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17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
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		Design Authority				2	1	RJ Parazin		9/14/98	N5-49
		Design Agent									
2	1	Cog.Eng.:	RM Mitchell	9/14/98	H1-13						
2	1	Cog. Mgr.:	JJ Dorian	9/14/98	H1-13						
		QA									
		Safety									
1	1	Env. Rev telegram		9/18/98							

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# TWRS Phase I Infrastructure Project (W-519) Characterization

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Waste Management Federal Services, Inc., Northwest Operations,  
T. M. Mitchell

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U.S. Department of Energy Contract DE-AC06-96RL13200

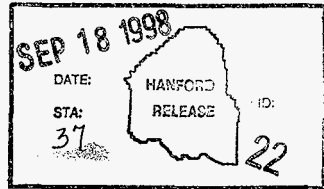
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Abstract: This document provides a detailed description of the  
environmental samples collected for the TWRS (W-519) Infrastructure  
Characterization effort in and around the 200 East Area.

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**TWRS PHASE I INFRASTRUCTURE PROJECT  
(W-519) CHARACTERIZATION**

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September 14, 1998  
Waste Management Federal Services, Inc.,  
Northwest Operations

**CONTENTS**

1.0 INTRODUCTION ..... 1

2.0 PROJECT SCOPE ..... 1

3.0 GROUND PENETRATING RADAR ..... 1

    3.1 INTRODUCTION ..... 1

    3.2 OBJECTIVES ..... 5

    3.3 GROUND-PENETRATING RADAR METHODOLOGY ..... 5

    3.4 RESULTS ..... 5

4.0 GLOBAL POSITIONING SYSTEM INFORMATION ..... 8

    4.1 GPR GRID LOCATIONS ..... 8

5.0 DRILLING FIELD ACTIVITIES ..... 12

    5.1 PRELIMINARY FIELD ACTIVITIES ..... 12

    5.2 FIELD ACTIVITIES ..... 12

        5.2.1 Drilling ..... 12

6.0 SAMPLING ACTIVITIES ..... 15

    6.1 SAMPLING PREPARATION ..... 15

    6.2 SAMPLING ACTIVITIES ..... 15

    6.3 SAMPLING METHOD ..... 16

    6.4 POST-SAMPLING ACTIVITIES ..... 16

7.0 DATA EVALUATION ..... 16

8.0 CONCLUSIONS ..... 17

**Attachments**

A. Activity Hazard Analysis ..... A-i

B. Excavation Permit ..... B-i

C. Biological and Cultural Reviews ..... C-i

D. Soil Evaluation ..... D-i

E. Radiological Survey Reports ..... E-i

F. Start Card ..... F-i

G. WSCF Analytical Laboratory Report ..... G-i

H. Sampling Logbook ..... H-i

**LIST OF FIGURES**

1. Map of Project W-519 Grid Sites and Sampling Locations .....	2
2. General Location Map .....	3
3. GPR Investigation Summary .....	4
4. GPR Profile E145 .....	6
5. Sample Point No. 3 Waste Management FSI 06/02/98 .....	7
6. Sample Point No. 5 Waste Management FSI 06/02/98 .....	9
7. Sample Point No. 7 Waste Management FSI 06/02/98 .....	10
8. Sample Points No. 8 and 9 Waste Management FSI 06/04/98. ....	11

**LIST OF TABLES**

1. Corner Coordinates of GPR Grids for the Project W-519 Sample Locations .....	12
2. Sampling Activities for Designated Sites .....	16

**LIST OF TERMS**

BLS	below land surface
COC	Chain of Custody
EPA	U.S. Environmental Protection Agency
GIS	Geographic Information System
GPR	Ground Penetrating Radar
GPS	Global Positioning System
GSSI	Geophysical Survey Systems Inc.
HPT	Health Physics Technician
NAD	North American Datum
NHC	Numatec Hanford Corporation
SIR	Subsurface Interface Radar (trademark of GSSI)
SOW	statement of work
TWRS	Tank Waste Remediation System
WMNW	Waste Management Federal Services, Inc., Northwest Operations
WSCF	Waste Sampling and Characterization Facility

## **TWRS PHASE I INFRASTRUCTURE PROJECT (W-519) CHARACTERIZATION**

### **1.0 INTRODUCTION**

In order to treat the mixed radioactive and hazardous waste stored in 177 underground tanks, the Tank Waste Remediation System (TWRS) program is developing a "demonstration" site for treatment and immobilization of these wastes by a private contractor. Project W-519 is providing the infrastructure support to this site by developing the designs and emplacing required pipelines, roads, electrical, etc. In support of the TWRS Phase I Infrastructure Project (W-519) Characterization, Numatec Hanford Corporation (NHC) contracted with Waste Management Federal Services, Inc., Northwest Operations (WMNW) to investigate a number of locations in and just outside the 200 East Area eastern fence line boundary. These areas consisted of known or suspected waste lines or waste sites that could potentially impact the construction and emplacement of the proposed facility improvements, including waterlines and roads. These sites were all located subsurface and augering would be required to obtain sample material from the desired depth. The soils would then be sampled and submitted to the laboratory for analysis of radioactivity.

### **2.0 PROJECT SCOPE**

After reviews of the site, historical documents, and site maps, including a complete site walkdown, it was determined that five locations (see Figure 1; the numbers in brackets represent the original planning designations) would be designated for augering and sampling. Field work was directed by a statement of work (SOW) developed by NHC personnel. At three of these locations, the site was staked out in a 50 ft by 50 ft grid marked off on 5 ft centers. Sites 2 (8) and 3 (9) were conducted along a single 30 ft x 200 ft grid. Each location was subject to a Ground Penetrating Radar (GPR) survey. Each of the grids was permanently located using the Global Positioning System (GPS). One sample was collected from the desired depth ranging from 5 ft to 8 ft below existing grade. The samples were monitored by a Health Physics Technician (HPT), released, and submitted to the Waste Sampling and Characterization Facility (WSCF) laboratory for analyses of total alpha, total beta, and gamma spectroscopy.

### **3.0 GROUND PENETRATING RADAR**

#### **3.1 INTRODUCTION**

WMNW provided a subcontract to CH2M Hill to conduct GPR investigations of five sites in support of the TWRS Phase I Infrastructure Characterization (Figure 2). The five sites were where the soil was to be sampled using a drilling auger. Figure 3 is a summary of the investigation parameters.

Figure 1. Map of Project W-519 Grid Sites and Sampling Locations.

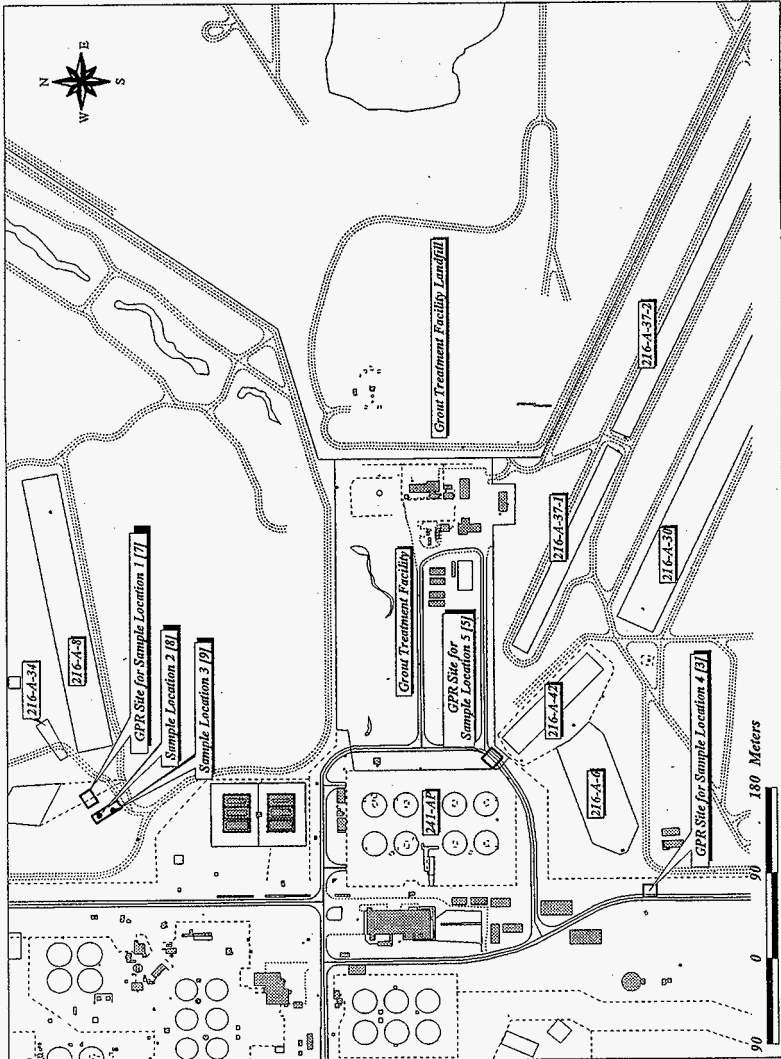


Figure 2. General Location Map.

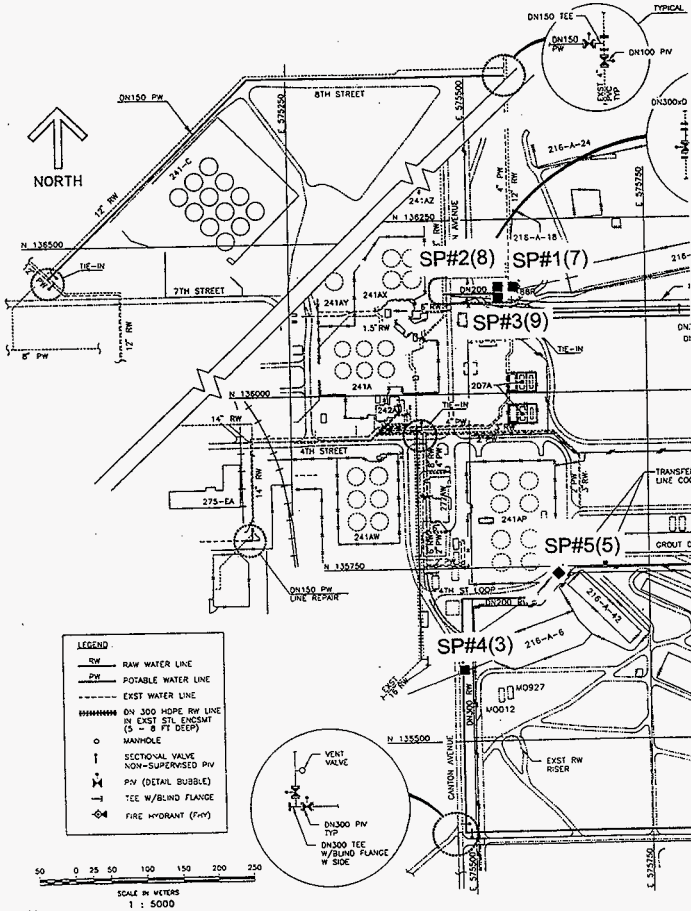




Figure 3. GPR Investigation Summary.

Sites: Sample Point #3, Sample Point #5, Sample Point #7, Sample Point #8, and Sample Point #9.

Document Number: None

Date: June 1998

Sponsor (Contact, phone): Ron Mitchell (WMFSI) 509-376-5122

Investigators (Name, Company, Phone, E-mail): Tom Mitchell & Kevin Bergstrom CH2M Hill  
509-372-9690 (Thomas\_H\_Mitchell@RL.gov), 509-372-9591 (Kevin\_A\_Bergstrom@RL.gov)

Location: All in 200 East Area, Hanford Site, Richland, WA.

Sample Point #3- East side of Canton Ave., south of 241-AP Tank farm

Sample Point #5- Between 241-AP tank farm and 216-A-42 trench on 4<sup>th</sup> Street.

Sample Point #7- East of tank farm 241-AX and south of 216-A-24 crib, outside of the perimeter fence.

Sample Point #8- East of tank farm 241-AX and south of 216-A-24 crib, outside of the perimeter fence.

Sample Point #9- East of tank farm 241-AX and south of 216-A-24 crib, outside of the perimeter fence.

Objectives: To locate underground utilities, pipelines, or any other subsurface features that might impact the sampling with a cone penetrometer.

---

#### Site Description

Cultural Resource Setting: NA

##### Terrain:

SP#3 – Flat gravel surface.

SP#5 – Primarily flat asphalt with a ~2-ft deep ditch on the southeastern edge of the road and minor undulations immediately north of the road.

SP#7- The grid is centered on a east-west trending 3-4-ft high berm. The crest is at ~ N175.

SP#8- The grid is centered on a east-west trending 3-4-ft high berm. The crest is at ~ N175.

SP#9- The grid is centered on a east-west trending 1-2-ft high berm. The crest is at ~ N120.

##### Vegetation:

SP#3 – None

SP#5 – None

SP#7- Minimal, scattered tumble weed, cheat grass, and rabbit brush.

SP#8- Minimal, scattered tumble weed, cheat grass, and rabbit brush.

SP#9- Minimal, scattered tumble weed, cheat grass, and rabbit brush.

##### Hydro Properties (water table, moisture etc.):

All sites- Very dry, depth of investigation was entirely within the vadose zone.

##### Soil/sediments/rock type:

All sites - Eolian sand with scattered gravel/cobbles

##### Anticipated Bedrock (depth and type):

NA

##### Obstacles (rocks, trees, buildings etc):

SP#3, 7, 8, and 9 – none

SP# 5 – Steep 3-ft bank just outside the grid along E150.

##### Site limitations:

None

##### Overall assessment of site for geophysical investigations:

GPR was effective to depths of 0-10-ft at all five sites.

##### Equipment:

Type/model: GSSI SIR10A ground penetrating radar system. All data were collected with a GSSI 300 MHZ model 3105 antenna. All hard copies were made with a GS-608P Plotter.

Data format (tape/disk/hardcopy): Hard copies on file.

---

#### Data Collection Parameters:

##### Survey Parameters/grid:

A 5x5-ft grid was established at each site. Blue stakes were placed at the corner of each grid. Data were collected along parallel profiles spaced 5 feet apart in two orthogonal directions. WMFSI personnel surveyed the grids with a global positioning system (GPS).

##### Equipment Settings:

Range 108 ns: Scans/second- 25: Sample/scan 512

Continuous data collection: Signal gains and filtering were performed in the field. No post processing of the data was performed.

### 3.2 OBJECTIVES

The primary objectives of the GPR investigation were:

- To locate and map subsurface utilities and other buried anthropogenic material that might interfere with the sampling.
- To identify alternative sites for sampling if the pre-selected sites had subsurface obstructions.

### 3.3 GROUND-PENETRATING RADAR METHODOLOGY

The GPR system for this work utilized a 300-megahertz (MHz) transducer. The transducer transmits electromagnetic energy into the ground. Buried objects such as pipes, barrels, foundations, and buried wires can cause all, or a portion, of the transmitted energy to be reflected back towards a receiving antenna. Geologic features such as cross bedding, caliche horizons, paleosols, and clays can also cause reflections of the transmitted energy. The reflected energy provides the means for mapping the subsurface features of interest, whether man-made or geologic.

The maximum depth of investigation varies from site to site, and is a function of the transmit power, receiver sensitivity, frequency of the antenna, and attenuation of the transmitted energy. The attenuation of the energy is primarily a function of the local soil conditions. Depth of investigation is also affected by highly conductive material, such as metal drums and pipes, which essentially reflect all the energy. The method cannot "see" directly below areas of highly reflective material since "all" of the energy is reflected. The maximum depth for usable data was about 14 ft below the surface for these surveys.

Display and interpretation of GPR data are similar to that of seismic reflection data (i.e. data displayed as horizontal distance versus time, depicting pseudo cross-sections of the earth). Figure 4 is an example of a typical GPR profile, taken from the sample point #3 site. The approach to an interpretation can be variable and influenced by the objectives of the survey and the experience of the interpreter. Numerous data processing techniques are available that may or may not aid in the interpretation process. In some areas, interpretations can be straight forward, but often a highly variable subsurface yields complex data that is difficult to interpret. The end product, in these surveys, is a plan view map showing the location and depth of features that were detected within the survey area.

The GPR data were collected with a Geophysical Survey Systems Inc. (GSSI) Subsurface Interface Radar (SIR)<sup>1</sup> System 10A Plus with a recording window of 108 nanoseconds, two-way travel time. A 300 MHz, model 3105 antenna was used.

### 3.4 RESULTS

Several linear anomalies were detected at the Sample Point #3 site that have the characteristics of buried utilities or pipelines. The staked sample point was very near an east west trending linear (Figure 5). It was recommended that the sample point be moved a few feet to safely avoid the linear if the risk of inadvertent contact is important. Several isolated anomalies were also detected at Sample Point #3. The majority of these anomalies were located in the northern and eastern portion of the survey grid and should be avoided if possible.

---

<sup>1</sup>A trademark of Geophysical Survey Systems Inc. (GSSI).

File 20: E145.SUN(06/02/98 12:36:58)  
Samp/Scan 5125/320  
Location: WM SAMPLE POINT #3

Mark Spacing: 5FT  
Range: N100 TO N145

Position: -10.0nS Range: 108.0nS  
Range Gain: -221.38 SI 60  
V(IIR LP N=2 F=103)  
V(IIR HP N=2 F=103)  
H(IIR STK TC=3)

Table #2: Transform #1; Contrast #4(-9%);Chart Scale 102

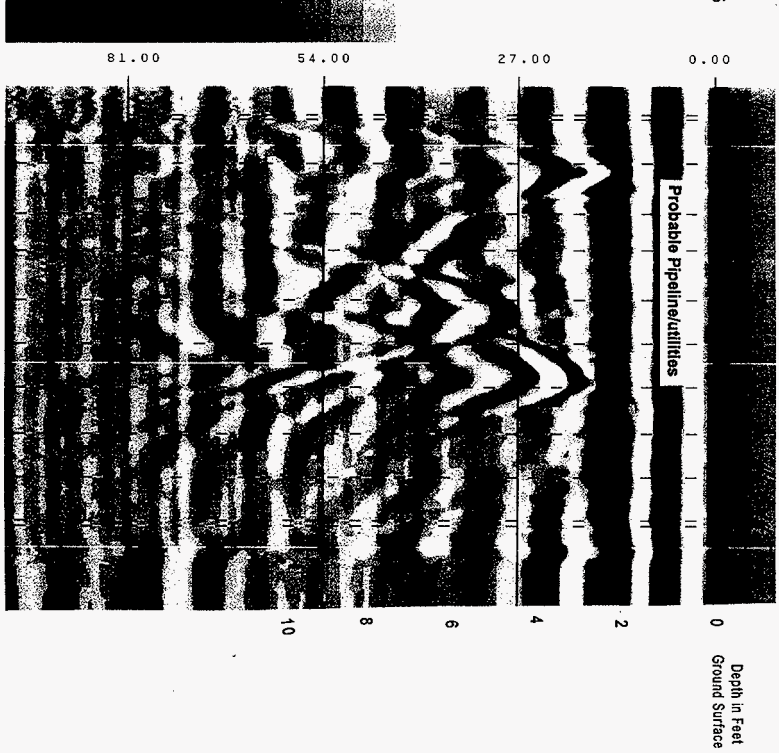


Figure 4. GPR Profile E145.

Figure 5. Sample Point No. 3 Waste Management FSI 06/02/98.

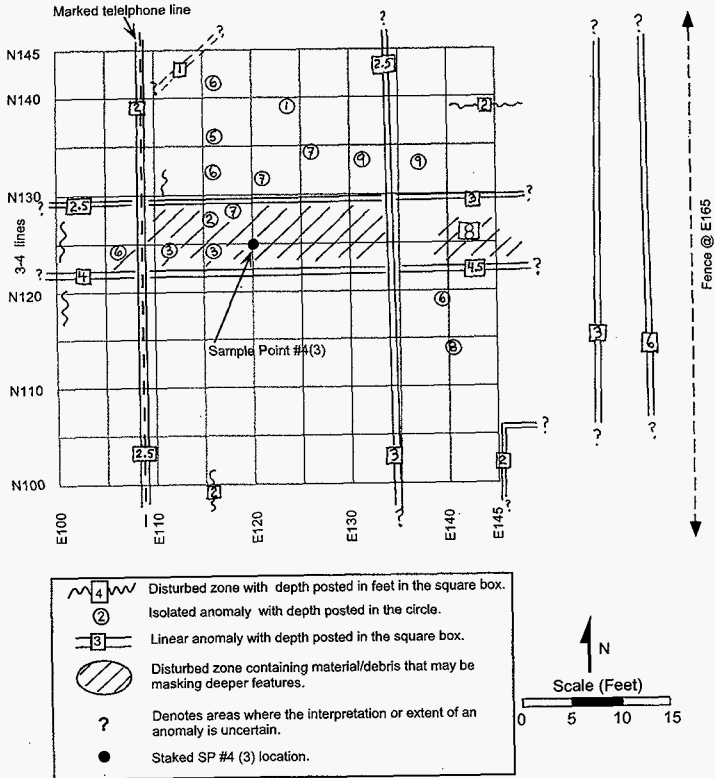


Figure 6 shows the results of the GPR survey at Sample Point #5. Four distinct linears were identified. All linears, isolated anomalies, and disturbed zones should be avoided when selecting the final sample point if inadvertent contact is to be avoided.

Figure 7 shows the results of the GPR survey conducted at Sample Point #7. The staked sample point was within 1-2 ft to a linear anomaly that has the characteristics of a buried pipeline or utility.

A single grid system was used that incorporated both Sample Point #8 and Sample Point #9 (Figure 8). Two linears were detected, one near each sample point. Sample Point #9 is in a disturbed zone that may contain anthropogenic material that could effect the sampling at the site.

## 4.0 GLOBAL POSITIONING SYSTEM INFORMATION

### 4.1 GPR GRID LOCATIONS

GPR operators using standard measuring techniques (i.e., tape measure) prepared the GPR grids. A global positioning system operator then collected geographic data pertaining to the corners of these grids using a survey quality GPS, capable of 2 cm (0.8 in.) accuracy in real time. These data were transferred to a personal computer with software designed to process and assess the quality of the GPS data. This software was also used to convert the raw GPS data into the Washington State Plane, North American Datum (NAD) 83-91 coordinate system as required by state and federal regulations. Once the data had been processed and approved, it was exported to an ASCII comma delimited file for use in conventional software programs (i.e., Microsoft<sup>2</sup> Excel and Word) for reporting and to use in Geographic Information System (GIS) software to prepare scale maps of the GPR locations.

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<sup>2</sup>Microsoft is a trademark of the Microsoft Corporation.

Figure 6. Sample Point No. 5 Waste Management FSI 06/02/98.

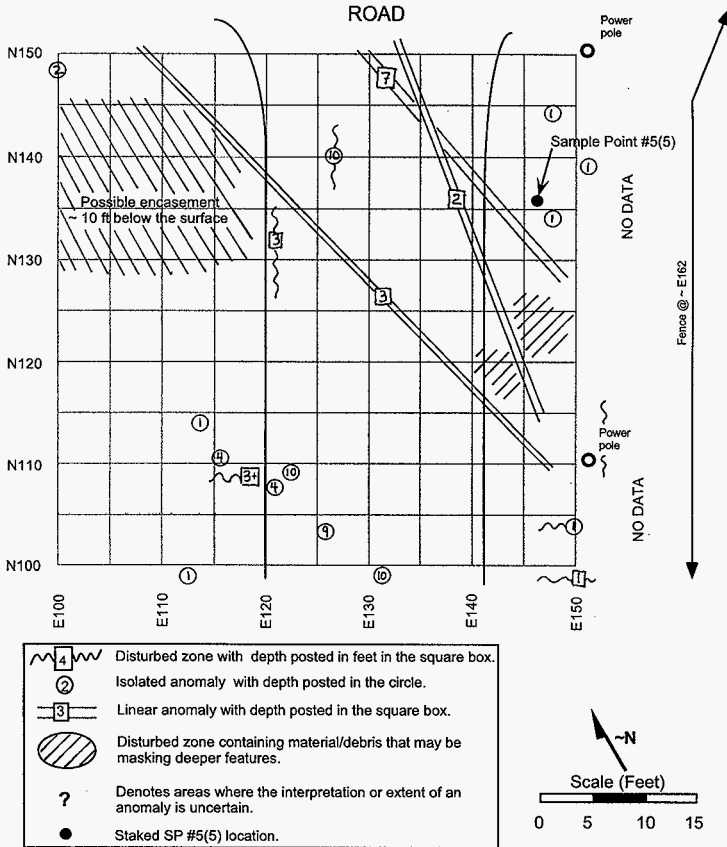


Figure 7. Sample Point No. 7 Waste Management FSI 06/02/98.

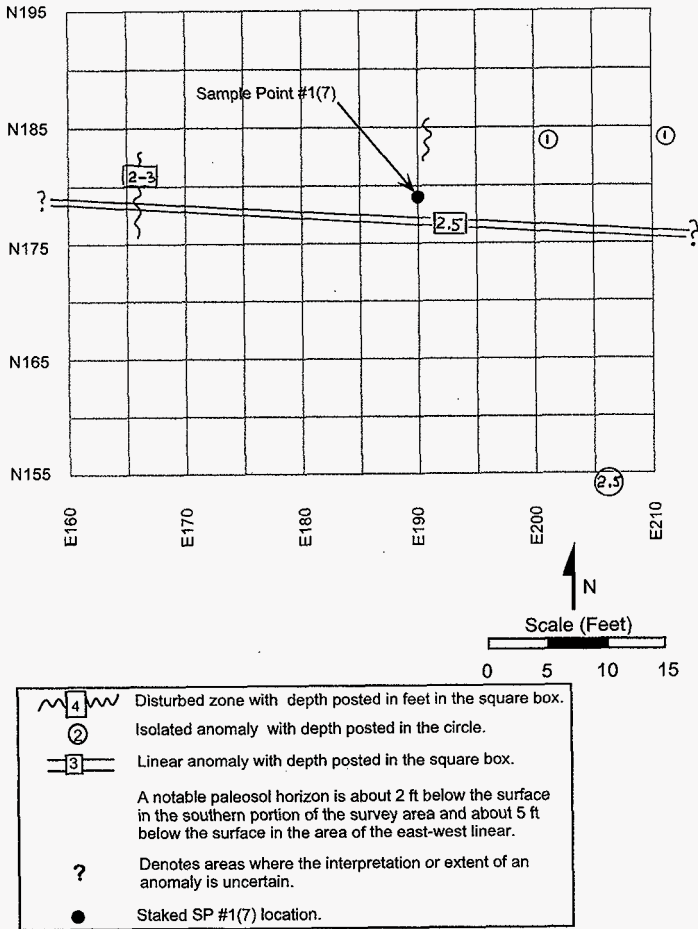


Figure 8. Sample Points No. 8 and 9 Waste Management FSI 06/04/98.

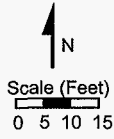
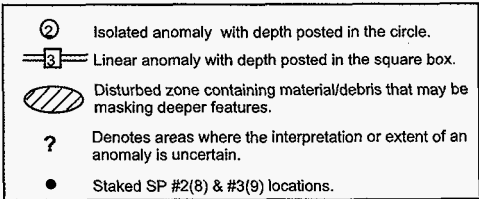
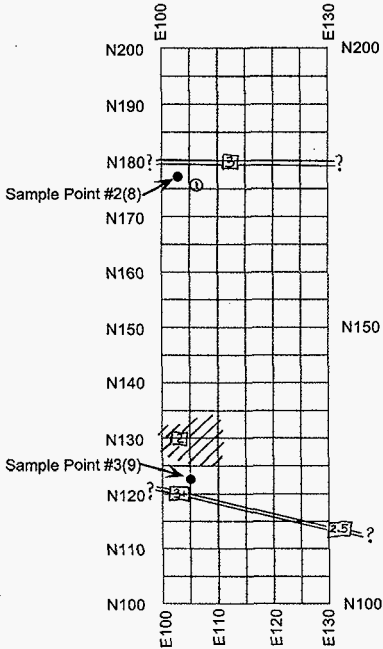




Table 1. Corner Coordinates of GPR Grids for the Project  
W-519 Sample Locations.

Site No.	Point ID	Easting	Northing	Elevation
1	1	575560.156	136165.175	203.025
1	2	575567.882	136170.058	202.488
1	3	575584.233	136144.413	202.065
1	4	575576.433	136173.808	202.565
2,3	5	575576.569	136139.461	202.409
2,3	6	575589.335	136182.020	202.260
2,3	7	575595.842	136171.785	202.039
2,3	8	575583.026	136163.537	202.132
4	9	575615.349	135756.334	208.139
4	10	575625.418	135767.738	208.029
4	11	575636.878	135757.672	207.782
4	12	575626.774	135746.282	207.741
5	13	575478.996	135602.698	214.656
5	14	575492.665	135602.629	214.335
5	15	575492.639	135588.958	214.709
5	16	575478.987	135589.015	214.942

## 5.0 DRILLING FIELD ACTIVITIES

### 5.1 PRELIMINARY FIELD ACTIVITIES

Field inspections were completed prior to on-site drilling activities. Prior to initiating field work, excavation permits, cultural and biological resource reviews, start cards, etc. were obtained (see Attachments A through H). These field inspections provided information supporting preliminary documentation and planning.

Boring designations were obtained for five (5) geotechnical borings (B8701 through B8705).

### 5.2 FIELD ACTIVITIES

#### 5.2.1 Drilling

Drilling commenced on June 10, 1998 and was completed on June 11, 1998. A SIMCO model 2400 auger drill (gasoline over hydraulic) was used in conjunction with 8 in. O.D. solid stem augers.

The following describes boring reference numbers:

1. Site 1, B8701 (boring designation), planning number 7;
2. Site 2, B8702 (boring designation), planning number 8;
3. Site 3, B8703 (boring designation), planning number 9;
4. Site 4, B8704 (boring designation), planning number 3; and
5. Site 5, B8705 (boring designation), planning number 5.

Drilling details such as duration, sample times, and methods were documented in the Samplers Logbook (reference WM-SML-H13). A discussion on site specific operations is as follows:

1. Site 4 (sample point 3, B8704): June 10, 1998. A Pre-Job Safety meeting was held; the auger unit was set-up and drilling initiated at 08:50; an auger flight was added to the drill string at 09:04; sample depth achieved (7 ft below land surface [BLS]) at 09:08; drilled to a depth of 8 ft BLS and a sample obtained (09:18) by pulling flights up. Sample interval 7 ft to 8 ft BLS.

A soil change was noted from ~6 ft to 8 ft BLS. The soil change consisted of a washed medium/coarse grained sand.

Upon removal of the auger flights, the boring was backfilled and slightly compacted with previously excavated (drilled) soil. The flag locator was placed at the boring location.

No contamination was noted with field instrumentation. Background was noted at 100 cpm/PA Beta/Gamma.

Visitors on location were Mr. William Hopkins and Mr. Ted Perry with the water utilities department. The Water utilities personnel viewed drilling operations at Site 4, since a water line was located to the East of the boring location.

The sampling Team consisted of Mr. Karl Hulse (Scientific Technician), Mr. Laurence Corgatelli (Health Physics Technician), Mr. Ron Mitchell (Project Manager) and Mr. Dave Skoglie (Drilling Engineer).

2. The Original plan was to drill boring B8705 (Site 5, sample point 5); however, the electrical utilities planning department could not fit us in their schedule for the 10th of June. Prior arrangements had been made with the utilities department. Electrical utilities will turn-off power to RO600 2,400 volt lighting line) the 11th at 08:00.

Site 3 (sample point 9, B8703): The auger unit was set-up and drilling initiated at 10:15; sample depth achieved (4 ft BLS) at 10:20; drilled to a depth of 5 ft BLS and a sample obtained (10:23) by pulling flights up. Sample interval 4 ft to 5 ft BLS.

A soil change was noted from ~4 ft to 5 ft BLS. The soil change consisted of a light colored fine grained sand.

Upon removal of the auger flights, the boring was backfilled and slightly compacted with previously excavated (drilled) soil. The flag locator was placed at the boring location.

No contamination was noted with field instrumentation. Background was noted at 100 cpm/PA Beta/Gamma.

No visitors were on location.

The sampling Team consisted of Mr. Karl Hulse (Scientific Technician), Mr. Laurence Corgatelli (Health Physics Technician), Mr. Ron Mitchell (Project Manager) and Mr. Dave Skoglie (Drilling Engineer).

3. Site 2 (sample point 8, B8702): The auger unit was set-up and drilling initiated at 10:37; sample depth achieved (4 ft BLS) at 10:42; drilled to a depth of 5 ft BLS and a sample obtained (10:45) by pulling flights up. Sample interval 4 ft to 5 ft BLS.

A soil change was noted from ~4 ft to 5 ft BLS. The soil change consisted of a light colored fine grained sand.

Upon removal of the auger flights, the boring was backfilled and slightly compacted with previously excavated (drilled) soil. The flag locator was placed at the boring location.

No contamination was noted with field instrumentation. Background was noted at 100 cpm/PA Beta/Gamma.

No visitors were on location.

The sampling Team consisted of Mr. Karl Hulse (Scientific Technician), Mr. Laurence Corgatelli (Health Physics Technician), Mr. Ron Mitchell (Project Manager) and Mr. Dave Skoglie (Drilling Engineer).

4. Site 1 (sample point, B8701): The auger unit was set-up and drilling initiated at 10:50; sample depth achieved (5 ft BLS) at 11:01; drilled to a depth of 5 ft BLS and a sample obtained (11:04) by pulling flights up. Sampling interval 5 ft to 5.75 ft BLS.

A soil change was noted from ~5 ft to 5.75 ft BLS. The soil change consisted of a light colored fine-grained sand.

Upon removal of the auger flights, the boring was backfilled and slightly compacted with previously excavated (drilled) soil. The flag locator was placed at the boring location.

No contamination was noted with field instrumentation. Background was noted at 100 cpm/PA Beta/Gamma.

No visitors were on location.

The sampling Team consisted of Mr. Karl Hulse (Scientific Technician), Mr. Laurence Corgatelli (Health Physics Technician), Mr. Ron Mitchell (Project Manager) and Mr. Dave Skoglie (Drilling Engineer).

5. Site 5 (sample point 5, B8705): June 11, 1998. The Electricians met with Mr. Skoglie at the breaker location in 200 East. The Electricians de-energized the RO600 lighting line and tagged out the system. Mr. Skoglie notified the dispatcher and overtagged the system. The electricians viewed the boring location and verified the lighting line.

The auger unit was set-up and drilling initiated at 08:27; an auger flight was added to the drill string, sample depth achieved (5 ft BLS) at 08:41; drilled to a depth of 6 ft BLS and a sample obtained (08:50) by pulling flights up. Sampling interval 5 ft to 6 ft BLS.

A soil change was noted from ~5 ft to 6 ft BLS. The soil change consisted of a light colored fine-grained sand.

Upon removal of the auger flights, the boring was backfilled and slightly compacted with previously excavated (drilled) soil. The flag locator was placed at the boring location.

No contamination was noted with field instrumentation. Background was noted at 100 cpm/PA Beta/Gamma.

No visitors were on location. However, adjacent to the work location were two operators watching the sampling operation (~08:35). No comments were made to Mr. Hulse whom initiated discussions with the Operators.

The sampling Team consisted of Mr. Karl Hulse (Scientific Technician), Mr. Laurence Corgatelli (Health Physics Technician), and Mr. Dave Skoglie (Drilling Engineer).

## **6.0 SAMPLING ACTIVITIES**

### **6.1 SAMPLING PREPARATION**

In support of Phase 1 Privatization Site Infrastructure (W-519) sampling containers and laboratory provided Petri dishes meeting U.S. Environmental Protection Agency (EPA) Level 1 cleanliness guidelines were selected for this project. Each container had been bar coded with a lot and serial number (provided by the manufacturer). Certificates of analysis verifying the cleanliness of the containers by lot are maintained by Sampling Services in accordance with SML-EP-001, Section 1.3, "Control of Certificates of Analysis." Types of containers and lot numbers are listed in the field logbook (WM-SML-H13, pages 77-82) and are contained in this document (Attachment H).

The work plan for Phase 1 Privatization Site Infrastructure specified that stainless steel sampling equipment be cleaned in accordance with SML-EP-001, 2.5, Rev. 0 "Laboratory Cleaning of Sampling Equipment." All stainless steel bowls and spoons were cleaned to this procedure prior to deployment to the field.

### **6.2 SAMPLING ACTIVITIES**

Sampling activities were conducted at the designated sites from June 10-11, 1997. Sampling was performed in accordance with SML-EP-001, 4.1, Rev. 0, "Soil and Sediment Sampling." A list of the sample site locations, corresponding sample identification numbers, collection dates and times, and the analytical laboratory are provided below.

Table 2. Sampling Activities for Designated Sites.

Sample #	Sample Site	Borehole #	Sample Depth	Date	Time	Lab
S8091-01	1 [7]	B8701	5 ft-6 ft	6-10-98	1104	WSCF
S8091-02	2 [8]	B8702	4 ft-5 ft	6-10-98	1045	WSCF
S8091-03	3 [9]	B8703	4 ft-5 ft	6-10-98	1023	WSCF
S8091-04	4 [3]	B8704	7 ft-8 ft	6-10-98	0918	WSCF
S8091-05	5 [5]	B8705	5 ft-6 ft	6-11-98	0850	WSCF

WSCF = Waste Sampling and Characterization Facility.

A map of sample locations are in the Field logbook (WM-SML-H13, pages 77-82) and are attached to this document (Attachment H).

### 6.3 SAMPLING METHOD

A SIMCO model 2400 auger drill with a 8 in. outside diameter solid stem auger was used to reach the desired sample depth. When the Auger reached the sample depth the auger was raised the flights were cleaned of soil and the auger was lowered back into the hole and drilled an additional foot. The auger was then raised were the sample was collected from the lower flights with a cleaned stainless steel spoon and bowl.

Samples were shipped to the WSCF by government vehicle in a sealed ice chest, packed on wet ice.

### 6.4 POST-SAMPLING ACTIVITIES

Chain of Custody (COC) #101078 was used to maintain custody on all samples and maintained in accordance with SML-EP-001, 1.1, "Chain of Custody/Sample Analysis Request." The COC was maintained from the sample collection site through delivery of the samples to the Laboratory. Samples were delivered to the laboratory on the final day of collection. Samples from the previous day were stored overnight in a refrigerated custody locked storage area (6269 Building) maintained by Sampling Services.

Field logbook WM-SML-H13 was used in accordance with SML-EP-001, 1.5, "Field Logbooks" to document all sampling activities.

## 7.0 DATA EVALUATION

Analytical data were received from the WSCF laboratory and the complete data set is included in Attachment G. All of the values for total alpha and total beta were below the minimum detection limits for the laboratory and showed up as "undetected" by the result qualifier.

For the gamma spectroscopy, all of the radioanalytes were below the minimum detection limits and were designated as "undetectable," with the exception of  $^{134}\text{Cs}$ . However, the WSCF lab has since determined that the reported  $^{134}\text{Cs}$  values are invalid and represent naturally-occurring

radionuclides, such as thorium. Therefore, no radionuclides were detected in the samples above the detection limits. The average value reported for  $^{137}\text{Cs}$  in the 200 Area surface soils for the near-facility monitoring in 1997 was  $1.8 \text{ E} + 00 \text{ pCi/g}$ .

## 8.0 CONCLUSIONS

Based on the results of the field characterization efforts and analytical data, some general conclusions can be made regarding the project locations investigated. The data collected represent a good "snapshot" of conditions where a high probability of radioactive contamination would have been expected. However, sampling methods by their very design do not provide detailed information on every aspect of the proposed site. Unanticipated field conditions during construction can occur and should probably be expected within the 200 Areas where 50 years of waste operations activities, changing environmental conditions, and current cleanup operations affect these sites on a daily basis. The conclusions reached to date include the following:

- There should be limited potential for contamination at the proposed construction depth inside a 3 to 5 ft radius from identified structures where boreholes were completed.
- The above statement is an extrapolation of evidence from previous studies on the 200 Areas plateau of the Hanford Site that indicate that leaks, spills, etc., generally move through the sandy soils in a roughly spherical pattern. Localized soil anomalies, however, could be expected to affect this process.
- Data from a single borehole which indicates a lack of contamination at, or near, a known disposal site should not be construed to mean that the site is entirely free of contamination.
- The borehole location represents only one of the four compass points around any particular underground facility. This should be kept in mind during construction planning.
- Comprehensive health and safety guidelines should be delineated for workers included in construction activities, with special consideration given to any and all areas around the boreholes investigated during this study, or to any other underground structures or utilities.
- Any of the above conclusions can be obviated by anomalous conditions not encountered during the characterization study, by ongoing or new construction or operational activities which may impact the proposed route, and by constantly changing environmental conditions which could affect the movement of contaminants away from the waste site during the period from finalization of this characterization effort to project completion.

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**Attachment A.**  
**Activity Hazard Analysis.**



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vision of Work Package: 0

Page 1 of 2

PRE-JOB BRIEFING FORM

Description/Title: W-519 AUGER SAMPLING  
 Work Package Number: W-519  
 Person in Charge: RON MITCHELL  
 Names of First Aid Qualified Person(s): DAVE SKOGIE

Check Items Discussed:

- Required Design Documents are Complete? No. N/A
- Procedures/Plans to be Used No. N/A
- Applies OSR's No. N/A
- Radiation Work Permit No. N/A
- Activity hazard Analysis, SS HASP No. 98-008
- Construction Permit (as needed) No. N/A
- Additional Permits (i.e., confined space, excavation, etc.) No. DAN 1067
- Review all Applicable Safety Precautions and Prestart Conditions per Procedures/Plans to be used
- Components Locked and Tagged (Job Specific Work Instructions and Lock and Tag Signature Sheet will be issued if Lock and Tag is applicable)
- ALARA Considerations (applicable MSDS's)
- Respiratory Protection (fresh air, PAPR's, chemical filters, etc.) N/A
- Radioactive Contamination Containment Device N/A
- Emergency Response and Actions
- Summary of Job Sequence (or steps)
- Work Area Conditions (high/low temperatures, lighting, proper equipment location, pinch points, etc.)
- All Equipment Functionally Checked and at Work Site

OTHER TOPICS Electrical - A lighting line will be turned off and WMNW hang (over tag) a DANGER TAG.

CONCERNS: Radio logical contamination is a possibility. Biological hazards may also be present.

TRAINING: (Initial)

- Field Superintendent, or Alternate, **VERIFY TRAINING OF ALL PERSONNELL CONDUCTING TASKS IS CURRENT FOR BOTH MANDATORY TRAINING AND DIRECTED (TASK SPECIFIC) TRAINING.** Directed (Task specific) training for example is Basic Crane & Rigging, or Advanced Crane & Rigging for personnel using cranes/hoists.

SIGNATURE:

Dave Skogie 6/10/98  
 Supervisor/Field Superintendent, or Alternate SIGN/DATE

**E-JOB BRIEFING FORM (Continued)**

**ATTENDANCE ROSTER**

TIRE WORK PACKAGE REVIEWED ALONG WITH CURRENT RWP's.

checkname off on attached list. ADD name to list if not listed.

NAME (Print/Sign)	Org. Code	Payroll No.	Date
David E. Skoghe	03F00	9-19-98 57056	6/10/98
<i>Lawrence Costello</i>		57056	6/10/98
<i>Paul R. Miller</i>	03E00	42311	6-10-98
<i>Paul Miller</i>	03F00	65497	6/10/98

**ACTIVITY HAZARD ANALYSIS**  
**WASTE MANAGEMENT FEDERAL SERVICES, INC.**  
**HANFORD SITE**

Site/Activity Name:	W-519 PRIVATIZATION SITE INFRASTRUCTURE SAMPLING		AHA NUMBER: 98-008
Job Site Location:	200 EAST AND IMMEDIATE AREA		
Field Task Lead:	RON MITCHELL	Alternate:	DAN EDWARDS
Field Superintendent:	BOB JONES	Alternate:	DAVE SKOGLIE
Safety Representative:	MIKE MADISON	Alternate:	MARTY GARDNER
<b>APPROVALS:</b>			
Name - Field Superintendent/Supervisor/Field Team Leader	<i>David E. Skoglie</i>	Date	5/12/98
Name - Safety and Health Professional (Independent Review)	<i>[Signature]</i>	Date	5/12/98
<p><b>TASKS/SITE DESCRIPTION:</b> The Phase 1 Privatization Site Infrastructure W-519 sampling project is being conducted to screen for radiological contamination. The sampling and analysis will support planning for upcoming construction activities. Radiological Control Technician(s) will be present continuously to monitor the drill cuttings whenever a change occurs in the soil, i.e., color, moisture content, etc., or at ~2 ft intervals. Shallow &lt;20 ft in depth geotechnical auger borings will be drilled and samples obtained from the drill cuttings for screening. The borings will be temporary and will be decommissioned upon completion of drilling/sampling.</p>			

HAZARD ANALYSIS							
Check below all items applicable to job or task being carried out							
	Yes	No		Yes	No	Yes	No
Electrical	X		Noise	X			X
Material Handling		X	Dust	X			X
Heavy Equipment		X	Temperature Extremes	X			X
Manual Lifting	X		Illumination		X		X
Elevated Work		X	Chemicals	X			X
Pinch Points	X		Biological Hazards	X			X
Power Tools		X	Radiological Hazards	X			X
Compressed Gas Cylinder		X	Asbestos		X		X
Welding & Cutting		X	Scaffolding		X		X
Steam		X	Subsidence		X	X	
Hot Surfaces		X	Confined Space		X		X
Ladders		X	Water Hazards		X		X
Walking/Working Surfaces	X		Remote Work Area		X		X
Excavation	X		Cranes/Rigging		X		X
Vehicle Traffic		X	Drilling	X			X
Overhead Hazards	X		Spill Containment		X	X	
Falling Objects	X		Sign/Site Control	X			X
Sanitation	X		OB-Road Vehicle Use		X	X	
Hazard Communication	X		Non-Ionizing Radiation		X	X	
Lasers		X	Aerial Lifts		X		X
Electromagnetic Rad		X	Flammable/Combustible Materials	X		X	
							X

**NOTE:** If additional hazards are discovered during the conduct of this activity, work shall stop until such hazards are controlled Approval (written or verbal) of the independent S&H reviewer is necessary before work can resume.

ACTIVITY HAZARD ANALYSIS  
 WASTE MANAGEMENT FEDERAL SERVICES, INC.  
 HANFORD SITE

**JOB HAZARD CONTROLS CHECKLIST**

For each item checked "yes" on Hazards Analysis, complete a box below outlining the primary control measures to mitigate/control health & safety hazards. When an item is a non-hazard program or procedural requirement, then provide applicable information.

**ELECTRICAL:** Power lines are within 20 ft of the sample location ( numbers 5 and 6). The electrical utilities will be contacted and power turned off if required.

**MANUAL LIFTING:** Use proper lifting techniques (bend knees, straight back, firm grip on load). Use buddy system for heavy/bulk/awkward loads.

**PINCH POINTS/GUARDING:** Wear sturdy leather work gloves when handling equipment and tools. Assure all guards are in place and functional. Be watchful of moving parts and other potential pinch points.

**WALKING SURFACES:** Wear substantial footwear with lugged or other non-slip sole. Be careful of equipment on the ground. Keep work area picked up.

**EXCAVATION:** An approved Excavation Permit, with appropriate signatures, is needed prior to drilling operations.

**OVERHEAD HAZARDS:** Level D PPE is required. Be aware of overhead operations.

**FALLING OBJECTS:** Level D PPE is required. Conduct weekly and monthly Checklist for drill unit/pump setting rig.

**SANITATION:** Have wash water, soap and towels available. Know the location of the nearest portable toilet or restroom.

**HAZARD COMMUNICATION:** OSHA 1910.1200 hazard communication will be posted at the 600 Area Pipeyard for employees.

**NOISE:** Wear hearing protection when drill unit, work-over unit, support equipment is operating. Post work area "Hearing Protection Required."

**DUST:** During dust storms that create a hazardous work environment, work will STOP.

**TEMPERATURE EXTREMES:** Wear clothing appropriate for prevailing weather conditions. Know the symptoms of heat/cold stress and monitor each other for symptoms. Have plenty of drinking water available during hot weather and encourage frequent water consumption. Have shaded/warming areas available for rest breaks, depending on conditions.

**CHEMICALS:** Develop and maintain an MSDS file for ready reference of all chemicals and chemical products used on the job (ie, oils, lubes and fluids). Secondary containers will be labeled appropriately.

**BIOLOGICAL HAZARDS:** Be watchful for poisonous reptiles/insects around work area, particularly beneath equipment that has rested on the ground over night and in shaded areas beneath shrubs. Watch where you reach! If encountered, do not attempt to handle reptiles or insects. Contact BHI animal control at 373-1383/531-0719.

**RADIOLOGICAL HAZARDS:** Rad Con will evaluate data to determine necessary protocol. A Radiation Work Permit will be developed if contamination levels are reached beyond set limits.

**DRILLING:** Be aware of rotating pipe (stand clear) it can grab. Be aware of pinch points.

**SITE CONTROL:** Demarcate work area by use of traffic cones and/or a rope boundary. Post work area for PPE requirements. Keep unauthorized personnel away from operating equipment. A map is attached for access/egress.

**FLAMMABLE/COMBUSTIBLE MATERIALS:** Store in appropriate and labeled containers.

**ACTIVITY HAZARD ANALYSIS  
WASTE MANAGEMENT FEDERAL SERVICES, INC.  
HANFORD SITE**

**SHARP OBJECTS:** Be aware of sharp objects and wear gloves.

**GUARDING:** All guards must be in place and secure.

**HAND TOOLS:** Inspect tools before use. Replace defective/worn tools. Use correct tool for the task. Do not attempt to modify tools.

**FIRST AID:** Supervisor and at least one additional crew to be first Aid/CPR trained. First aid kit shall be available on job. See Page #4 for emergency phone numbers.

**EMERGENCY CONTROLS:** Emergency Control contacts are Dan Edwards (372-2429) or Mary Gardner (372-8029). A radio and/or cellular phone will be onsite and operational at all times.

**PERMITS:** RWP, as determined by Radcon. Excavation permit, Biological and Cultural reviews.

**TRAINING:** (1) Operators to be qualified to operate associated equipment, i.e., SIMCO auger drill, sampling equipment, and support equipment. (2) Crew to read and acknowledge the AHA governing activity. (3) Hearing conservation and baseline audiogram. and (4). Conduct and document Pre-Job Briefing prior to start of activity and daily Safety Briefing.

ACTIVITY HAZARD ANALYSIS  
WASTE MANAGEMENT FEDERAL SERVICES, INC.  
HANFORD SITE

<b>REQUIRED:</b> <input checked="" type="checkbox"/> Coveralls/Work Clothes (either) <input checked="" type="checkbox"/> Substantial Footwear with non-slip soles <input checked="" type="checkbox"/> Safety glasses with Side Shields <input checked="" type="checkbox"/> Hard Hats	<b>BOOTS:</b> <input checked="" type="checkbox"/> Steel Toed Boot for Field Operations <input type="checkbox"/> Other _____
<b>HEAD AND EYE:</b> <input type="checkbox"/> Face Shield <input type="checkbox"/> Goggles (Chemical Splash)	<b>GLOVES:</b> <input checked="" type="checkbox"/> Work Gloves _____ <input type="checkbox"/> Chemical Gloves _____ <input type="checkbox"/> Other Gloves _____
<b>RESPIRATOR:</b> <input type="checkbox"/> MSA (HEPA) for mixing grout <input type="checkbox"/>	<b>OTHER (SPECIFY):</b> <i>N/A</i> _____ _____ _____

EMERGENCY CONTACTS		OFFICE PHONE	CELLULAR PHONE
24-Hour All Employee Line - Fire/Patrol/Ambulance	Land Line:	811	
	Cellular Phone:	373-3800	
Occurrence Reporting		376-2900	
Safety Representative	Mike Madison	373-3722	
Field Superintendent	Bob Jones	373-2048	
Task Lead	Field Superintendent	372-8045	
Project Manager	Marty Gardner	372-8029	
199-B3-2 Site Cellular Phone			
Radio	R&R		
<b>MEDICAL EMERGENCY:</b>			
First Aid Stations/Hospital			
100-N Area	Bldg. 1115N	373-1695	
200 East	Bldg. 2719EA	373-2314	
200 West	Bldg. 2719WB	373-2714	
300 Area	Bldg. 3719A	376-3315	
HEHF	3080 Geo. Wash. Way	376-6981	
Federal Building	Medical Services	376-7022	
Kadelec Medical Center	888 Swift Blvd.	946-4611	

ACTIVITY HAZARD ANALYSIS  
WASTE MANAGEMENT FEDERAL SERVICES, INC.  
HANFORD SITE

ACTIVITY HAZARD ANALYSIS ACKNOWLEDGMENT

I have read, understand, and agree to abide by the provisions detailed in this Activity Hazard Analysis. I understand that failure to comply with these provisions may lead to disciplinary action and my removal from this job activity.

PRINTED NAME	SIGNATURE	EMPLOYEE NO. OR SOCIAL SECURITY NO.	DATE
David E. Shuglin	<i>[Signature]</i>	<i>[Signature]</i>	6/10/98
K.B. Hulse	<i>[Signature]</i>	<i>[Signature]</i>	6/10/98
Z. C. 9. 97-111	<i>[Signature]</i>	57056	6/10/98
R.M. Mitchell	<i>[Signature]</i>	65497	6/10/98



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Attachment B.  
Excavation Permit.

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HANFORD SITE EXCAVATION PERMIT	EXCAVATION PERMIT NO. <b>DAN-1067</b>
--------------------------------	--

1. Work Package No. <b>W519</b>	2. W.O./Project No. <b>772029/23005001</b>	3. Location of Excavation <b>200 EAST AND ADJACENT AREA @ EAST SIDE, 12N 26E sec 1</b>
------------------------------------	---	---

4. Originated By <b>D.E. SKOGLIE</b>	Date <b>05/26/98</b>	5. Engineering Change Notice (ECN) <b>N/A</b>
---	-------------------------	--

6. Drawings Required (Identification Numbers)  
**N/A**

7. Description of Work (Attach composite drawing of excavation location and all known interferences)  
**THE PHASE 1 PRIVATIZATION SITE INFRASTRUCTURE W-519 SAMPLING PROJECT IS BEING CONDUCTED TO SCREEN FOR RADIOLOGICAL CONTAMINATION. SHALLOW (<10 FT IN DEPTH) GEOTECHNICAL AUGER BORINGS (5 LOCATIONS) WILL BE DRILLED AND SAMPLES OBTAINED FROM THE DRILL CUTTINGS FOR SCREENING. THE BORINGS WILL BE TEMPORARY AND WILL BE DECOMMISSIONED UPON COMPLETION OF SAMPLING.**

8. Special Instructions or Comments (including safety requirements found in HNF-PRO-90 for BHI-SH-01 10.3.3, as applicable) and applicable company-specific procedure)  
**RADIOLOGICAL CONTROL TECHNICIAN(S) WILL BE PRESENT CONTINUOUSLY TO MONITOR THE AUGER CUTTINGS WHENEVER A CHANGE OCCURS IN THE SOIL, I.E., COLOR, MOISTURE CONTENT, etc., OR AT APPROXIMATELY 2 FT INTERVALS.**  
  
**A JOB SPECIFIC ACTIVITY ANALYSIS (AHA) WILL BE PREPARED AND REVIEWED BY PERSONNEL CONDUCTING THIS WORKSCOPE. A PRE-JOB SAFETY MEETING WILL BE HELD PRIOR TO THE START OF SAMPLING ACTIVITIES.**

9. List Facilities, Services, and Utilities Affected by Excavation  
**ELECTRICAL UTILITIES WILL BE EFFECTED AT SAMPLE LOCATION 5. THE OVERHEAD POWER LINE WILL BE SHUT DOWN FOR AUGERING OPERATIONS IF REQUIRED.**

**APPROVALS**

10. Project Engineer <i>[Signature]</i> <b>65722</b> Date <b>6/3/98</b>	18. Traffic Engineer <b>N/A</b> Date
11. Environmental <b>Phil Miller</b> Per attached FAX <b>31920</b> Date <b>6/01/98</b>	19. Track Maintenance <b>N/A</b> Date
12. Radiological Control <b>DAVE PHEPPS</b> Per attached FAX <b>34749</b> Date <b>5/26/98</b>	20. 600 Area Landlord <b>R.R. Knight</b> Per attached FAX <b>66654</b> Date <b>5/26/98</b>
13. Steam-ESPC <b>N/A</b> Date	21. Safeguards and Security <b>N/A</b> Date
14. Electrical Utilities <b>M.A. Heile</b> Per attached FAX <b>32354</b> Date <b>6/01/98</b>	22. Land Use Planning <b>Boyd Hathaway</b> Per attached FAX <b>67340</b> Date <b>6/02/98</b>
15. Water Utilities <b>P.E. Stanley</b> per attached FAX <b>37103</b> Date <b>6/09/98</b>	23. Other <b>N/A</b> Date
16. Telecommunications <b>Jeremy Oliver</b> Per attached FAX <b>28815</b> SEE NOTE LOC. 415 <b>5/27/98</b> Date	24. Facility/System Owner/Cognizant Engineer (Last Signature) <b>KC BURBAED</b> per attached FAX <b>32695</b> Date <b>6/02/98</b>
17. Process Sewer - 300 Area <b>N/A</b> Date	<b>J.A. Voogd</b> per attached FAX <b>34101</b> Date <b>6/03/98</b>

531-3100

Locate Request No. **9822 01734**

**CALL 1-800-424-5555, 2 TO 10 WORKING DAYS PRIOR TO DIGGING**  
 8:40 (MEET TO SHOW SITE) 11  
 A-7400-373 (03/98)

Hanford Site Wide Categorical Exclusion Screening Form

http://www.rl.gov/1050/ese/epa/epa/swcx/swcxform.h

Hanford Site Wide Categorical Exclusion Screening Form	
For SITE-WIDE CATEGORICAL EXCLUSION (SWCX) requirements, see HNF-PRO-452, Project Hanford Policy and Procedure System. Answer questions YES or NO, and list NUMBER if applicable.	
Work Item Title:	<u>Protect W-519 SAMPLING PROJECT</u>
Work Package Number:	<u>DAN-1067</u>
Project Description: (please limit to 6 lines)	
<p><i>The Phase I Privatization Site Infrastructure W-519 Sampling Project is being conducted to screen for radiological contamination. Shallow Geo Technical Auger Borings will be drilled and samples obtained from drill cuttings</i></p>	
<b>A SITE-WIDE CATEGORICAL EXCLUSION (SWCX)</b>	
As part of the Pollution Prevention review, was a Checklist prepared? If yes, attach Checklist(s).	
<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Yes <input type="radio"/> No	
Is the work covered by a SWCX?	
<input type="radio"/> Yes <input checked="" type="radio"/> No	
If YES, list SWCX that applies: _____ Go to B; If NO, Go to E	
<b>B INTEGRAL ELEMENTS</b>	
Will work threaten to violate environmental laws, regulations, permits, or safety requirements?	
<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No	
Will work involve construction/expansion of waste treatment, storage, disposal facilities?	
<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No	
Will hazardous substances be disturbed allowing uncontrolled/unpermitted releases?	
If all answers are NO, go to C; If any answer is YES, go to E.	
<b>C ECOLOGICAL RESOURCES</b>	
Will work affect Wetlands/Aquifers/ALE Reserve?	
<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No	
Will work occur within 1/4 mile of Columbia River (Hanford Reach)?	
<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No	
Will wildlife or natural habitat be disturbed?	
If all answers are NO, go to D; If any answer is YES, get Ecological Review. NUMBER: _____ then go to D.	
<b>D CULTURAL RESOURCES</b>	
Does the work require excavations or surface disturbing activities? Obtain permit if required.	
<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No	
Does the work require building or equipment modifications to listed historic structures?	
<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Yes <input type="radio"/> No	
If all answers are NO, and all conditions have been met and the SWCX applies. PRINT FORM AND SIGN; If any answer is YES, a Cultural Resources Review is required. List review NUMBER: _____	
NOTE: If adverse impacts are identified, go to E; if not, SWCX applies. PRINT FORM AND SIGN.	
<b>E SITE-WIDE CX DOES NOT APPLY</b>	
Does either DOE approved NEPA documentation apply for this activity? If yes provide applicable document number:	
<input type="radio"/> Yes <input type="radio"/> No EA: _____ EIS: <u>DOE/EIS-0189 SA1</u>	
If CX or EA preparation may be needed, contact WNH NEPA Services 372-2454.	
Signature _____ Reviewer: _____ Phone: _____ (Cep. Engineer, Scheduler, Planner) Concurrence: _____ Date: <u>6/1/88</u> (Manager, Env. Compliance Officer, WNH NEPA Services)	SWCX is not valid until any applicable Cultural/Ecological Resource Reviews are received and attached to this form.
SWCX cannot be used if the action is part of an activity under review in an EA/EIS. MAINTAIN A COPY IN THE APPLICABLE PROJECT FILE OR WORK PACKAGE A-6001-497 (10/97)	

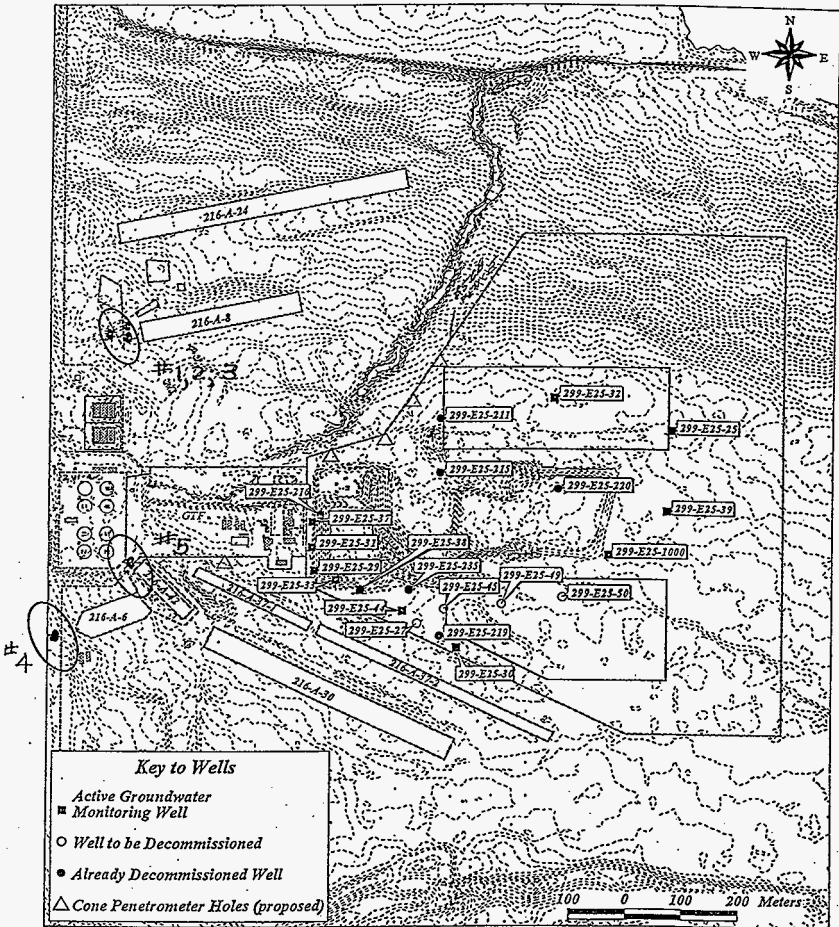


Figure A1-1. Locations of Existing Deep Boreholes and Planned Cone Penetrometer Holes at the TWRS Phase I Demonstration Site.

5/26/98

NOTE: SITES SUPPORTING WS19 ARE MARKED WITH ○

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**Attachment C.**

**Biological and Cultural Reviews.**



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**Pacific Northwest National Laboratory**

Operated by Battelle for the U.S. Department of Energy

May 26, 1998

*No Known Historic Properties*

Mr. D. E. Skoglie  
Waste Management Federal N. W.  
P. O. Box 650/H1-12  
Richland, WA 99352-0650

Dear Mr. Skoglie:  
CULTURAL RESOURCES REVIEW OF THE W-519 SAMPLING PROJECT.  
HCRC #98-200-059.


In response to your request received May 22, 1998, staff of the Hanford Cultural Resources Laboratory (HCRL) conducted a cultural resources review of the subject project, located in the 200 East and 600 Areas of the Hanford Site. According to the information that you supplied, the project will entail drilling 5 geotechnical auger borings in order to test for radiological contamination adjacent to pipelines. The borings will be less than 20 feet in depth and approximately 8 inches in diameter. No site preparation is needed prior to drilling with the chain auger. The sampling locations will be in graveled or previously excavated areas.

Our literature and records review shows that the borings will be located in industrial areas of the 200 East and 600 Areas in ground that has been disturbed by previous Hanford Site construction activities. It is unlikely that any intact archaeological materials will be affected by the proposed project. Survey of the project area and monitoring of the excavations by an archaeologist are not necessary.

It is the finding of the HCRL staff that there are no known cultural resources or historic properties within the proposed project area. The workers, however, must be directed to watch for cultural materials (e.g., bones, artifacts) during all work activities. If any are encountered, work in the vicinity of the discovery must stop until an HCRL archaeologist has been notified, assessed the significance of the find, and, if necessary, arranged for mitigation of the impacts to the find. The HCRL must be notified if any changes to project location or scope are anticipated. This is a Class III case, defined as a project which involves new construction in a disturbed, low-sensitivity area.

Copies of this letter will be sent to D. W. Lloyd, DOE, Richland Operations Office, as official documentation. If you have any questions, please call me at 376-8107. Please use the HCRC# above for any future correspondence concerning this project.

Very truly yours,



N. A. Cadoret  
Technical Specialist  
Cultural Resources Project

Concurrence:   
D. C. Stapp, Project Manager  
Cultural Resources Project

cc: D. W. Lloyd, RL (2)  
G. D. Cummins  
F. J. Swan  
File/LB

---

**Pacific Northwest National Laboratory**

Operated by Battelle for the U.S. Department of Energy

---

May 26, 1998

376-5345

Mr. David Skoglie  
Waste Management Northwest  
P. O. Box 650, MSIN H1-12  
Richland, WA 99352

Dear Mr. Skoglie:

BIOLOGICAL REVIEW FOR THE W-519 SAMPLING PROJECT, 200 East Area, #98-200-059

**Project Description:**

- Drill 5 shallow (< 20' in depth) geotechnical auger borings in graveled or previously excavated areas.

**Survey Objectives:**

- To determine the occurrence in the project area of plant and animal species protected under the Endangered Species Act (ESA), candidates for such protection, and species listed as threatened, endangered, candidate, sensitive, or monitor by the state of Washington, and species protected under the Migratory Bird Treaty Act,
- To evaluate the potential impacts of disturbance on priority habitats and protected plant and animal species identified in the survey.

**Survey Methods:**

- Pedestrian and ocular reconnaissance of the sites proposed for the 5 geotechnical auger borings was conducted by M. Sackschewsky, C. Duberstein, and J. Becker May 26, 1998.
- Priority habitats and species of concern are documented as such in the following: Washington Department of Fish and Wildlife (1996, 1998), Washington State Department of Natural Resources (1997), and for migratory birds, U.S. Fish and Wildlife Service (1985). Lists of animal and plant species considered Endangered, Threatened, Proposed, or Candidate by the USFWS are maintained at 50 CFR 17.11 and 50 CFR 17.12.

**Survey Results:**

- All of the sites proposed for the 5 geotechnical auger borings have been previously disturbed and are occupied by weedy vegetation consisting largely of Russian thistle (*Salsola kali*).
- No avian use of the sites proposed for the 5 geotechnical auger borings was observed.

Mr. David Skoglie  
98-200-059  
Page 2 of 2

**Conclusions and Recommendations:**

- No plant and animal species protected under the ESA, candidates for such protection, or species listed by the Washington state government as threatened or endangered were observed in the vicinity of the sites proposed for the 5 geotechnical auger borings.
- No adverse impacts to species, habitats, or other biological resources are expected to result from the proposed action.
- This Ecological Compliance Review is valid until 15 April 1999.

Sincerely,

*Q. M. Becker for C. A. Brandt*

CA Brandt, Ph.D.  
Project Manager  
Ecological Compliance Assessment

CAB:jmb

**REFERENCES**

- Bonham, Charles D. 1989. Measurements for Terrestrial Vegetation, John Wiley & Sons, Inc. pp. 127-128.
- U. S. Fish and Wildlife Service. 1985. Revised List of Migratory Birds; Final Rule. 50 FR 13708 (April 5, 1985).
- Washington Department of Fish and Wildlife. 1994. Species of Special Concern in Washington. (April 1994).
- Washington Department of Fish and Wildlife. 1996. Priority Habitats and Species List. (January 1996).
- Washington Department of Natural Resources. 1997. Endangered, Threatened & Sensitive Vascular Plants of Washington (August 1997).

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Attachment D.

Soil Evaluation.

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**DON'T SAY IT --- Write It!**

DATE: May 26, 1998

TO: Dave Skoglie

HI-12

FROM: Scott E. Myers

HI-12

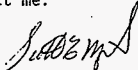
Telephone: 372-8033

SUBJECT: Waste Management Support for TWRS Infrastructure W519  
Characterization Project

In general, soil removed from a contaminated area for investigative purposes can be returned to that area. This doesn't mean that soil from an adjacent area can be dumped. It means that soil removed from a specific area for sampling, etc., can be returned to that specific area, given that no increased potential for site contamination or personnel exposure is realized. Please see the attached letter "Management of Contaminated Soil from Nonremediation Activities at the Hanford Site" for more complete information.

Soil removed from the investigation points for this project may be controlled during sampling activities and then returned to the boreholes. Any plastic, wipes, etc., which are generated during this work scope which can't be released for disposal must be retained and packaged as radioactive waste.

For further information concerning packaging or management of this waste, please contact me.







**Department of Energy**  
Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352  
JUL 02 1996

96-EAP-186

Mr. Michael Bussell, Director  
Office of Waste and Chemical Management  
U.S. Environmental Protection Agency  
Region 10  
1200 Sixth Avenue  
Seattle, Washington 98101

Mr. Michael A. Wilson  
Program Manager  
Nuclear Waste Program  
State of Washington  
Department of Ecology  
P.O. Box 47600  
Olympia, Washington 98504-7600

Dear Messrs. Bussell and Wilson:

**MANAGEMENT OF CONTAMINATED SOIL FROM NONREMEDICATION ACTIVITIES AT THE HANFORD SITE**

In a letter from the State of Washington Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) entitled "Proposed Site Policy for Management of Contaminated Soil," dated September 14, 1994, to the U.S. Department of Energy, Richland Operations Office (RL) it was proposed that appropriate staff from RL and the above agencies work together to reach agreement on substantive elements of a contaminated soils management policy. Staff from these agencies have been meeting with representatives of RL and RL contractors to resolve contaminated soil issues and reach agreement on a practical, workable policy. Ecology was designated the Lead Regulatory Agency.

The policy described in this letter is the result of that joint effort and will be implemented immediately on the Hanford Site. Your formal response and agreement on the policy is requested.

Purpose: The purpose of this policy is to define a consistent approach at the Hanford Site for managing contaminated soil encountered during excavation activities.

The contaminated soil policy is relatively simple. In most cases, it is expected that contaminated soil encountered during excavation activities will be returned to the site of the original excavation at the conclusion of the activity. While awaiting return to the ground, contaminated soil will be managed in a manner to prevent the spread of contamination. Management of contaminated soil will be conducted so as to be protective of human health and the environment.

Messrs. Bussell and Wilson  
96-EAP-186

-2-

JUL 02 1996

Scope: The premise for this policy is that, as representatives from EPA and Ecology have agreed, excavation activities are considered to be normal earth moving and grading activities which are not considered "placement," are not considered waste treatment, storage, or disposal, do not trigger requirements found in the Land Disposal Restrictions, and are not subject to any generator requirements. For environmental remediation (ER) activities, the proper disposition of contaminated soil is generally described in the appropriate decision documents. However, for excavation activities not associated with remediation where final cleanup is not the objective, such as excavation for routine maintenance, common trenching for pipeline installation, or excavation for building foundation construction, there has been no sitewide policy for proper disposition of contaminated soil. This policy applies to soils displaced during nonremediation excavation activities.

Contaminated soil will not be returned to its original excavation if such action would create As Low As Reasonably Achievable (ALARA) concerns. Management of contaminated soil must avoid significant adverse impacts to exposure pathways to humans and the environment. For example, creating significant surface contamination at a site that was previously uncontaminated would have an adverse impact on exposure pathways and would preclude return of the soil to ground. Management of contaminated soil will not be allowed to create unacceptable exposure of radiological or hazardous chemical constituents to workers, the public, or environmental receptors.

Potential occupational exposures to hazardous substances and radiological substances during excavation activities are minimized by adhering to requirements in Hanford Site industrial safety programs and the Hanford Site Radiological Control Manual (HSRCM-1). Industrial safety programs prescribe the use of appropriate field monitoring instruments when there is a reasonable possibility of exposing an employee to hazardous substances at concentrations or levels in excess of published occupational exposure standards. As discussed in HSRCM-1, Radiation Work Permits are used to control the entry into radiation and contamination areas. The details of monitoring and surveys for radiation, contamination, and airborne radioactive materials are specified in these work permits.

As part of the contaminated soil policy, it is important for the Hanford Site contractor conducting excavation activities to communicate excavation and soil management plans with the Hanford Site remediation contractor. Management of contaminated soil cannot be allowed to adversely impact current or future remediation of an operable unit. Excavations and management of contaminated soil will be coordinated with the environmental remediation contractor to avoid adverse impacts to remediation activities. When soil contamination is discovered during an excavation activity, the contractor responsible for the excavation will be responsible for documenting this contamination in the Waste Information Data System. Information in this database will be used by the remediation contractor to help plan the future remediation of the site.

Messrs. Busseil and Wilson  
96-EAP-186

-3-

JUL 02 1996

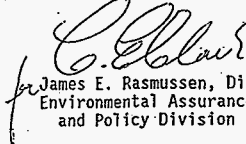
The contaminated soil policy does not apply to current spills or unpermitted discharges of dangerous wastes or hazardous substances. In these cases, the source of the spill needs to be identified, the unpermitted discharge stopped, and the spill site remediated, as necessary, per the requirements of the Washington Administrative Code, Section 173-303-145(3). Soil cleaned up during remediation of an active spill site cannot be returned to ground.

Contaminated soil that cannot be returned to its excavation site will be considered waste, will be properly designated, and will be managed in accordance with all applicable regulations. For those waste soils that are designated as dangerous waste due to the contained-in policy, RL may elect to request a determination from Ecology that the contaminated soil no longer contains dangerous waste when the concentrations of dangerous waste constituents in the soil are below specific health-based levels. Such "contained-in determinations" will be requested on a case-by-case basis. Along these lines, RL encourages Ecology to adopt the Hazardous Waste Identification Rule, with its concentration-based exit levels for certain listed wastes, as soon as possible once the rule is finalized.

In summary, it is expected that most contaminated soil displaced during excavation activities will be returned to the ground in the general vicinity of the original excavation. ALARA concerns may preclude returning excavated soil directly to ground, in which case the contaminated soil would be managed as any other waste generated on the Hanford Site.

Should you have any questions on this matter, please contact Felix Miera of my staff, on (509) 373-7589, or Eric Greager of WHC Environmental Services Division, on (509) 376-3132.

Sincerely,



James E. Rasmussen, Director  
Environmental Assurance, Permits,  
and Policy Division

EAP:FRM

cc: W. Dixon, WHC  
E. Greager, WHC  
T. Lazarski, PNNL  
R. Jim, YIN  
D. Powaukee, NPT  
J. Wilkinson, CTUIR

Attachment E.  
Radiological Survey Reports.

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**PROJECT HANFORD  
RADIOLOGICAL SURVEY REPORT**

Survey Report No.  
**SS 248538**

Page 1 of 3

Date <b>6/10/98</b>	Time (Start/Stop) <b>0800 1570</b>	Area/Bldg./Room/Location <b>200 EAST AREA</b>	F.C. <b>SS</b>
RWP Number <b>N/A</b>	Work Package/Job Control Package/JSA <b>W 579</b>	Routine Surveillance Task Number <b>N/A</b>	Radiological Shipping Rec. Number <b>N/A</b>
Purpose of Survey (check appropriate box(es)): <input checked="" type="checkbox"/> Job Coverage, <input checked="" type="checkbox"/> Required Task, <input checked="" type="checkbox"/> Material Release, <input checked="" type="checkbox"/> Ram Shipment			
Contamination Incident: <input checked="" type="checkbox"/> Skin, <input checked="" type="checkbox"/> Clothing, <input checked="" type="checkbox"/> Spill Alarm Response: <input checked="" type="checkbox"/> Cam, <input checked="" type="checkbox"/> ARM, <input checked="" type="checkbox"/> APM			
Exposure Incident <input checked="" type="checkbox"/> HRA/VHRA Work Other: <b>N/A</b>			

Job Description:  
**COVERAGE OF SOIL - 4015 NEAR PIPELINES AND SAMPLING OF SOIL - VERIFICATION SURVEY PERFORMED OF SOIL + SAMPLES. SAMPLES WERE PLACED BACK INTO HOLES.**

DOSE RATE MEASUREMENTS Note 1 F = Field (>30 cm) C = Contact (<1 cm)

No.	Description	Micro-rxn N/A	Dist. (cm) Note 1	WO (mR/hr)	WC (mR/hr)	CF <sub>B</sub>	CF <sub>Y</sub>	Neutron Dose (mrem/hr)	Shallow Dose (mrem/hr)	Deep Dose (mrem/hr)
1	sample point #3 (A8704) (1.5 m/ft)		@C	MA	MA	MA	MA	MA	MA	MA
2	sample point #7 (A8703) (1.7 m/ft)		@C							
3	sample point #8 (A8702) (1.6 m/ft)		@C							
4	sample point #7 (B8201) (1.7 m/ft)		@C							
MA	MA		MA							

**UNCONTROLLED COPY**

**CONTAMINATION (C) MEASUREMENTS**

No.	Description	Direct		Background		Total dpm/100 cm <sup>2</sup>		Removable dpm/100 cm <sup>2</sup>	
		Gross cpm/PA g Y	Gross cpm/PA g	B Y	α	B Y	α	B Y	α
1	sample point #3 (A8704)	100	0	100	0	<0	<0	MA	MA
-	Accepted soil 7'-8' depth	100	0	100	0	<0	<0		
2	sample point #7 (A8703)	100	0	100	0	<0	<0		
-	Accepted soil 4'-5' depth	100	0	100	0	<0	<0		
3	sample point #8 (B8702)	100	0	100	0	<0	<0		
-	Accepted soil 4'-5' depth	100	0	100	0	<0	<0		
4	sample point #7 (B8201)	100	0	100	0	<0	<0		
-	Accepted soil 5 3/4' depth	100	0	100	0	<0	<0		
MA	MA	MA	MA	MA	MA	MA	MA	MA	MA

**AIR SAMPLE MEASUREMENTS (μ Ci/ml)**

	BZ		Initial	Decay		BZ		Initial	Decay	Sample Counter Log Number or Sample ID Number
	GA					GA				
α 1	1/4				→	α 2	1/4			MA
B Y 1	1/4				→	B Y 2	1/4			MA

Signature: <i>James Campbell</i>		Signature: _____	
Name (Print): <i>James Campbell</i>		Name (Print): _____	
Date: _____		Date: _____	
Payroll No.: <i>5205</i>		Payroll No.: _____	
Reviewer: _____		Reviewer: _____	

Efficiency (Used)	Serial No.	Brit./Probe Model
NA	1023-0241	PO-38 (CP)
NA	CH280010	GM Model (in probe)
14%	ACHT20829	PAM
NA	OTHER 3	Other
NA	LMC9-058	Other
NA		Other

COMMENTS: (Additional information as necessary to interpret results)

----- (designation inside) -----  
 \* Contact Reading     Neutron     LAW     Air Sample     Smear

UNCONTROLLED COPY

Map/Sketch

PROJECT HANFORD  
 RADIOLOGICAL SURVEY REPORT

Survey Report No. **SS 248538**

Page 2 of 3

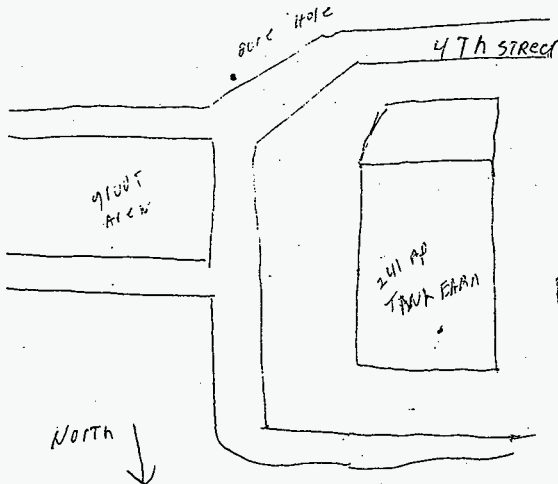
<b>PROJECT HANFORD RADIOLOGICAL SURVEY REPORT</b>						Survey Report No. <b>SS 248543</b>	Page <u>1</u> of <u>2</u>				
Date <u>6/11/95</u>	Time (Start/Stop) <u>0700 / 1600</u>	Area/Bldg./Room/Location <u>200 EAST AILEA</u>				F.C. <u>SS</u>					
RWP Number <u>N/A</u>	Work Package/Job Control Package/JSA <u>W-519</u>	Routine Surveillance Task Number <u>N/A</u>		Radiological Shipping Rec. Number <u>N/A</u>							
Purpose of Survey (check appropriate box(es)): <input checked="" type="checkbox"/> Job Coverage, <input checked="" type="checkbox"/> Required Task, <input checked="" type="checkbox"/> Material Release, <input checked="" type="checkbox"/> Rem Shipment											
Contamination Incident: <input checked="" type="checkbox"/> Skin, <input checked="" type="checkbox"/> Clothing, <input checked="" type="checkbox"/> Spill			Alarm Response: <input checked="" type="checkbox"/> Cen, <input checked="" type="checkbox"/> ARM, <input checked="" type="checkbox"/> APM								
Exposure Incident: <input checked="" type="checkbox"/> HRA/VHRA Work Other: <u>VERIFICATION WORK</u>											
Job Description: <u>COMPLETION OF 315-HOLE NEAR PIPELINES AND SAMPLING OF SOIL VERIFICATION SURVEY PROGRAM OF SOIL - SAMPLE, SPILLS WAS PLACED BACK INTO HOLE</u>											
DOSE RATE MEASUREMENTS <small>Note 1 F = Field (&gt;30 cm) C = Contact (&lt;1 cm)</small>											
No.	Description	MICROREM mrem	Dist. (cm) Note 1	WO (mR/hr)	WC (mR/hr)	CF <sub>B</sub>	CF <sub>V</sub>	Neutron Dose (mrem/hr)	Shallow Dose (mrem/hr)	Deep Dose (mrem/hr)	
1	SAMPLE POINT #5	120	100	NA	NA	NA	NA	NA	NA	NA	
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
CONTAMINATION (C) MEASUREMENTS											
No.	Description	Direct		Background		Total dpm/100 cm <sup>2</sup>		Removable dpm/100 cm <sup>2</sup>			
		Gross cpm/PA α	Gross cpm/PA α	B Y	α	B Y	α	B Y	α		
1	SAMPLE POINT #5 B8705	100	0	100	0	100	0	NA	NA		
-	Auxiliary SOIL 6 FT depth	100	0	100	0	100	0	NA	NA		
NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
AIR SAMPLE MEASUREMENTS (µ Ci/ml)											
	BZ	GA	Initial	Decay		BZ	GA	Initial	Decay	Sample Counter Log Number or Sample ID Number	
α 1	1/4				α 2	1/4					N/A
B Y 1	1/4				B Y 2	1/4					N/A



<b>PROJECT HANFORD RADIOLOGICAL SURVEY REPORT</b>	Survey Report No. <b>SS 248543</b>	Page <u>2</u> of <u>2</u>
---	---------------------------------------	---------------------------

NOTE NOT TO SCALE

Map/Sketch



UNCONTROLLED COPY

**LEGEND**

<input checked="" type="radio"/> Smear	<input checked="" type="radio"/> Air Sample	<input checked="" type="radio"/> LAW	<input checked="" type="checkbox"/> Neutron	* Contact Reading
--	---	--------------------------------------	---	-------------------

----- (designation inside) ----- Radiological Area Boundary      Dose Rates in mrem/h unless otherwise noted

COMMENTS: (Additional information as necessary to interpret results)

**VERIFICATION SURVEY**

<D = 2-5 cm/sec  
6 cm from item  
45 % of item surveyed

No audible counts above background

Instr./Probe Model	RO-3B (CP)	GM Model g-m probe	FAM	Bioson Air/chem		
Serial No.	1CB87-0741	GM190-110	ACH20529	LA8C3-0050	N	A
Efficiency (used)	NA	DT689-0278	07HNS-0124	N/A		
	NA	1096	1496	N/A		

RCT: Date: <u>6/11/98</u> Payroll No.: <u>5705C</u>	Reviewer: Date: _____      Payroll No.: _____
Name (Print): <u>Lawrence Conzatti</u>	Name (Print): _____
Signature: <u>Lawrence Conzatti</u>	Signature: _____

BD-6000-010R (11/87)

Attachment F.

Start Card.

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# Notice of Intent to Construct a GEOTECHNICAL SOIL BORING

S 00607

*This form must be received by the Department of Ecology 72 hours prior to construction of soil boring. Complete this form and mail to Department of Ecology, Water Resources Program, Well Drilling Unit, P.O. Box 47600, Olympia, WA 98504-7600. Instructions for filling out this form are printed on the back.*

1. Property Owner U.S. Department of Energy Phone No. 509 372-9176  
Address (include city, state, zip) 825 Jadwin Ave, Richland, WA. 99320
2. Agent (if different from #1) Numatec Phone No. 509 372-2435  
Address (include city, state, zip) 2440 Stevens, #1414A, Richland, WA. 99352
3. Project Name W519 Project; Radiological Contamination Screening
4. Well Location: 1/4 of the 1/4 Section 01 Township 12N Range 26E EWM or (circle one)  
Address (if known) Well ID #'s: B8701; B8702; B8703; B8704; B8705 WWM
5. Location of Well(s)
 

<input type="checkbox"/> Adams County	01-ERO	<input type="checkbox"/> Grays Harbor County	14-SWR	<input type="checkbox"/> Pierce County	27-SWR
<input type="checkbox"/> Asotin County	02-ERO	<input type="checkbox"/> Island County	15-NWR	<input type="checkbox"/> San Juan County	28-NWR
<input checked="" type="checkbox"/> Benton County	03-CRO	<input type="checkbox"/> Jefferson County	16-SWR	<input type="checkbox"/> Skagit County	29-NWR
<input type="checkbox"/> Chelan County	04-CRO	<input type="checkbox"/> King County	17-NWR	<input type="checkbox"/> Skamania County	30-SWR
<input type="checkbox"/> Clallam County	05-SWR	<input type="checkbox"/> Kitsap County	18-NWR	<input type="checkbox"/> Snohomish County	31-NWR
<input type="checkbox"/> Clark County	06-SWR	<input type="checkbox"/> Kittitas County	19-CRO	<input type="checkbox"/> Spokane County	32-ERO
<input type="checkbox"/> Columbia County	07-ERO	<input type="checkbox"/> Klickitat County	20-CRO	<input type="checkbox"/> Stevens County	33-ERO
<input type="checkbox"/> Cowlitz County	08-SWR	<input type="checkbox"/> Lewis County	21-SWR	<input type="checkbox"/> Thurston County	34-SWR
<input type="checkbox"/> Douglas County	09-CRO	<input type="checkbox"/> Lincoln County	22-ERO	<input type="checkbox"/> Wahkiakum County	35-SWR
<input type="checkbox"/> Ferry County	10-ERO	<input type="checkbox"/> Mason County	23-SWR	<input type="checkbox"/> Walla Walla County	36-ERO
<input type="checkbox"/> Franklin County	11-ERO	<input type="checkbox"/> Okanogan County	24-CRO	<input type="checkbox"/> Whatcom County	37-NWR
<input type="checkbox"/> Garfield County	12-ERO	<input type="checkbox"/> Pacific County	25-SWR	<input type="checkbox"/> Whitman County	38-ERO
<input type="checkbox"/> Grant County	13-ERO	<input type="checkbox"/> Pend Oreille County	26-ERO	<input type="checkbox"/> Yakima County	39-CRO
6. Total number of borings to be constructed 5
7. Approx soil boring construction date \_\_\_\_\_
8. Well Drilling Co Name Waste Management Federal Svcs, Inc. Phone No. 372-8845
9. Well Driller's Name Dave Skoogie Driller's License No. 1588
10. Contractor's L & I Registration No. \_\_\_\_\_
11. Please fill out the portion below carefully. The return address label must contain the name and address of the person submitting this notification. This portion will be validated and returned to them as proof of notification. Send the entire form to Department of Ecology, Water Resources Program, Well Drilling Unit, P.O. Box 47600, Olympia, WA 98504-7600.

This notification number must be provided to your well driller:

S 00607

Submit by (return address)

Name <u>Martin Gardner</u>	
Mailing Address <u>P.O. Box 650/ H1-12</u>	
City <u>Richland</u>	State <u>WA</u> Zip <u>99352</u>

Agency Validation
Date _____

ECY 040-55 (10/97)

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Attachment G.

WSCF Analytical Laboratory Report.

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**WSCF  
ANALYTICAL LABORATORY REPORT**

for

**PROJECT HANFORD MANAGEMENT CONTRACTORS  
RICHLAND WA 99352**

**Attention: RON MITCHELL T3-30 FX 2-3396**

HNF-3210 Rev. 0

G-1

Report#: 9800843  
Report Date: 29-jun-1998  
W004

*PROJECT HANFORD MANAGEMENT CONTRACTORS*

Page 1



# WSCF

## ANALYTICAL LABORATORY REPORT

Attention: RON MITCHELL T3-30 FX 2-3396  
 Project Number MISC. :PROJ. HANFORD MNGMT. CONT.

Group #: 98000843

Sample #	Client ID	Test Performed	Matrix	Method	RQ	Result	Units	MDL	Analyzed	Sampled	Received
W980000972	S8091-01	TWRS	Ca-144 Rel.% Count Error (GEA)	SOLID	LA-508-462	102.	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Ca-144 by GEA	SOLID	LA-508-462	U 6.48e-02	pCi/g	0.11	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	CaPr-144 Rel.% Count Error	SOLID	LA-508-462	102.	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	CaPr-144 by GEA	SOLID	LA-508-462	U 1.30e-01	pCi/g	0.22	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Co-60 Rel.% Count Error (GEA)	SOLID	LA-508-462	130.	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Co-60 by GEA	SOLID	LA-508-462	U 1.26e-02	pCi/g	2.63e-002	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Cs-134 Rel.% Count Error (GEA)	SOLID	LA-508-462	43.9	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Cs-134 by GEA	SOLID	LA-508-462	U 5.20e-02	pCi/g	2.34e-002	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Cs-137 Rel.% Count Error (GEA)	SOLID	LA-508-462	79.2	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Cs-137 by GEA	SOLID	LA-508-462	U 2.19e-02	pCi/g	2.28e-002	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Eu-152 Rel.% Count Error (GEA)	SOLID	LA-508-462	211.	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Eu-152 by GEA	SOLID	LA-508-462	U -1.51e-02	pCi/g	5.34e-002	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Eu-154 Rel.% Count Error (GEA)	SOLID	LA-508-462	600.	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Eu-154 by GEA	SOLID	LA-508-462	U 9.33e-03	pCi/g	8.10e-002	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Eu-155 Rel.% Count Error (GEA)	SOLID	LA-508-462	102.	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Eu-155 by GEA	SOLID	LA-508-462	U 4.19e-02	pCi/g	6.66e-002	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Nb-94 Rel.% Count Error (GEA)	SOLID	LA-508-462	724.	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Nb-94 by GEA	SOLID	LA-508-462	U 1.71e-03	pCi/g	2.11e-002	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Ru-103 Rel.% Count Error (GEA)	SOLID	LA-508-462	198.	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Ru-103 by GEA	SOLID	LA-508-462	U 5.59e-03	pCi/g	1.94e-002	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Ru-106 Rel.% Count Error (GEA)	SOLID	LA-508-462	110.	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Ru-106 by GEA	SOLID	LA-508-462	U -1.06e-01	pCi/g	0.19	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Sb-125 Rel.% Count Error (GEA)	SOLID	LA-508-462	743.	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Sb-125 by GEA	SOLID	LA-508-462	U 4.20e-03	pCi/g	5.24e-002	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Sn-113 Rel.% Count Error (GEA)	SOLID	LA-508-462	100	%	0.00	06/15/98	06/11/98	06/11/98
W980000972	S8091-01	TWRS	Sn-113 by GEA	SOLID	LA-508-462	U 2.24e-02	pCi/g	2.37e-002	06/15/98	06/11/98	06/11/98

MDL=Minimum Detection Limit

RQ=Result Qualifier

B - The analyte was detected in the associated method blank.

E - Compound concentration exceeded calibration range.

N - Identification is based on a mass spectral library search.

D - Compound concentration resulted from a dilution.

J - Estimated value.

Z - See Comments.

U - The analyte was analyzed for but not detected.

\* - Indicates results that have NOT been validated.

W004

PROJECT HANFORD MANAGEMENT CONTRACTORS

# WSCF ANALYTICAL LABORATORY REPORT

Attention:  
Project Number

RON MITCHELL T3-30 FX 2-3396  
MISC. :PROJ. HANFORD MNGMT. CONT.

Group #: 98000843

Sample #	Client ID	Test Performed	Matrix	Method	RQ	Result	Units	MDL	Analyzed	Sampled	Received
W98000972	S8091-01	TWRS	Zn-65 Rel.% Count Error (GEA)	SOLID	LA-508-462	183.	%	0.00	06/15/98	06/11/98	06/11/98
W98000972	S8091-01	TWRS	Zn-65 by GEA	SOLID	LA-508-462	U 2.00e-02	pCl/g	4.95e-002	06/15/98	06/11/98	06/11/98
W98000972	S8091-01	TWRS	Gross Beta	SOLID	LA-508-410	U 6.4E-01	pCl/g	2.50	06/26/98	06/11/98	06/11/98
W98000972	S8091-01	TWRS	Gross Beta % Method Error	SOLID	LA-508-410	240	%	0.00	06/26/98	06/11/98	06/11/98
W98000972	S8091-01	TWRS	Total Alpha	SOLID	LA-508-410	U 1.7	pCl/g	3.30	06/26/98	06/11/98	06/11/98
W98000972	S8091-01	TWRS	Total Alpha % Method Error	SOLID	LA-508-410	120	%	0.00	06/26/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Ce-144 Rel.% Count Error (GEA)	SOLID	LA-508-462	312.	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Ce-144 by GEA	SOLID	LA-508-462	U 2.40e-02	pCl/g	0.12	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	CePr-144 Rel.% Count Error	SOLID	LA-508-462	312.	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	CePr-144 by GEA	SOLID	LA-508-462	U 4.81e-02	pCl/g	0.25	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Co-60 Rel.% Count Error (GEA)	SOLID	LA-508-462	232.	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Co-60 by GEA	SOLID	LA-508-462	U 6.60e-03	pCl/g	2.55e-002	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Co-134 Rel.% Count Error (GEA)	SOLID	LA-508-462	49.5	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Co-134 by GEA	SOLID	LA-508-462	U 4.11e-02	pCl/g	2.38e-002	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Co-137 Rel.% Count Error (GEA)	SOLID	LA-508-462	105.	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Co-137 by GEA	SOLID	LA-508-462	U 1.82e-02	pCl/g	2.38e-002	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Eu-152 Rel.% Count Error (GEA)	SOLID	LA-508-462	329.	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Eu-152 by GEA	SOLID	LA-508-462	U 1.07e-02	pCl/g	5.53e-002	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Eu-154 Rel.% Count Error (GEA)	SOLID	LA-508-462	189.	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Eu-154 by GEA	SOLID	LA-508-462	U 2.25e-02	pCl/g	7.60e-002	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Eu-155 Rel.% Count Error (GEA)	SOLID	LA-508-462	78.9	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Eu-155 by GEA	SOLID	LA-508-462	U 5.16e-02	pCl/g	7.35e-002	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Nb-94 Rel.% Count Error (GEA)	SOLID	LA-508-462	656.	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Nb-94 by GEA	SOLID	LA-508-462	U 1.86e-03	pCl/g	2.08e-002	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Ru-103 Rel.% Count Error (GEA)	SOLID	LA-508-462	191.	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Ru-103 by GEA	SOLID	LA-508-462	U 6.16e-03	pCl/g	2.05e-002	06/15/98	06/11/98	06/11/98

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N - Identification is based on a mass spectral library search.

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J - Estimated value.  
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W004

PROJECT HANFORD MANAGEMENT CONTRACTORS

# WSCF ANALYTICAL LABORATORY REPORT

Attention: **RON MITCHELL T3-30 FX 2-3396**  
Project Number **MISC. :PROJ. HANFORD MNGMT. CONT.**

Group #: **98000843**

Sample #	Client ID	Test Performed	Matrix	Method	RQ	Result	Units	MDL	Analyzed	Sampled	Received
W98000973	S8091-02	TWRS	Ru-106 Rel. % Count Error (GEA)	SOLID	LA-508-462	166.	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Ru-106 by GEA	SOLID	LA-508-462	U 6.61e-02	pCi/g	0.19	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Sb-125 Rel. % Count Error (GEA)	SOLID	LA-508-462	457.	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Sb-125 by GEA	SOLID	LA-508-462	U 8.60e-03	pCi/g	5.24e-002	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Sn-113 Rel. % Count Error (GEA)	SOLID	LA-508-462	197.	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Sn-113 by GEA	SOLID	LA-508-462	U 7.24e-03	pCi/g	2.43e-002	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Zn-65 Rel. % Count Error (GEA)	SOLID	LA-508-462	1000	%	0.00	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Zn-65 by GEA	SOLID	LA-508-462	U 2.61e-03	pCi/g	5.31e-002	06/15/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Gross Beta	SOLID	LA-508-410	U 2.3	pCi/g	2.70	06/26/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Gross Beta % Method Error	SOLID	LA-508-410	70	%	0.00	06/26/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Total Alpha	SOLID	LA-508-410	U 1.8	pCi/g	3.40	06/26/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Total Alpha % Method Error	SOLID	LA-508-410	120	%	0.00	06/26/98	06/11/98	06/11/98
W98000973	S8091-02	TWRS	Ce-144 Rel. % Count Error (GEA)	SOLID	LA-508-462	311.	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	Ce-144 by GEA	SOLID	LA-508-462	U 2.80e-02	pCi/g	0.14	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	CePr-144 Rel. % Count Error	SOLID	LA-508-462	311.	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	CePr-144 by GEA	SOLID	LA-508-462	U 5.60e-02	pCi/g	0.28	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	Co-60 Rel. % Count Error (GEA)	SOLID	LA-508-462	601.	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	Co-60 by GEA	SOLID	LA-508-462	U 3.33e-03	pCi/g	2.98e-002	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	Ce-134 Rel. % Count Error (GEA)	SOLID	LA-508-462	76.5	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	Ce-134 by GEA	SOLID	LA-508-462	3.46e-02	pCi/g	2.95e-002	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	Ce-137 Rel. % Count Error (GEA)	SOLID	LA-508-462	1000	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	Ce-137 by GEA	SOLID	LA-508-462	U 1.15e-03	pCi/g	2.53e-002	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	Eu-152 Rel. % Count Error (GEA)	SOLID	LA-508-462	287.	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	Eu-152 by GEA	SOLID	LA-508-462	U 1.41e-02	pCi/g	6.37e-002	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	Eu-154 Rel. % Count Error (GEA)	SOLID	LA-508-462	272.	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS	Eu-154 by GEA	SOLID	LA-508-462	U 1.77e-02	pCi/g	5.19e-002	06/15/98	06/11/98	06/11/98

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J - Estimated value.

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\* - Indicates results that have NOT been validated.

W004

PROJECT HANFORD MANAGEMENT CONTRACTORS

# WSCF

## ANALYTICAL LABORATORY REPORT

Attention: **RON MITCHELL T3-30 FX 2-3396**  
 Project Number **MISC. :PROJ. HANFORD MNGMT. CONT.**

Group #: **98000843**

Sample #	Client ID	Test Performed	Matrix	Method	RQ	Result	Units	MDL	Analyzed	Sampled	Received
W98000974	S8091-03	TWRS		Eu-155 Rel.% Count Error (GEA)		481.	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS		Eu-155 by GEA							
W98000974	S8091-03	TWRS		Nb-94 Rel.% Count Error (GEA)		121.	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS		Nb-94 by GEA							
W98000974	S8091-03	TWRS		Ru-103 Rel.% Count Error (GEA)		378.	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS		Ru-103 by GEA							
W98000974	S8091-03	TWRS		Ru-108 Rel.% Count Error (GEA)		1000	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS		Ru-108 by GEA							
W98000974	S8091-03	TWRS		Sb-125 Rel.% Count Error (GEA)		1000	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS		Sb-125 by GEA							
W98000974	S8091-03	TWRS		Sn-113 Rel.% Count Error (GEA)		100	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS		Sn-113 by GEA							
W98000974	S8091-03	TWRS		Zn-65 Rel.% Count Error (GEA)		185.	%	0.00	06/15/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS		Zn-65 by GEA							
W98000974	S8091-03	TWRS		Gross Beta							
W98000974	S8091-03	TWRS		Gross Beta % Method Error.		200	%	0.00	06/28/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS		Total Alpha		1.0	pCi/g	3.50	06/28/98	06/11/98	06/11/98
W98000974	S8091-03	TWRS		Total Alpha % Method Error.		200	%	0.00	06/28/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS		Ce-144 Rel.% Count Error (GEA)		1000	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS		Ce-144 by GEA							
W98000975	S8091-04	TWRS		Co-60 Rel.% Count Error		1000	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS		Co-60 by GEA							
W98000975	S8091-04	TWRS		Co-60 Rel.% Count Error (GEA)		334.	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS		Co-60 by GEA							
W98000975	S8091-04	TWRS		Cs-134 Rel.% Count Error (GEA)		61.3	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS		Cs-134 by GEA							
W98000975	S8091-04	TWRS		Cs-134 Rel.% Count Error (GEA)		3.15e-02	pCi/g	3.01e-002	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS		Cs-134 by GEA							

HNF-3210 Rev. 0

G-5

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W004

PROJECT HANFORD MANAGEMENT CONTRACTORS

# WSCF ANALYTICAL LABORATORY REPORT

Attention: RON MITCHELL T3-30 FX 2-3396  
Project Number MISC. :PROJ. HANFORD MNGMT. CONT.

Group #: 98000843

Sample #	Client ID	Test Performed	Matrix	Method	RQ	Result	Units	MDL	Analyzed	Sampled	Received
W98000975	S8091-04	TWRS	Cs-137 Rel.% Count Error (GEA)	SOLID	LA-508-462	529.	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Cs-137 by GEA	SOLID	LA-508-462	U 2.84e-03	pCi/g	2.43e-002	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Eu-152 Rel.% Count Error (GEA)	SOLID	LA-508-462	161.	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Eu-152 by GEA	SOLID	LA-508-462	U 2.09e-02	pCi/g	5.76e-002	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Eu-154 Rel.% Count Error (GEA)	SOLID	LA-508-462	216.	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Eu-154 by GEA	SOLID	LA-508-462	U 2.20e-02	pCi/g	7.95e-002	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Eu-155 Rel.% Count Error (GEA)	SOLID	LA-508-462	116.	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Eu-155 by GEA	SOLID	LA-508-462	U 3.32e-02	pCi/g	6.83e-002	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Nb-94 Rel.% Count Error (GEA)	SOLID	LA-508-462	155.	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Nb-94 by GEA	SOLID	LA-508-462	U 8.57e-03	pCi/g	2.30e-002	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Ru-103 Rel.% Count Error (GEA)	SOLID	LA-508-462	666.	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Ru-103 by GEA	SOLID	LA-508-462	U -1.95e-03	pCi/g	2.17e-002	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Ru-106 Rel.% Count Error (GEA)	SOLID	LA-508-462	106.	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Ru-106 by GEA	SOLID	LA-508-462	U -1.14e-01	pCi/g	0.20	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Sb-125 Rel.% Count Error (GEA)	SOLID	LA-508-462	1000	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Sb-125 by GEA	SOLID	LA-508-462	U 1.32e-03	pCi/g	5.46e-002	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Sr-113 Rel.% Count Error (GEA)	SOLID	LA-508-462	1000	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Sr-113 by GEA	SOLID	LA-508-462	U 1.44e-03	pCi/g	2.53e-002	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Zn-65 Rel.% Count Error (GEA)	SOLID	LA-508-462	289.	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Zn-65 by GEA	SOLID	LA-508-462	U 1.36e-02	pCi/g	5.73e-002	06/16/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Gross Beta	SOLID	LA-508-410	U 6.2E-01	pCi/g	2.50	05/26/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Gross Beta % Method Error	SOLID	LA-508-410	240	%	0.00	05/26/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Total Alpha	SOLID	LA-508-410	U 9.5E-01	pCi/g	3.20	05/26/98	06/11/98	06/11/98
W98000975	S8091-04	TWRS	Total Alpha % Method Error	SOLID	LA-508-410	200	%	0.00	05/26/98	06/11/98	06/11/98
W98000975	S8091-05	TWRS	Ce-144 Rel.% Count Error (GEA)	SOLID	LA-508-462	170.	%	0.00	06/16/98	06/11/98	06/11/98
W98000975	S8091-05	TWRS	Ce-144 by GEA	SOLID	LA-508-462	U 3.91e-02	pCi/g	0.12	06/16/98	06/11/98	06/11/98

MDL=Minimum Detection Limit

RQ=Result Qualifier

B - The analyte was detected in the associated method blank.  
E - Compound concentration exceeded calibration range.  
N - Identification is based on a mass spectral library search.

D - Compound concentration resulted from a dilution.  
J - Estimated value. Z - See Comments.  
U - The analyte was analyzed for but not detected.

\* - Indicates results that have NOT been validated.

W004

PROJECT HANFORD MANAGEMENT CONTRACTORS

# WSCF ANALYTICAL LABORATORY REPORT

Attention: **RON MITCHELL T3-30 FX 2-3396**  
 Project Number **MISC. :PROJ. HANFORD MNGMT. CONT.**

Group #: **98000843**

Sample #	Client ID	Test Performed	Matrix	Method	RQ	Result	Units	MDL	Analyzed	Sampled	Received
W98000976	S8091-05	TWRS	Ca-P144 Rel.% Count Error	SOLID	LA-508-462	170.	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Ca-P144 by GEA	SOLID	LA-508-462 U	7.81e-02	pCi/g	0.23	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Co-60 Rel.% Count Error (GEA)	SOLID	LA-508-462	426.	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Co-60 by GEA	SOLID	LA-508-462 U	3.71e-03	pCi/g	2.68e-002	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Cs-134 Rel.% Count Error (GEA)	SOLID	LA-508-462	50.8	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Cs-134 by GEA	SOLID	LA-508-462 U	4.79e-02	pCi/g	2.44e-002	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Cs-137 Rel.% Count Error (GEA)	SOLID	LA-508-462	72.5	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Cs-137 by GEA	SOLID	LA-508-462 U	2.05e-02	pCi/g	2.65e-002	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Eu-152 Rel.% Count-Error (GEA)	SOLID	LA-508-462	920.	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Eu-152 by GEA	SOLID	LA-508-462 U	3.39e-03	pCi/g	5.33e-002	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Eu-154 Rel.% Count Error (GEA)	SOLID	LA-508-462	742.	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Eu-154 by GEA	SOLID	LA-508-462 U	6.20e-03	pCi/g	7.87e-002	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Eu-155 Rel.% Count Error (GEA)	SOLID	LA-508-462	288.	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Eu-155 by GEA	SOLID	LA-508-462 U	1.26e-02	pCi/g	8.30e-002	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Nb-94 Rel.% Count Error (GEA)	SOLID	LA-508-462	194.	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Nb-94 by GEA	SOLID	LA-508-462 U	6.80e-03	pCi/g	2.23e-002	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Ru-103 Rel.% Count Error (GEA)	SOLID	LA-508-462	165.	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Ru-103 by GEA	SOLID	LA-508-462 U	7.09e-03	pCi/g	2.06e-002	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Ru-106 Rel.% Count Error (GEA)	SOLID	LA-508-462	247.	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Ru-106 by GEA	SOLID	LA-508-462 U	4.67e-02	pCi/g	0.19	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Sb-125 Rel.% Count Error (GEA)	SOLID	LA-508-462	499.	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Sb-125 by GEA	SOLID	LA-508-462 U	6.08e-03	pCi/g	6.08e-002	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Sn-113 Rel.% Count Error (GEA)	SOLID	LA-508-462	105.	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Sn-113 by GEA	SOLID	LA-508-462 U	1.75e-02	pCi/g	2.36e-002	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Zn-65 Rel.% Count Error (GEA)	SOLID	LA-508-462	144.	%	0.00	06/16/98	06/11/98	06/11/98
W98000976	S8091-05	TWRS	Zn-65 by GEA	SOLID	LA-508-462 U	2.67e-02	pCi/g	6.76e-002	06/16/98	06/11/98	06/11/98

MDL=Minimum Detection Limit

RQ=Result Qualifier

B - The analyte was detected in the associated method blank.

F - Compound concentration exceeded calibration range.

N - Identification is based on a mass spectral library search.

D - Compound concentration resulted from a dilution.

J - Estimated value. Z - See Comments.

U - The analyte was analyzed for but not detected.

\* - Indicates results that have NOT been validated.

W004

PROJECT HANFORD MANAGEMENT CONTRACTORS

# WSCF

## ANALYTICAL LABORATORY REPORT

Attention: RON MITCHELL T3-30 FX 2-3396  
 Project Number MISC. :PROJ. HANFORD MNGMT. CONT.

Group #: 98000843

Sample #	Client ID	Test Performed	Matrix	Method	RQ	Result	Units	MDL	Analyzed	Sampled	Received
W88000976	S8091-05	TWRS Gross Beta	SOLID	LA-508-410	U	1.9	pCi/g	2.70	08/26/98	06/11/98	06/11/98
W88000976	S8091-05	TWRS Gross Beta % Method Error	SOLID	LA-508-410	U	90	%	0.00	08/26/98	06/11/98	06/11/98
W88000976	S8091-05	TWRS Total Alpha	SOLID	LA-508-410	U	2.5E-03	pCi/g	3.40	08/26/98	06/11/98	06/11/98
W88000976	S8091-05	TWRS Total Alpha % Method Error	SOLID	LA-508-410	U	1000	%	0.00	08/26/98	06/11/98	06/11/98

MDL=Minimum Detection Limit

RQ=Result Qualifier

B - The analyte was detected in the associated method blank.

E - Compound concentration exceeded calibration range.

N - Identification is based on a mass spectral library search.

D - Compound concentration resulted from a dilution.

J - Estimated value.

Z - See Comments.

U - The analyte was analyzed for but not detected.

\* - Indicates results that have NOT been validated.

W004

PROJECT HANFORD MANAGEMENT CONTRACTORS

WSCF  
ANALYTICAL COMMENT REPORT

Group #: 98000843

Attention: RON MITCHELL T3-30 FX 2-3396  
Project Number MISC.

Comment

Test

Lab Area

Sample # Client ID

VALGROUP

TESTDATA - Test Data Entry

VALTEST - Test Validation  
LOGTEST - Login for Tests

Lab Areas: VALGROUP - Group Validation  
LOGSAMP - Login for Sample

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PHMC  
W04C12

Report Date: 28-Jun-1989

Report#: 98000843

Page 1



**WSCF**  
**TENTATIVELY IDENTIFIED PEAK REPORT**

Attention:  
Project Number

Group #: 98000843

Sample #	Client ID	Test Name	Peak Name	CAS#	RT	RQ	Result	Units
----------	-----------	-----------	-----------	------	----	----	--------	-------

RQ=Result Qualifier  
ND=Not Detected

B - The analyte was detected in the associated method blank.  
N - Identification is based on a mass spectral library search.

J - Estimated value.  
U - The analyte was analyzed for but not detected.

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Attachment H.  
Sampling Logbook.

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KB Hole B8704

6-22-98

TWO PHOTOS AND ONE TABLE ATTACHED ON THIS PAGE

79

KB Hole B8704

Sample #	Borehole #	Sample depth	Date	Time
S8091-05	B8705	5'-6"	6-11-98	0850
S8091-04	B8704	7'-8"	6-10-98	0918
S8091-03	B8703	4'-5"	6-10-98	1023
S8091-02	B8702	4'-5"	6-10-98	1045
S8091-01	B8701	5'-6"	6-10-98	1104

KB Hole B8704

KB Hole B8704

0919 Sample # S8091-04  
6-10-98 Borehole B8704



KB Hole B8704



KB Hole B8704

0919 Sample # S8091-04  
6-10-98 Borehole B8704

1104 NOTED SAMPLE INTERVAL CHANGE IN SOIL FROM Brown soil  
 TO a light dry fine soil.  
 1108 WEATHER SUNNY, 80°F, WIND 3-7 mph  
 CONTACTED Electric Utilities, No support until 6-11-98 for  
 Last SAMPLE SITE

KB Hole B8704

WIN-5ML-A18  
77

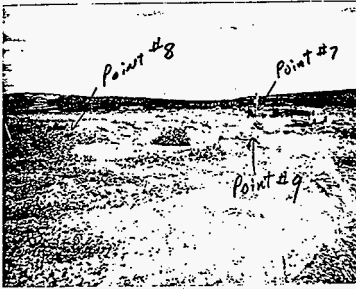
TWRS Sols. 58-041

F TURS Soils 58-091

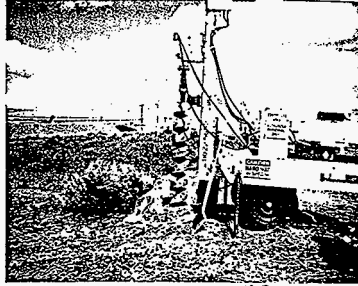
WM-SML-H13  
78

79

XBZ 6-10-98



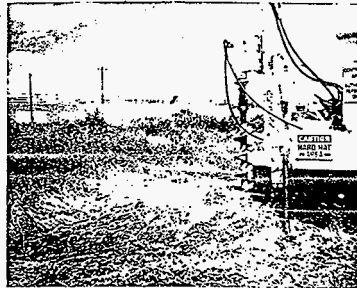
6-10-98  
XBZ Hulse



1025 SAMPLE POINT #9  
6-10-98 SAMPLE # 58091-03  
XBZ Hulse Bore hole B8703



1104 SAMPLE POINT #7  
6-10-98 SAMPLE # 58091-01  
XBZ Hulse Borehole B8701



1047 Point #8 SAMPLE #  
6-10-98 58091-02 Borehole  
XBZ Hulse B8702

XBZ 6-10-98  
FOUR PHOTOS ATTACHED ON THIS PAGE

80

XBZ Hulse XBZ Hulse 6-22-98

80

PRJ TWRS Soils 58-091

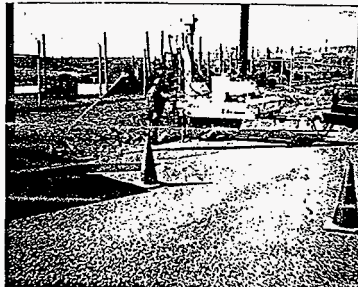
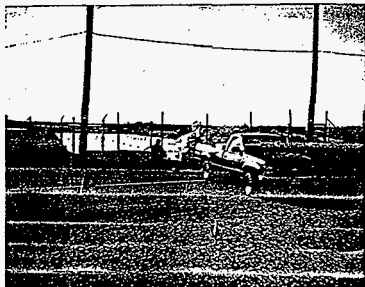
INS. WM-SML-N3  
Page 79

Soil SAMPLING CONTINUED: ~~6-22-98~~<sup>7/27</sup> 6-11-98  
 Field Personal: Ron Mitchell Project Lead  
 Dave Scogley Driller + PIC  
 K.B. Hulce SAMPLER  
 L. Corgatelli HPT  
 Reference Documents: Work PACKAGE No. W519  
 SAMPLING DONE TO RCRA Protocol

- 0810 ON LOCATION SITE #5
- 0822 SET UP ON SAMPLE SITE #5, Blocked Road with CONES
- 0827 STARTED DRILLING
- 0841 Reached 5' Depth and added additional Flite to Sample depth of 5'-6"
- 0850 SAMPLED OFF Bottom auger flite. SAMPLE # 58091-05
- 0855 WEATHER; SUNNY, 72°F, WIND 3-7 mph NW
- 0900 OFF SITE NO RADIOACTIVE MATERIAL Detected with Field Instruments. ON ANY of the SAMPLE SITES

7/27 6-22-99

7/27 6-22-99



7/27 6-22-99

0824 SAMPLE SITE #5  
 6-11-98 SAMPLE # 58091-05  
 K.B. Hulce Borehole B8705

0854 SAMPLE SITE #5 Borehole  
 6-11-98 B8705 SAMPLE # 58091-05  
 K.B. Hulce

7/27 6-22-99

Two Photos ATTACHED ON THIS PAGE

Continued on Page 81

Read and Understand E,

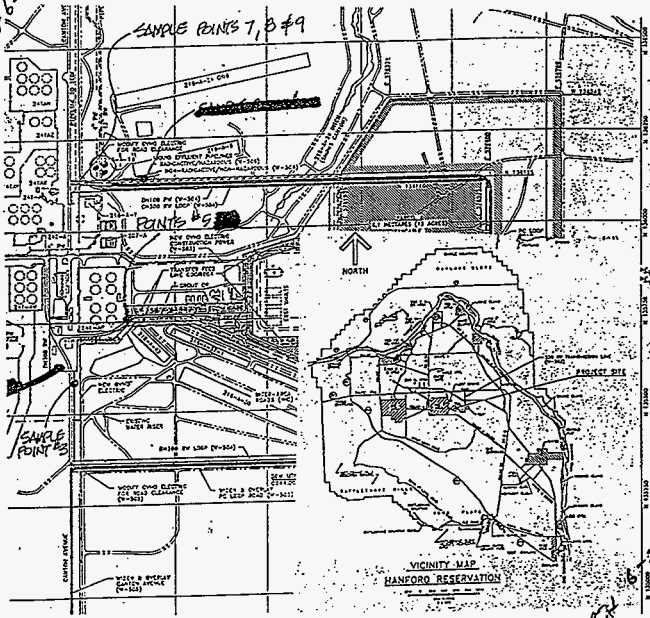
K.B. Hulce K.B. Hulce 6-22-98  
 Signed Date

PROJECT *TWRS Soils S8-091*  
MAP

Notebook No. *WM-396-113*  
Continued From Page *80*

81

*7/24/6-22-98*



*7/24/6-22-98*

SAMPLE METHOD: AN Auger was used to reach the sample depth. The auger was pulled up and a stainless steel cleaned spoon was used to collect the soil into certified clean sample bottles or lab provided Petri Dish.

SHIPPING INFORMATION:

SAMPLES shipped to WSCF LAB IN Gov Vehicle on C.O.C # 101078 IN COOLER ASH ON 6-11-98.

ONE MAP ATTACHED ON THIS PAGE

Continued on Page *82*

Read and Understood By

*KB Hulke* *NS Zula*

*6-22-98*

Signed

Date

Signed

Date

PROJECT

TWRS soils 58-091

Notebook No. W11-5ML-H13

Continued From Page 81

*7/27/6-22-98*

Sample Point: Point #3 Borehole B8704

Lead Sampler: HULSE, K. B. Sample Matrix: SOIL

Sample ID	Date Collected: Time Collected	Analysis	Preservative(s)	Container	Lot #	Laboratory COG#
S8091-04	6/10/98	Activity Scan (Lab Specific)	None	20 mL P	N/A	WSCF
	0918					101078
S8091-04	6/10/98	GEA (LAB SPECIFIC)	Cool to 4°C	<i>PETRIE Dish</i>	N/A	WSCF
	0918	Total Alpha Total Beta				101078

Sample Point: Point #5 Borehole B8705

Lead Sampler: HULSE, K. B. Sample Matrix: SOIL

Sample ID	Date Collected: Time Collected	Analysis	Preservative(s)	Container	Lot #	Laboratory COG#
S8091-05	6/11/98	Activity Scan (Lab Specific)	None	20 mL P	N/A	WSCF
	0850					101078
S8091-05	6/11/98	GEA (LAB SPECIFIC)	Cool to 4°C	<i>PETRIE Dish</i>	N/A	WSCF
	0850	Total Alpha Total Beta				101078

Sample Point: Point #7 Borehole B8701

Lead Sampler: HULSE, K. B. Sample Matrix: SOIL

Sample ID	Date Collected: Time Collected	Analysis	Preservative(s)	Container	Lot #	Laboratory COG#
S8091-01	6/10/98	Activity Scan (Lab Specific)	None	20 mL P	N/A	WSCF
	1104					101078
S8091-01	6/10/98	GEA (LAB SPECIFIC)	Cool to 4°C	<i>PETRIE Dish</i>	N/A	WSCF
	1104	Total Alpha Total Beta				101078

Sample Point: Point #8 Borehole B8702

Lead Sampler: HULSE, K. B. Sample Matrix: SOIL

Sample ID	Date Collected: Time Collected	Analysis	Preservative(s)	Container	Lot #	Laboratory COG#
S8091-02	6/10/98	Activity Scan (Lab Specific)	None	20 mL P	N/A	WSCF
	1045					101078
S8091-02	6/10/98	GEA (LAB SPECIFIC)	Cool to 4°C	<i>PETRIE Dish</i>	N/A	WSCF
	1045	Total Alpha Total Beta				101078

Sample Point: Point #9 Borehole B8703

Lead Sampler: HULSE, K. B. Sample Matrix: SOIL

Sample ID	Date Collected: Time Collected	Analysis	Preservative(s)	Container	Lot #	Laboratory COG#
S8091-03	6/10/98	Activity Scan (Lab Specific)	None	20 mL P	N/A	WSCF
	1023					101078
S8091-03	6/10/98	GEA (LAB SPECIFIC)	Cool to 4°C	<i>PETRIE Dish</i>	N/A	WSCF
	1023	Total Alpha Total Beta				101078

*7/27/6-22-98*

ONE ATTACHMENT ON THIS PAGE

Continued on Page NONE

Read and Understood By

*KB Hulse* *KR Hulse*

6-22-98

Signed

Date

Signed

Date



PROJECT TWRS Soils 58-091

SAF 58-091

6-10-98

CROSSWALK # 772029/23005001

WORK DONE TO RCRA PROTOCOL

PURPOSE: To get indication of what contamination might be encountered at the sites where proposed construction would cross old lines.

PRE-JOB SAFETY MEETING 0815 By Dave Skogle

## ATTENDEES:

KB Hulce

WMNW

372-2321

SAMPLER

D.E. Skogle

WMNW

372-8045

DRILLER

L. C. ISARETT

FDW

377-5040

HPT

B.M. Mitchell

WMNW

522-40-5640

Project Lead

- 0850 SET UP ON Borehole # B8704 sample point #3 AND STARTED TO DRILL
- 0915 Reached sample depth of 7' cleaned off auger flights. ~~Drilled~~ Drilled one more foot, raised auger to take sample from lower flights.
- 0918 SAMPLED, NOTED change IN soil from a fine sand to a COARSE SAND <sup>20'</sup> AT ON THE Bottom flights from where sample was taken.
- WEATHER: SUNNY, 72°F WIND WSW 5-10 mph
- 0930 Filled hole in and moved to NEXT SITE
- 1015 SET UP AND STARTED DRILLING ON SITE. Borehole # B8703 point #9
- 1020 Reach sample depth of 4', cleaned soil back around hole
- 1023 SAMPLED OFF OF Bottom Flight of Auger, NOTED a change IN soil from SAND TO a very fine light colored sand IN THE SAMPLE INTERVAL 4'-5'
- 1030 Filled IN hole and moved to NEXT BORE HOLE, Weather Sunny 78°F, wind 3-10 mph WSW
- 1037 ON SITE Borehole B8702 point #8, STARTED AUGERING
- 1042 Reached sample depth 4'
- 1045 SAMPLED OFF AUGER flights near bottom, SAMPLE INTERVAL 4'-5' NOTED ~~change~~ <sup>20'</sup> change IN soil near sample depth from moist dirt/sand to dry fine light colored sand
- 1050 ON SITE Borehole B8701 Point #7, STARTED DRILLING
- 1101 Reached sample depth of 5', drilled sample interval 5'-5.75'
- 1104 SAMPLED OFF OF Bottom Flight AUGER

Continued on Page 78

Read and Understood By

KB Hulce *KB Hulce*

6-22-98

Signed

Date

Signed

Date

Waste Management Northwest		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C# 101078	
Collector HULSE, K. B.		Contact/Requestor MITCHELL, RONALD C.		Tel.No. 372-2632 MSIN T3-30		Page 1 of 1 FAX 372-3396	
SAF Number S8-091		Sample Origin 200 EAST		Purchase Order/Charge Code D6350			
Project Title TWRS Soils		Logbook# WM-SML-H13		Ice Chest# <del>BE</del> ASH Temp.			
Shipped To (Lab) WSCF		Method of Shipment Gov. Vehicle		Bill of Lading/Air Bill No. N/A			
Protocol RCRA		Data Turnaround REGULAR		Office Property No. N/A			
Sample No.	Lab. ID	*	Date	Time	No/Type Container	Sample Analysis	Perservative
S8091-01		S	6/10/98	1104	(1) 20 P	Activity Scan (Lab Specific)	None
S8091-01		S	6/10/98	1104	(1) PETRI	GEA (LAB SPECIFIC), Total Alpha Total Beta	Cool to 4°C
S8091-02		S	6/10/98	1045	(1) 20 P	Activity Scan (Lab Specific)	None
S8091-02		S	6/10/98	1045	(1) PETRI	GEA (LAB SPECIFIC), Total Alpha Total Beta	Cool to 4°C
S8091-03		S	6/10/98	1023	(1) 20 P	Activity Scan (Lab Specific)	None
S8091-03		S	6/10/98	1023	(1) PETRI	GEA (LAB SPECIFIC), Total Alpha Total Beta	Cool to 4°C
S8091-04		S	6/10/98	0918	(1) 20 P	Activity Scan (Lab Specific)	None
S8091-04		S	6/10/98	0918	(1) PETRI	GEA (LAB SPECIFIC), Total Alpha Total Beta	Cool to 4°C
S8091-05		S	6/11/98	0850	(1) 20 P	Activity Scan (Lab Specific)	None
S8091-05		S	6/11/98	0850	(1) PETRI	GEA (LAB SPECIFIC), Total Alpha Total Beta	Cool to 4°C

H-7

HNF-3210 Rev. 0

POSSIBLE SAMPLE HAZARDS/REMARKS List all known wastes.		MSDS Yes <input type="checkbox"/> No <input type="checkbox"/>		SPECIAL INSTRUCTIONS		Hold Time	
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	KB Hulse	KB Hulse	6-11-98	SI Cobb	Spencer Cobb		06/11/98
Relinquished By	Date/Time			Received By	Date/Time		
Relinquished By	Date/Time			Received By	Date/Time		
Relinquished By	Date/Time			Received By	Date/Time		
FINAL SAMPLE DISPOSITION	Disposal Method e.g. Return to customer, per lab procedure, used in process.			Disposed By		Date/Time	

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6001-600 (07/95)

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## DISTRIBUTION SHEET

To	From	Page 1 of 1
R. J. Parazin	R. M. Mitchell	Date 09/11/98
Project Title/Work Order		EDT No.
W-519 Infrastructure Characterization/D6350		ECN No. NA

Name	MSIN	Text With All Attach.	Text Only	Attach./Appendix Only	EDT/ECN Only
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P. A. Haine	R3-47	X			
T. R. Hoertkorn	B4-55	X			
A. R. Johnson	H1-13	X			
B. M. Markes	H1-13	X			
R. M. Mitchell (5 copies)	H1-13	X			
T. H. Mitchell	H9-02	X			
D. J. Moak	H1-11	X			
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