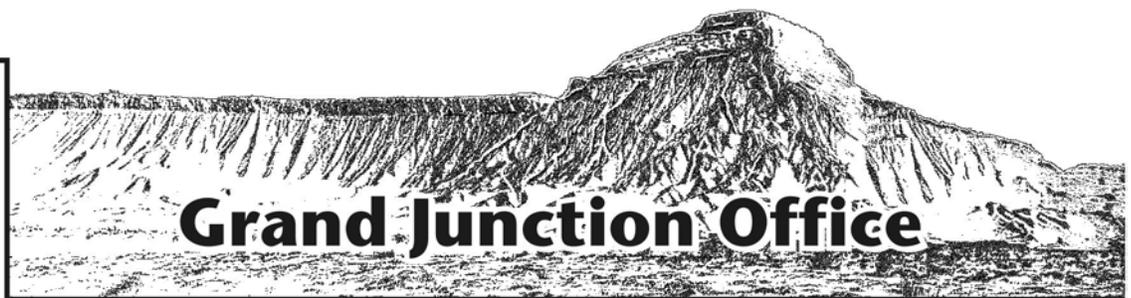


# Hanford Geophysical Logging Project Health and Safety Plan

May 2003



U.S. Department  
of Energy



GJO-HGLP 1.6.4  
Revision 0

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**Hanford Geophysical Logging Project**

**Health and Safety Plan**

**May 2003**

Prepared for  
U.S. Department of Energy  
Grand Junction Office  
Grand Junction, Colorado

Prepared by  
S.M. Stoller Corp.  
Grand Junction Office  
Grand Junction, Colorado

Work performed under DOE Contract No. DE-AC13-02GJ79491.

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# 1.0 Introduction

## 1.1 Background

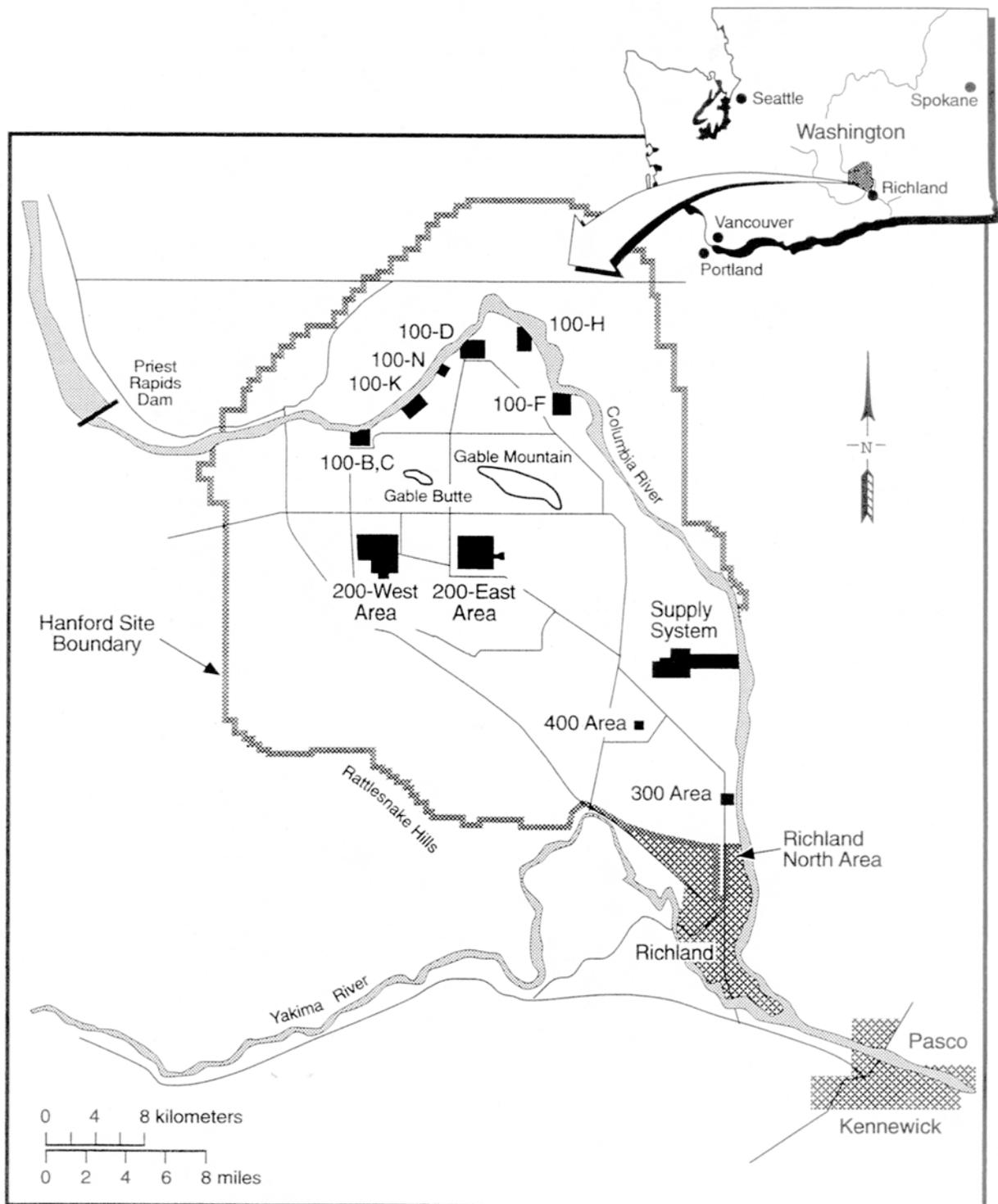
The U.S. Department of Energy Richland Operations Office (DOE-RL) has tasked the DOE Grand Junction Office (GJO) and its prime contractor, S.M. Stoller Corp. (Stoller), with borehole geophysical logging at the Hanford Site near Richland, Washington. This health and safety plan (HASP) has been prepared and issued by Stoller. Throughout this HASP, Stoller will be referred to as the GJO contractor.

## 1.2 Site Description

The Hanford Site occupies approximately 1,450 square kilometers (km<sup>2</sup>) (560 square miles [mi<sup>2</sup>]) within the semiarid Pasco Basin of the Columbia Plateau in south-central Washington State (Figure 1-1). This area is under restricted public access and provides a buffer for the smaller fenced operational areas currently used for storage of nuclear materials, waste storage, and waste disposal. The Hanford Site was established in 1943 to produce plutonium in support of the U.S. nuclear weapons program. Uranium metal was fabricated in the 300 Area into jacketed fuel elements. The fuel elements were used to run reactors, located near the river in the 100 Areas, for plutonium production. Irradiated fuel elements were processed in the 200 Areas to recover plutonium and uranium. High-level wastes, including activation and fission products were stored in underground tank farms. Low- and intermediate-level waste streams were frequently discharged to ponds, cribs, and ditches in the 200 Areas.

The 200 Areas are located on a broad plateau at the approximate center of the Hanford Site. Chemical separation plants were located in both the 200 East and 200 West Areas (Figures 1-2 and 1-3). With the startup and operation of the separation plants, large quantities of wastes were generated. High-level radioactive wastes were neutralized and stored in underground tanks. Liquid wastes (primarily water) containing minor concentrations of radionuclides and chemicals were discharged to the soil column via surface ponds, ditches, cribs, reverse wells, and French drains. These facilities were generally located in the 200 Areas and in the surrounding 600 Area.

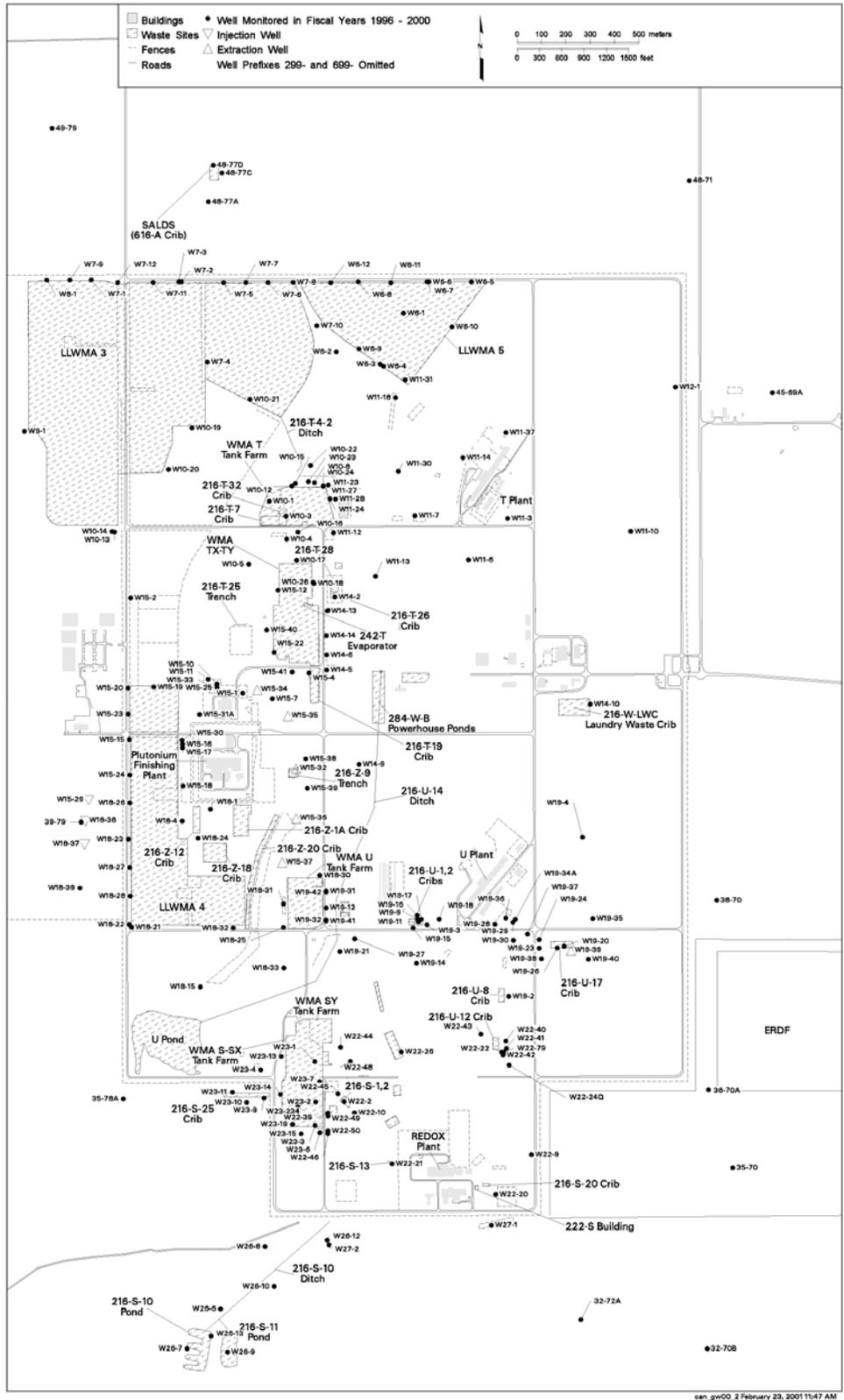
The majority of the geophysical logging will be performed at or near waste sites located in the 200 Areas. Logging may be performed at other sites (e.g., 100, 300, and 600 Areas) across the entire Hanford Site as needed.



From PNNL (1998)

Figure 1-1. Location Map for the Hanford Site and 200 Areas





From PNNL (2001)

Figure 1-3. Location Map for the 200 West Area Waste Disposal Sites

### **1.3 Scope of Work**

Several logging systems have been developed by DOE-GJO for logging at the Hanford Site. The Spectral Gamma Logging System (SGLS) utilizes a high-purity germanium (HPGe) semiconductor detector with a relatively efficiency of approximately 35%. This detector is capable of quantifying gamma-emitting radionuclides from background levels to several thousand picocuries per gram (pCi/g). A second system, the High Rate Logging System (HRLS) has been specifically developed for use in zones of high gamma flux. With shielding, this system is capable of measurements of up to several hundred million picocuries per gram. A third system developed at Hanford utilizes a neutron moisture probe configured as a logging sonde to measure moisture in the vadose zone.

Any and/or all of these systems may be used to support various projects across the Hanford Site. Their primary use, however, will be for the baseline characterization of the liquid effluent sites located on the 200 Area plateau.

### **1.4 Scope of Health and Safety Plan**

This HASP describes the hazards and the overall health and safety requirements for GJO contractor personnel operating geophysical logging equipment on the Hanford Site. Activities will be conducted under the controls contained in site-specific HASPs, approved Hanford Site Contractor (HSC) health and safety procedures, 29 CFR 1910, "Occupational Safety and Health Standards," and 29 CFR 1926, "Safety and Health Regulations for Construction."

### **1.5 Health and Safety Plan Page Changes**

The information in this HASP will be maintained current with conditions at the work site. Changes to this HASP will be completed according to the *Grand Junction Office Health and Safety Manual* (GJO 2). A document revision will be issued to amend the information or requirements in this HASP. No other mechanisms (pen and ink line outs, Program Directives, etc.) are authorized for use in amending the information or requirements of this HASP.

### **1.6 Records**

The GJO contractor forms referenced throughout this HASP are to be completed as necessary to record completion of training, medical surveillance, occurrence reporting, and other requirements. HSC forms will be utilized as necessary.

The Project Manager will make the determination to acquire specific records generated by non-GJO contractor individuals or organizations in support of GJO contractor work. This may include records generated or maintained by non-GJO contractor individuals or organizations for GJO contractor employees (e.g., Health and Safety records). Transfer of these records from non-GJO contractor subcontractors will be according to the project working file index. The Project Manager will identify records critical to the project, and copies of these records will be made available through the appropriate HSC. The GJO contractor may accept original records or

record copies from non-GJO contractor sources. In either case, records will be evaluated before acceptance to the central file station.

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## 2.0 Key Personnel

### 2.1 Organizational Structure

Table 2-1 provides a listing of DOE, GJO contractor, and HSC personnel that support or will implement the Hanford Geophysical Logging Project.

Table 2-1. Project Management and Support Personnel

POSITION	NAME	PHONE EXT.
Stoller Task Order Manager, GJO	Mike Butherus	(970) 248-6332
Project Manager, GJO	Doug Steele	(970) 248-6703
Project Coordinator, Hanford	Steve Kos	(509) 376-6432
Technical Lead, Hanford	Rick McCain	(509) 376-6435
Technical Lead, GJO	Carl Koizumi	(970) 248-7797
Office Administrator, Hanford	Jill Meinecke	(509) 376-6454
Health and Safety Manager, GJO	Michael Hurshman	(970) 248-6468
Fluor Hanford, Inc. Hanford Site Health & Safety	Deana Colley	(509) 373-9213
CHG Hanford Site Safety	Kevin Sheffield	(509) 372-0108
DOE/GJO Contracting Officer's Representative	Mike Tucker	(970) 248-6004
DOE-RL Program Manager/TOM/COR	John Silko	(509) 373-9876
DOE-ORP Project Manager	Robert Yasek	(509) 372-1270

### 2.2 Project Manager

The Project Manager has the responsibility for ensuring the overall Hanford Geophysical Logging Project complies with this HASP. Further responsibilities are to ensure the applicable health and safety and medical records are formally transferred from the HSC to Stoller.

## **2.3 Project Coordinator**

The Project Coordinator is responsible and accountable for ensuring day-to-day activities comply with the requirements of this HASP. If any circumstances arise with the potential for the health and safety of any project personnel to be jeopardized, the Project Coordinator has the authority and responsibility to halt work until the situation can be adequately addressed.

In addition, the Project Coordinator is responsible for conducting pre-entry briefings and routine safety meetings (see Section 4.3). He or she will ensure the *Grand Junction Office Health and Safety Manual* (GJO 2), any applicable site-specific HASPs, and this HASP are available at the GJO contractor offices.

## **2.4 Office Administrator**

The Stoller Hanford Office Administrator will serve as the training records contact with HSC Training Records.

## **2.5 Health and Safety**

The HSC will supply health and safety coverage for project personnel. All personnel will follow the safety requirements contained in this HASP, any applicable site-specific HASPs, and the *Project Hanford Radiological Control Manual* (DOE 2000). It is each individual's responsibility to actively pursue safe work practices for their own safety and for their co-workers.

## **2.6 Hanford Site Contractor Health and Safety Personnel**

### **2.6.1 Hanford Site Contractor Safety Management**

The HSC Safety manager is responsible for ensuring close coordination between the facility and the organization for the purpose of maintaining a safe and healthful workplace. Other responsibilities include developing and implementing any applicable HASPs and auditing field activities, as appropriate, to verify compliance; ensuring the effective integration and involvement of safety and health professionals in daily activities to ensure hazards are identified and controlled; and supporting the line organization in dealing with hazards and establishing safety and health requirements.

### **2.6.2 Hanford Site Contractor Safety Personnel**

The HSC safety personnel are responsible for assisting management in defining, monitoring, and resolving safety and health issues; aiding in the communication of hazards to employees; providing evaluations of hazards; and verifying compliance with any applicable HASPs and assisting personnel to ensure all designated health and safety procedures and requirements are properly implemented in the field.

Radiological and chemical exposure monitoring and air sampling will be performed by the HSC.

### **2.6.3 Hanford Site Contractor Radiological Control**

The HSC Radiological Control organization (RADCON) is responsible for monitoring radiological hazards, for providing radiological survey maps to support work planning/performance, for verifying compliance with established radiological procedures, and for invoking stop work authority for radiological hazards that could potentially jeopardize worker health and safety.

## 3.0 Hazard Assessment

Hazard assessment is an ongoing process. All personnel engaged in logging activities should maintain a questioning attitude about their personal safety and be aware of their surroundings and ongoing activities. Every attempt has been made to describe the hazards likely to be encountered while performing these activities and their prerequisite controls. Hazards unique to each waste site are addressed in site-specific HASPs and are beyond the scope of this plan. However, should any hazards not previously identified and listed in this HASP and/or in the site-specific HASPs be encountered, the Project Coordinator will ensure appropriate controls are enacted and this plan is amended as necessary.

### 3.1 Hazards List

The hazards presented in the following sections were identified by reviewing the Activity Hazard Analysis for borehole geophysical logging and from experience gained performing borehole geophysical logging across the Hanford Site.

#### 3.1.1 Operational Hazards

Logging at the Hanford Site is a non-intrusive activity. A monitoring borehole is uncapped and a sonde is lowered into the borehole/well from a logging truck. Data collected with the sonde is transmitted to instrumentation in the logging vehicle. The tasks, hazards, and controls associated with the logging operations are presented in Table 3-1.

#### 3.1.2 Radiological Hazards

The radiological conditions present at the various waste sites on the Hanford Site are described in individual Radiological Work Permits (RWPs) and/or site-specific HASPs. These documents will be reviewed prior to initiating work. Personnel will adhere to all controls and procedures presented in the applicable documents.

Individual boreholes will be swabbed and surveyed for internal radiological contamination by HSC Radiological Control Personnel prior to logging. The presence and extent of contamination will dictate the degree of radiological surveillance that will be required during logging in the particular borehole/well.

Logging operations will involve the use of sealed radiological sources. ALARA principles will be followed when handling these sources to ensure worker exposure is kept as low as possible. Personnel will also adhere to the *Hanford Geophysical Logging Project Logging System Operating Procedures* (DOE 2003a), HSC RADCON procedures, and standard operating procedures when handling these sources.

Table 3-1. Logging Tasks, Hazards, and Controls

Task	Hazard	Control
1. Select and train operators.	Operator respiratory or heart problems; other physical limitations.  Untrained operator; failure to perform task.	Examination by industrial physician for suitability to work.  Train operators or use experienced operators; dry run (Reference: National Institute for Occupational Safety and Health, Doc. #80-406).
2. Opening boreholes.	Biological (spiders, snakes, etc.); chemical.	Open with caution, stay upwind, visually inspect, and let vent; PID monitor for organic vapors; and explosometer monitor for lower explosive limits (LELs).
3. Position sheave, lower/raise detector into dry well.	Pinch points from cable pulleys or reel.  Physical weight of probe (approximately 65 pounds).	Keep hands and fingers clear of moving cable. Leather gloves shall be worn when handling cable and as appropriate when using hand tools.  Use proper lifting techniques, e.g., use legs instead of back, use two people to lift probe. Use a handling device to lift the probe.
4. Entering and exiting truck.	Trips, slips, and falls.	Use 3-point holds while using stairway. Be cognizant of slipping hazards, e.g., melted snow, and wet stairway treads.
5. Operational check of probe.	Radiation exposure from check source.	Use as low as reasonably achievable practices; time, distance, and shielding. Use proper source storage devices.
6. Use of neutron source.	Radiation exposure from neutron source.	Use as low as reasonably achievable practices; time, distance and shielding; follow approved procedures.
7. Use of liquid nitrogen.	Frostbite or tissue damage.	Wear insulated gloves and face shields, no exposed skin; follow approved procedures.
8. Monitoring of instrumentation	Carbon monoxide exposure (truck is kept running for the duration of the logging activities).	Install a carbon monoxide detector and alarm in the logging truck.

### 3.1.3 Chemical and Other Hazards

Thorough descriptions of the health hazards and hazardous substances associated with individual waste sites are addressed in site-specific HASPs. The hazards and controls common to all waste sites are presented in Table 3-2.

Table 3-2. Waste Site Common Tasks, Hazards, and Controls

Task	Hazard	Control
1. Select and train operators.	Operator respiratory or heart problems; other physical limitations. Untrained operator; failure to perform task.	Examination by industrial physician for suitability to work. Train operators; use experienced operators, dry run (Reference: National Institute for Occupational Safety and Health, Doc. #80-406).
2. Donning PPE.	Spider or snakebite, scorpion or bee sting.	Inspect PPE before donning.
3. Work within a waste site.	Exposure to radiological contamination. Exposure to chemical hazards: Listed in individual site-specific HASPs. Heat stress. Cold stress. Ambient Temp. < 30 °F. Evaluate Chill Temp. < 20 °F.	Wear PPE as prescribed in the applicable radiation work permit (RWP). Wear PPE as prescribed by applicable site-specific HASPs. Provide shade, use work/rest schedule as established in the <i>Heat Stress Control</i> , HNF-IP-0842. Drink plenty of fluids 20 to 30 minutes before the start of work. Dress appropriately within the guidelines permitted by the RWP. Reference site-specific HASP. Reference site-specific HASP.
4. Decontamination.	Spread of contamination.	Follow procedures as prescribed in HSC Procedures.

Carbon tetrachloride may be encountered in the vadose zone and/or in the groundwater at many waste sites in the 200 West Area, and boreholes in this area may vent carbon tetrachloride vapor

to the atmosphere particularly during episodes of low atmospheric pressure. The primary route of worker exposure is inhalation of vapors near the borehole. Carbon tetrachloride is a confirmed carcinogen, which targets the central nervous system, eyes, lungs, liver, kidneys, and skin. Symptoms of exposure may include irritation of the eyes and skin, central nervous system depression, nausea, vomiting, dizziness, drowsiness, and injury to the liver and/or kidneys. HSC safety personnel will be contacted for VOC monitoring prior to logging boreholes in this area, and HSC safety personnel will determine the appropriate respiratory protection based on the monitoring results.

Controlled Area

## 4.0 Training

### 4.1 Employee Participation

GJO contractor employees will not be permitted to participate in or supervise hazardous waste site operations that could expose them to hazardous substances or safety or health hazards until they have been provided training to a level required by their job function and responsibility.

Management and field personnel directly responsible for Hanford operations will complete required training as described in Table 4-1 as appropriate for the areas or facilities in which logging will be performed. Field personnel are responsible for reviewing and being familiar with project plans and procedures applicable to their job function, as directed by management.

### 4.2 Pre-Entry Briefing

The Pre-Entry Briefing training will be conducted by the Project Coordinator and assisted by the HSC. This training should include:

- Names of key personnel responsible for site health and safety.
- Safety, health, and other hazards present on the site.
- The proper uses of PPE.
- The approved standard operating procedure (SOP) and emergency response actions.
- The safe uses of engineering controls and equipment on the site.
- The medical surveillance requirements for the site.
- Site access controls.
- A review of the controls contained in the site-specific HASP and any applicable RWPs.

Table 4-1. Training and/or Site Access Requirements

TRAINING COURSE	STOLLER FIELD PERSONNEL	STOLLER PROJECT COORDINATOR	STOLLER OFFICE PERSONNEL
Hanford Site Orientation/General Employee Training (HGET) (000001)	X	X	X
40-hour Hazardous Waste Site Training	X	X	
24-hour On-The-Job Supervised Field Training (031420)	X	X	
Annual Physical	X	X	
Annual Whole Body Count	X	X	
8-hour Manager/Supervisor Hazardous Waste Site Operation Training		X	
8-hour Hazardous Waste Site Refresher (032020)	X	X	
Basic Respiratory Training (02R041)	X	X	
Quantitative Mask Fit (020044)	X	X	
Radiation Worker II (020003)	X	X	
Tank Farm Facility Orientation (part of HGET)	X	X	
Building Emergency Plan Checklist (FEHIC) (WHC IP-0263-TF)	X	X	
Tank Farms Waste Handling, Segregation, and Packaging (350561)	X	X	
Site-Specific Pre-Entry Briefings	X	X	
Portable Fire Extinguisher Training	X		
Commercial Drivers License (well-logging vehicle drivers only)	X		
Hazardous Materials General Awareness Training (020075)	X	X	
Intro to Fed. Motor Carrier Safety Regulations (020083)	X		

### 4.3 Safety Meetings

Weekly safety meetings will be conducted for the GJO contractor employees by the Project Coordinator. Topics discussed will be recorded in the field logbook for the particular logging system at which the safety meeting was held. Discussions will include:

- Health and safety considerations and necessary PPE for the current operations.
- Any revisions to the HASP or to the site-specific HASP.
- All documented and/or observed unsafe acts committed on the site since the previous meeting and methods to prevent recurrence.
- Lessons learned.
- Evacuation routes and staging areas for the specific waste site being logged.

The safety meetings will also be conducted whenever starting work at a new waste site or when operational conditions change.

## 5.0 Personal Protective Equipment

### 5.1 PPE Selection Guidelines

The HSC safety personnel will evaluate the hazards identified for logging activities at the individual waste sites. If engineered safeguards or administrative controls cannot be used, the HSC safety personnel and Project Coordinator will implement the Respiratory Protection Program guidelines for choosing nonradiological respiratory protection to select PPE to protect employees from the known or potential hazards likely to be encountered at the site. HSC RADCON will identify PPE requirements for radiological hazards via the RWP. Where PPE is necessary to address both chemical and radiological concerns, the HSC safety personnel, Project Coordinator, and HSC RADCON will jointly determine requirements.

Employees who are engaged in activities at the Hanford Site that require the use of PPE must meet all applicable training and medical surveillance requirements specified in this HASP and the *Project Hanford Site Radiological Control Manual* (HNF-5173).

If the level of PPE for the actual conditions is found to be inadequate after the borehole logging has begun, the Project Coordinator will be notified immediately and all affected activities will be terminated until an evaluation is performed and approval to resume is granted.

PPE will be donned and doffed at the access control point. There will no eating, drinking, smoking, or chewing allowed within the exclusion zone. The exception is drinking water as a heat stress control measure in accordance with the Heat Stress Program outlined in *Heat Stress Control* (HNF-IP-0842).

The majority of the waste sites are posted as Underground Radiological Hazards, but conditions and postings may vary from site to site. Specific radiological PPE requirements will be contained in the RWP issued by HSC RADCON. The applicable site-specific HASPs will dictate other PPE.

Respiratory protection will be worn as required by the RWP or by HSC safety personnel.

If HSC RADCON prescribes no PPE requirements in the RWP or as specified by the site-specific HASP, then as a minimum, personnel will wear shirts with sleeves, steel-toe safety work shoes, and pants while engaged in well logging activities.

## 6.0 Temperature Extremes

### 6.1 Heat Stress

All fieldwork will be performed in accordance to the Heat Stress Program outlined in *Heat Stress Control* (HNF-IP-0842), for heat stress protection.

The Project Coordinator is responsible for implementing the requirements and work/rest guidelines established in the heat stress procedure.

### 6.2 Cold Exposure

Exposure to low temperatures may be a factor if work is done in the evening hours, if winds are high, if unpredictable weather moves in, or during winter months. Extra care must be exercised while working in cold environments.

Injuries caused by exposure to cold may include frostbite, trench foot, blood vessel abnormalities, and hypothermia. Decreased mental coherence and body movements are signs of hypothermia. If individuals demonstrate evidence of hypothermia or other significant cold injuries (e.g., frostbite), co-workers should notify the Hanford Fire Department and the Project Coordinator.

Normal logging operations will not require employees to be exposed to extreme temperatures for more than 30 minutes at one time. Employees will spend the majority of the workday inside the logging vehicle and/or support vehicle, which are equipped with heaters. The GJO contractor will provide its employees with cold weather gear to protect them from cold temperatures.

The individual employees should consider the following to help protect them from cold exposure:

- Increased fluid intake is essential to ensure proper hydration, which allows adequate blood flow to the extremities.
- A well-balanced diet is important to ensure adequate stores of energy.
- Dress appropriately with layered clothing to create dead air space.
- Wear clothing that allows for moisture to be “wicked away” from the body.
- Protective clothing for the hands, feet, and head are the most important.
- Loose fitting cotton clothing is appropriate.
- Socks with high wool content are best.
- Socks should be changed when wet.
- Use a liner when a hard hat is worn.
- Use a hood/scarf/cap as needed to prevent heat loss from the head.
- Stay dry if at all possible.

## 7.0 Medical Surveillance

In most situations, the medical surveillance requirements described in this section will be performed by the Hanford Environmental and Health Foundation (HEHF). The required medical surveillance records generated by HEHF will be formally transmitted to the GJO contractor.

### 7.1 Examinations

Standards and requirements for health assessments of employees and subcontractors are maintained according to DOE orders, 29 CFR 1910.20 Hazardous Waste Site Medical Surveillance, the *Grand Junction Office Health and Safety Manual* (GJO 2), and other applicable codes and regulations. Hanford Site forms will be used and approved sample protocols followed during employee and subcontractor medical examinations.

#### 7.1.1 Initial Examinations

The initial examination satisfies two requirements. The first is the provision of baseline data. Subsequent physical examinations may then be compared with the baseline information to suggest physiologic trends. The second requirement is the determination of an individual's fitness for the job, including the ability to work while wearing PPE.

#### 7.1.2 Qualification Physicals

Qualification physicals are required every year. The purpose of this physical is to qualify employees for job assignments with specific medical qualification standards or for medical surveillance. Medical surveillance is instituted for employees who:

- are or may be exposed to hazardous substances or health hazards at or above the PEL for 30 days or more a year,
- wear a respirator for 30 days or more, or
- are injured, become ill, or develop signs or symptoms because of possible overexposure.

Table 7-1 describes the medical surveillance requirements for the GJO contractor personnel working at the Hanford Site.

#### 7.1.3 Exit Physicals

An exit physical is required at termination of employment with the GJO contractor. Content of the exit physical is based upon the time elapsed since the previous physical examination and the potential for exposure to toxic chemicals or hazardous physical agents.

Table 7-1. Medical Surveillance Requirements

Job Description	Initial	Annual Qualification <sup>a</sup>	Respirator	Heavy Metals	Asbestos	Exit Physical
Logging Engineer	x	a	x			x
Geophysicist	x	a	x			x
Project Coordinator	x	a	x			x

<sup>a</sup> An annual qualification physical required if the employee meets any of the three criteria listed in Section 7.1.2.

## 7.2 Injury/Illness Examinations

An injury/illness reexamination will be given if any of the following situations arise:

- An employee notifies the Project Coordinator that he/she has developed signs or symptoms indicating possible overexposure or sensitivity to the hazardous substances or health hazards on the site.
- An employee has been injured or exposed above the PEL or other published exposure levels in an emergency.
- An employee develops a lost-time illness of 3 working days or more.
- An employee sustains any injury.

If an injury/illness is the result of exposure to a hazardous substance or health hazard, the Project Manager, HEHF, and the Contractor Health and Safety Manager (GJO) will be notified of the substance or hazards suspected. The HEHF physician will specify the scope of the reexamination. The contract physician will complete a Physician's Recommendation for Return to Work after completion of the reexamination to certify that the employee is fit to return to work and, if necessary, specify any activity restrictions.

## 7.3 Contract Physician Information

The employee and the GJO contractor will supply the following information to the contracting physician:

- Any data relating to expected or known exposure levels to hazardous or radiological substances.
- A description of PPE expected to be used on work sites.

- A description of employee's duties as they relate to the employee's exposure.
- Any available information from previous medical examinations not readily available to the contract physician.

#### **7.4 Medical Records**

Personnel medical and exposure monitoring records will be maintained according to the requirements of 29 CFR 1910.120 and the *General Administrative Procedures Manual* (STO-1000), Section 3.0 "Records Management Plan," and this HASP. Employee confidentiality will be maintained to the extent permitted by law. Employees will be notified annually of the following:

- Status/results of medical examinations.
- The right to access medical records anytime.
- Where and how to access medical records.

#### **7.5 Employee Responsibilities**

The following responsibilities are applicable to personnel engaged in the Hanford Geophysical Logging Project:

- Report any work-related injury or illness immediately to line management, HEHF, and the HSC safety personnel.

## 8.0 Exposure Monitoring and Air Sampling

Radiological and chemical exposure monitoring and air sampling will be performed by the HSC as required. All personnel engaged in borehole logging at the Hanford Site will be issued thermoluminescent dosimeters (TLDs) and neutron dosimetry. Results of personnel exposure monitoring will be formally transmitted to the Richland office of the GJO contractor quarterly. The Richland office will forward any results for GJO-based personnel to the GJO office. GJO-based personnel are those persons who normally work in Grand Junction. Their exposure records are tracked through the GJO and DOE-ID office. Exposure records of the Richland-based personnel are tracked at Hanford.

Before beginning logging at a waste site, the GJO contractor personnel will contact the HSC safety personnel to receive a briefing on the potential hazards/exposures and verify assessed exposures. On the basis of past borehole logging experience, it is unlikely that logging engineers will experience significant exposures. In the event observations indicate potential hazards may exist during logging activity, personnel will request support from HSC safety personnel to assess the situation.

The HSC monitoring program, as described in site-specific HASPs, should be referred to for entry and specific respiratory protection requirements for a particular waste site. Copies of the site-specific HASPs will be maintained at the worksite.

Radiological surveys for entering or exiting radiological control areas will be performed as required by the applicable RWP by the HSC Radiological Control Technicians (RCTs). Personnel qualified for self-survey may survey themselves upon exiting a radiological control area upon approval for HSC RADCON.

## **9.0 Site Control**

### **9.1 Work Coordination**

The Project Coordinator will coordinate with HSC personnel to stay abreast of scheduled waste site activities. The Project Coordinator will schedule well logging activities to ensure the GJO contractor personnel are not exposed to any hazards not addressed in this HASP.

### **9.2 Radiological Work Permits**

Work at the individual waste sites may or may not require an RWP. This will be determined by the HSC radiological control organization responsible for the specific waste site. Employees performing work at a site controlled by an RWP will adhere to all requirements listed on the RWP.

### **9.3 Access Control**

Access control to some waste sites containing radiological and chemical hazards is performed by the Access Control Entry System (ACES). Processing through ACES verifies entry requirements for individuals accessing radiologically controlled areas. Once entry requirements are verified, access is permitted and controlled.

Employees entering these areas are required to review the facility radiological status map and respiratory requirements and acknowledge understanding of the entry requirements, which are typically posted at the controlled area access point. In addition, processing through ACES requires identification of the specific RWP regulating the particular scope of work being performed.

### **9.4 Vehicle Control**

Vehicles may exit radiologically controlled waste sites after routine monitoring for contamination. However, these vehicles will remain on the Hanford Site and under the radiological controls of HSC RADCON. Should eventual unconditional release of these trucks be necessary, a more thorough and extensive radiological survey may be required.

### **9.5 Safe Work Practices**

#### **9.5.1 Daily Inspections**

The logging truck and equipment will be inspected daily, if the truck/equipment will be operated that day. As a minimum, the inspection will include the tires, brakes, cables, pulleys, and sheaves. Any defects discovered will be fixed prior to commencing logging activities.

## **9.5.2 Communication**

In some instances a GJO contractor employee may be required to work alone and/or after hours on the Hanford Site. The Project Coordinator will ensure that a two-way radio or cellular phone is available to GJO contractor employees during logging operations at the Hanford Site. A list of current emergency phone numbers will also be posted in each logging truck.

## **9.5.3 Accident Prevention Responsibilities**

Only qualified employees, by training or experience, will operate machinery and equipment. All manufacturer guidelines for safe operation, inspection, or repair of equipment will be followed.

Personnel should always be alert for unsafe conditions or environments. Should unforeseen health safety hazards be encountered, HSC and the GJO contractor management will be notified immediately and additional controls will be implemented as necessary.

Every employee is responsible for exercising stop-work authority when observing an act that may result in an imminent life-threatening or hazardous situation.

## **9.5.4 Eye and Face Protection**

Employees will wear appropriate eye and face protection equipment when machines or operations present potential eye or face injury from physical or chemical agents. Eye and face protection shall be certified and marked by the manufacturer as meeting the requirements of ANSI Standard Z87.1 and Z87.1A (current edition), "Practice for Occupational and Educational Eye and Face Protection."

Personnel may be required by the HSC to don safety glasses with side shields or goggles prior to entering a waste site. The HSC will be responsible for notifying GJO contractor personnel of this requirement.

## **9.5.5 Electrical**

Personnel will ensure electrical equipment is free from hazards likely to cause physical injury or death to themselves or co-workers. All electrical equipment associated with the logging vehicle should be in good working order with no defects and conform to the Electrical Safety Standard 2.7 provided in the *Grand Junction Office Health and Safety Manual (GJO 2)*.

Every employee is responsible for exercising stop-work authority when observing an unsafe electrical hazard.

### **9.5.6 Unplanned Activities**

If an unplanned activity is necessary and requires additional safety requirements, the GJO contractor Project Coordinator will coordinate with HSC to address safety concerns and requirements before work is performed.

### **9.5.7 Asbestos**

GJO contractor personnel will not disturb any material they suspect may contain friable asbestos. Monitoring activities in the vicinity of the material suspected to be or containing friable asbestos will be suspended, and HSC will be notified of the material. Monitoring activities in the vicinity of non-friable asbestos (e.g., unbroken transit piping) will be continued at the discretion of the HSC.

### **9.5.8 Material Safety Data Sheets**

Material Safety Data Sheets (MSDSs) will be maintained in the logging vehicle for all hazardous materials kept on the truck. All personnel utilizing these materials will be trained to the MSDS, as necessary, and training records will be maintained.

### **9.5.9 Liquid Nitrogen**

Liquid nitrogen can cause severe frostbite and can cause asphyxiation by displacing oxygen in a confined area. Handlers of this material must familiarize themselves with the Material Safety Data Sheet (MSDS) and the handling procedures outlined in the *Hanford Geophysical Logging Project Logging System Operating Procedures* (DOE 2003a). All personnel should have proper training and instructions for the specific cryogenic liquid and the storage and distribution system utilized in the logging system before attempting to make a liquid nitrogen transfer.

Handlers of liquid nitrogen must use the appropriate PPE, which includes the following: insulated leather or synthetic gloves, splash-proof goggles, safety glasses or face shield for the eyes and face, long-sleeved shirt or coveralls for the upper body, and long pants and closed-top shoes for protection of the feet.

## **9.6 Vehicle Movement**

Where required, HSC personnel will be contacted prior to initiating logging activities at a waste site to determine specific vehicle movement restrictions. A spotter may be required during vehicle movement at some waste sites (e.g., Hanford Tank Farms). This is essential when backing the logging truck to the wellhead. Movement of the logging truck will be performed in accordance with the route specified on the HSC supplied route map. Vehicles will not be driven over or parked on a site posted as having a cave-in potential. Before logging activities commence, the logging truck wheels will be chocked (at least one), and the emergency brake set will be set.

## **10.0 Decontamination**

### **10.1 Personnel Decontamination**

Personnel decontamination will be performed by HSC personnel according to approved HSC procedures. Contamination of personnel is not expected; however, should personnel contamination be detected, the individual will be decontaminated before leaving the waste site. Most contamination can be removed using simple, non-abrasive techniques such as tape presses or soap and water. Decontamination for non-radiological concerns will conform to the site-specific HASP.

### **10.2 Equipment Decontamination**

Equipment decontamination will be performed by HSC personnel according to approved HSC procedures.

## 11.0 Emergency Response/Contingency Plan

The site-specific training will compliment the information contained in this HASP. GJO contractor personnel will ensure the Hanford Site emergency actions are understood and followed.

### 11.1 Emergency Contacts and Phone Numbers

The Patrol Operations Center has been designated as the **single point-of-contact** to mobilize responses from support organizations for any emergency whether it is a fire, an accident, a spill, or otherwise. The single point-of-contact is available at all times (**911 or 373-3800, cellular**) and has the responsibility to initiate notifications as well as to dispatch emergency responders (Hanford Fire Department, Hanford Patrol, and ambulance services).

For non-emergencies, Table 11-1 provides useful phone numbers. The Project Coordinator will ensure Table 11-1 is posted in a conspicuous location in the logging truck.

*Table 11-1. Useful Phone Numbers for Non-Emergencies*

Position/Agency	Phone Number
Shift Office	373-3475
Patrol Operations Center	911 south of the Wye Barricade 911 or 373-3800 north of the barricade. NOTE: Cellular users dial 373-3800.
200 West Health Service Center (7:00 AM - 4:00 PM)	373-2714

### 11.2 Emergency Alarms

The Project Coordinator will ensure that Table 11-2, "Emergency Alarms," is posted in the logging truck. At the activation of an alarm or signal, the listed actions shall be followed. Site-specific HASPs will be reviewed prior to initiating logging activities at a waste site to determine the appropriate staging area and specific actions that must be taken in the event of an emergency.

Table 11-2. Emergency Alarms

Signal	Meaning	Actions to be Taken
Crash alarm telephone (steady ringing phone)	Emergency message	Lift receiver, do not speak, listen to caller and relay message(s) to building occupants and BED of alternate.
Gong or bell and flashing lights	Fire	Evacuate building. Move upwind. Keep clear of emergency vehicles.
Siren (steady blast)	Area evacuation	Proceed promptly to accountability area. Follow instructions.
Wavering (tone) siren	Take cover	Close all exterior doors, turn off all intake ventilation and notify manager of whereabouts. Request call back for status and monitor portable radios.

### 11.3 Fire Response Procedure

The following steps will be taken when a fire occurs at the project work site:

1. Contact the Patrol Operations Center using the available communications equipment (telephone or radio) and notify them of the situation.
2. Small, localized fires may be handled using the appropriate fire extinguisher to bring the occurrence under control.
3. Large, uncontrolled fires will be handled by the Hanford Fire Department. Evacuate and isolate the area and deny entry to unauthorized personnel.
4. If the fire involves material that could potentially release toxic gases, all persons in the immediate vicinity will be evacuated (sound the evacuation alarm), then the fire department will be notified of the potential toxic gas hazard.

### 11.4 Notification and Reporting

The employee that discovers the emergency is responsible for immediately reporting the situation by most expeditious means available to the Project Coordinator and HSC. The Project Coordinator will provide immediate verbal notification followed by written notification of any serious or potentially serious unplanned events and conditions. This notification will be sent to the HSC point of contact for the particular site where emergency condition occurred.

GJO contractor management will be notified promptly (within 1 hour). The Project Coordinator will complete and forward or fax an Incident/Safety Report (GJO Form 1743e) to the Project Safety Office (PSO) within 1 working day of the event and provide a copy of the form to the HSC. Other reports may be required (i.e., personal injuries/illness or automobile accidents) as described in the *Grand Junction Office Health and Safety Manual* (GJO 2).

The HSC will be responsible for reporting under the DOE Occurrence Reporting and Processing System (ORPS). The GJO contractor will assist HSC in the development of GJO contractor-related ORPS reports. The GJO contractor will provide qualified personnel to assist in any required investigations.

## **11.5 Emergency Response Equipment**

### **11.5.1 Communications Equipment**

Cellular telephones or two-way radios will be kept in the logging truck for communication with Emergency Response personnel.

### **11.5.2 Fire Suppression**

The Project Coordinator will ensure that a 10-pound or greater BC-Rated, dry chemical fire extinguisher is available in the logging truck. All portable fire extinguishers shall be tested, inspected, and maintained in accordance with *Fire Protection System Testing/Inspection/Maintenance/Deficiencies* (HNF-RD-7899, Rev. 0).

### **11.5.3 First Aid Kits**

First aid kits will be maintained in each support vehicle. The kits will conform to Occupational Safety and Health Administration (OSHA) guidelines provided in Appendix A to 29 CFR 1910.151, "First Aid Kits." All injuries will be reported to the Project Coordinator and the individual will report immediately to the nearest first aid station.

## 12.0 Confined Space Entry

### 12.1 Evaluation

No confined space entry is anticipated for the Hanford Geophysical Logging Project.

## 13.0 Spill Containment

No tasks specific to the Hanford Geophysical Logging Project require controls for spill containment. However, should a spill of any hazardous material (e.g., petroleum products via a leaking gas tank or broken crank case) occur, then personnel should attempt to stop the spill and minimize its extent (e.g., pushing dirt up around the spill to contain it). Immediately notify Patrol Operations Center at 373-3800 and the Project Coordinator. Contact HSC to provide assistance for spill clean up and proper disposal.

## References

*Fire Protection System/Inspection/Maintenance/Deficiencies*, 2002, HNF-RD-7899, Rev. 1, Richland Washington.

*General Administrative Procedures Manual*, STO-100, Grand Junction, Colorado.

*Grand Junction Office Health and Safety Manual*, GJO 2, Grand Junction, Colorado.

*Heat Stress Control*, 2000, HNF-IP-0842, Vol. 9, Section 4.25, Richland, Washington.

Pacific Northwest National Laboratory (PNNL), 1998. *Hanford Site Groundwater Monitoring for Fiscal Year 1997*, PNNL-11793, Richland, Washington.

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U.S. Department of Energy (DOE), 1998. *Groundwater/Vadose Zone Integration Project Background Information and State of Knowledge*, DOE/RL-98-48, Vol. II, Rev. 0, prepared by BHI for the U.S. Department of Energy, Richland Operations Office, Richland, Washington.

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