emergency Action Plan is designed to make optimum use of all available resources for speedy containment of the incident, so that the threat to people, the environment, and site property is minimized. The following sections provide a description of the responsibilities, emergency actions, contacts, and procedures necessary for an effective emergency response system.

Responsibilities

As a result of the potential hazards at the site, and conditions under which operations are conducted, the possibility of an emergency situation developing is real, although not likely. Should an emergency develop while environmental personnel are onsite, lines of authority have been established for supervising the situation. The Site Emergency Coordinator for this project are the SSOs.

The Emergency Coordinator shall implement the contingency plan whenever conditions at the site warrant such action. The coordinator will be responsible for assuring the evacuation, emergency treatment, emergency transport of site personnel as necessary, and notification of the appropriate emergency response units and management staff.

All project personnel will be instructed in the functions of the Emergency Response Plan. Because an incident can occur anywhere at any time, each individual may become the first observer of an incident and as such has definite responsibilities. These incidents include hazardous material spills, fires and explosions, personnel injuries, and transportation accidents. Any individual who discovers any of these situations becomes the first-responder. The Emergency Coordinator should be notified as soon as possible.

Emergency Procedures

In the event of a fire or explosion, or potential fire/explosion, immediately notify the local fire or emergency authority by radio or by phone at 911. Second, call the ARL emergency telephone number (301-394-1117) and report the incident and/or emergency.
First Aid and Emergency Equipment

During onsite investigation activities at the WRF, a variety of first aid and emergency equipment will be maintained in the support zone. All environmental personnel will have access to this equipment in the event an injury or an exposure occurs. The various types of first aid equipment that will be available include:

- Fire Extinguisher
- First Aid Kit
- Instant Coldpacks
- Scissors
- Sterile Eye Wash
- Bloodborne Pathogen Kit

Personnel Injury

Emergency first aid will be applied onsite as deemed necessary, followed by decontamination and transport of the individual to the nearest medical facility, if needed. The SSO will supply medical information to the appropriate medical personnel. An ambulance/rescue squad shall be contacted for transport as necessary in an emergency.

General First Aid

Generic first aid procedures are included in this section. Typical responses may include:

Skin Contact: Use copious amounts of soap and water. Wash/rinse affected area thoroughly, then provide appropriate medical attention. An eyewash system will be provided onsite at the support zone as appropriate. Eyes should be rinsed for 15 minutes upon chemical contamination.

Inhalation: Move the victim to fresh air immediately. If necessary, restore breathing. Decontaminate and transport to hospital if required.

Ingestion: Decontaminate and transport the victim to emergency medical facility immediately.

Fire/Explosion

In the event of fire or explosion, or potential fire/explosion, WRF security should be immediately notified either by radio or by phone at 911.

Spread of Contamination

In the event of the spread of contaminants beyond the work area, WRF security should be immediately notified.

Adverse Weather Conditions

In the event of adverse weather conditions, the SSO will assess if work can continue without
sacrificing the health and safety of any field workers. Items to be considered prior to assessing if work should continue include:

- Potential for heat stress and heat-related injuries,
- Limited visibility,
- Potential for electrical storms,
- Potential for flash floods, and
- Potential for high winds resulting in contaminant transport.
ADD THE FOLLOWING TO HASP TABLE 11-1
### TABLE 11-2
WRF AND ICF KAISER EMERGENCY CONTACTS

<table>
<thead>
<tr>
<th>NAME</th>
<th>TITLE</th>
<th>TELEPHONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jeff Waugh</td>
<td>USAEC Project Officer</td>
<td>(410) 671-1610</td>
</tr>
<tr>
<td>Patricia Thompson</td>
<td>ICF KE Project Manager</td>
<td>(410) 612-6371</td>
</tr>
<tr>
<td>Jack Choynowski</td>
<td>Health and Safety Officer</td>
<td>(410) 612-6370</td>
</tr>
<tr>
<td>Patricia Thompson</td>
<td>Field Team Leader</td>
<td>(410) 612-6371</td>
</tr>
<tr>
<td>William Houser</td>
<td>USAEC Industrial Hygiene</td>
<td>(410) 671-4811</td>
</tr>
<tr>
<td>Gerald Joy, CIH, CSP</td>
<td>ICF KE Director Industrial Hygiene</td>
<td>(412) 497-2056</td>
</tr>
<tr>
<td>Todd Waltemyer</td>
<td>WRF Facility Manager</td>
<td>(703) 490-2511</td>
</tr>
<tr>
<td>Robert Craig</td>
<td>ARL Environmental Officer</td>
<td>(301) 394-4511</td>
</tr>
</tbody>
</table>

An accident report form must be completed and submitted to the office health and safety officer.
REPLACE HASP APPENDIX A WITH THE FOLLOWING

FINAL
INITIAL LEVEL OF PROTECTION

PCBs, the contaminant of primary concern, are semi-volatile, and in the concentrations identified in the Preliminary Site Investigation, and Phase I Site Supplemental Site Investigation, should not present a substantial inhalation hazard. Inhalation of PCBs bound to dust can contribute to overall dose, but maintenance of airborne dust levels below 2.5 mg/M³, and use of organic vapor/HEPA combination respirator cartridges will control this route of exposure.

PCBs can be absorbed through intact skin in amounts large enough to contribute to overall dose. This route of entry is not likely to be significant at this site, but localized skin irritation could occur in sensitive individuals from skin contact with contaminated soils. Direct skin contact with contaminated soils shall be avoided, and field team members shall field wash when leaving the contaminated zone, and whenever skin exposure occurs.

Materials brought onto the site may also present hazards, examples are preservative chemicals for water samples, bentonite and grout mixes, and fuels. These materials will be used in accordance with their MSDS information.

All site activities will be initiated in a modified Level D. The components of this modification are as follows:

Dry Operations (without exposure to potentially contaminated groundwater or other hazardous liquids)

- Hardhat (within 25 feet, or length of longest drill stem component, from the rig)
- Safety glasses with side-shield
- Steel toe shoes (polymeric material or leather with disposable cover)
- Disposable permeable coverall (Kleenguard or equivalent)
- Gloves (for protection against physical hazards)

Wet Operations (where exposure to potentially contaminated groundwater or other hazardous liquids could occur)

- Hardhat (within 25 feet, or length of longest drill stem component, from the rig)
- Safety glasses with side-shield with a faceshield, or goggles
- Steel toe shoes (polymeric material or leather with disposable cover)
- Disposable coated coverall (CPF II or equivalent; when sampling installed monitoring wells, a full length apron of PVC, CPF II or other liquid proof material can be used in lieu of coveralls)
- Gloves (nitrile, neoprene, PVC, or latex)

Level C will consist of the above Level D equipment with the addition of an air purifying respirator with organic vapor/HEPA combination cartridges.
Level B will consist of the above Level D equipment with the addition of a pressure demand airline respirator, or pressure demand SCBA. An escape SCBA is required when using an airline respirator in oxygen deficient atmospheres.

Level A will not be used on this project.
APPENDIX D, REPLACE ETC FORMS WITH ICF KAISER FORMS
ADD THE FOLLOWING AS APPENDIX I
APPENDIX I
ICF KAISER PERSONNEL
DOCUMENTATION OF TRAINING
CERTIFICATE OF COMPLETION

This is to certify that

JOHN P. CHOYNOWSKI

has successfully completed

HAZARDOUS MATERIALS SITE WORKER COURSE (40-HOUR)

at

HAZMAT CENTER, COLUMBIA, MARYLAND

January 11 - 15, 1993

C93-0026

Chief Executive Officer
ICF KAISER ENGINEERS, INC.

This is to certify that

Jack Choynowski

Has completed 8 hours of OSHA Hazardous Materials Site Worker Annual Recertification Training as Required under 29 CFR 1910.120

Date April 5, 1995

Instructor [Signature]
American Red Cross

This certifies that
Jack Chovnowski
has completed the requirements for
STANDARD FIRST AID
sponsored by
CENTRAL MARYLAND CHAPTER
I.C.F. Kaiser Engineers

Date completed
04/06/95
# RESPIRATOR TRAINING COMPLETION FORM

**FIT TEST PROTOCOL USED:**
- Standard
- Other (Specify) ____________________________

**BUSINESS UNIT** 1157

**FIT TEST CONDUCTED BY:** Larry TheBeau

**LOCATION** MD 06

**DATE** 3/2/95

<table>
<thead>
<tr>
<th>NAME</th>
<th>SCBA Model</th>
<th>AIRLINE PRESSURE DEMAND Model</th>
<th>PAPR Model</th>
<th>AIR PURIFYING FULL FACE Size</th>
<th>AIR PURIFYING HALF MASK Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jack Chymynski (please print)</td>
<td>Size: S M L</td>
<td>Size: S M L</td>
<td>Size: S M L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SS #: 053-44-1366</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. I understand why respiratory protection is needed and where and when it should be used. [✓]

2. I know how to use this respirator properly. [✓]

3. I know how to clean and inspect this respirator. [✓]

4. I understand the limitations and restrictions of the respirators I will be using. [✓]

5. I wore this respiratory equipment in normal air and checked the facepiece fit. [✓]

6. I wore this respiratory equipment in a test atmosphere generated by smoke or other means. [✓]

7. I understand that a good gas-tight face seal cannot be achieved with obstruction such as facial hair or glasses (with full face mask). [✓]

Form No. S&H21-001
This is to certify that

MICHAEL ELIAS
has successfully completed

HAZARDOUS MATERIALS SITE WORKER COURSE (40-HOUR)
at

HAZMAT T.I.S.I.; COLUMBIA, MARYLAND

October 14 - 18, 1991

C01-2563
CERTIFICATE OF COMPLETION

This is to certify that

MICHAEL C. ELIAS

has successfully completed

OSHA HAZ-MAT SITE WORKER (Annual Recertification)

at

HAZMAT T.I.S.I.; COLUMBIA, MARYLAND

January 5, 1995

REF-9501A
January 18, 1995

Ms. Samantha Brooks

Type of Exam: Annual Engineer/Field Personnel  ICF VA01A
Exam: 01/11/95.132155 Employee: Michael Elias -

The individual identified above has completed a medical surveillance examination. Review of the data from this examination resulted in the following conclusions:

MEDICAL AND SAFETY RESTRICTIONS / RECOMMENDATIONS
- None

CLEARANCE FOR WORK WITH HAZARDOUS MATERIALS
- In compliance with 29 CFR 1910.120 (f), medical clearance is issued for individual to work with hazardous materials.

CLEARANCE FOR WORK WITH ASBESTOS
- This individual has been examined in compliance with 29 CFR 1926.58. This examination has not disclosed the presence of any medical condition that would constitute an increased risk of material health impairment from exposure to asbestos, tremolite, anthophylite, or actinolite.

USE OF RESPIRATORY EQUIPMENT
- In compliance with 29 CFR 1910.134, medical clearance is issued for unrestricted use of respiratory protective equipment. This regulation stipulates:
  » Contact lenses shall not be worn when using respiratory protective equipment.
  » Facial hair shall not be interposed between the face and the sealing surface of the respirator.

EXPOSURE TO TEMPERATURE EXTREMES
- Exposures to temperature extremes are acceptable providing that reasonable precautions are taken.

PUBLIC LAW 100-690
- Not a requirement of this examination.

DEPARTMENT OF TRANSPORTATION CERTIFICATION
- Not requested

The employee has been informed of the results of this medical examination and also advised of any specific health implications of employment to the extent required by existing law.

Elayne F. Theriault, M.D.
Medical Director
October 11, 1994

Ms. Samantha Brooks

Type of Exam: Annual Engineer/Field Personnel ICF VA01A
Exam: 09/29/94.119168 Employee: Marilyn Garcia -

The individual identified above has completed a medical surveillance examination. Review of the data from this examination resulted in the following conclusions:

MEDICAL AND SAFETY RESTRICTIONS / RECOMMENDATIONS
- None

CLEARANCE FOR WORK WITH HAZARDOUS MATERIALS
- In compliance with 29 CFR 1910.120 (f), medical clearance is issued for individual to work with hazardous materials.

CLEARANCE FOR WORK WITH ASBESTOS
- This individual has been examined in compliance with 29 CFR 1926.58. This examination has not disclosed the presence of any medical condition that would constitute an increased risk of material health impairment from exposure to asbestos, tremolite, anthophylite, or actinolite.

USE OF RESPIRATORY EQUIPMENT
- In compliance with 29 CFR 1910.134, medical clearance is issued for unrestricted use of respiratory protective equipment. This regulation stipulates:
  » Contact lenses shall not be worn when using respiratory protective equipment.
  » Facial hair shall not be interposed between the face and the sealing surface of the respirator.

EXPOSURE TO TEMPERATURE EXTREMES
- Exposures to temperature extremes are acceptable providing that reasonable precautions are taken.

PUBLIC LAW 100-590
- Not a requirement of this examination.

DEPARTMENT OF TRANSPORTATION CERTIFICATION
- Not requested

The employee has been informed of the results of this medical examination and also advised of any specific health implications of employment to the extent required by existing law.

Elayne F. Theriault, M.D.

Elayne F. Theriault, M.D.
Medical Director
LETTER OF SATISFACTORY COMPLETION

HAZMAT Training, Information and Services, Inc. (Hazmat TISI) hereby certifies that Marilyn Garcia satisfactorily completed a 40-hour course of instruction titled "The Hazardous Materials Site Worker" on October 8, 1993.

The course addressed the training needs of employees working hazardous material sites where there is significant threat of exposure to hazardous substances, health hazards, or safety hazards.

Hazmat TISI certifies that the course satisfies the initial off-site training requirements for employees specified by the Department of Labor, Occupational Safety and Health Administration, as found in 29 CFR 1910.120(e) Final Rule dated March 6, 1989.

Hazmat TISI provides this certificate based on this individual’s demonstration of practical skills and the successful completion of a written examination.

Hazmat TISI recommends that this letter be made a part of the employee’s personnel file.

The Department of Labor requires that this individual undergo annual refresher training and recertification.

Edward E. Hartin
Vice President of Operations
Hazmat TISI
ICF KAISER ENGINEERS, INC.

This is to Certify That

Marilyn Garcia

Has Completed 8 Hours of OSHA Hazardous Materials  
Site Worker Annual Recertification Training as  
Required under 29 CFR 1910.120

Instructor  

Date April 5, 1995
# RESPIRATOR TRAINING COMPLETION FORM

**FIT TEST PROTOCOL USED:**
- [√] Standard
- ___ Other (Specify) ___

**BUSINESS UNIT:** 11547

**FIT TEST CONDUCTED BY:** Larry Thebeau

**LOCATION:** MDO6

**DATE:** 3/3/95

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<td>Marilyn Garcia</td>
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1. I understand why respiratory protection is needed and where and when it should be used.

2. I know how to use this respirator properly.

3. I know how to clean and inspect this respirator.

4. I understand the limitations and restrictions of the respirators I will be using.

5. I wore this respiratory equipment in normal air and checked the facepiece fit.

6. I wore this respiratory equipment in a test atmosphere generated by smoke or other means.

7. I understand that a good gas-tight face seal cannot be achieved with obstruction such as facial hair or glasses (with fullface mask).
LETTER OF SATISFACTORY COMPLETION

HAZMAT Training, Information and Services, Inc. (Hazmat TISI) hereby certifies that Carol Henry satisfactorily completed a 40-hour course of instruction titled "The Hazardous Materials Site Worker" on September 17, 1993.

The course addressed the training needs of employees working hazardous material sites where there is significant threat of exposure to hazardous substances, health hazards, or safety hazards.

Hazmat TISI certifies that the course satisfies the initial off-site training requirements for employees specified by the Department of Labor, Occupational Safety and Health Administration, as found in 29 CFR 1910.120(e) Final Rule dated March 6, 1989.

Hazmat TISI provides this certificate based on this individual's demonstration of practical skills and the successful completion of a written examination.

Hazmat TISI recommends that this letter be made a part of the employee's personnel file.

The Department of Labor requires that this individual undergo annual refresher training and recertification.

Edward E. Hartin
Vice President of Operations
Hazmat TISI
ICF KAISER ENGINEERS, INC.

This is to certify that

Carol Henry

Has completed 8 hours of OSHA Hazardous Materials
Site Worker Annual Recertification Training as
Required under 29 CFR 1910.120

Instructor

Date April 5, 1995
# RESPIRATOR TRAINING COMPLETION FORM

**FIT TEST PROTOCOL USED:**
- [ ] Standard
- [ ] Other (Specify) ________________

**BUSINESS UNIT** 11847  
**FIT TEST CONDUCTED BY:** Larry Thabang  
**LOCATION** MDole  
**DATE** 3/3/93

**NAME** Carol Henry  
**SIG.** Carol Henry  
**SS #** 4/17-15-9741

| 1. I understand why respiratory protection is needed and where and when it should be used. | CAH |
| 2. I know how to use this respirator properly. | CAH |
| 3. I know how to clean and inspect this respirator. | CAH |
| 4. I understand the limitations and restrictions of the respirators I will be using. | CAH |
| 5. I wore this respiratory equipment in normal air and checked the facepiece fit. | CAH |
| 6. I wore this respiratory equipment in a test atmosphere generated by smoke or other means. | CAH |
| 7. I understand that a good gas-tight face seal cannot be achieved with obstruction such as facial hair or glasses (with fullface mask). | CAH |

**SCBA**
- **Model:** ________________
- **Size:** S M L

**AIRLINE PRESSURE DEMAND**
- **Model:** ________________
- **Size:** S M L

**PAPR**
- **Model:** ________________
- **Size:** S M L

**AIR PURIFYING FULL FACE**
- **Size:** S M L
- **Brand:** ________________

**AIR PURIFYING HALF MASK**
- **Size:** S M L
- **Brand:** ________________

**OTHER**
September 12, 1994

Mr. Richard Neubauer

Type of Exam: Annual Engineer/Field Personnel  ICF VA01A
Exam: 08/29/94.114832 Employee: Richard Neubauer - [Redacted]

The individual identified above has completed a medical surveillance examination. Review of the data from this examination resulted in the following conclusions:

MEDICAL AND SAFETY RESTRICTIONS / RECOMMENDATIONS
- None

CLEARANCE FOR WORK WITH HAZARDOUS MATERIALS
- In compliance with 29 CFR 1910.120 (f), medical clearance is issued for individual to work with hazardous materials.

CLEARANCE FOR WORK WITH ASBESTOS
- This individual has been examined in compliance with 29 CFR 1926.58. This examination has not disclosed the presence of any medical condition that would constitute an increased risk of material health impairment from exposure to asbestos, tremolite, anthophylite, or actinolite.

USE OF RESPIRATORY EQUIPMENT
- In compliance with 29 CFR 1910.134, medical clearance is issued for unrestricted use of respiratory protective equipment. This regulation stipulates:
  » Contact lenses shall not be worn when using respiratory protective equipment.
  » Facial hair shall not be interposed between the face and the sealing surface of the respirator.

EXPOSURE TO TEMPERATURE EXTREMES
- Exposures to temperature extremes are acceptable providing that reasonable precautions are taken.

PUBLIC LAW 100-690
- Not a requirement of this examination.

DEPARTMENT OF TRANSPORTATION CERTIFICATION
- Not requested

The employee has been informed of the results of this medical examination and also advised of any specific health implications of employment to the extent required by existing law.

Elayne F. Theriault, M.D.
Elayne F. Theriault, M.D.
Medical Director
CERTIFICATE OF COMPLETION

This is to certify that

JOSEPH NEUBAUER

has successfully completed

HAZARDOUS MATERIALS SITE WORKER COURSE (40 HOURS)

at

HAZMAT T.I.S.I.; COLUMBIA, MARYLAND

November 11 - 15, 1991
C91-2748
This is to Certify That

Joe Neubauer

Has Completed 8 Hours of OSHA Hazardous Materials
Site Worker Annual Recertification Training as
Required under 29 CFR 1910.120

Instructor

Date April 5, 1995
**RESPIRATOR TRAINING COMPLETION FORM**

**FIT TEST PROTOCOL USED:**
- Standard
- Other (Specify)

**BUSINESS UNIT:** 11547

**FIT TEST CONDUCTED BY:** Lacey Turchan

**LOCATION:** MD06

**DATE:** 6 MAR 2015

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<tr>
<td>1.</td>
<td>I understand why respiratory protection is needed and where and when it should be used.</td>
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<td>2.</td>
<td>I know how to use this respirator properly.</td>
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<td>3.</td>
<td>I know how to clean and inspect this respirator.</td>
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<td>4.</td>
<td>I understand the limitations and restrictions of the respirators I will be using.</td>
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<td>5.</td>
<td>I wore this respiratory equipment in normal air and checked the facepiece fit.</td>
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<td>6.</td>
<td>I wore this respiratory equipment in a test atmosphere generated by smoke or other means.</td>
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<td>7.</td>
<td>I understand that a good gas-tight face seal cannot be achieved with obstruction such as facial hair or glasses (with fullface mask).</td>
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MEDICAL CLEARANCE

ATTN: Ms. Deborah Romano

RE: Employee: Deborah Romano

Exam No: 143363
Exam Date: 04/19/95

Ms. Romano has completed a(n) Annual Engineer/Field Personnel Examination for ICF VA01A with the following results and clearances:

YES   NO

[X]  [ ] To work with HAZARDOUS MATERIALS in accordance with 29 CFR 1910.120.
[X]  [ ] To use RESPIRATORY PROTECTIVE EQUIPMENT in accordance with 29 CFR 1910.134.
[X]  [ ] To work with ASBESTOS in accordance with 29 CFR 1926.1101.

Work-related limitations and additional recommendations:

NONE.

By separate letter, Ms. Romano has been informed of the medical findings of this examination and their specific health implications.

Elayne F. Theriault, M.D.
Elayne F. Theriault, M.D.
Medical Director
This is to certify that

Debbie Romano

has completed 8 hours of OSHA Hazardous Materials Site Worker Annual Recertification Training as required under 29 CFR 1910.120

Date: April 5, 1995

Instructor
August 9, 1994

Ms. Margaret Schweighauser

Type of Exam: Annual Engineer/Field Personnel  ICF VA01A Exam: 07/26/94.109879 Employee: Margaret Schweighauser -

The individual identified above has completed a medical surveillance examination. Review of the data from this examination resulted in the following conclusions:

MEDICAL AND SAFETY RESTRICTIONS / RECOMMENDATIONS

- None

CLEARANCE FOR WORK WITH HAZARDOUS MATERIALS
- In compliance with 29 CFR 1910.120 (f), medical clearance is issued for individual to work with hazardous materials.

CLEARANCE FOR WORK WITH ASBESTOS
- This individual has been examined in compliance with 29 CFR 1926.58. This examination has not disclosed the presence of any medical condition that would constitute an increased risk of material health impairment from exposure to asbestos, tremolite, anthophylite, or actinolite.

USE OF RESPIRATORY EQUIPMENT
- In compliance with 29 CFR 1910.134, medical clearance is issued for unrestricted use of respiratory protective equipment. This regulation stipulates:
  » Contact lenses shall not be worn when using respiratory protective equipment.
  » Facial hair shall not be interposed between the face and the sealing surface of the respirator.

EXPOSURE TO TEMPERATURE EXTREMES
- Exposures to temperature extremes are acceptable providing that reasonable precautions are taken.

PUBLIC LAW 100-690
- Not a requirement of this examination.

DEPARTMENT OF TRANSPORTATION CERTIFICATION
- Not requested

The employee has been informed of the results of this medical examination and also advised of any specific health implications of employment to the extent required by existing law.

Elayne F. Theriault, M.D.
Elayne F. Theriault, M.D.
Medical Director
# RESPIRATOR TRAINING COMPLETION FORM

**FIT TEST PROTOCOL USED:**
- Standard
- **Other (Specify)**

**BUSINESS UNIT:** 11547

**FIT TEST CONDUCTED BY:** Larry Thebeau

**LOCATION:** MD06

**DATE:** 03/03/95

Initial only the appropriate blocks

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1. I understand why respiratory protection is needed and where and when it should be used.  

2. I know how to use this respirator properly.  

3. I know how to clean and inspect this respirator.  

4. I understand the limitations and restrictions of the respirators I will be using.  

5. I wore this respiratory equipment in normal air and checked the facepiece fit.  

6. I wore this respiratory equipment in a test atmosphere generated by smoke or other means.  

7. I understand that a good gas-tight face seal cannot be achieved with obstruction such as facial hair or glasses (with full face mask).
ecology and environment, inc.

This certifies that
LARRY THEBEAN
has completed the
5-DAY HAZARDOUS WASTE SITE INVESTIGATION TRAINING COURSE
Presented by the
NATIONAL PROJECT MANAGEMENT OFFICE
of the
FIELD INVESTIGATIONS OF UNCONTROLLED HAZARDOUS WASTE SITES PROJECT

April 1982
Date

Robert J. King
Assistant National Project Manager for Training and Safety

Roger J. Gray
National Project Manager
This is to Certify That

Larry Thebeau

Has Completed 8 Hours of OSHA Hazardous Materials Site Worker Annual Recertification Training as Required under 29 CFR 1910.120

Instructor Larry Thebeau

Date April 5, 1995
# RESPIRATOR TRAINING COMPLETION FORM

**FIT TEST PROTOCOL USED:**
- [ ] Standard
- [ ] Other (Specify)

**BUSINESS UNIT:** 11547

**FIT TEST CONDUCTED BY:** Kim Mason  
Initial only the appropriate blocks

**LOCATION:** MOP6

**DATE:** 3/3/95

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1. I understand why respiratory protection is needed and where and when it should be used. 
2. I know how to use this respirator properly.
3. I know how to clean and inspect this respirator.
4. I understand the limitations and restrictions of the respirators I will be using.
5. I wore this respiratory equipment in normal air and checked the facepiece fit.
6. I wore this respiratory equipment in a test atmosphere generated by smoke or other means.
7. I understand that a good gas-tight face seal cannot be achieved with obstruction such as facial hair or glasses (with fullface mask).
ATTN: Mr. Mark Thomas

March 14, 1995

Exam No: 138206
Exam Date: 03/06/95

Mr. Thomas has completed a(n) Baseline Engineer/Field Personnel Examination for ICF VA01A with the following results and clearances:

YES [X] NO [ ]

[X] To work with HAZARDOUS MATERIAL in accordance with 29 CFR 1910.120.


[X] To work with ASBESTOS in accordance with 29 CFR 1926.58.

Work-related limitations and additional recommendations:

NONE.

By separate letter, Mr. Thomas has been informed of the medical findings of this examination and their specific health implications.

Elayne F. Theriault, M.D.
Medical Director
LETTER OF SATISFACTORY COMPLETION

HAZMAT Training, Information and Services, Inc. (Hazmat TISI) hereby certifies that Mark A. Thomas satisfactorily completed a 40-hour course of instruction titled "The Hazardous Materials Site Worker" on February 27 - March 3, 1995.

The course addressed the training needs of employees working hazardous material sites where there is significant threat of exposure to hazardous substances, health hazards, or safety hazards.

Hazmat TISI certifies that the course satisfies the initial off-site training requirements for employees specified by the Department of Labor, Occupational Safety and Health Administration, as found in 29 CFR 1910.120(e) Final Rule dated March 6, 1989.

Hazmat TISI provides this certificate based on this individual's demonstration of practical skills and the successful completion of a written examination.

Hazmat TISI recommends that this letter be made a part of the employee's personnel file.

The Department of Labor requires that this individual undergo annual refresher training and recertification.

Edmund M. Conaway
President
Hazmat TISI
# Respirator Training Completion Form

**Fit Test Protocol Used:**
- Standard
- Other (Specify) ____________

**Business Unit:** 11547

**Fit Test Conducted By:** Larry Thebeau

**Location:** MD 06

**Date:** 3/30/95

---

**Name:** Mark A. Thomas  
(please print)

**Sig:** Mark A. Thomas

**SS #:** 220-06-1379

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1. I understand why respiratory protection is needed and where and when it should be used. MT

2. I know how to use this respirator properly. MT

3. I know how to clean and inspect this respirator. MT

4. I understand the limitations and restrictions of the respirators I will be using. MT

5. I wore this respiratory equipment in normal air and checked the facepiece fit. MT

6. I wore this respiratory equipment in a test atmosphere generated by smoke or other means. MT

7. I understand that a good gas-tight face seal cannot be achieved with obstruction such as facial hair or glasses (with fullface mask). MT
AMENDED CLEARANCE

March 23, 1995

ATTN: Ms. Patricia Thompson

RE: Employee: Patricia J. Thompson

Exam No: 134520
Exam Date: 11/30/94

Ms. Thompson has completed the requirements of a baseline exam. Examination for ICF MD06 with the following results and clearances:

YES NO

[X] [ ] To work with HAZARDOUS MATERIALS in accordance with 29 CFR 1910.120.

[X] [ ] To use RESPIRATORY PROTECTIVE EQUIPMENT in accordance with 29 CFR 1910.134.

[X] [ ] To work with ASBESTOS in accordance with 29 CFR 1926.1101.

Work-related limitations and additional recommendations:

- NOTE: Asbestos clearance is issued based on the B-READ performed on this individual's chest x-ray taken on 01/30/94.

- NOTE: The history portion of Orange Book 1 has been reviewed and filed with this individual's medical records.

Elayne F. Theriault, M.D.
Medical Director

4360 Chamblee Dunwoody Rd. • Suite 202 • Atlanta, Georgia 30341 • (404) 455-0813 • (800) 229-3674 • fax (404) 457-1429
The Professional Development Program for Hazardous Waste Remediation and Emergency Response Workers

Proudly Presents This Certificate to

Patricia Jean Thompson

for completing the initial 40-hours training in Hazardous Waste Operations and Emergency Response at Oak Ridge, Tennessee on June 4 - 8, 1990 to satisfy OSHA rules, 29 CFR Part 1910.120

Certificate Number: 0690445
SSAH: 560-96-1418

Dr. James F. Bettschart, Director
Daniel J. Steller, Trainer

Waste Management Training Center
Roane State Community College
728 Emory Valley Road
Oak Ridge TN 37830
Phone 615-481-3493
This is to certify that

Thompson

Has completed 8 hours of OSHA Hazardous Materials Site Worker Annual Recertification Training as required under 29 CFR 1910.120

Date April 5, 1995

Instructor
# RESPIRATOR TRAINING COMPLETION FORM

**FIT TEST PROTOCOL USED:**
- [x] Standard
- [ ] Other (Specify)

**BUSINESS UNIT:** 11547

**FIT TEST CONDUCTED BY:** [Last Name] Thebeau

**LOCATION:** MP041

**DATE:** 3/31/15

Initial only the appropriate blocks

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<th>SCBA Model:</th>
<th>AIRLINE PRESSURE DEMAND Model:</th>
<th>PAPR Model:</th>
<th>AIR PURIFYING FULL FACE Size:</th>
<th>AIR PURIFYING HALF MASK Size:</th>
<th>OTHER</th>
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<td>[First Name] [Last Name]</td>
<td>[Size: S M L]</td>
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1. I understand why respiratory protection is needed and where and when it should be used.
2. I know how to use this respirator properly.
3. I know how to clean and inspect this respirator.
4. I understand the limitations and restrictions of the respirators I will be using.
5. I wore this respiratory equipment in normal air and checked the facepiece fit.
6. I wore this respiratory equipment in a test atmosphere generated by smoke or other means.
7. I understand that a good gas-tight face seal cannot be achieved with obstruction such as facial hair or glasses (with full face mask).
Type of Exam: Annual Engineer/Field Personnel  ICF VA01A
Exam: 07/21/94.109880 Employee: Tammy Williams - [Redacted]

The individual identified above has completed a medical surveillance examination. Review of the data from this examination resulted in the following conclusions:

MEDICAL AND SAFETY RESTRICTIONS / RECOMMENDATIONS

- None

CLEARANCE FOR WORK WITH HAZARDOUS MATERIALS
- In compliance with 29 CFR 1910.120 (f), medical clearance is issued for individual to work with hazardous materials.

CLEARANCE FOR WORK WITH ASBESTOS
- This individual has been examined in compliance with 29 CFR 1926.58. This examination has not disclosed the presence of any medical condition that would constitute an increased risk of material health impairment from exposure to asbestos, tremolite, anthophylite, or actinolite.

USE OF RESPIRATORY EQUIPMENT
- In compliance with 29 CFR 1910.134, medical clearance is issued for unrestricted use of respiratory protective equipment. This regulation stipulates:
  » Contact lenses shall not be worn when using respiratory protective equipment.
  » Facial hair shall not be interposed between the face and the sealing surface of the respirator.

EXPOSURE TO TEMPERATURE EXTREMES
- Exposures to temperature extremes are acceptable providing that reasonable precautions are taken. PUBLIC LAW 100-690
- Not a requirement of this examination.
- Not requested

DEPARTMENT OF TRANSPORTATION CERTIFICATION
- Not requested

The employee has been informed of the results of this medical examination and also advised of any specific health implications of employment to the extent required by existing law.

Elayne F. Theriault, M.D.
Medical Director
CERTIFICATE OF COMPLETION

This is to certify that TAMMY D. WILLIAMS has successfully completed HAZARDOUS MATERIALS SITE WORKER COURSE (40-HOUR) at HAZMAT T.I.S.I.: COLUMBIA, MARYLAND

July 19 - 23, 1993
40S-9307B
ICF KAISER ENGINEERS, INC.

This is to Certify That

Tammy Williams

Has Completed 8 Hours of OSHA Hazardous Materials Site Worker Annual Recertification Training as Required under 29 CFR 1910.120

Instructor

Date April 5, 1995
**RESPIRATOR TRAINING COMPLETION FORM**

**FIT TEST PROTOCOL USED:**
- [x] Standard
- [ ] Other (Specify)

**BUSINESS UNIT** 11547

**FIT TEST CONDUCTED BY:** Larry Thebeau

**LOCATION** MDOT

**DATE** 3 Mar 95

Initial only the appropriate blocks

<table>
<thead>
<tr>
<th>NAME</th>
<th>Tammy Williams (please print)</th>
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<td>SIG.</td>
<td>Tammy Williams</td>
</tr>
<tr>
<td>SS #</td>
<td>417-94-5386</td>
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| 1. | I understand why respiratory protection is needed and where and when it should be used. |
| 2. | I know how to use this respirator properly. |
| 3. | I know how to clean and inspect this respirator. |
| 4. | I understand the limitations and restrictions of the respirators I will be using. |
| 5. | I wore this respiratory equipment in normal air and checked the facepiece fit. |
| 6. | I wore this respiratory equipment in a test atmosphere generated by smoke or other means. |
| 7. | I understand that a good gas-tight face seal cannot be achieved with obstruction such as facial hair or glasses (with full face mask). |

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<tr>
<th>SCBA Model:</th>
<th>AIRLINE PRESSURE DEMAND Model:</th>
<th>PAPR Model:</th>
<th>AIR PURIFYING FULL FACE Model:</th>
<th>AIR PURIFYING HALF MASK Model:</th>
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**OTHER**
August 4, 1994

Ms. Diane Harbertson

Type of Exam: Annual Engineer/Field Personnel ICF VA01A
Exam: 07/20/94.108891 Employee: Diane Harbertson - [Redacted]

The individual identified above has completed a medical surveillance examination. Review of the data from this examination resulted in the following conclusions:

**MEDICAL AND SAFETY RESTRICTIONS / RECOMMENDATIONS**

- None

**CLEARANCE FOR WORK WITH HAZARDOUS MATERIALS**

- In compliance with 29 CFR 1910.120 (f), medical clearance is issued for individual to work with hazardous materials.

**CLEARANCE FOR WORK WITH ASBESTOS**

- This individual has been examined in compliance with 29 CFR 1926.58. This examination has not disclosed the presence of any medical condition that would constitute an increased risk of material health impairment from exposure to asbestos, tremolite, anthophylite, or actinolite.

**USE OF RESPIRATORY EQUIPMENT**

- In compliance with 29 CFR 1910.134, medical clearance is issued for unrestricted use of respiratory protective equipment. This regulation stipulates:
  
  » Contact lenses shall not be worn when using respiratory protective equipment.
  » Facial hair shall not be interposed between the face and the sealing surface of the respirator.

**EXPOSURE TO TEMPERATURE EXTREMES**

- Exposures to temperature extremes are acceptable providing that reasonable precautions are taken.

**PUBLIC LAW 100-690**

- Not a requirement of this examination.

**DEPARTMENT OF TRANSPORTATION CERTIFICATION**

- Not requested

The employee has been informed of the results of this medical examination and also advised of any specific health implications of employment to the extent required by existing law.

Elayne F. Theriault, M.D.
Medical Director
CERTIFICATE OF COMPLETION

This is to certify that

DIANE HARBERTSON

has successfully completed

HAZMAT MATERIALS SITE WORKER COURSE (40-HOUR)

at

HAZMAT T.I.S.I.; COLUMBIA, MARYLAND

June 29 - July 3, 1992

CY2-1457

Chief Executive Officer
CERTIFICATE OF COMPLETION

This is to certify that

PATRICIA J. THOMPSON

has successfully completed

OSHA HAZ-MAT SITE WORKER (Annual Recertification)

at

HAZMAT-T.I.S.I.; COLUMBIA, MARYLAND

June 5, 1995

REF: 9566A
ICF KAISER ENGINEERS, INC.

This is to certify that

Diane Wisbeck

has completed 8 hours of OSHA Hazardous Materials Site Worker Annual Recertification training as required under 29 CFR 1910.120.

Instructor: [Signature]

Date: April 5, 1995