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<b>RELEASE INSTRUCTIONS (RI)</b>	DOCUMENT NO.:
	WHC-CM-7-7
PAGE 1 of 1	

<b>TO:</b> DEBRA A ISOM H6-08  0176	<b>TITLE:</b> Environmental Investigations and Site Characterization Manual  <b>RELEASE NO.:</b> 102  <b>DATE PREPARED:</b> February 5, 1996
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I have entered this release into the document per instructions.  <i>Debra A. Isom</i> 2/14/96 Signature Date	If you have any questions about this release contact:  Jean Feaster Phone: 372-2340
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SECTION NO. AND TITLE(S)	REMOVE			INSERT		
	PAGES	REV	DATE	PAGES	REV	DATE
Table of Contents	1 - 4	101	01/09/96	1 - 4	102	02/07/96
EII 5.4, Field Cleaning and/or Decontamination of Equipment	3 of 4 4 of 4	5, Chg 2 5, Chg 2	08/31/95 08/31/95	3 of 4 4 of 4	5, Chg 3 5, Chg 2	02/07/96 08/31/95
EII 5.5, Laboratory Cleaning of RCRA/CERCLA Sampling Equipment	1 - 3	3, Chg 1	08/07/95	1 - 6	4	02/07/96

**IMPLEMENTATION NOTICE**

(ROUTE A COPY OF THE IMPLEMENTATION NOTICE TO ALL USERS OF THIS COPY OF THE MANUAL)

- EII 5.4, Field Cleaning and/or Decontamination of Equipment, Page Change 3 to Revision 5:**  
 Page 3 updated to reflect new location of cleaning facility.
- EII 5.5, Laboratory Cleaning of RCRA/CERCLA Sampling Equipment, Rev 4:**  
 Cleaning activity moved from 1706KE to 6268 facility.



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## Table of Contents

<u>Number</u>	<u>Title</u>	<u>Rev</u>	<u>Effective Date</u>
N/A	Introduction	2	06/27/94
N/A	Quality Assurance Records	0	03/15/93
	PAGE CHANGE 1 (p. 4)		04/05/93
	PAGE CHANGE 2 (pp. 4, 5, 6)		04/19/93
	PAGE CHANGE 3 (pp. 4, 6)		05/24/93
	PAGE CHANGE 4 (pp. 3, 4)		09/07/93
<b>1.0 GENERAL ADMINISTRATIVE REQUIREMENTS</b>			
EII 1.1	Hazardous Waste Site Entry Requirements	3, Chg 1	04/28/95
EII 1.2	Preparing and Revising Procedures	8, Chg 1	10/23/95
EII 1.4	Instruction Change Authorizations	8	05/31/95
EII 1.5	Field Logbooks	6	08/07/95
EII 1.6	Record Processing	4	11/12/93
EII 1.7	Qualification and Training	5, Chg 1	05/31/95
EII 1.9	Primary and Secondary Document Review & Control	2	10/19/92
EII 1.10	Identifying, Evaluating and Documenting Suspect Waste Sites	3	12/22/93
EII 1.12	Performance Audit	1	09/20/93
EII 1.13	Environmental Readiness Review	2	12/29/93
	PAGE CHANGE 1 (p. 3)		04/04/94
	PAGE CHANGE 2 (p. 3)		04/13/94
EII 1.14	Preparation of Descriptions of Work	0	08/10/92
	PAGE CHANGE 1 (p.2)		09/20/93
EII 1.15	Preparation of SOW/LOI	1	01/31/94
EII 1.16	Guidance for Evaluating Unreviewed Safety Questions for Environmental Restoration & Decontamination and Decommissioning Activities	0	05/04/94

## Table of Contents

<u>Number</u>	<u>Title</u>	<u>Rev</u>	<u>Effective Date</u>
<b>2.0 HEALTH AND SAFETY</b>			
EII 2.1	Preparation of Site-Specific Health & Safety Plans PAGE CHANGE 1 (p. 2) PAGE CHANGE 2 (pp. 3, 4) PAGE CHANGE 3 (p. 3)	4	04/19/93 06/24/93 09/07/93 09/20/93
EII 2.2	Occupational Health Monitoring	4	03/15/93
<b>3.0 FIELD CHARACTERIZATION</b>			
EII 3.2	Calibration and Control of Monitoring Instruments PAGE CHANGE 1 (p. 5)	4	05/24/93 01/31/94
EII 3.5	Cone Penetrometer	0	01/31/94
<b>4.0 WASTE MANAGEMENT</b>			
EII 4.2	Interim Control of Unknown, Suspected Hazardous and Mixed, and Radioactive Waste PAGE CHANGE 1 (p. 7)	4	01/25/93 10/18/93
EII 4.3	Control of CERCLA and Other Past-Practice Investigation Derived Waste PAGE CHANGE 1 (p. 26) PAGE CHANGE 2 (p. 17)	2	06/24/93 10/18/93 01/31/94
EII 4.4	Control and Storage of Radioactive Materials and Equipment	1	02/28/94
<b>5.0 FIELD SAMPLING</b>			
EII 5.1	Chain of Custody/Sample Analysis Request	6	06/27/94
EII 5.2	Soil and Sediment Sampling PAGE CHANGE 1 (pp. 2, 4) PAGE CHANGE 2 (pp. 6, 21)	5	11/12/93 01/31/94 06/27/94
EII 5.3	Biotic Surveying and Sampling PAGE CHANGE 1 (page 2)	2	10/18/93 05/04/94
EII 5.4	Field Cleaning and/or Decontamination of Equipment PAGE CHANGE 3 (page 3)	5, Chg 2	08/31/95 02/07/96
EII 5.5	Laboratory Cleaning of RCRA/CERCLA Sampling Equipment	4	02/07/96

## Table of Contents

<u>Number</u>	<u>Title</u>	<u>Rev</u>	<u>Effective Date</u>
EII 5.7A	Hanford Geotechnical Sample Control	4, Chg 1	01/09/96
EII 5.8	Groundwater Sampling ICA 095 (T) Change 1, (pages 5, 9, 11 and 12) ICA 096 (T) ICA 097 (T) ICA 099 (P)	4	06/09/95 03/22/95 08/07/95 08/21/95 11/01/95 12/01/95
EII 5.9	Soil-Gas Sampling	1	05/04/94
EII 5.10	Obtaining Sample Identification Numbers and Accessing HEIS Data	0	12/20/91
EII 5.11	Sample Packaging and Shipping PAGE CHANGE 1 (pages 3, 6) PAGE CHANGE 2 (pages 3, 7) PAGE CHANGE 3 (page 3)	3	12/14/92 04/05/93 01/31/94 10/23/95
<b>6.0 DRILLING</b>			
EII 6.4	Well Services Support	3	06/27/94
EII 6.6	Resource Protection Well Characterization and Evaluation	3	03/17/95
EII 6.7	Documentation of Well Drilling and Completion Operations ICA 089 (T) PAGE CHANGE 1 (p. 2) PAGE CHANGE 2 (p. 7)	4	12/01/93 02/08/94 04/04/94 06/27/94
EII 6.9	Groundwater Well and Borehole Identification and Tracking (No technical impact)	0	06/27/94
EII 6.10	Decommissioning Wells CHANGE 1 (p. 3)	3 3, Chg 1	03/17/95 04/24/95
<b>7.0 RESERVED</b>			
<b>8.0 RECLAMATION</b>			
EII 8.3	Remediation of Groundwater Well	2, Chg 1	03/17/95

## Table of Contents

<u>Number</u>	<u>Title</u>	<u>Rev</u>	<u>Effective Date</u>
<b>9.0 GEOLOGY</b>			
EII 9.1	Geologic Logging	3, Chg 2	08/31/95
<b>10.0 HYDROLOGY</b>			
EII 10.1	Aquifer Testing	5	06/27/94
EII 10.2	Measurement of Groundwater Levels	3, Chg 2	08/07/95
EII 10.3	Purgewater Management	4, Chg 2	10/23/95
EII 10.4	Well Development Activities	2	02/16/93
<b>11.0 GEOPHYSICS</b>			
EII 11.1	Geophysical Logging	4	03/31/95
EII 11.2	Geophysical Survey Work	4	06/27/94
<b>12.0, 13.0 and 14.0 - RESERVED</b>			
<b>14.0 DATA MANAGEMENT</b>			
<b>OTHER</b>			
N/A	Glossary/Acronyms	4	02/28/94
	PAGE CHANGE 1 (pp. 9, 18, 19, 20)		06/27/94

ICA = INSTRUCTION CHANGE AUTHORIZATION, (P) = PERMANENT (BLUE SHEET), (T) = ONE TIME (GOLDENROD SHEET)

**Field Cleaning and/or Decontamination of Equipment****5.0 PROCEDURE****5.1 Steam Cleaning**

The following applies for steam cleaning (washing) the drill rig when decontamination is not required. Steam cleaning (washing) requirements are a minimum of 80 psi and 180°F.

1. Each drill rig will be steam cleaned between potentially hazardous waste sites. The rinsate from this steam cleaning (washing) does not require collection except as noted in 4.3.1, step 4 of this EII. The FTL/FTC will determine if an absorbent pad is required during steam cleaning operations.
2. Equipment that has been successfully decontaminated may be washed at the discretion of the FTL/FTC. In this case the fluids do not have to be collected.

**5.2 Decontamination**

Decontamination of the drill rig and drilling equipment is required if operating inside a known waste site or if the equipment being cleaned was associated with soils/drill cuttings collected as suspected hazardous or radioactive waste.

Field decontamination activities are described below.

1. Radiological decontamination consisting of wiping and other nonsteam cleaning or pressure washing methods.
2. Nonradiological decontamination consisting of scrubbing, wiping, flushing, rinsing and steam cleaning methods.
3. Steam cleaning/pressure washing can be done on chemically and fixed radiologically contaminated equipment when a method is available to collect rinsate.
4. Sampling equipment used to obtain physical samples shall be decontaminated in accordance with this EII before it is transported to the 6268 *cleaning* facility for *cleaning*/decontamination in accordance with EII 5.5 of this manual. Equipment that is not successfully decontaminated will not be transported to the facility and must be stored in accordance with EII 4.4 of this manual.
5. All water used for decontamination activities shall be potable water (for example, Hanford System or City of Richland water) or Columbia River raw water drawn from Hanford Site raw water supply points.
6. All decontaminated materials and equipment shall be stored in a manner to minimize the possibility of recontamination.
7. Decontamination fluids shall be designated and managed in accordance with EII 4.2 or EII 4.3 of this manual.

**Field Cleaning and/or Decontamination of Equipment****5.2.1 Radiological Decontamination**

Survey and unconditional radiological release is the criterion for successful radiological decontamination.

If unable to eliminate fixed radioactive contamination, the FTL/FTC will decide whether to control the equipment as radioactive material or dispose of it as radioactive waste.

Before it is taken from the site, equipment designated for disposal shall be decontaminated to remove nonradiological hazards.

The following methods may be used to perform radiological decontamination.

1. **Wiping.** This method consists of wiping the contaminated equipment with clean paper towels and/or clean rags. It is often performed to prevent the spread of radioactive contaminants as the equipment (drill string, sampler, casing, or drill line) is being removed from the borehole. When all smearable radiological contamination has been removed, the equipment will be cleaned or decontaminated to remove chemical contaminants as required before it is reused or transported to another site.
2. **Abrasive Method.** This method is used in the field to remove fixed radioactive contamination after all the smearable radioactive contamination has been eliminated. The abrasive cleaning method is used to remove small isolated areas of fixed radioactive contamination on equipment. It consists of scrubbing the contaminated area with a wire brush, sandpaper or other mechanical means using an approved cleaner or removing a thin layer of metal using a metal file, sandpaper (garnet, silicon dioxide grit). The equipment will be cleaned or decontaminated to remove chemical contaminants as required before it is reused or transported offsite.

**5.2.2 Nonradiological Decontamination**

Nonradiological field decontamination is accomplished by using one or more of the following techniques and occurs if the HPT has determined that smearable radiological contaminants are not present.

The criterion for nonradiological field decontamination is successful completion of one or more of the following methods with no visible residues remaining.

1. **Steam Cleaning/Pressure Washing Decontamination.** All exposed surfaces of the equipment are steam cleaned or pressure washed with an approved cleaner, such as Built Laundry Detergent<sup>1</sup> or Simple Green<sup>2</sup>. The equipment is then rinsed with water.

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<sup>1</sup>Klix Corporation, San Francisco, CA

<sup>2</sup>Sunshine Makers, Huntington Harbor, CA

**Laboratory Cleaning of RCRA/CERCLA Sampling Equipment****1.0 PURPOSE**

This Environmental Investigations Instruction (EII) establishes the method of cleaning equipment used for RCRA and CERCLA protocol sampling. The steps provided in this EII are intended to prevent cross-contamination of samples by contaminated sampling equipment.

**2.0 SCOPE**

This EII applies to the cleaning of equipment used for RCRA/CERCLA sampling before the equipment is taken into the field.

This procedure applies only to the personnel of Environmental Operations (Sampling Team) who have been indoctrinated in RCRA/CERCLA sampling and have been trained in the operation of this procedure.

**3.0 REQUIREMENTS****3.1 Safety**

1. Equipment cleaning presents the following hazards.
  - a. Nitric acid (although diluted) may react with metallic objects and could produce toxic fumes. Nitric acid shall be stored in approved acid containment and shall be labeled properly.
  - b. Hexane is a flammable liquid and could produce serious physical effects if inhaled or spilled on the skin. Hexane shall be stored in UL-approved containers and shall be labeled properly.
  - c. A burn hazard is encountered if hot drying ovens are used.
  - d. Lifting hazards and possible pinch points.
2. Use personal protective equipment (PPE) in accordance with WHC-CM-1-1, safety requirements, and laboratory-specific procedures.
3. When handling dangerous chemicals, wear proper PPE, such as appropriate gloves, safety glasses, lab coats, and face shields to protect your skin from burns.
4. Clean with dangerous chemicals only under a laboratory hood or in a properly ventilated area to prevent inhalation of dangerous fumes.

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\* This procedure has been rewritten, therefore, no revision bars were used to denote changes.

**Laboratory Cleaning of RCRA/CERCLA Sampling Equipment**

5. Exercise caution and wear proper PPE when working with equipment in a drying oven.

**3.2 Equipment**

1. At a minimum, the laboratory facility must have the following:
  - a. Exhaust hood(s) to eliminate inhalation hazards.
  - b. Drying ovens of sufficient size to accept a 24-inch-long drive barrel.
  - c. A lockable storage area with controlled access to store cleaned equipment.
  - d. Drains or containment facilities for hazardous chemical waste.
  - e. Water system capable of providing ASTM D1193, "Standard Specifications for Reagent Water", Type I, II, or III. ASTM Type I, II, or III water is referenced as RO/DI water for the remainder of this procedure.
  - f. Safety shower.

**3.3 Equipment Receipt at the 6268 Facility**

Equipment must be surveyed and unconditionally released from radiological controls before being transported to the 6268 cleaning station. All equipment shall be free of visible dirt, oils, and tape, prior to being accepted at 6268.

**4.0 RESPONSIBILITIES**

The Environmental Operations (Sampling Team) is responsible for:

1. Conducting equipment cleaning activities.
2. Based on field conditions, equipment, material, and manpower availability, assigning personnel to transport contaminated equipment.
3. Tracking and maintaining an inventory of cleaned sample equipment.

The customer shall:

1. Ensure that all equipment brought into the cleaning station is new (off-the-shelf), has been free-released by the field RCT support for the job, or was never used inside a radiologically-zoned area.
2. Ensure that the proper charge code is provided when picking up equipment. Equipment will not be distributed without a charge code.

**Laboratory Cleaning of RCRA/CERCLA Sampling Equipment****5.0 PROCEDURE****5.1 Cleaning**

**NOTE:** Ensure that proper PPE is available and is worn during the cleaning process.

1. Prepare work area for cleaning.
2. Note numbered location of all reservoirs. All reservoirs (with the exception of the nitric rinse and the hexane rinse) shall be filled with RO/DI water.
3. Fill reservoirs 1, 2, 3, 4, 6, 7, and 8 (one at a time, in order) with RO/DI water to approximately 1/2 full capacity.
4. Place three scoops of dry phosphate-free detergent into reservoir 1.
5. Wash equipment in reservoir 1 to remove all visible dirt and grease with the phosphate-free detergent/water mixture.
6. Rinse equipment in reservoirs 2, 3, and 4 with RO/DI water.

**NOTE:** When cleaning equipment other than stainless steel or glass, skip steps 7, 8, and 9.

**NOTE:** The 1M HNO<sub>3</sub> rinse does not need to be replaced for each cleaning cycle. Check the acidity of the rinse with pH paper to ensure a pH less than 2. Also visually check the rinse for cleanliness. If the pH is greater than 2 or the rinse appears dirty then replace the HNO<sub>3</sub> solution.

7. Rinse with 1M or 10% solution of HNO<sub>3</sub> under the exhaust hood in reservoir 5.
8. Rinse equipment in reservoirs 6, 7, and 8 with RO/DI water.

**NOTE:** **HEXANE IS CONSIDERED A FLAMMABLE MATERIAL.**

9. Allow the equipment to drain excess water prior to proceeding to the next step.
10. Rinse with chromatograph grade hexane under an exhaust hood in reservoir 9.
11. Place on the oven drying rack.

## 5.2 Oven Operation

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**CAUTION:** Do not use the oven to dry equipment that may melt when subjected to temperatures of 100°C.

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1. Place drying rack loaded with equipment into the drying oven.
2. Close door and lock door handle.
3. Place the Chamber Power switch to the "ON" position.
4. Check that the Oven Temperature Controls (2) are both set at 120° C.
5. Adjust the set point to 100° C by depressing the "↑" key on the control pad and holding it until the readout displays "100".

**NOTE:** The oven will purge for 10 minutes before the heating elements heat up.

**NOTE:** The oven will take approximately 50 minutes to reach the set point of 100° C.

6. Once the oven reaches the set point, allow the equipment to bake for 20 minutes.
7. Adjust the set point to 30° C by depressing the "↓" key on the control pad and holding it until the readout displays "30".
8. Once the oven temperature reaches 30° C, place the Chamber Power switch to the "OFF" position.
9. Open the door handle lock and open the door to the oven.
10. Remove the drying rack from the oven.

## 5.3 Equipment Wrapping/Storage

**NOTE:** When wrapping/handling equipment, wear surgeons gloves to reduce the potential for equipment contamination.

1. Enclose cool/dry equipment in clean, unused aluminum foil (shiny side out) or another clean, air-tight container that will not contaminate the equipment.
2. Seal the protective wrapping as needed with tape or similar sealant to maintain cleanliness.
3. Store wrapped equipment in a custody-locked, controlled-access area until needed.

**Laboratory Cleaning of RCRA/CERCLA Sampling Equipment****5.4 Waste Accumulation/Disposal**

All waste management activities for the handling of waste associated with the cleaning process are conducted in accordance with WHC-IP-1127, Section 5.7, "Satellite Accumulation Area Management at 6268 and 6269 Facilities."

**NOTE: DO NOT DISPOSE OF POTENTIALLY HAZARDOUS MATERIALS IN THE 6268 FACILITY DRAIN SYSTEM.**

1. Reservoirs 1, 2, 3, 4, 7, and 8 shall be collected and placed in a 55 gallon rinsate drum located on the spill pallets in the 6268 working area.
  - a. The volume (%) added to the drum shall be entered into the specific drum inventory log.

**NOTE: When the drums located in the Satellite Accumulation Area (SAA) are approximately 2/3 full, notify the organizational Environmental Compliance Officer (ECO) to make arrangements for disposal of the waste materials.**

2. Reservoir 5 (when pH is greater than 2 or the rinsate looks dirty) and reservoir 6 shall be collected and placed in the nitric rinsate drum located in the SAA. The volume (%) added to the drum shall be entered into the specific drum inventory log.

**NOTE: If the contents of reservoir 5 are not dirty or the pH remains less than 2, leave the material in reservoir 5 and cover with the protective lid.**

3. Reservoir 9 shall be collected and poured into a separatory funnel under the exhaust hood. The hexane and water mixture shall be separated with the water being added to the hexane rinse drum located in the SAA. The volume (%) added to the drum shall be entered into the specific drum inventory log. The remaining hexane, if not visually contaminated shall be placed back into the original container and shall be stored in a flammable cabinet under the benchtop working area of the exhaust hood.
4. Cover each of the reservoirs with a lid once all waste materials have been removed.
5. Completed drum inventory log sheets shall be placed in the file cabinet located in the office area file cabinet in 6268. One log sheet is required per waste drum.

**5.5 Equipment Check-out**

1. When equipment is checked-out to customers, prepare the Equipment Check-Out form, A-6001-828, macro WEF301.
2. Provide a copy of the form to the customer and retain a copy in the 6268 facility filing system.

### 5.6 Equipment Check-in

1. When equipment is dropped-off for cleaning at the 6268 cleaning facility, ensure that the customer completes the Equipment Check-In form, A-6001-829, macro WEF302.
2. Retain the form in the 6268 facility filing system.

### 6.0 DESIGNATED REVIEWING ORGANIZATION

The organization designated to review changes to this document is Hanford Technical Services, the process owner. Comments from other organizations are welcome, however, such comments are dispositioned at the option of the process owner.

### 7.0 REFERENCES

WHC-IP-1127, *Sampling and Mobile Laboratories Procedure Manual*, Section 5.7, "Satellite Accumulation Area Management at 6268 and 6269 Facilities."

ASTM D 1193, "Standard Specification for Reagent Water."

### 8.0 BIBLIOGRAPHY

Job Safety Analysis-3, "RCRA Sampler Decontamination."

WHC-CM-1-1, *Safety Manual*.

WHC-SD-CP-HSP-001, *Westinghouse Hanford Company Chemical Hygiene Plan*.