U.S. Department of Energy

Oakland Operations Office, Oakland, California

WASTE DELINEATION PLAN FOR CHLORDANE EXCAVATION AREA OF THE SOUTHWEST TRENCHES AREA REMOVAL ACTION

at the

LABORATORY FOR ENERGY-RELATED HEALTH RESEARCH (LEHR)
UNIVERSITY OF CALIFORNIA AT DAVIS, CALIFORNIA

Submitted to:

United States Department of Energy
Oakland Operations Office
1301 Clay Street
Oakland, California 95612-5208

Prepared by:

Weiss Associates
5500 Shellmound Street
Emeryville, California 94608

July 10, 1998
Rev. 0

DOE Oakland Operations Contract DE-AC03-96SF20686

Weiss Associates
Environmental and Geologic Services

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Approvals Page

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WASTE DELINEATION PLAN

This document describes the *in-situ* delineation soil sampling activities planned for the area shown on Figure 1. The primary objective of this proposed *in-situ* delineation soil sampling is to minimize the volume of mixed-waste potentially generated as part of the Southwest Trench removal action (RA). This will be accomplished by:

- Investigating shallow soils *in-situ* within the southwest quadrant for the existence of additional buried waste trenches (Figure 1); and,
- Defining the in-situ vertical distribution of chlordane in the waste trench shown on Figure 1.

Defining the *in-situ* distribution of chlordane in the buried waste will allow the removal and segregation of potential mixed waste from low level radioactive waste and thus substantially reduce the disposal-related costs.

To date, backhoe excavation and visual field-observation of the backhoe spoils have been the methods employed in investigating the Southwest Trench Area for the possible existence of buried waste trenches/pits. Since May 1, 1998, approximately 75% of the entire Southwest Trench Area, with the exception of the southwest quadrant shown on Figure 1, has been excavated on a 10-ft grid density to a depth of about 6-ft in order to visually identify and flag buried waste.

Prior to excavation, a two-dimensional 10-ft by 10-ft grid system was overlain on the Southwest Trenches Area and select grid nodes were sampled for chlordane using a hand-auger and immunoassay-based field chlordane test kits. Samples were collected from 0.5-ft and 1.5-ft over most of the area, with the exception of the southwest quadrant, where soil was sampled at 0.5-ft, 1.5-ft, and 3-ft depth. As compared to the northwest, northeast and southeast quadrants, chlordane exceeding 2 ppm was detected in several locations within the southwest quadrant to the total depth explored (4-ft depth). Furthermore, chlordane was detected at concentrations exceeding 2 ppm in soil directly overlying an identified, north-south buried debris/waste trench (Figure 1).

To complete the trenching and visual observation of excavated material for buried debris in the southwest quadrant while minimizing the potential for generating mixed waste, direct-push drilling rather than a backhoe excavator will be used to complete the 10-ft grid investigation of southwest quadrant. Direct push drilling was successfully used at LEHR on several occasions in the past including the June 1997 Data Gaps Investigation and the February 1998 Phase C Western Dog Pen Investigation. The drilling method produces little waste, provides high-quality core for visual logging purposes, is rapid, and can be used in areas of limited access and uneven terrain.

Chlordane and waste delineation drilling, sampling, and analysis will be performed in accordance with this plan, the "Draft Work Plan for Removal Actions in the Southwest Trenches,

RA/SR Treatment Systems, and Domestic Septic System Areas," the Quality Assurance Project Plan (QAPP), and appropriate Standard Operating Procedures (SOPs).

Specific issues outlined in this plan include:

- Direct-push sampling locations within the southwest quadrant of the Southwest Trenches; and,
- Lithologic logging, sample collection, and sample analysis.

Each of these is described in greater detail below.

Direct-Push Sampling Locations within the Southwest Trenches

Fifty one (51) borings are proposed for the southwest quadrant of the Southwest Trenches. The borings will be advanced using direct push drilling technology as described in Standard Operating Procedure (SOP) 3.2, Subsurface Soil Sampling While Drilling (attached). The onsite excavator will be used to create a ramp into the southwest quadrant so that the drill rig can enter the excavation for sampling. The ramp will be created in an area that is unaffected by surface chlordane exceeding 2 ppm and buried debris.

As shown on Figure 1, two groups of borings will be installed within the southwest quadrant and include:

1. Group 1 – All borings will be advanced to at least 3-ft below grade on 5-ft centers over the entire area. The core produced from these borings will be used for visual observation of buried debris. No samples from the Group 1 borings will be collected for laboratory analysis.

2. Group 2 - All borings located directly above or in a disposal trench and within the 2 ppm chlordane area shown on Figure 1 will be advanced to approximately 12 ft below existing grade or until native soil is encountered. As shown on Figure 1, a group of borings is located directly above a previously identified disposal trench and are already assumed to be in Group 2 category. Group 2 borings will be used to define the vertical extent of chlordane in soils containing debris and waste and will also be used to determine the vertical extent of the buried debris and depth to native soil. Samples will be collected from Group 2 borings for laboratory analysis.

During logging of the core, a photoionization detector (PID), Geiger Mueller Detector (GM), and scintillation detector (SCIN) will be used to screen for organic vapors and radionuclide activity. At the conclusion of soil sampling and visual analysis, coreholes will be backfilled with unused core. Remaining unused core will be spread out immediately near its point of origin and as described in the project Draft Investigative Derived Waste Management Plan (PNL, 1994).

Lithologic Logging, Sample Collection, and Analysis

Lithologic core logging will be performed using the United Soil Classification System (USCS) method as described in SOP 15.1, Logging of Soils – Visual Unified Soil Classification (USCS). Furthermore, soil sample collection during drilling will be conducted according to SOP 3.1, Surface and Shallow Subsurface Soil Sampling, and SOP 3.2, Subsurface Soil Sampling while Drilling (attached).

Direct push drilling methods will follow the Continuous Core Sampling System Methods in SOP 3.2, (attached). Sample handling, packaging, and shipping are described in SOP 2.1 (attached). Decontamination of drilling and sampling equipment will follow the procedures described in Sampling Equipment and Well Material Decontamination in SOP 6.1 and Drilling and Heavy Equipment Decontamination described in SOP 6.2 (attached).

Soil samples will be collected from each of the borings located above the buried debris trench at 3, 6, 9, and 12-ft bgs. Soil samples will be collected in 6-inch brass tubes. One 6-inch tube will be capped, labeled, and refrigerated for chlordane analysis. The remaining tubes will be used for lithologic description. One duplicate sample will be collected from 5% of the borings. In addition, one (1) equipment rinseate sample will be collected for this sampling event.

Furthermore, prior to the start of the field work described in this work plan, the Field Coordinator (FC) will review with the field crew all relevant and appropriate Activity Hazard Analysis (AHA) sheets contained in the Draft Project Health and Safety Plan for LEHR, Davis, California (WA, 1997).

Soil samples collected from Group 2 borings will be analyzed by a contract laboratory for:

- Chlordane by EPA Method 8080.

Additionally, 20% of the Group 2 samples will be analyzed for:

- Chlordane by TCLP method.

Based on the results of the total chlordane and TCLP analyses, additional samples will be analyzed for:

- Chlordane by TCLP.

REFERENCES

Pacific Northwest Laboratory (PNL), 1994, Draft Waste Management Plan for Investigation Derived Wastes, January 1994.

Weiss Associates (WA), 1998, Draft Work Plan for Removal Actions in the Southwest Trenches, RA/SR Treatment Systems, and Domestic Septic System Areas, Laboratory for Energy-related Health Research (LEHR), University of California at Davis, California, April 6, 1998, 42 pp., 4 tables, 4 figures, 5 appendices, and 2 attachments.

WA, 1997, Draft Project Health and Safety Plan for Environmental Restoration and Waste Management, LEHR, UC Davis, California, WA, February 1997.

FIGURE

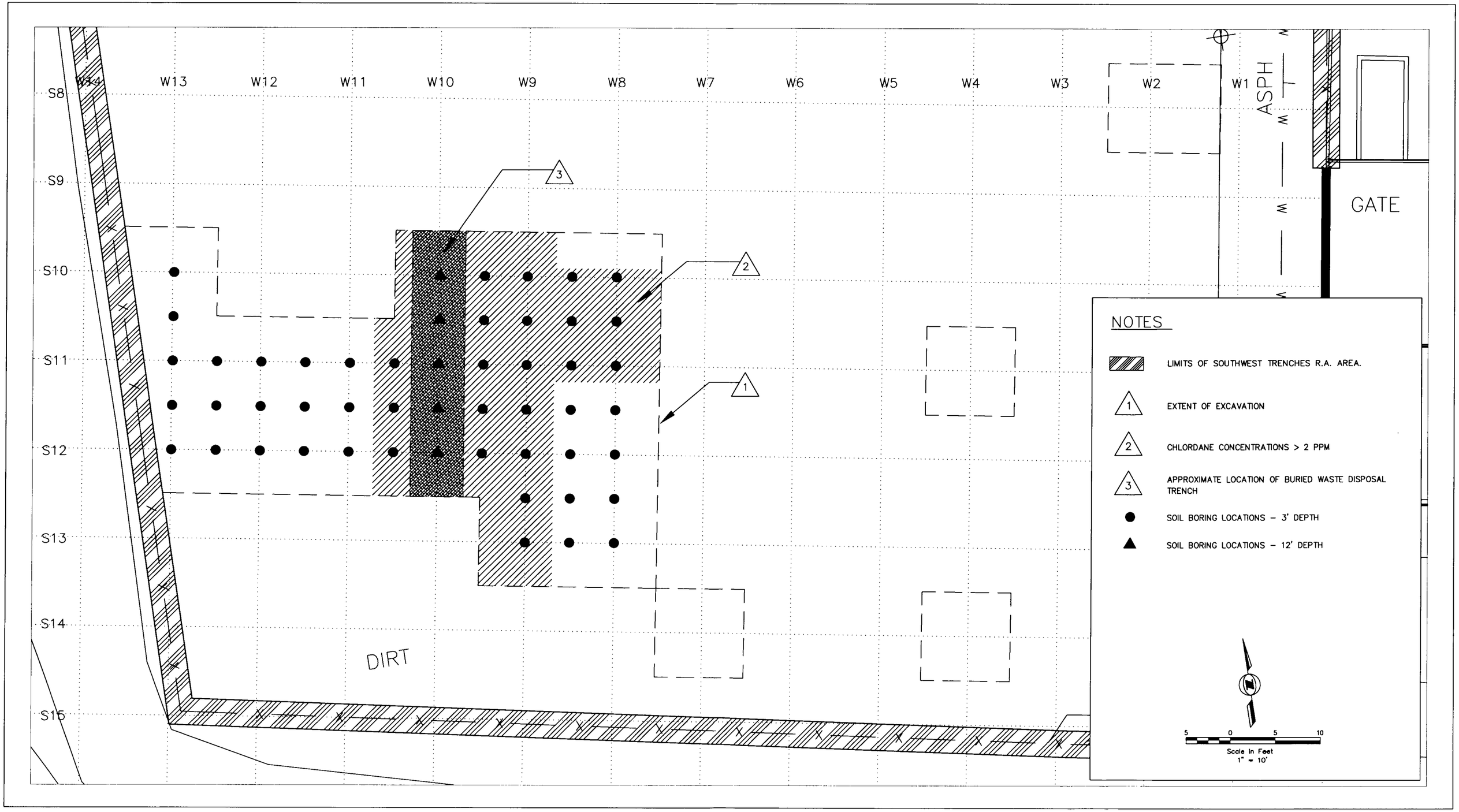

Figure 1. In-Situ Soil Sampling Locations for Chlordane and Buried Waste Delineation

WEISS ASSOCIATES

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