# Soil Treatment Final Report
# Woods Industries Site
# Yakima, Washington

## Volume I — Report and Appendices A Through D

August 7, 1996

Prepared for:

**BURLINGTON NORTHERN RAILROAD**
Seattle, Washington

PHILIP ENVIRONMENTAL SERVICES CORPORATION
210 West Sand Bank Road
Post Office Box 230
Columbia, Illinois 62236-0230

Project 12883088

PHILIP
ENVIRONMENTAL

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# 1 Introduction

Burlington Northern Railroad (BNRR), owner of the Woods Industries Site (Woods Site) property, had approximately 27,000 tons of soil treated by low-temperature thermal desorption on site between March and August 1995. This soil was treated to remove contaminants remaining in the soil from operations of Woods Industries, Inc., which was the former pesticide-formulating company that operated on the property before 1985.

BNRR, through Philip Environmental Services Corporation (Philip), has prepared this final report for soil removal and treatment activities on the Woods Site, which is located at 2 East King Street in Yakima, Washington. These activities were performed as a removal action in accordance with the March 30, 1993, Administrative Order on Consent Number 1087-03-106 (the Order) and the National Oil and Hazardous Substances Contingency Plan (NCP). This removal action reduced contaminant concentrations to acceptable levels under an industrial future-use scenario as defined under the State of Washington's Model Toxics Control Act (MTCA). A chronological summary of events is presented in the weekly project status reports previously submitted to the U.S. Environmental Protection Agency (USEPA) site coordinator and included as Appendix D of this report. USEPA Region X is the lead agency for BNRR's environmental remediation of this site.

Planning for soil treatment began in 1993, concurrent with soil removal activities. Williams Environmental Services Corporation (Williams) was selected as BNRR's thermal desorption contractor. The first draft of the *Soil Treatment Work Plan* (prepared by Williams) was issued to the USEPA on June 18, 1993. Conditional USEPA approval of the Work Plan was received on January 20, 1995. The conditions set forth in USEPA's January 20, 1995, letter were negotiated, revised, and the USEPA issued a final Work Plan approval letter on January 31, 1995.

BNRR is submitting this report for soil removal and treatment activities according to the Order. As specified in Section 5.16 of the Order, this document is required to include:

> a listing of quantities and types of materials removed, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destination of those materials, a presentation of the analytical results of all sampling and analyses performed, and accompanying

appendices containing all available relevant documentation generated during the removal action (manifests, invoices, bills, contracts, and permits).

The final cost of soil removal and treatment activities will be forwarded to the USEPA as soon as it becomes available.

This document contains:

- the Order (Appendix A) as modified by the USEPA;
- a description of soil removal and treatment activities;
- a description of Ambient Air monitoring activities and data;
- weekly project status reports;
- Williams' daily reports;
- preliminary soil sample data collected during soil removal activities;
- verification soil sample data collected during soil removal activities;
- waste profiles;
- USEPA approval forms for treated soil and supporting analytical data; and
- photographs.

Additional details, as required in 40 CFR 300.165, OSC Reports, Paragraphs (1)(v) through (1)(x), have been presented to the USEPA via daily reports provided by Williams to the USEPA on-site representative. Those daily reports are included in Appendix F of this final report.

## 1.1 Site Location

The site is located on King Street west of North First Street along the railroad tracks within the city limits of Yakima, Washington. This is in an industrial area within the Northwest Quarter of the Northeast Quarter of Section 31, Township 13 North, Range 19 East, West Meridian (Figure 1-1, Site Location Map). The site consists of two areas formerly leased from BNRR to Woods

Industries, which sublet a portion of the site to Akland Irrigation. The entire area that was leased from BNRR covers approximately four acres. Land use in the immediate vicinity of the site is primarily industrial. Hansen Fruit and Cold Storage (Hansen), a fruit packing facility, operates on the property north and east of the site; Washington Central Railroad operates on the west; and HAAS Fruit Company on the south.

## 1.2 Site History

For approximately 50 years, BNRR and its predecessors leased the site to industrial lessees. The area leased by Woods Industries was used for the contract formulation of market-grade pesticides from technical-grade material from approximately 1938 until May 1985, when the lease was terminated by BNRR because of environmental concerns. After Woods Industries' lease was terminated in May 1985, Woods Industries removed some personal property from the site, and BNRR assumed control of the site.

In December 1985, the USEPA issued a Removal Action Order, which, among other things, required that a detailed plan for site characterization be developed and executed. Morrison-Knudson Engineers, Inc., (MKE), under contract to BNRR, prepared and implemented the site characterization plan in 1986.

Based on the results of the preliminary site characterization, elevated concentrations of p,p'-DDT (DDT), p,p'-DDD (DDD), p,p'-DDE (DDE), copper, lead, zinc, hexachlorobenzene, bis(2-ethylhexyl)phthalate, acetone, and methylene chloride were found in soil samples collected from the site. This preliminary study concluded that DDT was the most widely spread of the pesticides in soil.

Pesticides, volatile organic compounds (VOCs), and metals were detected in groundwater samples collected from five wells installed during this preliminary investigation.

In 1990 and 1991, BNRR conducted a remedial investigation (RI) of the site in accordance with the requirements of Consent Order Number 1087-03-18-106 as amended June 28, 1990, and the Remedial Investigation/Feasibility Study Work Plans approved by the USEPA. The investigations were performed in two phases. Phase I was performed in 1990 and Phase II was performed in 1991. Some additional tasks, such as disposal of drummed drill cuttings and well development water, were performed in 1992. The primary soil contaminants were identified to be p,p'-DDT, DDD,

DDE, hexachlorobenzene, and dieldrin. Other organochlorine pesticides and some metals (mercury, arsenic, and lead) were also detected above cleanup levels at some locations.

In January and February of 1993, buildings on the site were demolished to grade. The buildings were demolished to remove a physical hazard, a toxic health hazard, and a fire hazard from the site and to expedite site remediation. Building demolition was performed in accordance with the Building Demolition Work Plan, the Administrative Order on Consent for Building Demolition, and the NCP. In summary, the existing buildings were demolished and debris was removed and disposed of properly.

In March 1993, a separate Administrative Order on Consent was entered into by BNRR for the removal, temporary storage, and treatment of pesticide-impacted soil from the site.

From April to September of 1993, approximately 19,000 cubic yards of pesticide-impacted soil was excavated and placed in temporary soil storage areas located on the north and south ends of the site. Additional details regarding building demolition and soil removal activities are described in the March 26, 1993, *Building Demolition Final Report* (Philip, 1993b) and the October 13, 1993, *Soil Removal Final Report* (Philip, 1993a). Site features after these 1993 activities are shown in Figures 1-2 and 1-3.

## 1.3 Project Overview and Organization

This section is a summary of the history of the soil treatment planning process and the entities responsible for implementation of the Work Plans.

### 1.3.1 Soil Treatment History

The Administrative Order on consent for Soil Removal and Soil Treatment was signed on March 30, 1993. According to the Schedule of Deliverables, Attachment B of the Order, completion of interim milestones was required and soil treatment was to be completed within one year of the effective date of the Order. In May 1993, BNRR selected Williams as their soil treatment contractor.

A chronological summary of the soil treatment planning process is included in Table 1–A — Summary of Planning Process.

Drafts of the Soil Treatment Work Plan were issued on:

- November 22, 1993;
- March 11, 1994;
- April 26, 1994;
- October 7, 1994; and
- November 18, 1994.

USEPA's comments on the November 18, 1994, revised Draft Work Plan were received on January 5, 1995, and responses to these comments were issued to the USEPA on January 17, 1995. Conditional USEPA approval of the Work Plan was received on January 20, 1995. The conditions set forth in USEPA's January 20, 1995, letter were negotiated, revised, and the USEPA issued a final Work Plan approval letter on January 31, 1995.

The following table, although not all inclusive, illustrates the complexity of the planning process.

**Table 1–A — Summary of Planning Process**

| Date | Activity |
|---|---|
| April 29, 1993 | • BNRR issued the Draft Scope Of Work for Soil Treatment to the USEPA. |
| June 18, 1993 | • The Draft Soil Treatment Work Plan was submitted to the USEPA. |
| July 20, 1993 | • USEPA commented on the Draft Soil Treatment Work Plan. |
| August 10, 1993 | • BNRR/USEPA held a conference call to discuss comments on the Draft Soil Treatment Work Plan. |
| October 15, 1993 | • BNRR submitted response to USEPA comments on the Draft Soil Treatment Work Plan. |
| November 5, 1993 | • BNRR submitted Proposed Modification to the Schedule for Soil Treatment in the Order. |
| November 10, 1993 | • BNRR issued a letter describing the proposed method for characterizing oversized material. |
| November 18, 1993 | • BNRR issued the Ambient Air Quality Impact Report (AAQIR) to the USEPA. |
| November 22, 1993 | • BNRR submitted revised Draft Soil Treatment Work Plan. |
| December 30, 1993 | • USEPA issued comments on the revised Draft Soil Treatment Work Plan and AAQIR. |
| February 2, 1994 | • BNRR and USEPA met to discuss status of the Soil Treatment Work Plan. USEPA agreed the schedule for soil treatment must be amended. |
| February 11, 1994 | • BNRR issued a revised approach for the characterization and disposition of cobbles mixed with soils at the Woods Site. |
| February 14, 1994 | • BNRR issued a summary of the February 2 meeting. |
| February 16, 1994 | • BNRR issued air monitoring data collected from 1993 soil removal activities to the USEPA for use in revising the air monitoring plan for soil treatment activities. |

**Table 1–A — Summary of Planning Process**

| | | |
|---|---|---|
| February 18, 1994 | • | BNRR issued a letter to the USEPA describing changes to the low-temperature thermal desorption (LTTD) system configuration for handling baghouse dust. |
| March 2, 1994 | • | BNRR renewed its request for a modification to the soil treatment schedule in the Order. |
| March 11, 1994 | • | BNRR submitted revised Soil Treatment Work Plan. |
| March 30, 1994 | • | Soil treatment was required to be complete according to the Order. |
| April 1, 1994 | • | USEPA issued a letter to BNRR extending the schedule for completion of soil treatment until April 30, 1994. This letter also indicated that an additional extension would be granted based on USEPA's review of the revised Soil Treatment Work Plan. |
| April 7, 1994 | • | BNRR faxed a copy of a letter that it had received from Williams to the USEPA notifying them of Williams' schedule conflict with another project if not given approval to mobilize by the first week in May. |
| April 14, 1994 | • | USEPA issued comments on the Draft Soil Treatment Work Plan. |
| April 20, 1994 | • | USEPA issued a letter to BNRR regarding soil treatment schedule modifications, requirements for receiving full USEPA approval of the Work Plans and Notice to Proceed, and comments on the April 14 Soil Treatment Work Plan. |
| April 26, 1994 | • | BNRR issued a comment response letter responding to USEPA's April 20 comments on the Soil Treatment Work Plan. |
| April 29, 1994 | • | BNRR proposed modifications to the schedule in the Order for soil treatment. |
| | • | BNRR issued a revised Ambient Air Monitoring Plan (AAMP) to the USEPA. |
| May 2, 1994 | • | A conference call was held to discuss BNRR's April 26 comment response letter responding to USEPA's April 20 comments on the Soil Treatment Work Plan. |
| | • | BNRR issued a revised AAQIR to the USEPA. |
| May 6, 1994 | • | BNRR issued revised pages to the Soil Treatment Work Plan in response to USEPA's April 14 comments. |
| May 11, 1994 | • | BNRR received written notice from Williams that the TPU3 Thermal Desorption Unit would not be available for use at the Woods Site until early 1995, due to a conflict with work at the Lipari Superfund Site. |
| | • | BNRR issued a letter to the USEPA notifying USEPA that Williams' TPU3 soil treatment unit will not be available for use on the Woods project until early January 1995 and giving notice of *force majeure*. |
| May 18, 1994 | • | BNRR submitted details of the *force majeure* describing three potential alternatives and their respective schedules for treatment of soil at the Woods Site. |
| June 15, 1994 | • | BNRR issued results from crushed cobble samples to the USEPA. |
| | • | USEPA issued a letter to BNRR extending the soil treatment schedule until July 15, 1994, and giving BNRR two options for proceeding. |
| June 20, 1994 | • | BNRR and USEPA met to discuss status of the soil treatment project. USEPA informed BNRR that it intends to switch the Order from a time-critical to a non-time-critical removal action. |
| June 22, 1994 | • | BNRR issued a letter to the USEPA confirming an agreement regarding deferral of dispute resolution. |
| June 30, 1994 | • | USEPA issued a letter to BNRR specifying the schedule for future work. |
| July 6, 1994 | • | BNRR issued a letter to the USEPA in response to the USEPA's June 30, 1994, letter describing the project schedule and the meeting held on June 20, 1994, between the USEPA and BNRR. |

**Table 1–A — Summary of Planning Process**

| | | |
|---|---|---|
| July 7, 1994 | • | BNRR issued a memo to the USEPA regarding the scope and schedule for Engineering Evaluation/Cost Analysis (EE/CA) preparation. |
| July 8, 1994 | • | BNRR issued a request for proposals to conduct soil treatment via thermal desorption to potential contractors and mailed a copy to Lynda Priddy. |
| | • | USEPA issued comments on the April 29, 1994, AAMP and the May 2, 1994, AAQIR. |
| July 13 | • | BNRR received from the USEPA guidance documents for use in preparing an indirect risk assessment of the LTTD unit to be included in the AAQIR. |
| July 20, 1994 | • | BNRR and USEPA met to discuss the project. |
| July 29, 1994 | • | BNRR issued a letter to the USEPA regarding proposed schedule modifications for soil treatment as discussed in the July 20 meeting. |
| August 12, 1994 | • | BNRR issued the EE/CA Equivalent for Soil Treatment at the Woods Site to the USEPA. |
| August 15, 1994 | • | BNRR issued a response to USEPA's July 8 comments on the AAMP. |
| August 22, 1994 | • | BNRR issued a letter to the USEPA regarding contractor selection, selecting Williams for remediation of the Woods Site. |
| August 26, 1995 | • | BNRR issued a comment response letter regarding USEPA's July 13, 1994, comments on the AAQIR. |
| September 7, 1994 | • | A conference call was conducted to discuss revising the AAQIR. |
| | • | USEPA issued a revised schedule for completion of soil treatment activities. |
| September 13, 1994 | • | A conference call was held to discuss revising the AAMP. |
| September 21, 1994 | • | A conference call was held to discuss model inputs for the indirect risk assessment to be included in the revised AAQIR. |
| September 28, 1994 | • | BNRR proposed COMPDEP modeling inputs to be used in revising the AAQIR. |
| October 5, 1994 | • | USEPA issued comments on the proposed indirect risk assessment model inputs. |
| October 6, 1994 | • | BNRR issued a revised Preliminary AAMP to the USEPA. |
| | • | BNRR issued a letter to Williams giving them authorization to proceed with equipment pad construction. |
| October 7, 1995 | • | BNRR issued a Draft Soil Treatment Work Plan for TPU IV. |
| | • | BNRR issued technical information regarding proposed revisions to the AAQIR. |
| | • | BNRR issued a letter to the USEPA regarding satisfying the requirement for submitting a Draft Soil Treatment Work Plan. |
| October 31, 1994 | • | USEPA issued Draft Comments on the Soil Treatment Work Plan. |
| November 4, 1994 | • | USEPA issued a letter to BNRR describing the approach for handling oversized materials (cobbles too large for treatment in the soil treatment unit). |
| November 2, 1994 | • | USEPA issued a letter regarding the Soil Treatment Work Plan. |
| November 7, 1994 | • | BNRR received comments on the October 7 Soil Treatment Work Plan and BNRR's proposed revisions to the AAQIR. |
| November 4, 1994 | • | BNRR issued a response to USEPA's comments on the October 6 preliminary Ambient Air Monitoring Plan. |
| November 18, 1994 | • | BNRR issued a revised Soil Treatment Work Plan. |
| November 18, 1994 | • | BNRR issued a revised AAQIR and AAMP. |
| December 21, 1994 | • | USEPA issued a letter regarding the January 15, 1995, date for start-up/ shakedown of the soil treatment unit. |
| December 30, 1994 | • | Construction of the soil treatment equipment pad and installation of the meteorological tower base were completed. |
| January 5, 1995 | • | USEPA issued draft comments on the November 18, 1994, Soil Treatment Work Plan, AAMP, and AAQIR. |
| January 5, 1995 | • | BNRR issued a letter to the USEPA regarding the schedule for soil treatment. |

**Table 1–A — Summary of Planning Process**

| | | |
|---|---|---|
| January 9, 1995 | • | BNRR issued Standard Operating Procedures for Ambient Air Monitoring. |
| January 13, 1995 | • | BNRR issued a response to USEPA's January 5 draft comments on the AAMP. |
| January 17, 1995 | • | BNRR issued a comment response letter regarding USEPA's January 5 draft comments on the Soil Treatment Work Plan. |
| January 17, 1995 | • | BNRR issued a proposed approach to data validation of treated soil sample analytical results. |
| January 18, 1995 | • | BNRR issued a revised response to USEPA's January 5 comment regarding continuous emission monitor calibration procedures. |
| January 19, 1995 | • | BNRR issued a response to USEPA's January 5 comments on the AAQIR. |
| January 20, 1995 | • | USEPA issued a letter to BNRR conditionally approving the Soil Treatment Work Plan. |
| January 30, 1995 | • | Williams issued a letter to the USEPA responding to conditions for Soil Treatment Work Plan approval contained in USEPA's January 20 letter. |
| January 31, 1995 | • | USEPA conditionally approved the AAMP, AAQIR, and Soil Treatment Work Plan. |
| February 1, 1995 | • | USEPA issued a letter to BNRR conditionally approving the January 17 approach to data validation of treated soil sample analytical results. |
| February 7, 1995 | • | BNRR issued a revised AAMP to the USEPA. |

### 1.3.2 Project Organization

The entities listed in the following table had roles in this project. The relationships between these entities are illustrated in Figure 1-4.

**Table 1–B — Entities Involved in Soil Treatment at the Woods Industries Site**

## BURLINGTON NORTHERN RAILROAD (BNRR)

BNRR is the owner of the site.

PHILIP

Philip Environmental Services Corporation is environmental consultant to BNRR on the project. On behalf of BNRR, Philip developed the Ambient Air Quality Impact Report (AAQIR) and Ambient Air Monitoring Plan for the soil treatment project. On behalf of BNRR, Philip provided oversight of soil removal and treatment activities, and performed ambient air monitoring.

Laucks Laboratories

Provided preliminary soil sample analytical services to Philip.

Sound Analytical

Provided preliminary soil sample analytical services to Philip.

Quanterra

Provided verification soil sample analytical services to Philip.

Ross

Provided air sample analytical services to Philip.

WILLIAMS ENVIRONMENTAL SERVICES

Williams Environmental Services, Inc. was contracted directly by BNRR to develop the Soil Treatment Work Plan and implement the Plan.

Quanterra

Provided treated soil verification sample analytical services to Williams.

Focus Environmental, Inc.

Performance test consultant for Williams. Assisted Williams in developing the performance test plan, implementation of the plan, and developing the Performance Test Report.

York Services Corporation

Stack testing contractor for Williams. Responsible for collecting and analyzing the samples collected during stack testing (the pretest and the performance test).

Ken Leingang Excavating, Inc.

Subcontracted by Williams to backfill the site.

OLYMPUS ENVIRONMENTAL, INC.

Contracted directly by BNRR to provide soil removal activities under Philip oversight.

KEN LEINGANG EXCAVATING, INC.

Contracted directly by BNRR to construct the concrete pad for the LTTD unit.

## U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION X

USEPA is the lead agency.

ROY F. WESTON, INC.

Under contract with the USEPA, Weston assisted in technical review the AAQIR, Soil Treatment Work Plan, and Air Monitoring Plan. In addition, Weston assisted in oversight of the performance test and technical review of the Performance Test Report and the AAQIR Addendum.

URS CONSULTANTS, INC. (URS)

Under contract to the USEPA, URS provided oversight of thermal treatment operations. A minimum of one URS representative was on site every day of thermal operations, approximately 12 hours per day.

# 2 Administrative Order on Consent for Removal Response Activities (Soil Removal and Soil Treatment)

This chapter presents an overview of the Consent Order requirements for soil removal and soil treatment removal response activities and a summary of modifications to the Order for implementation of soil treatment.

## 2.1 Overview of Consent Order Requirements for Removal Response Activities

The Administrative Order on Consent for Soil Removal and Soil Treatment was signed on March 30, 1993. A copy of the Order is included in Appendix A. The Order was time critical in nature and called for excavation and treatment of contaminated soils. The Order was broken down into two phases: Phase I, Soil Removal; and Phase II, Soil Treatment. According to the Schedule of Deliverables (Attachment B of the Order), both soil removal and soil treatment were originally to be completed within one year of the effective date of the Order.

**Phase I - Soil Removal** — The soil removal phase included the excavation and temporary storage of soils on site that contained pesticides at concentrations greater than the cleanup standards established for the site under an industrial future-use scenario as defined under the State of Washington's MTCA. Soil removal was conducted from March through September 1993 according to the USEPA-approved *Revised Soil Treatment Work Plan* dated March 17, 1993. BNRR issued a *Final Report for Soil Removal* on October 13, 1993, in compliance with the Order.

**Phase II - Soil Treatment** — The soil treatment phase required thermal treatment, in accordance with treatment standards established for the site, of all soils excavated in Phase I, and those soils to be excavated from below the temporary soil storage areas during Phase II.

In May 1993, BNRR selected Williams as the soil treatment contractor.

Drafts of the Soil Treatment Work Plan were issued on:

- November 22, 1993;
- March 11, 1994;

- April 26, 1994;
- October 7, 1994; and
- November 18, 1994.

USEPA's comments on the November 18, 1994, revised Draft Work Plan were received on January 5, 1995, and responses to these comments were issued to the USEPA on January 17, 1995. Conditional USEPA approval of the Work Plan was received on January 20, 1995. The conditions set forth in USEPA's January 20, 1995, letter were negotiated, revised, and the USEPA issued a final Work Plan approval letter on January 31, 1995.

Williams began mobilizing thermal treatment equipment in February 1995. Treatment of contaminated soils began April 2, 1995. On August 9, 1995, Williams completed treatment of soil stored on the waste feed pad. Williams initiated decontamination and demobilization activities on August 10, 1995.

Decontamination and demobilization were completed on September 22, 1995, with the exception of containerized waste remaining on site, pending completion of profiling for treatment or disposal.

Backfilling began September 6, and was completed September 19, 1995.

## 2.2 Modifications to the Order

Table 2-A, although not all inclusive, is a summary of modifications to the Order.

**Table 2–A — Summary of Modifications to the Consent Order**

| Date | Activity |
|---|---|
| November 5, 1993 | • BNRR submitted a Proposed Modification to the Schedule for Soil Treatment in the Order. |
| March 2, 1994 | • BNRR renewed its request for a modification to the soil treatment schedule in the Order. |
| April 20, 1994 | • USEPA issued a letter to BNRR regarding soil treatment schedule modifications, requirements for receiving full USEPA approval of the Work Plans and Notice to Proceed, and comments on the April 14 Soil Treatment Work Plan. |
| April 29, 1994 | • BNRR proposed modifications to the schedule for soil treatment. |
| May 11, 1994 | • BNRR issued a letter to the USEPA notifying USEPA that Williams' TPU III soil treatment unit will not be available for use on the Woods project until early January 1995 and giving notice of *force majeure.* |
| May 18, 1994 | • BNRR submitted details of the *force majeure* describing three potential alternatives and their respective schedules for treatment of soil at the Woods Site. |
| June 15, 1994 | • USEPA issued a letter to BNRR extending the soil treatment schedule until July 15, 1994, and giving BNRR two options for proceeding. |
| June 20, 1994 | • BNRR and USEPA met to discuss the status of the soil treatment project. |
| June 22, 1994 | • BNRR issued a letter to the USEPA confirming an agreement regarding deferral of dispute resolution. |
| June 30, 1994 | • USEPA issued a letter specifying the schedule for future work. |
| July 6, 1994 | • BNRR issued a letter to the USEPA in response to the USEPA's June 30, 1994, letter describing the project schedule and the meeting held on June 20, 1994, between the USEPA and BNRR. |
| July 20, 1994 | • BNRR and USEPA met to discuss the project. |
| July 29, 1994 | • BNRR issued a letter to the USEPA regarding proposed schedule modifications for soil treatment as discussed in the July 20 meeting. |
| August 22, 1994 | • BNRR issued a letter to the USEPA regarding contractor selection, selecting Williams for remediation of the Woods Site. |
| September 7, 1994 | • USEPA issued a revised schedule for completion of soil treatment activities establishing a completion data of June 30, 1995. |
| December 21, 1994 | • USEPA issued a letter regarding the January 15, 1995, date for start-up/ shakedown of the soil treatment unit. |
| January 5, 1995 | • BNRR issued a letter to the USEPA regarding the schedule for soil treatment. |
| June 29, 1995 | • BNRR issued a letter to the USEPA proposing schedule modifications for completion of soil treatment, proposing the Soil Treatment Final Report be submitted to USEPA September 29, 1995. |

# 3 Work Plans and Documents Completed for Soil Treatment Activities

## 3.1 Williams' Soil Treatment Plan

From May 1993 through January 1995, Williams developed the USEPA-approved Thermal Desorption Work Plan under contract with BNRR. Williams was responsible for implementation of the plan. A copy of Williams' Work Plan is included in Appendix E-1. The Work Plan is summarized in the following sections.

**Process Description** — The thermal desorption unit to be operated at the Woods Site (TPU IV) was designed to process feed soils at temperatures between approximately 700 and 1,000 degrees Fahrenheit, volatilizing the hazardous organic constituents in the soil to achieve cleanup objectives established for the site. The process was to include the use of a thermal desorber (rotary dryer) to treat contaminated soils excavated from the site. The off-gas from the desorber was to be treated first in a baghouse to remove particulate matter, then the gas stream from the process was to be treated in a thermal oxidizer followed by a wet scrubber. Treated gasses were to be monitored using a continuous emissions monitoring system and were to be discharged through a stack.

**Feed Processing** — The feed material for this project was to consist of soil that had been previously excavated and stockpiled on site and some soils to be excavated beneath the stockpiles once they were emptied. A significant amount of material handling was to be required.

Material over three inches in size (designated "oversized material" or "cobbles") was to be removed through a screening operation because it could not be handled by the thermal desorption process.

As part of the planning process, this oversized material was characterized to measure the concentration of contamination in the cobbles. Based on this characterization, USEPA and BNRR agreed that the cobbles should be backfilled on site, provided they would be backfilled on clean or treated soil one foot above the season groundwater high; be capped with a foot of clean or treated soil; and be free of clumps of soil (November 4, 1994, letter from the USEPA).

Material passing through the three-inch screen was to be transported by truck from the screen area to the feed material

storage area. From there, a front-end loader was to be used to add the material to the feed metering unit of the thermal desorption process.

**Planned Project Schedule** — Williams estimated that production operations would last approximately 11 weeks, based on continuous-feed operation after successful completion of the performance testing. Prior to treatment of contaminated soil, Williams' scheduled activities included equipment setup, start-up, continuous emissions monitor certification, and performance testing with contaminated soil. After completion of the treatment of contaminated soil, Williams' work schedule included backfilling the site with treated soil and cobbles, decontamination of equipment and the treatment pad, and equipment demobilization.

Williams was to be allowed up to 360 operating hours of processing contaminated soils during the start-up and shakedown period to achieve steady-state conditions in preparation for the upcoming performance test.

**Process Controls** — Williams was to provide instrumentation for process control of feed rates, temperatures, pressures, burner efficiency, and gas stream contents. Instrumentation was to be provided to monitor process conditions, provide data for assuring compliance with regulatory requirements, and to assure appropriate process response, control, operations flexibility, safety interlocks, and shutdown features. Key process parameters which monitored for specific process upsets requiring timely actions were identified in the Work Plan by Williams. Two automatic control actions were provided by Williams to address the most probable upsets, failures or emergencies. These two automatic control actions included vent opening (VO) and automatic waste feed shutoff (AWFSO) actions. The VO control action protects gas train components from high temperature excursions. The major purpose of the AWFSO action was to discontinue processing if conditions are outside acceptable limits for adequate treatment of the soil or gas streams.

**Performance Criteria** — Performance standards identified in the Work Plan included interim operating parameters effective through successful completion of the performance test, cleanup criteria for treated soils, and stack emissions standards. Performance criteria for soil treatment were based on levels of target compounds established as allowable cleanup goals. Soil treatment goals were based on MTCA Residential Method B. Air pollution control equipment was designed to satisfy all Removal Action based criteria. Air emission limits were based on Washington

Administration Code (WAC) Chapter 173-460, Controls for New Sources of Toxic Air Pollutants.

**Performance Test Plan** — A performance test was to be conducted to establish final operating conditions under which the low-temperature thermal desorption (LTTD) system meets all soil treatment and air emissions criteria.

Between completion of the performance test and the time that authorization was received from USEPA for full-scale production, feed restrictions would be imposed to limit the amount of soil that would be processed.

**Sampling Analysis and Monitoring Plan** — One composite sample of treated soil was to be collected each day of production in compliance with USEPA SW-846, *Test Method for Evaluating Solid Waste, Physical/Chemical Methods*. Treated soil samples were to be analyzed for 15 indicator chemicals identified in Table 7.1 of the Work Plan.

The monitoring plan identified operating limits to be used until the performance test. Final operating limits were to be determined based upon performance test results. Key process parameters to be monitored were identified in Table 6.1 of the Work Plan. Events triggering interlock control system were identified in Table 6-2 of the Work Plan.

**Security Plan** — Williams was to be responsible for controlling entry and exit from the facility and monitoring the premises continuously during soil treatment operations. The existing security fence was to be used to control access to the property.

**Mobilization/Demobilization** — Mobilization activities were to begin with construction of a concrete treatment pad to support TPU IV and to contain spills or rain water runoff during operation. After the treatment pad was constructed, Williams was to assemble the thermal desorption system and support equipment. The equipment trailers were to be parked and the interconnecting ductwork and controls constructed.

Demobilization activities, scheduled to occur after confirmation that cleanup criteria for on-site soils were obtained, were to include dismantling trailer interconnections, decontaminating equipment, transporting trailers and support equipment off site, and pressure wasting the treatment pad.

**Dust Control** — Williams was responsible for continuous dust control during the treatment activities. Dust control was to be accomplished by wetting soil piles with water and covering material stockpiles with polyethylene plastic sheeting. Haul roads and other applicable areas were also wetted as necessary to reduce fugitive dust emissions.

**Health and Safety** — Williams prepared a Site-Specific Health and Safety Plan for thermal desorption activities. According to the Work Plan, Williams was to be responsible for implementation of the plan. The plan identified responsibilities of site employees and described safety procedures.

**Project Quality Assurance/Quality Control** — Williams developed a quality control (QA/QC) plan to assure that the proposed work was accomplished according to the requirements of applicable Work Plans and to specify inspection and recordkeeping requirements during production. Williams identified an on-site QA/QC manager responsible for monitoring performance with this plan. Daily production reports and LTTD Round Sheets were to be developed to record daily activities.

**Remedial Action Contingency Plan** — Williams developed a contingency plan that presented requirements for responding to emergencies that could occur during implementation of treatment activities. The plan presented a discussion of emergency recognition and prevention, emergency response procedures, lines of authority, and evacuation procedures that would be implemented in the event of an emergency. Due to the nature of the site remedy for soil, the emergencies that could arise included fires involving the LTTD, and water-related incidents such as spills of wastewater.

## 3.2 AAQIR

On behalf of BNRR, Philip developed the USEPA-approved Ambient Air Quality Impact Report. This report described the impact that treatment of the soil would have on ambient air quality around Yakima. Based on the pollutant concentrations and emission rates modeled to occur during operation of the LTTD unit to treat soil at the Woods Site, the AAQIR concluded that impacts to ambient air quality and to human health and the environment would be within USEPA and Washington Department of Ecology (WDOE) guidelines. A copy of the final AAQIR is included in Appendix E-2.

That report was revised by Philip based on actual data obtained through the performance test. A final AAQIR was issued July 27, 1995. The findings presented in the original AAQIR did not change significantly.

## 3.3 Ambient Air Monitoring Plan

On behalf of BNRR, Philip developed and implemented the USEPA-approved Ambient Air Monitoring Plan. Ambient air monitoring is described in detail in Chapter 7 of this report.

# 4 On-Site Activities Before Soil Treatment

This chapter describes site preparation activities conducted prior to mobilization of the thermal treatment equipment.

## 4.1 Site Preparation and Soil Treatment Equipment Pad Construction

BNRR contracted Ken Leingang Excavating, Inc., (Leingang) to perform equipment pad construction and other site preparation activities according to specifications provided by Williams. The pad was constructed of concrete and included curbs, sumps, and ecology block walls to contain feed material and treated soil. Seams in the concrete were sealed to control liquids. Photographs of the soil treatment pad are in Appendix J. Site preparation was completed December 30, 1994.

## 4.2 Delivery and Assembly of Soil Treatment Unit TPU IV

Once approval of all documents listed in Chapter 3 was received from USEPA, Williams began mobilizing equipment to the Woods Site. Completion of thermal desorption being performed by Williams with TPU IV at another site delayed arrival of the equipment to the Woods Site. Williams began receiving equipment at the site on February 13, 1995. Some equipment deliveries were delayed as a result of weather-related poor road conditions. In addition, some assembly operations were delayed due to rain.

Assembly of TPU IV was completed on March 15, 1995.

## 4.3 Background Ambient Air Monitoring

Philip assembled air monitoring equipment and conducted ambient air monitoring to establish baseline conditions prior to soil treatment operations. Additional details regarding ambient air monitoring are included in Chapter 7 of this report.

## 4.4 Support Office Installation

Philip, on behalf of BNRR, installed an office trailer on site for USEPA and URS Consultants, Inc. (URS). Philip furnished a site

office in the north part of the Akland Building on site. Williams installed its site office in the south part of that building.

# 5 Soil Treatment Unit TPU IV Operation

This chapter describes soil handling and treatment operations. Williams submitted daily reports to URS and Philip documenting the operational activities conducted each day and these reports are included in Appendix F.

## 5.1 Clean Soil Shakedown

After completion of equipment assembly, Williams followed a sequence of start-up/shakedown activities required by the Work Plan.

Williams processed clean soil to identify operational problems with TPU IV and its control systems, and to demonstrate to the USEPA that the unit's AWFSO systems were operating. Clean soil shakedown began on March 19 and was completed on March 27.

## 5.2 Demonstration of AWFSOs

On March 27, 1995, Williams demonstrated that the required AWFSOs were operational. USEPA authorized Williams to begin treating contaminated soil on March 28.

## 5.3 Feed Processing

On March 28, 1995, in preparation for processing pesticide-impacted soils, Williams began screening material from the northern temporary soil storage area. This screening was performed to separate oversized material from the soil to be treated in TPU IV. Details of feed processing are described in Chapter 3. Photographs of screening operations are included in Appendix J.

## 5.4 Treated Soil Handling

During all operations of TPU IV at the Woods Site, treated soil was covered with plastic and stored on the treated soil pad in separate bins for each day of operation, pending receipt of analytical data confirming that treatment levels had been achieved.

Sampling of this treated soil was performed in accordance with the Work Plan.

Analytical results were compared to previously established cleanup goals listed in Table 7.1 of the Work Plan. QA/QC checks were performed by the USEPA.

If analytical results were less than cleanup goals for all target compounds and QA/QC criteria were met, USEPA or URS issued approval for Williams to remove the soil from the treated soil pad. USEPA issued rejection forms if the analytical results were greater than the cleanup goals or if QA/QC criteria were not met. In that case, Williams transported the soil to the feed material pad for reprocessing.

Analytical results for processed soil, along with approval and rejection forms, are included in Appendix G. A soil tracking log is also presented in Appendix G.

## 5.5 Contaminated Soil Shakedown

In a letter dated March 28, 1995, the USEPA granted approval for Williams to start screening contaminated soils and to start processing contaminated soil through TPU IV.

Williams began processing pesticide-impacted soils through TPU IV on April 2, 1995. Shakedown continued until the start of the performance test.

## 5.6 Pre-Performance Test

From April 12 through April 15, Williams, Focus, and York conducted a pre-performance test. Stack sampling was performed similar to the stack testing to be performed during the performance test. Due to schedule restrictions of York, VOST sampling was not performed during the pre-performance test. Results of the pre-performance test were issued to the USEPA. Representatives from USEPA, Weston, and URS observed and provided oversight during the pre-performance test.

## 5.7 Performance Test Operations

Williams conducted a performance test in accordance with the *Performance Test Work Plan* (Focus, 1994) included in Appendix A of the Work Plan. The purpose of the performance test was to demonstrate that treated soil cleanup levels and stack emissions standards would be met by TPU IV during soil treatment

operations. Representatives from USEPA, Weston, and URS observed and provided oversight during the performance test.

Williams conducted three performance test runs required by the Performance Test Work Plan. In a letter dated May 3, 1995, the USEPA required that one of these three runs be performed during a "cold start." This letter is included in Appendix B of this report.

### 5.7.1 Completion of the Performance Test

In accordance with the Work Plan, soils containing much higher concentrations of pesticides than found in typical site soils were processed during this test.

In preparation for the performance test, Williams screened oversized material from the pesticide-impacted soil contained in five rolloff boxes on site. Soils in the rolloff boxes contained significantly higher pesticide concentrations than the typical pesticide-impacted soils contained in the temporary soil storage areas. The oversized material from these five rolloff boxes was placed back in the boxes.

As a result of operational problems with TPU IV, Williams did not complete the performance test as scheduled. Details regarding the testing are included in Williams' daily reports and the weekly reports.

The performance test began May 1, 1995. Testing was discontinued on May 2 due to operational problems with TPU IV. Williams retrofitted the pugmill in an attempt to solve these problems.

The performance testing resumed May 9. Testing was discontinued on May 10 due to operational problems/scrubber demister problems.

Williams did not start up TPU IV again until May 20.

On May 18, USEPA granted Williams 40 additional operating hours prior to Williams' resuming the performance test scheduled for May 25.

USEPA required that Williams operate TPU IV only while URS was on site (12 hours per day).

On May 24, Williams received data from performance test runs conducted May 9 and May 10. USEPA lifted operating restrictions at that time.

The final run of the performance test was completed on May 25.

### 5.7.2 Performance Test Report

Williams issued the Performance Test Report on June 22 for USEPA review.

In a letter dated June 30, 1995, USEPA granted conditional approval for Williams to operate TPU IV at 100 percent capacity (26.7 tons per hour). A copy of this letter, listing the conditions Williams would have to meet to operate TPU IV at 100 percent capacity, is in Appendix B.

### 5.7.3 AAQIR Addendum/Final AAQIR

Philip issued the AAQIR Addendum to the USEPA on June 22, 1995, incorporating results of the performance test into the AAQIR. The USEPA issued comments on the AAQIR Addendum on June 30 and required that a "Final AAQIR" be submitted. The Final AAQIR was submitted on July 27, 1995. The Final AAQIR concluded that, based on measured emission rates, impacts to ambient air quality and to human health and the environment would be within USEPA and WDOE guidelines during soil treatment at the Woods Site.

## 5.8 Post-Performance Test Operations

This section describes soil treatment operations after Williams received USEPA's conditional approval to operate TPU IV at 100-percent capacity. Additional details are included in the weekly status reports (Appendix D) and Williams' daily reports (Appendix F) previously submitted to the USEPA.

Immediately following the performance test, from May 27 through June 2, Williams decided to perform general maintenance rather than operate TPU IV under the 50 percent of maximum capacity feed restriction required by the Work Plan.

On June 1, Williams issued proposed operating limits for TPU-IV at the Woods Site to the USEPA based on the performance test data.

In a letter dated June 2, USEPA approved TPU IV operations of 75 percent of the capacity demonstrated during the performance test, which is 20 tons per hour. Williams resumed treatment operations.

On June 30, 1995, USEPA granted conditional approval for Williams to operate TPU IV at 100 percent capacity (26.7 tons per hour).

Williams continued operating at 75 percent for the duration of the project.

On August 9, 1995, Williams completed treatment of soils remaining on the waste feed pad and began dismantling TPU IV.

## 5.9 Quantity of Soil Treated

The total amount of soil treated was 25,786.88 tons. Appendix G contains a daily summary of soil treated.

# 6 Additional Removal Activities

This chapter describes the types and approximate quantities of materials removed and treated during 1995 on-site activities and the manner in which these materials were handled

## 6.1 Materials Removed

Table 6-A summarizes the types of materials removed, approximate quantities, and their respective treatment or destination. Each type of material handled during 1995 on-site activities is discussed in the following sections.

### 6.1.1 Pesticide-Impacted Soil

Soils impacted with pesticides represent the largest volume of material handled during the 1995 removal action. Williams treated a total of 25,786.88 tons of pesticide-impacted soils. Approximately 2,500 tons of this soil were excavated from below the Northern Temporary Soil Storage Area and approximately 600 tons from below the Southern Temporary Soil Storage Area.

Excavation, preliminary sampling, and verification sampling activities were performed in accordance with the *Soil Removal Work Plan* dated March 17, 1993, and with revisions as noted in a USEPA letter dated May 10, 1995, and Philip/BNRR letters dated May 15 and May 19, 1995.

Preliminary sampling and verification sampling are described in Section 6.3 and Section 6.4, respectively, of this report.

### 6.1.2 Miscellaneous Materials

This section describes the types and quantities of waste other than pesticide-impacted soil handled during 1995 on-site remedial activities.

#### *6.1.2.1 Debris*

**Concrete Debris** — Concrete debris from the building foundation below the former Northern Temporary Soil Storage Area was removed and was disposed of at Chemical Waste Management (CWM) of the Northwest in Arlington, Oregon.

**Table 6–A — Summary of Materials Handled During 1995 On-Site Activities**

| Material Type | Approximate Quantity | Destination* |
|---|---|---|
| **BNRR - WOODS SITE** | | |
| Pesticide-impacted soil | 25,786.88 tons | Treated/backfilled on site |
| Debris | 461 tons | Chemical Waste Management Arlington, Oregon (Profile #1509) |
| Cobbles - screened from the 5 rolloffs that contained the highly concentrated pesticide-impacted soils treated during the performance test | 40 cubic yards | Washed on the soil treatment pad and backfilled on site |
| Water from washing cobbles | 5,000 gallons | Treated with carbon, sampled, and discharged to the sewer (Permit #CY9601) |
| Sediment and Carbon from washing oversized material | Fourteen 55-gallon drums | Treated at Philip's Kent, Washington, Facility (Profile # 144100-00) |
| Former "Akland Sump" Water | 2.75 drums | Sampled and Discharged to sewer (Permit #CY9502) |
| Former "Akland Sump" Sediment | 5-gallon lab pack | Treated at Philip's Kent, Washington, Facility (Profile # 144099-00) |
| 1993 equipment decontamination pad | 15 cubic yards | Sampled and Backfilled on site |
| Misc. drummed water and sediment | 10 gallons | Sampled and mixed with feed soil and treated in the Thermal Desorption Unit |
| **PROCESS-DERIVED WASTE** | | |
| Baghouse bags and PPE | 5,480 pounds | Disposed of at CWM's Arlington, Oregon, "hazardous waste" landfill (Profile #BQ5443) |
| Soil from north haul road cleanup - post operations, soil and sediment from equipment pad cleanup, frac tank sediment, and dust from cleanout of baghouse | 55 tons | Disposed of at CWM's Arlington, Oregon, "hazardous waste" landfill (Profile # BQ5439) |
| Frac tank water | 60,000 gallons | Sampled and discharged over treated soil or into sanitary sewer |
| Spent activated carbon canisters | 27 drums | Regenerated at Westates |

*Profiles, manifests, and certificates of disposal for material treated or disposed of off site are included in Appendix K.

(The visibly contaminated building demolition debris from 1993 building demolition activities had been handled the same way.)

During 1995 approximately 461 tons of debris was transported for final disposal. The majority of the debris consisted of concrete from the building foundation below the former Northern Temporary Soil Storage Area. Other debris consisted of plastic from above and below storage areas, personal protection equipment, and any miscellaneous debris removed during screening to separate oversized material from the soil to be treated.

The debris had previously been profiled for disposal during 1993 removal activities. Copies of the profile, manifests, and certificates of disposal for debris are included in Appendix K-4.

**Tires** — On June 28, tires that had been used to secure covers on the former temporary soil storage areas were transported to the Terrace Heights Landfill tire recycling facility in the Yakima vicinity.

#### *6.1.2.2 Oversized Materials from Soil Treated During Performance Test*

On April 26, Williams screened soils from five rolloff boxes containing pesticide-impacted soils that contained much higher contaminant concentrations than typical site soils. Soils from these rolloff boxes were treated in the performance test. Approximately 40 cubic yards of cobbles were removed during screening of this soil. Because of the higher contaminant concentrations of the soils, these cobbles were placed back into two of the rolloff boxes to be washed at a later date.

Following completion of soil treatment, Olympus Environmental, Inc., (Olympus) washed these cobbles on the soil treatment pad to remove particulate. Following this washing, the cobbles were backfilled on site. The wash water was treated on site with activated carbon, sampled, and discharged to the Yakima Waste Water Treatment Plant under a permit issued by the City of Yakima. The sediment and carbon were treated at Philip's Kent, Washington, facility. Copies of the profile, manifests, and certificate of disposal are included in Appendix K-6.

#### *6.1.2.3 Water and Sediment From Akland Sump*

A concrete sump was located directly south of the Akland Building. The sump's contents (liquid and sediment) had been sampled during

the RI. On June 30, 1993, the sump was cleaned by pressure washing, and the contents were drummed. After cleaning, the sump was filled with sand and sealed with concrete.

In agreement with the City of Yakima and the USEPA, the Akland sump cleanout water was discharged to the sanitary sewer on August 4, 1995, according to a discharge permit from the City (discharge permit included in Appendix K-8).

Sediment from the three drums was consolidated into one drum. The total volume of sediment was approximately four gallons. The sediment was transported to Philip's Kent, Washington, facility for treatment (profile included in Appendix K-5).

#### *6.1.2.4 Former Equipment Decontamination Pad*

An equipment decontamination pad was constructed to support 1993 soil removal activities. However, the equipment pad was not used during 1995 on-site activities and, due to site constraints, the pad was removed and staged south of the Southern Temporary Soil Storage Area.

On July 11, a composite preliminary sample of the former equipment decontamination pad material was collected. Analytical results of this preliminary sample, included in Appendix I-6, indicate concentrations below site cleanup levels. Subsequently, a composite verification sample was collected on July 21, 1995. Analytical results of this verification sample, also included in Appendix I-6, also indicated concentrations below site cleanup levels. As a result, approximately 15 cubic yards of former pad material was backfilled on site.

#### *6.1.2.5 Drummed Water and Sediment*

One drum approximately one-third full of water and some sediment was present on site reportedly from earlier removal activities. On July 12, 1995, a liquid sample was collected to characterize drum contents. Analytical results are included in Appendix M.

On behalf of BNRR, Philip issued a memo to the USEPA presenting the analytical results and summarizing options for treating the material. The USEPA approved of blending the drummed water with soils staged on the waste feed pad to be treated on site.

## 6.2 Process-Derived Waste

This section describes waste generated as a result of the on-site thermal treatment activities and decontamination activities or which could have been treated by the process if the thermal unit was operating.

### 6.2.1 Baghouse-Derived Wastes

This section describes waste derived from decontaminating the baghouse.

**Baghouse Dust** — After the completion of soil treatment operations, dust was removed from the baghouse and sampled. Analytical results indicated contaminant concentrations of the baghouse dust greater than the designated treatment levels. This material was disposed of at CWM's Arlington, Oregon, Subtitle C "hazardous waste" landfill facility under Profile #BQ5439, Appendix K-2.

**Baghouse Bags** — Approximately 700 bags were removed from the baghouse after soil treatment activities. Williams placed these bags with their personal protective equipment for disposal. The bags and the personal protective equipment were disposed at CWM's Arlington, Oregon, Subtitle C "hazardous waste" landfill facility under Profile #BQ5443, Appendix K-1.

### 6.2.2 Waste From Equipment Pad Cleanup

Following completion of soil treatment activities, Williams pressure washed the equipment pad, including the ecology blocks. Williams combined soil from cleaning the treated soil side with the soil generated from the waste feed side of the pad. This material was disposed of at CWM's Arlington, Oregon, Subtitle C "hazardous waste" landfill facility under Profile #BQ5439, Appendix K-2.

### 6.2.3 Soil From North Haul Road Cleanup - Post Operations

As described below in Section 6.4.3, a sample collected from the haul road immediately north of the waste feed side of the pad was above cleanup concentrations.

Williams excavated this 'hot' spot and this material was disposed of at CWM's Arlington, Oregon, Subtitle C "hazardous waste" landfill facility under Profile #BQ5439, Appendix K-2.

### 6.2.4 Frac Tank Sediment

Sediment removed from the frac tanks after completion of Williams' on-site water treatment activities was disposed of at CWM's Arlington, Oregon, Subtitle C "hazardous waste" landfill facility under Profile #BQ5439, Appendix K-2.

### 6.2.5 Decontamination "Frac Tank" Water

As described in Section 12.5 of the Work Plan, decontamination water generated after soil treatment operations was treated on site by activated-carbon adsorption. Following treatment, water generated via decontamination activities was discharged over site soils with EPA approval or discharged to the sanitary sewer in accordance with the terms of a temporary City wastewater discharge permit obtained by Williams.

Wastewater in Frac Tank 3 generated from decontamination activities was treated via carbon filters and sampled. On August 23, Williams received USEPA approval to discharge water from Frac Tank 3 over site soils. Remaining water generated from decontamination activities was treated on site by activated-carbon adsorption and discharged to the sewer.

### 6.2.6 Spent Carbon Adsorption Units

Per the Work Plan, Williams sampled spent carbon units for characterization. Twenty-seven drums of activated carbon were transported off site and regenerated by Westates in accordance with all applicable regulations or disposed of in accordance with all applicable regulations. A waste profile is included in Appendix K-3.

## 6.3 Preliminary Sampling

Approximately 250 preliminary samples were collected and analyzed during 1995 soil removal activities. The objective of preliminary sampling as described in the 1993 *Soil Removal Work Plan* was to direct or guide further excavation.

Preliminary samples were analyzed for the indicator chemicals listed in Table 6-2. If concentrations were below all the indicator chemicals' respective cleanup levels shown in Table 6-2, no further excavation was necessary in that area pending verification sampling.

Preliminary sampling data, sample logs, site sketches of approximate sample locations, and analytical results, are included in Appendix H.

**Table 6–B — Preliminary Sample Indicator Chemical Cleanup Levels**

| Indicator Chemicals | Cleanup Level (mg/kg) |
|---|---|
| p,p'-DDE | 30 |
| p,p'-DDE | 10 |
| p,p'-DDT | 30 |
| Dieldrin | 0.63 |
| Hexachlorobenzene | 40 |

mg/kg Milligrams per kilogram.

## 6.4 Verification Sampling

After preliminary samples indicated that soil remaining in an area which was recently excavated was below the cleanup levels, verification samples were collected and analyzed. Verification sampling provides data to serve as evidence that the site had been cleaned to meet the cleanup criteria.

Verification sampling of the excavations was divided into two areas, the north and south excavation. Verification sampling of these areas is described in the following sections.

Verification samples were also collected on haul roads as described in Section 6.4.3.

### 6.4.1 North Excavation

The north excavation included the area beneath the former Northern Temporary Soil Storage Area shown in Figure 6-1.

Excavation of this area began once Williams removed the majority of the soil from the temporary soil storage area and Olympus removed the building foundation below the storage area.

Olympus began removing portions of the building foundation on May 16, 1995. On May 19, Philip collected three preliminary samples from test pits excavated in accessible portions of the north excavation to assess the depth of contamination and expedite further excavation. Williams completed screening soils from the Northern Temporary Soil Storage Area on June 5, 1995. Olympus

resumed building foundation and soil removal activities on June 19, 1995. Soil was excavated and transported by Olympus to Williams' power screen located near the Southern Temporary Soil Storage Area.

Photographs of excavation activities are included in Appendix J.

As soil removal continued, Philip continued characterizing soils in and around the excavation by collecting 111 preliminary samples (NE-01 through NE-111) to guide excavation and prepare for verification sampling. Preliminary sample data are arranged in chronological order and included in Appendix H.

**Verification Samples** — On July 6 and 7, 1995, 10 verification samples (NV-01 through NV-10) were collected at the sample locations shown in Figure 6-1 in accordance with Section 4 of the *Soil Removal Work Plan*. The sampling grid for this area was approved by the USEPA before sampling began and results were sent to the USEPA.

Results of these samples (included in Appendix I-2) indicated that three of the samples (NV-03, NV-05, and NV-10) exceeded the cleanup criteria.

On July 18, 1995, BNRR received approval from the USEPA to backfill a portion of the North excavation represented by the verification samples that were below cleanup levels.

The areas around NV-03, NV-05, and NV-10 were further characterized by preliminary samples, and additional excavation was performed. On August 2, samples of the new NV-03 and NV-05 areas were recollected, and analytical results were below the cleanup levels.

On August 7, 1995, a sample of the new NV-10 area was collected. Results of this sample showed all parameters below their cleanup levels, with the exception of dieldrin, which was not more than twice its cleanup level, which is allowed by MTCA for a percentage of samples.

On behalf of BNRR, Philip performed a statistical evaluation of the results in accordance with Section 4.1.2 of the *Soil Removal Work Plan* and submitted this evaluation along with the analytical results to the USEPA. Based on this evaluation, the USEPA and BNRR agreed that no further excavation was required, and the USEPA

granted BNRR permission to backfill the entire area. A summary of this evaluation is included in Appendix I-1.

### 6.4.2 South Excavation

The south excavation included the area beneath the former southern temporary soil storage area shown in Figure 6-2. Excavation of this area began as Williams completed removing soil from the storage area.

Williams cleared the southern temporary soil storage area from south to north by removing the bottom liner and excavating approximately four inches of soil from below the liner. Preliminary samples were then collected to evaluate whether additional soil removal was necessary. The first preliminary samples were collected on July 20, 1995. Approximately 127 preliminary samples were collected, as excavation proceeded, from the area below the southern temporary soil storage area between July 20, and August 6, 1995.

**Verification Samples** — On August 7, 1995, 11 verification samples (SV-01 through SV-11) shown in Figure 6-2 were collected from below the former southern temporary soil storage area.

On August 8, 1995, a twelfth verification sample was collected.

Results of these samples (included in Appendix I-3) were all below the cleanup levels, with the exception of DDT in one sample which was less than two times the cleanup level. This is allowed by MTCA for a percentage of samples.

A statistical evaluation of the results was performed according to Section 4.1.2 of the *Soil Removal Work Plan* and is included in Appendix I-1. Based on the statistical evaluation and the analytical results, the USEPA and BNRR agreed that no further excavation was required and that the area could be backfilled.

### 6.4.3 Haul Roads

Prior to completion of the project, roads used for transporting contaminated soil to the waste feed side of the operations pad (haul roads) were sampled to document that they had not been cross-contaminated. The areas used as haul roads were clean prior to soil treatment. BNRR and the USEPA agreed to the protocol for haul

road sampling that is described in a letter from the USEPA to BNRR dated May 10, 1995. This letter is included in Appendix B.

For sampling purposes, haul roads were divided into the northwest haul road (NWHR samples), northeast haul road or north haul road (NEHR or NHR samples), southwest haul road (SWHR samples), and north pad haul road (NPHR samples). The haul roads with approximate locations of the verification samples are shown in Figure 6-1 and Figure 6-2. Not all haul road samples are shown on Figure 6-1 or 6-2 because some samples results exceeded cleanup levels and these areas were subsequently excavated and resampled. Sampling data of all haul road samples are included in Appendix I-4.

**Northwest Haul Road** — The northwest haul road was sampled on May 12, 1995, (NWHR 01, 02, and 03), and analytical results indicated concentrations below the cleanup levels. In Appendix I-4.1, sample identifications WHR 01, 02, and 03 are the same samples as NWHR 01, 02, and 03. On June 6, Philip (on behalf of BNRR) issued a letter requesting permission to backfill the northwest haul road. On June 14, 1995, USEPA issued a letter approving the backfill over the northwest haul road. These letters are included in Appendix B.

**Northeast Haul Road** — Samples NEHR 01, 02, 03, 04, and 05 were collected on June 14. Analytical results showed that Samples NEHR 01 through 04 contained concentrations that exceed the cleanup levels; 05 was below the cleanup levels. Additional excavation was performed from the areas of NEHR 01, 02, and 03 to beyond NEHR 04. Preliminary samples were collected in this excavation and results indicated no further excavation was necessary. On July 3 and July 5, Philip collected Verification Samples NEHR 06 and NEHR 07, respectively, in areas where NEHR 01 through 04 were previously collected. Results included in Appendix I-4.2 indicated that the northeast haul road was clean, and BNRR received verbal approval to backfill the northeast haul road on July 18.

**Southwest Haul Road** — Upon completion of transporting soil from the Southern Temporary Soil Storage Area to the waste feed pad, Williams removed a "lift" of soil from the Southwest Haul Road. Once Williams removed the "lift," Philip collected preliminary samples and results indicated no further excavation was necessary. On August 7, 1995, verification Samples SWHRV 01, 02, 03, and 04 were collected. These sampling locations are shown

in Figure 6-2. Results included in Appendix I-4.3 indicated that the haul road was clean.

**North Haul Road** — Samples NPHRV 01 and 02 were collected on August 8 at locations shown in Figure 6-1. Analytical results (Appendix I-4.4) indicate p,p'-DDT (at the NPHRV 01 location) exceeded cleanup levels with a concentration of 69 milligrams per kilogram. On September 14, Williams excavated the 'hot' spot on the north haul road located immediately north of the waste feed side of the pad. The excavated soil was staged in a rolloff box on site. Philip subsequently collected one composite preliminary sample from the excavation and one preliminary sample on the haul road just north of the excavation as shown in Appendix I-4.4.

Preliminary sample results indicated that the haul road was clean. Philip subsequently collected one verification sample in the excavation.

Williams backfilled the excavation after the verification sample was collected to allow the baghouse to be demobilized from the site.

**Area Beneath the Stacking Conveyor** — Upon completion of soil treatment activities, a relatively small hole in the soil treatment pad was observed directly below the discharge of the treated soil stacking conveyor. The hole was apparently created by abrasion. A sample was collected from within this hole, and analytical results included in Appendix I-5 indicate the area was clean.

# 7 Ambient Air Monitoring

This chapter presents the design, procedures, and findings of the ambient air monitoring program that was performed as part of these soil treatment activities.

## 7.1 Introduction

Before and during on-site soil treatment activities at the Woods Site, Philip monitored, on behalf of BNRR, ambient air for certain contaminants that could be released from the soil being treated. The contaminants monitored were those identified to be either prevalent in the soil to be treated or likely to be detected in ambient air. These contaminants were:

- particulate matter smaller than 10 microns ($PM_{10}$);
- hexachlorobenzene;
- p,p'-DDT;
- dieldrin; and
- mercury.

USEPA and BNRR selected these parameters to be monitored based on the *Ambient Air Quality Impact Report for Soil Treatment, Woods Industries Site, Yakima, Washington* (AAQIR) (Philip, 1995b). Action levels for p,p'-DDT, dieldrin, hexachlorobenzene, and mercury were developed based on a hypothetical exposure scenario for an individual exposure that lasted the entire duration of the project. Philip monitored ambient air for $PM_{10}$ also to evaluate the efficiency of Williams' program to control fugitive emissions.

The ambient air monitoring performed during soil treatment indicated that the overall concentrations of DDT, dieldrin, hexachlorobenzene, and particulate-phase mercury were well below the action levels. The average $PM_{10}$ concentration was also below the action level.

**USEPA Oversight** — USEPA Region X and its contractor, URS, provided oversight for this ambient air monitoring program.

**Ambient Air Monitoring Plan** — This ambient air monitoring program was performed in accordance with the *Ambient Air Monitoring Plan for Soil Treatment Activities, Woods Industries Site, Yakima, Washington* (Philip, 1995a). A copy of the Ambient Air Monitoring Plan is included in Appendix E-3. The draft plan was approved by USEPA Region X on January 31, 1995. The final plan was issued on February 7. Monitoring began on February 14, prior to soil treatment activities. Subsequent

modifications to the plan were approved, before implementation, by USEPA Region X. These modifications are described in Section 7.2.2.

**Site Vicinity** — The Woods Industries Site, as shown in Figure 7–1, Figure 7–2, and Figure 7–3, is located within an urban area in the southeastern part of Yakima, Washington. This area contains industrial, commercial, and residential properties. Properties bordering the site are industrial.

**Monitoring Locations** — Monitoring was performed at six stationary locations on the site perimeter and at two off-site locations. The positions of these locations relative to site features are shown in Figures 7–1 through 7–4.

The site perimeter locations were monitored to document whether Williams was effectively controlling fugitive emissions. Each day, the perimeter locations to be monitored were selected based on the activities planned to occur on site. When Williams was handling soil at either the north or south end of the site, monitoring was performed at that end of the site in accordance with the overall sampling program design described in Section 7.2.1.

Off-site monitoring was performed to confirm that ambient concentrations of site-related parameters were well below the chronic and acute risk levels as predicted in the evaluations of risk to the community that were described in the AAQIR. The ambient air monitoring location east of the site was chosen based on the modeled 24-hour maximum exposed individual presented in the February 1995 AAQIR. The off-site location west of the site was intended to represent: (1) the ambient air conditions an approximately equal distance from the site on the opposite side of the site from the 24-hour maximum exposed individual, (2) the background concentration of the monitored contaminants in the direction predominantly upwind of the site, and (3) conditions adjacent to the nearest residences.

## 7.2 Monitoring Program Design

This section describes the phases, program modifications, meteorological monitoring, monitoring locations, monitoring procedures, analysis procedures, data management, and reporting procedures that were part of this ambient air monitoring program.

### 7.2.1 Monitoring Program Phases

Ambient air was monitored in six phases related to on-site soil treatment. The scope of the monitoring program changed as site operations changed (as described in the plan) and after monitoring

data demonstrated that soil treatment operations were not significantly impacting ambient air quality. These phases are listed in Table 7–A. Changes not included in the plan were each made with the prior approval of USEPA Region X. A summary of the dates, locations monitored, QA samples submitted, and sampling technicians for each monitoring event is presented in Table 7–1.

**Table 7–A — Ambient Air Monitoring Program Phases**

| Monitoring Phase | Parameters Monitored | Sampling Dates | Sampling Frequency | Number of Locations | Number of Monitoring Events* |
|---|---|---|---|---|---|
| **Background Phase** | | | | | |
| 1. Background Monitoring (prior to start of soil treatment operations) | $PM_{10}$, particulate mercury, DDT, dieldrin, and hexachlorobenzene | February 14 to March 11 | 9 days total | 4 perimeter, 2 off site, 1 collocated | 9 |
| **Remedial Action Phase** | | | | | |
| 2. Soil Treatment Period — High-Intensity Monitoring | $PM_{10}$, particulate mercury, DDT, dieldrin, and hexachlorobenzene | March 18 to May 4 | Daily | 4 perimeter, 2 off site, 1 collocated | 42 |
| 3. Soil Treatment Period— Low-Intensity Monitoring (with Mercury Monitoring) | $PM_{10}$, particulate mercury, DDT, dieldrin, and hexachlorobenzene | May 4 to June 21 | Daily | 1 perimeter | 20 |
| | | | Every third day | 4 perimeter, 2 off site | 14 |
| 4. Soil Treatment Period — Low-Intensity Monitoring (without Mercury Monitoring) | $PM_{10}$, DDT, dieldrin, and hexachlorobenzene | June 21 to August 9 | Daily | 1 perimeter | 29 |
| | | | Every third day | 4 perimeter, 2 off site | 14 |
| 5. Treatment Unit Dismantling Operations Monitoring | $PM_{10}$ | August 10–31 | Daily | 1 perimeter | 13 |
| 6. Backfilling Operations Monitoring | $PM_{10}$ | September 1–15 | Every third day of site operations | 1 to 5 perimeter | 4 |

* Excluding monitoring events when samples were not submitted to the laboratory because the soil treatment unit was not operating, power failure halted all samplers, or other reason.

**Post-Remedial Action Ambient Air Monitoring** — Ambient air monitoring was not performed after soil treatment and backfilling operations were complete, with approval from USEPA Region X,

because ambient air was demonstrated to have not been significantly impacted by the soil treatment operations.

### 7.2.2 Modifications to Ambient Air Monitoring Plan

Modifications made to the Ambient Air Monitoring Plan during soil treatment activities are listed in Table 7–B. These modifications were implemented once monitoring demonstrated that operation of TPU IV was not significantly impacting ambient air quality.

**Table 7–B — Modifications to the AAMP During Soil Treatment**

| Modification | Date Approved | Date Implemented |
|---|---|---|
| USEPA approved performing the initial audit of the meteorological station by operating collocated meteorological sensors for a 20-hour period. | February 2 | February 15–17 |
| USEPA approved sampling on a reduced frequency. | May 3 | May 4 |
| USEPA approved discontinuation of analyzing $PM_{10}$ filters for particulate mercury. | May 3 | June 21 |
| BNRR indicated that sampling for mercury vapor was unfeasible using the existing procedures and requested USEPA identify an alternate sampling procedure. | USEPA did not identify an alternate procedure. | June 21 |
| USEPA approved sampling every third day for only $PM_{10}$ during thermal treatment unit dismantling and site backfilling activities. | August 10 | August 10 |
| USEPA approved elimination of post-remediation phase ambient air monitoring. | September 15 | September 15 |

### 7.2.3 Meteorological Monitoring

This section describes the procedures used to collect meteorological data during this program. Meteorological conditions during soil treatment activities are described in Section 7.4.

During these monitoring activities, weather conditions were recorded using an on-site meteorological station. The ambient air temperature, wind speed, wind direction, relative humidity, and barometric pressure were recorded hourly. Precipitation records (and, when unobtainable using the on-site station, meteorological data) were obtained from the National Weather Service station that is less than two miles from the site. Photographs of the on-site meteorological station are presented in Appendix J.

Barometric pressure and relative humidity were measured approximately 1.5 meters above ground. Horizontal wind speed, horizontal wind direction, and temperature sensors were installed on the 10-meter tower installed at monitoring location A12. A naturally aspirated shield was used to protect the temperature sensor from solar radiation. These sensors were selected to met the specifications listed in Table 7–C.

**Table 7–C — Meteorological Sensor Specifications**

| Sensor | Instrument | Specification | |
|---|---|---|---|
| Wind Speed | Met One 010C | Accuracy | 0.15 mph or ± 1.0% of true wind speed (whichever is greater) |
| | | Threshold | 0.5 mph |
| | | Range | 0 to 125 mph |
| Wind Direction | Met One 020C | Accuracy | ±3° |
| | | Threshold | 0.5 mph |
| | | Range | 0 to 360° |
| Temperature | Met One 083C-1-35 | Accuracy | ±0.27°F |
| | | Range | –22° to +122°F |
| Barometric Pressure | Met One 090D | Accuracy | ±0.04 in. Hg |
| Relative Humidity | Met One 083C-1-35 | Accuracy | ±3% |
| | | Range | 0 to 100% |

A Model 457 data logger from Met One Instruments (Met One) of Grants Pass, Oregon, calculated one-hour averages for meteorological readings taken every 10 seconds. Philip used MicroMet Report® software from Met One to download the one-hour average data via radio link (or cable connection when necessary) to a computer on site. Data for the entire day was compiled in an electronic spreadsheet.

Data from this spreadsheet for the hours most closely matching the monitoring event sampling period was exported to the "Event Calculation and Summary" spreadsheet. These hourly average values were used to calculate the reported average, maximum, and minimum values.

### 7.2.4 Ambient Air Monitoring Locations

The monitored locations are listed in Table 7–D and are shown in Figure 7–4. Photographs of the monitoring locations are in Appendix J.

Monitoring location A12, which is also the location of the on-site meteorology station, was placed on the opposite side of Washington Central Railroad's railroad tracks from the site due to space limitations during soil treatment. Nearly every part of the Woods Site was occupied by a building, the treatment unit, or a storage pile; was used as a haul road; or was backfilled during the soil treatment activities. On the west perimeter of the site, there was no space for installation of the ambient air monitoring location between the feed material storage pile at the fenceline and the railroad tracks. The north and south perimeter locations on the west perimeter were installed at locations just outside the site fence between the site and the railroad tracks.

Security fences were installed around the off-site and west perimeter monitoring locations. The east perimeter monitoring locations were inside the site fence.

**Table 7–D — Ambient Air Monitoring Locations**

| Location Designation | Location Description | Reason for Selection of Location | Other Uses |
|---|---|---|---|
| A11 | East Perimeter, Center of Site | Adjacent to Treated Soil Storage Area for Treatment Unit | Continuous $PM_{10}$ monitor |
| A12 | West Perimeter, Center of Site | Adjacent to Untreated Soil Storage for Treatment Unit | Meteorology Station |
| A13 | East Perimeter, North End of Site | Adjacent to North Temporary Soil Storage Area | — |
| A14 | West Perimeter, North End of Site | Adjacent to North Temporary Soil Storage Area | — |
| A15 | East Perimeter, South End of Site | Adjacent to South Temporary Soil Storage Area | — |
| A16 | West Perimeter, South End of Site | Adjacent to South Temporary Soil Storage Area | — |
| A21 | Off Site, East of Site | Modeled 24-Hour Maximum-Exposed Individual | — |
| A22 | Off Site, West of Site | Opposite Side of Site from Modeled 24-Hour Maximum-Exposed Individual, Predominantly Upwind of Site, and Nearest Residence | — |

| Quality Assurance Location Numbers | |
|---|---|
| A61 | Collocated Sampler at same location as A11 (East Perimeter, Center of Site) |
| A62 | Field Blank |
| A63 | Trip Blank |

### 7.2.5 Ambient Air Sampling Methods

Ambient air was sampled and analyzed using the procedures described in the *Ambient Air Monitoring Plan* (Philip, 1995a). These procedures are briefly described in this section.

Samples were collected by Philip personnel using stationary samplers installed at the monitoring locations. The samplers were calibrated at the monitoring locations using procedures and equipment supplied by the instrument manufacturers. The stationary samplers were operated by 120-volt electric power.

#### *7.2.5.1 Particulate Matter*

Particulate matter was measured by three methods: reference method $PM_{10}$, DataRAM real-time monitor, and portable real-time total particulate monitor.

**$PM_{10}$** was monitored by USEPA reference method 40 CFR 50, Appendix J, using Graseby Anderson High Volume $PM_{10}$ samplers. In this method, air passes through a particle size separator before being drawn through the filter at a rate of approximately 40 cubic feet per minute ($ft^3$/min). These samplers had mass flow controllers to maintain the desired sampling rate. These samplers were calibrated and operated in accordance with the manufacturer's instructions using a variable orifice high-volume calibrator.

The $PM_{10}$ samplers were installed permanently throughout the soil treatment activities at the eight monitoring locations. A collocated sampler was installed at monitoring location A11.

**Real-time $PM_{10}$** monitoring was performed by Philip at monitoring location A11 using a MIE DataRAM Real-time Aerosol Monitor. This instrument was calibrated and operated in accordance with the manufacturer's instructions. This instrument was equipped with a Model DR-PM10/2.5 Size-Selective Inlet set to measure $PM_{10}$

concentrations. An ARM-1 Alarm/Relay Module was wired directly to the instrument to notify Williams personnel in the control room when the 15-minute average concentrations exceeded 150 µg/L. An alarm was also installed in the Philip office on site to notify Philip personnel when the 10-second average concentration exceeded the action level. A inlet heater was connected to the unit to allow operation in cool and wet weather. The instrument has an internal pump that maintains the required flow rate.

The DataRAM contains an integral data logger that was set to record hourly averages. The data was downloaded via radio link (or cable connection when necessary) to the on-site computer in the Philip site office.

This instrument was operated continuously throughout the monitoring period, except when being calibrated or serviced. The instrument malfunctioned and had to be sent to the manufacturer for repair on one occasion. Another, identical instrument was substituted during the repair period.

**MiniRAM** — A portable total particulate meter (MIE MiniRAM Model PDM-3) was used by Philip during initial start-up of TPU IV to assist Williams, USEPA, and URS in identifying potential sources of emissions from site activities. This instrument was calibrated and operated in accordance with the manufacturer's instructions. This instrument was battery powered. The data was used by the site personnel on a daily basis during unit start-up and were not tabulated. Sketches of monitoring data were recorded during monitoring operations.

#### *7.2.5.2 Mercury*

Two forms of mercury were monitored during soil treatment operations: particulate and vapor.

**Particulate Mercury** — The $PM_{10}$ filters collected using the reference method described in Section 7.2.5.1 were analyzed for particulate mercury in accordance with the procedures described by USEPA in *Guidelines for PM-10 Sampling and Analysis Applicable at Receptor Modeling* (EPA-452/R-94-009).

**Mercury Vapor** — Philip monitored mercury vapor by adaptation of two industrial hygiene sampling methods to perform this ambient air monitoring.

The first sampling method was the use of gold coil dosimeters and a Model 431-X Mercury Vapor Analyzer from Jerome Instruments. This method involved drawing air through a pair of dosimeters connected in series to a low-flow industrial hygiene sampling pump (Gilian LFS-113 Low-Flow Air Sampler). A Gilian Gilibrator with an appropriately sized flow cell was used to calibrate these pumps.

A very low sampling rate (approximately 4 cubic centimeters per minute) was necessary to prevent the dosimeters from being potentially overloaded because of the longer-than-normal sampling duration for these samplers. The dosimeters were analyzed on site by Philip's air monitoring technician.

In addition, passive dosimeters designed for industrial hygiene sampling were exposed for 24 hours at the site on a few occasions to evaluate the accuracy of the Jerome method. These samplers were submitted to Ross for analysis.

#### *7.2.5.3 DDT, Dieldrin, and Hexachlorobenzene*

USEPA Method TO-10 was used to sample for these three organic compounds. Polyurethane foam plugs connected to low-flow pumps (Gilian Model AirCon-2 or similar) were used to collect these samples. Air was drawn through the sample media at a rate of approximately 4 liters per minute. A collocated sampler was installed at monitoring location A11.

A Gilian Gilibrator with an appropriately sized flow cell was used to calibrate these pumps on site.

### 7.2.6 Laboratory Analysis

Philip shipped the $PM_{10}$ filters and TO-10 foam plugs for the collected samples and associated field and trip blanks via overnight delivery service to the laboratory. The samples were analyzed by Ross Analytical Services, Inc., (Ross) of Strongsville, Ohio, in accordance with the work plan.

### 7.2.7 Data Management

Field data was recorded by the Philip sampling technician on "Event Record" forms.

Field data from this sheet was entered into the "Event Calculation and Summary" electronic spreadsheet by Philip's data clerk on site. Once laboratory data was received, the results were entered into the spreadsheet and the "Preliminary Event Summary" was printed.

Philip's QA reviewer for this project evaluated the accuracy of data entry in the "Preliminary Event Summary" and performed a quality assurance review of the laboratory report for the event. Once this review was complete, the event records were updated as necessary to create the "Final Event Summary." Copies of the "Final Event Summary" for each event are in Appendix S of this report.

Once calculations for an event were final, data was entered into the spreadsheet/database containing test results for each monitoring event. These spreadsheets were used to compile the tables and graphs in this chapter.

### 7.2.8 Reporting

Upon being calculated, a copy of the "Preliminary Event Summary" was provided to Philip's on-site supervisor, URS, and Philip's QA Reviewer. Monitoring results that exceeded action levels were brought to the attention of URS and Williams by Philip's on-site supervisor.

Shortly after soil treatment began, Philip, USEPA Region X, and Yakima County met with concerned citizens working at nearby facilities of Hansen Fruit Company and McGuire Lumber. Some individuals at those facilities feared that soil treatment operations were affecting their health. In that meeting, USEPA provided these groups with copies of test results available through that date. A copy of this information is in Appendix B.

Preliminary summary tables containing ambient air monitoring data were submitted to USEPA as requested to support BNRR's requests for modifications in the scope of the sampling program. Copies of these preliminary submittals are in Appendix B.

## 7.3 Quality Assurance

Quality assurance audits were performed as described in the Ambient Air Monitoring Plan (Philip, 1995a).

**Meteorological Station** — The meteorological station was installed, calibrated, and audited by experienced meteorological equipment installers and auditors independent of the personnel operating the equipment. These calibrations and audits were performed using NIST-traceable standards. Copies of the reports from these calibrations and audits are presented in Appendix N-1.

In early February, the meteorology station was installed, aligned, programmed, and tested by representatives of Met One, the manufacturer of the meteorological monitoring equipment.

On February 15–17, 1995, Mr. Thomas D. Russell of Weston, Oregon, performed the start-up audit of the meteorological station. This start-up audit was performed using collocated equipment, as authorized on Page 8-25 of the USEPA Document *On Site Meteorological Program Guidance for Regulatory Modeling Applications* (EPA-450/4-87-013) (Revised February 1993 edition). All parameters were well within the required criteria and the system performance was indicated to be acceptable.

Because the system remained in operation longer than the four months planned during development of the Ambient Air Monitoring Plan, a quarterly calibration/audit was performed in the fourth month of system operation. Calibration data is presented in Appendix P for the $PM_{10}$ samplers. On May 12, 1995, a quarterly calibration of the meteorological station was performed by Mr. Gary Wentz of Walla Walla, Washington. All parameters were well within the required criteria and the system performance was indicated to be acceptable.

On September 22, 1995, the final audit of the meteorological station was performed by Mr. Gary Wentz. All parameters were well within the required criteria and the system performance was indicated to be acceptable.

**Ambient Air Sampling** — The $PM_{10}$ sampling program was audited by Mr. Gary Wentz on February 23, February 26, and June 21. Copies of the reports from these audits are presented in Appendix N-2. The samplers were performing acceptably following the first audit.

Collocated samplers were operated at monitoring locations A11 and A61 during selected monitoring events. Analytical results for the collocated (duplicate) samples were generally comparable to one another. The analytical results for these collocated samples are presented in Tables 7-2, 7-3, 7-4, 7-5, and 7-6 for $PM_{10}$, particulate mercury, DDT, dieldrin, and hexachlorobenzene, respectively.

**Ambient Air Analytical Data** — Quality assurance samples (field blanks, trip blanks, and collocated samples) were submitted to Ross for analysis with the samples. These samples were submitted daily at the beginning of the ambient air monitoring program, then at random intervals until the end of the program. These samples are listed in Table 7-7. On no occasion was a significant amount of the analyte detected on the field or trip blank samples, as shown in the analysis reports presented in Appendix Q.

Ross evaluated the sample analysis data before sending the individual analysis reports to Philip. In some cases, Ross added flags to the analytical results to indicate qualifications on the precision or accuracy of the data.

Philip reviewed the analysis reports to evaluate whether additional flags should be applied to the data. Two sets of $PM_{10}$ samples (R-9 and R-11) were found to have become wet during shipment. These analysis results were rejected. Additional qualifiers were also added when appropriate. Copies of Philip's QA review memos are attached to the analytical data presented in Appendix Q.

## 7.4 Meteorological Conditions During Soil Treatment

Weather in Yakima became drier and warmer as soil treatment activities progressed. The graphs in Figure 7–5 illustrate the weather conditions monitored during these events.

As shown in these graphs, which are based on hourly averages, relative humidity varied greatly through the day. Dew was observed to be present in Yakima most mornings. Barometric pressure was generally stable through the day, except when storm fronts moved through the area. Temperature variation through the day was generally 20 to 30°F, but on one occasion was less than 10°F. Wind speed was generally less than 10 miles per hour (mph), but the maximum hourly average exceeded 20 mph on several occasions, and 50 mph on one occasion (Event R-80 on June 21).

Background air monitoring was performed in February and March, the coolest and wettest period monitored. Cooler, wetter weather would tend to keep contaminants from becoming airborne. Rainfall during the monitoring program is graphed in Figure 7–6 and tabulated in Table 7–8. As shown in this graph, precipitation generally occurred on a few consecutive days scattered between a longer interval of precipitation-free days. Rainfall within a single day did not exceeded 0.8 inch. Soil in Yakima is generally sandy and dries quickly once the rain stops.

Wind directions were generally from the west during the soil treatment activities, but varied throughout the day. For the duration of soil

treatment, the wind was most frequently from between the west and the north-northwest as shown in Figure 7–7. The wind was least frequently from the east-northeast.

## 7.5 Ambient Air Monitoring Results

This section is a presentation of all ambient air monitoring data collected related to soil treatment at the Woods Site.

Monitoring results were not adjusted to account for the contribution of upwind sources to the concentrations measured downwind of the site. Wind conditions were not stable enough during the 24-hour monitoring events to consistently identify which locations were upwind and downwind of the site.

### 7.5.1 Particulate Matter

Particulate matter concentrations were measured by three methods during soil treatment: USEPA reference method $PM_{10}$, DataRAM (a continuous, real-time instrument), and MiniRAM (a portable monitoring device). The first two of these methods were used to measure 24-hour time-weighted average concentrations. The MiniRAM was used to monitor short-term fugitive emissions adjacent to work zones.

#### *7.5.1.1 Reference Method $PM_{10}$*

The concentrations of particulate matter smaller than $PM_{10}$ measured for this soil treatment program are presented in Table 7-9 and graphed in Figure 7–8.

The $PM_{10}$ concentration in ambient air varied across the site. Concentrations were generally highest at monitoring location A11, which was adjacent to the treated soil stockpiles on the east fenceline near the center of the site. The action level of 150 $\mu g/m^3$ was exceeded on 19 occasions during soil treatment air monitoring, usually at location A11. These exceedances were usually on non-consecutive days.

Monitoring location A11, as shown in Photograph 7–1, was located in the midst of constant soil handling activities. The Woods Site was too small to allow a buffer zone to be left between the material handling operations and the site perimeter. Monitoring location A11 was selected as a worst-case representation of emissions from the soil

treatment unit. Emissions at that location do not represent the entire site.

**Photograph 7-1 — Monitoring Location A11**


As shown in the graphs in Figure 7–8, the concentration of $PM_{10}$ at the north end of the site (monitoring locations A13 and A14) remained less than the action level during all monitoring events.

The highest concentration measured (a 24-hour time-weighted average during monitoring event R-91 on July 2) was 441.9 micrograms per cubic meter ($\mu g/m^3$). Williams was operating TPU IV that day, immediately prior to the holiday shutdown for Independence Day.

The average concentration on the perimeter of the site was lower during remedial action monitoring than during background monitoring, except at location A11. The

average concentrations at the off-site locations were also lower during remedial action monitoring than during background monitoring.

In addition, average concentrations east of the site were higher than the average concentrations west of the site. Non-site-related traffic east of the site on gravel roads and on King Street are much higher than traffic levels on the west side of the site.

The City of Yakima is a non-attainment area for $PM_{10}$. Other sources of $PM_{10}$ in the area include the windblown soil from the semiarid land surrounding the city; smoke from smudge pots used to warm orchards in cold weather; smoke from wood fires used for residential heating; smoke from agricultural and wildfires in nearby forests, grasslands, and farming areas; dust and particulate emissions from vehicular traffic; and other sources.

During periods of high wind, the concentration of $PM_{10}$ increased because of the small particles picked up by the wind.

Williams operated a sprinkler system in areas where soil was handled to control fugitive dust emissions. This system was operated whenever Williams believed that fugitive emissions would be a problem. Philip and URS provided Williams with feedback when measured concentrations of $PM_{10}$ exceeded or approached the action level, to assist Williams in making this evaluation.

In addition, the treatment unit (TPU IV) included emission control devices to limit the amount of dust released from the stack. Williams operated a continuous emission monitor (CEM) to measure the opacity of the stack gas emissions. That CEM would automatically shut off the treatment unit if the opacity exceeded the limit established by USEPA Region X.

During the first days of TPU IV operation, occasional "puffs" of dust would be emitted from the discharge auger and the pugmill. The hood on the pugmill was modified on May 4 by Williams to solve this problem.

During the performance test while Williams was operating TPU IV at maximum capacity, the mist eliminators in the

stack became overloaded. Because of this, droplets of wet dirt began raining from the stack onto the site and nearby businesses on May 10. Williams provided free washes for affected vehicles parked at these nearby businesses to remove the dirt. Williams cleaned the water treatment equipment and the mist eliminators to stop these emissions. The scrubber demisters were subsequently replaced.

A small intermittent escape of dust was observed near the connection between the rotary dryer and the Dobson collar in late July. Williams installed a water spraying system at the location of this fugitive dust emission point to knock down the dust before it could be released off site. A dust collection hood was installed at this location, but had to be removed because of the heat. No noticeable change in the $PM_{10}$, DDT, dieldrin, and hexachlorobenzene concentrations was detected at nearby monitoring stations, particularly A11.

During backfilling operations performed after soil treatment was complete, Leingang used sprinkler systems and a water truck to control fugitive dust emissions.

#### *7.5.1.2 DataRAM*

Monitoring data recorded by the DataRAM at monitoring location A11 is presented in Table 7–10. This instrument was equipped with a size-selective inlet designed to allow measurement of $PM_{10}$ concentrations. As shown in the graph in Figure 7–9, the particulate matter concentration varied through the day.

As shown in the graph in Figure 7–10, the correlation between this real-time analyzer and the reference method was much less than desired. The readings from this instrument were of limited value in predicting ambient air concentrations and assisting Williams to decide when to operate the sprinkler system to control fugitive dust emissions.

#### *7.5.1.3 Portable Instrument (MiniRAM)*

The portable total particulate meter (MIE MiniRAM Model PDM-3) was used by Philip during initial start-up of TPU IV to assist Williams, USEPA, and URS in identifying potential sources of fugitive emissions from site activities.

Data from this instrument was used by the site personnel on a daily basis during unit start-up and were not tabulated.

### 7.5.2 Mercury

Mercury was monitored in the particulate and vapor phases by separate methods as described in the following subsections.

#### *7.5.2.1 Particulate Phase Mercury*

Particulate phase mercury was monitored by analyzing the $PM_{10}$ filters in the laboratory. Particulate phase mercury concentrations were much less than the action level of 0.3 $\mu g/m^3$. In fact, the concentration of particulate phase mercury was generally less than the detection limit (which was usually around 0.0003 $\mu g/m^3$). The highest detected concentration of particulate phase mercury in the $PM_{10}$ filters was 0.00084 $\mu g/m^3$. The particulate mercury monitoring results are presented in Table 7–11 and are graphed in Figure 7–11.

This method is not believed to be a precise measure of mercury concentrations in air because mercury is volatile.

Once mercury concentrations measured by this method were demonstrated to be well below the action level, analysis of the $PM_{10}$ filters for mercury was discontinued as approved by USEPA. (Correspondence regarding this approval is in Appendix B.)

#### *7.5.2.2 Vapor Phase Mercury*

Mercury vapor could not be accurately measured using the methods identified for this program.

Philip used the method involving gold-coil dosimeters, low-flow personal pumps, and a Jerome mercury vapor analyzer to collect mercury vapor samples during approximately 40 monitoring events. This equipment is normally used in industrial hygiene studies to measure 8-hour time-weighted average concentrations in a stable environment, rather than the 24-hour averages in widely variable outdoor conditions required for this program. The method was found to be unreliable for collecting 24-hour results and the analytical results were discarded as invalid.

Philip also used passive dosimeters to measure the mercury vapor concentration on a few occasions. These are also normally used to measure 8-hour average concentration and could not reliably achieve the necessary detection limit. These results were also discarded as unreliable.

### 7.5.3 DDT

The DDT concentration remained well below the action level of 3.25 $\mu g/m^3$ at all monitoring locations throughout the soil treatment activities. The concentration was generally less than the detection limit, which was usually about 0.029 $\mu g/m^3$. The highest concentration was 0.158 $\mu g/m^3$ at monitoring location A16 on June 8 (Event R-67), adjacent to the south stockpile. This was shortly after the beginning of soil removal from that end of the site. The DDT monitoring results are presented in Table 7–12 and are graphed in Figure 7–12.

### 7.5.4 Dieldrin

Dieldrin concentrations remained well below the action level of 0.0691 $\mu g/m^3$ during all but four monitoring events (R-42, R-58, R-61, and R-62). Soil from the "hot" soil in the rolloff boxes was first screened during Event R-42, in preparation for the performance tests that began the next day. During these monitoring events, only the sampler at monitoring location A11 exceeded the action level. Generally, the dieldrin concentration was less than the detection limit. The dieldrin monitoring results are presented in Table 7–13 and are graphed in Figure 7–13.

### 7.5.5 Hexachlorobenzene

The hexachlorobenzene concentration remained below the action level of 0.726 $\mu g/m^3$ during all but one monitoring event (R-98). During this July 8 event, the concentration of hexachlorobenzene was 1.458 $\mu g/m^3$ at monitoring location A16 (west perimeter at south end of the site). The hexachlorobenzene monitoring results are presented in Table 7–14 and are graphed in Figure 7–14.

Unlike DDT and dieldrin, hexachlorobenzene was detectable in many samples. Beginning with event R-12, hexachlorobenzene was detectable at one or more monitoring location in most monitoring events until sampling for hexachlorobenzene was discontinued on August 9.

The concentration of hexachlorobenzene was generally higher during soil treatment than during background monitoring. The average concentration at monitoring location A13 (the location of the highest hexachlorobenzene concentrations) during soil treatment was 0.14 $\mu g/m^3$, which is below the action level of 0.726 $\mu g/m^3$.

### 7.5.6 Summary of Ambient Air Monitoring Results

Average $PM_{10}$, particulate mercury, DDT, dieldrin, and hexachlorobenzene concentrations were less than the action level. A few scattered excursions beyond the action levels were detected for $PM_{10}$, dieldrin, and hexachlorobenzene. Of the organic parameters, only hexachlorobenzene was routinely detected in ambient air. None of the monitored parameters exceeded action levels at the off-site locations (A21 and A22). The average concentrations during each phase of the monitoring program are listed in the following table.

The overall average concentrations of DDT, dieldrin, and hexachlorobenzene were well below the action levels identified in the AAQIR for exposure that lasted the entire duration of the soil treatment activities. In addition, all measured concentrations of these contaminants were below action levels at the two off-site monitoring locations (A21 and A22) during all events.

**Table 7–E — Concentrations of Monitored Parameters**

| Monitoring Phase | | Average 24-Hour Concentration ($\mu g/m^3$) Calculated from Every Monitored Location | | | | |
|---|---|---|---|---|---|---|
| | | $PM_{10}$ | Particulate Mercury | DDT | Dieldrin | Hexachloro-benzene |
| Action Level | | 150 | 0.3 | 3.25 | 0.0691 | 0.726 |
| 1. Background Monitoring | Maximum | 93.0 | <0.00035 | <0.043 | <0.043 | <0.021 |
| | Average | 32.6 | <0.00028 | <0.030 | <0.030 | <0.015 |
| | Minimum | 10.6 | <0.00021 | <0.023 | <0.023 | <0.012 |
| | Detections | 54 | 0 | 0 | 0 | 1 |
| | Results | 54 | 54 | 49 | 49 | 49 |
| 2. Soil Treatment Period — High Intensity Monitoring | Maximum | 214.7 | <0.00042 | <0.097 | 0.139 | 0.610 |
| | Average | 33.4 | <0.00030 | <0.032 | <0.032 | <0.047 |
| | Minimum | 3.7 | <0.00014 | <0.014 | <0.006 | <0.007 |
| | Detections | 236 | 2 | 6 | 1 | 90 |
| | Results | 236 | 236 | 221 | 221 | 221 |

| Monitoring Phase | | Average 24-Hour Concentration (µg/m³) Calculated from Every Monitored Location | | | | |
|---|---|---|---|---|---|---|
| | | $PM_{10}$ | Particulate Mercury | DDT | Dieldrin | Hexachloro-benzene |
| **Action Level** | | **150** | **0.3** | **3.25** | **0.0691** | **0.726** |
| 3. Soil Treatment Period — Low Intensity Monitoring (with Mercury Monitoring) | Maximum | 262.6 | <0.00062 | <0.174 | <0.174 | 0.591 |
| | Average | 42.9 | <0.00031 | <0.032 | <0.033 | <0.097 |
| | Minimum | 3.6 | <0.00004 | <0.018 | <0.018 | <0.010 |
| | Detections | 110 | 9 | 11 | 7 | 71 |
| | Results | 110 | 96 | 108 | 108 | 108 |
| 4. Soil Treatment Period — Low-Intensity Monitoring (without Mercury Monitoring) | Maximum | 441.9 | — | 0.091 | 0.046 | 1.458 |
| | Average | 75.3 | — | <0.026 | <0.023 | <0.100 |
| | Minimum | 9.2 | — | <0.010 | <0.015 | <0.009 |
| | Detections | 134 | — | 15 | 2 | 71 |
| | Results | 134 | 0 | 109 | 109 | 108 |
| 5. Treatment Unit Dismantling Operations Monitoring | Maximum | 350.0 | — | — | — | — |
| | Average | 95.8 | — | — | — | — |
| | Minimum | 17.1 | — | — | — | — |
| | Detections | 13 | — | — | — | — |
| | Results | 13 | 0 | 0 | 0 | 0 |
| 6. Soil Backfilling Operations Monitoring | Maximum | 132.0 | — | — | — | — |
| | Average | 49.3 | — | — | — | — |
| | Minimum | 11.6 | — | — | — | — |
| | Detections | 16 | — | — | — | — |
| | Results | 16 | 0 | 0 | 0 | 0 |
| Overall for Entire Soil Treatment Activities | Maximum | 441.9 | 0.00062 | <0.174 | <0.174 | 1.458 |
| | Average | 47.0 | <0.00030 | <0.030 | <0.030 | <0.066 |
| | Minimum | 3.6 | <0.00004 | <0.010 | <0.006 | <0.007 |
| | Detections | 563 | 11 | 32 | 10 | 233 |
| | Results | 563 | 386 | 487 | 487 | 486 |

# 8 On-Site Activities After Soil Treatment

## 8.1 Disassembly, Decontamination, and Demobilization of TPU IV

On August 9, 1995, William's completed treatment of pesticide-impacted soil staged on the waste feed treatment pad. After treating the contaminated soil, Williams processed soil from the treated soil storage area for one hour at operating temperature through the treatment unit. Williams began the process of decontaminating and disassembling the equipment on August 10, 1995.

Williams began decontamination activities prior to receiving USEPA acceptance of the verification samples collected from soil excavation activities and approval to backfill treated soil from Storage Bin 3 on the treated soil pad.

Conveying equipment associated with the treatment unit was pressure washed and disconnected. Miscellaneous equipment and the piping system were removed from the treatment pad area. Treated soil, after approval by USEPA, was removed from the treatment pad, and the ecology blocks used to divide the soil staging areas were moved to provide access for transport trucks.

Decontamination of the equipment consisted of pressure washing and removal of remaining residual dust. Interconnecting PVC piping and control wiring were removed and washed prior to loading on trucks for transport or off-site disposal. The USEPA requested Williams to remove residual dust from the baghouse augers and dispose of that material with the dust removed during pulsing operations and other decontamination activities as described in Chapter 6 of this report. Williams decided also to remove the bags from the baghouse and pressure wash the inside of the unit.

Williams removed the bags and cages from the baghouse and placed them on plastic on the waste feed soil side of the treatment pad. The bags were later removed from the cages and placed in a rolloff box for disposal as described in Chapter 6 of this report. Cages that were damaged were placed with the bags; undamaged cages were returned to the baghouse.

The treatment pad was divided into two areas for purposes of separating waste. Soil collected from the treated soil area was separated from the waste feed soil area (including soils and debris

from around the treatment units). Dust removed from the baghouse or soils that came in contact with the dust was handled along with soil from pressure washing the waste feed side of the treatment pad. Dust and soils were washed toward the sump areas of the pad and either shoveled directly into drums or placed on plastic with a bobcat loader and transferred to drums later.

Ecology blocks were pressure washed near the sump areas on the side of the treatment pad where they had been used. The washed blocks were stacked on the pressure-washed treatment pad along the concrete curb. Material generated during block-washing activities was washed toward the sump areas and drummed.

Water generated during pad decontamination activities was collected at sump areas on the pad and pumped to a Baker tank. The water was filtered, passed through granular-activated carbon drums, and pumped into a second Baker tank. Water samples were collected and analyzed from this second tank and, upon approval of the USEPA, the water was either discharged on site or to the sanitary sewer with the City's permission.

## 8.2 Site Backfilling

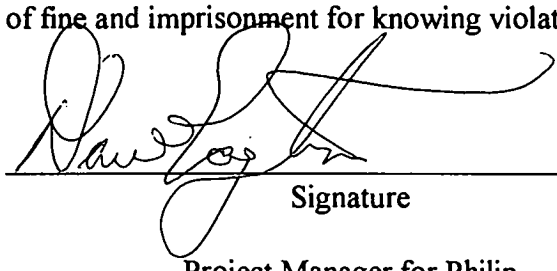
On September 6, 1995, Leingang, subcontracted by Williams, began backfilling cobbles and treated soil on site in accordance with procedures outlined in the approved Work Plan. Backfilling was completed on September 22, 1995.

# 9 Cost Information

Providing a statement of actual costs incurred with complying with this Order was not possible at the date of this report because all costs have not yet been received by BNRR. This information will be forwarded to the USEPA as soon as practicable.

# 10 Certification of the Report

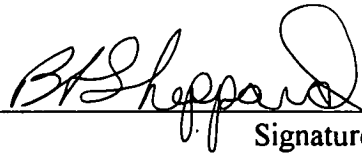
Under penalty of law, I certify that based on personal knowledge and appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Signature — Date: 7/23/96

Project Manager for Philip

Title



Signature — Date: 7/24/96

Manager ~~of~~ Environmental ~~Projects~~ Remediation Sites for BNRR

Title

# List of Abbreviations and Acronyms

| | |
|---|---|
| AAQIR | Ambient Air Quality Impact Report |
| AAMP | Ambient Air Monitoring Plan |
| AWFSO | automatic waste feed shutoff |
| BNRR | Burlington Northern Railroad |
| CEM | continuous emission monitor |
| CWM | Chemical Waste Management |
| DDD | p,p'-DDD |
| DDE | p,p'-DDE |
| DDT | p,p'-DDT |
| EE/CA | Engineering Evaluation/Cost Analysis |
| $ft^3/min$ | cubic feet per minute |
| Hansen | Hansen Fruit and Cold Storage |
| Leingang | Ken Leingang Excavating, Inc. |
| LTTD | low-temperature thermal desorption |
| Met One | Met One Instruments |
| mg/kg | milligrams per kilogram |
| MKE | Morrison-Knudson Engineers, Inc. |
| mph | miles per hour |
| MTCA | Model Toxics Control Act |
| NCP | National Oil and Hazardous Substances Contingency Plan |
| Olympus | Olympus Environmental, Inc. |
| Philip | Philip Environmental Services Corporation |
| $PM_{10}$ | particulate matter smaller than 10 microns |
| QA/QC | quality assurance/quality control |
| RI | remedial investigation |
| Ross | Ross Analytical Services, Inc. |
| the Order | Administrative Order on Consent Number 1087-03-106 |
| $\mu g/m^3$ | micrograms per cubic meter |
| URS | URS Consultants, Inc. |

| | |
|---|---|
| USEPA | U.S. Environmental Protection Agency |
| VO | vent opening |
| VOCs | volatile organic compounds |
| WAC | Washington Administration Code |
| WDOE | Washington Department of Ecology |
| Williams | Williams Environmental Services Corporation |
| Woods Site | Woods Industries Site |

## References


Focus. 1994. *Performance Test Work Plan.*

National Oceanic and Atmospheric Administration. 1987. *1987 Local Climatological Data, Annual Summary with Comparative Data, Yakima, Washington.*

Philip Environmental Services Corporation (formerly Burlington Environmental Inc.). 1995a. *Ambient Air Monitoring Plan for Soil Treatment Activities, Woods Industries Site, Yakima, Washington.* February 7.

_____. 1995b. *Ambient Air Quality Impact Report, Woods Industries Site, Yakima, Washington.* [DATE?].

_____. 1993a. *Soil Removal Final Report.* October 13.

_____. 1993b. *Building Demolition Final Report.* March 26.

URS Consultants, Inc. 1993. *Field Manual Of Technical Standard Operating Procedures: Portland Cement Sites 2 and 3 Superfund Site, Salt Lake City, Utah.* Contract No. 932290.

———. 1994. *Field Manual Of Technical Standard Operating Procedures: The Sand Creek Industrial Superfund Site, Commerce City, Colorado.* USEPA Contract No. 68-W9-0053. Work Assignment No. 29-8R14

U.S. Environmental Protection Agency. 1993. *Air/Superfund National Technical Guidance Study Series, Volume IV - Guidance for Ambient Air Monitoring at Superfund Sites (Revised).* EPA-451/1-89-004. May.

———. 1993. *Air/Superfund National Technical Guidance Study Series, Compilation of Information on Real-Time Air Monitoring for Use at Superfund Sites.* EPA-451/R-93-008. May.

———. 1993. *Air/Superfund National Technical Guidance Study Series, Estimation of Air Impacts from Area Sources of Particulate Matter Emissions at Superfund Sites.* EPA-451/R-93-004. April.

———. 1993. *Air/Superfund National Technical Guidance Study Series, Estimation of Air Impacts for Thermal Desorption Units Used at Superfund Sites.* EPA-451/R-93-005. April.

———. 1993. *Air/Superfund National Technical Guidance Study Series, Evaluation of Short-Term Air Action Levels for Superfund Sites.* EPA-451/R-93-009. May.

———. 1989. *Guidance on Applying the Data Quality Objectives Process for Ambient Air Monitoring Around Superfund Sites (Stages I & II)*. EPA-450/4-89-015. August.

———. 1984 and updates. *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air*. Environmental Monitoring Systems Laboratory. Updates obtained from Office of Air Quality Planning and Standards Technology Transfer Network.

———. 1988. *Control of Open Fugitive Dust Sources.* EPA-450/3-88-008. September

———. 1987. *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD)*. EPA-450/4-87-007. May.

Roy F. Weston, Inc. 1993. *Ambient Air Monitoring Plan for a Thermal Treatment Facility (TTF) at the Coal Creek Superfund Site, Chehalis, Washington.* October 1.

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Table 7-1

Ambient Air Monitoring Event Descriptions -- 1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| Monitoring Phase | Event No. | Sampling Period Start | Sampling Period End | LTTD Unit % Capacity | LTTD Unit Duration (Hr) | Type of Monitoring Performed A11 | A12 | A13 | A14 | A15 | A16 | A21 | A22 | A61 | QA Samples Field | QA Samples Trip | Sampling Technician Start | Sampling Technician End |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Background | 1 | 2/14/95 08:00 | 2/15/95 13:01 | 0 | 0.0 | P | P | B | T | N | N | P | P | P | P | P | MSM | MSM |
| | 2 | 2/15/95 10:05 | 2/16/95 12:30 | 0 | 0.0 | B | B | B | B | N | N | B | B | B | B | B | MSM | MSM |
| | 3 | 2/16/95 09:15 | 2/17/95 12:00 | 0 | 0.0 | B | B | B | B | N | N | B | B | B | B | B | MSM | MSM |
| | 4 | 2/17/95 09:15 | 2/18/95 11:45 | 0 | 0.0 | B | B | B | B | N | N | B | B | B | B | B | MSM | MSM |
| | 5 | 2/18/95 08:55 | 2/19/95 11:00 | 0 | 0.0 | B | B | B | B | N | N | B | B | B | B | B | DJL | DJL |
| | 6 | 2/21/95 16:05 | 2/22/95 16:00 | 0 | 0.0 | B | B | B | B | N | N | B | B | B | B | B | DJL | DJL |
| | 7 | 3/7/95 09:43 | 3/8/95 12:30 | 0 | 0.0 | B | B | B | B | N | N | B | B | B | N | N | KDM | KDM |
| | 8 | 3/8/95 10:10 | 3/9/95 18:37 | 0 | 0.0 | B | B | B | B | N | N | B | B | N | N | N | KDM | MSM |
| | 9 | 3/10/95 09:30 | 3/11/95 14:18 | 0 | 0.0 | B | B | B | B | N | N | B | B | N | N | N | MSM | MSM |
| 2. Soil Treatment - High Intensity | R-01 | 3/18/95 07:00 | 3/18/95 07:55 | 0 | 0.0 | B | B | B | B | N | N | B | B | P | B | B | MSM | MSM |
| | R-02 | 3/19/95 10:00 | 3/20/95 09:00 | 0 | 0.0 | B | B | B | B | N | N | B | B | P | B | P | MSM | MSM |
| | R-03 | 3/23/95 06:30 | 3/24/95 07:47 | 0 | 0.0 | P | P | P | P | N | N | P | P | P | P | P | MSM | MSM |
| | R-04 | 3/24/95 06:43 | 3/25/95 10:25 | 0 | 0.0 | P | P | P | P | N | N | P | P | P | P | P | MSM | MSM |
| | R-05 | 3/25/95 09:05 | 3/26/95 08:30 | 0 | 0.0 | P | P | P | P | N | N | P | P | P | P | P | RPM | RPM |
| | R-06 | 3/27/95 08:00 | 3/28/95 07:00 | 0 | 0.0 | P | P | P | P | N | N | P | P | P | P | P | RPM | RPM |
| | R-07 | 3/28/95 12:00 | 3/29/95 13:00 | 0 | 0.0 | B | B | B | B | N | N | B | B | B | B | B | RPM | RPM |
| | R-08 | 3/29/95 12:38 | 3/30/95 14:12 | 0 | 0.0 | B | B | B | B | N | N | B | B | B | T | P | RPM | RPM |
| | R-09 | 3/30/95 11:40 | 3/31/95 12:50 | 0 | 0.0 | B | B | B | B | N | N | B | B | B | P | P | RPM | RPM |
| | R-10 | 3/31/95 10:58 | 4/1/95 12:39 | 0 | 0.0 | B | B | B | B | N | N | B | B | B | B | P | RPM | RPM |
| | R-11 | 4/1/95 10:18 | 4/2/95 14:24 | 0 | 0.0 | B | B | B | B | N | N | P | B | B | P | P | RPM | RPM |
| | R-12 | 4/2/95 10:10 | 4/3/95 10:12 | 35 | 6.3 | B | B | B | B | N | N | B | B | B | P | P | RPM | RPM |
| | R-13 | 4/3/95 08:34 | 4/4/95 11:50 | 22 | 15.3 | B | B | B | B | N | N | B | B | B | N | N | RPM | RPM |
| | R-14 | 4/4/95 09:30 | 4/5/95 11:48 | 54 | 13.0 | B | B | B | B | N | N | B | B | B | N | N | MSM | MSM |
| | R-15 | 4/5/95 10:00 | 4/6/95 14:30 | 50 | 12.0 | B | B | B | B | N | N | B | B | B | N | N | MSM | MSM |
| | R-16 | 4/6/95 09:44 | 4/7/95 14:20 | 65 | 15.7 | N | B | B | B | N | N | N | B | B | N | N | MSM | MSM |
| | R-17 | 4/7/95 10:10 | 4/8/95 14:31 | 89 | 20.7 | P | B | B | B | N | N | P | B | B | N | N | MSM | MSM |
| | R-18 | 4/8/95 10:14 | 4/9/95 13:35 | 70 | 21.4 | B | B | B | B | N | N | B | B | N | N | N | MSM | MSM |
| | R-19 | 4/9/95 11:50 | 4/10/95 14:47 | 0 | 0.1 | B | B | B | B | N | N | B | B | N | N | N | MSM | MSM |
| | R-20 | 4/10/95 14:37 | 4/11/95 17:20 | 13 | 3.0 | B | N | B | N | N | N | B | P | N | N | N | DJL | DJL |
| | R-21 | 4/11/95 18:00 | 4/12/95 10:00 | 0 | 0.0 | ---------- Site Activities Did Not Warrant Sampling. ---------- | | | | | | | | | -- | | -- | -- |
| | R-22 | 4/12/95 10:35 | 4/13/95 12:10 | 2 | 2.0 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-23 | 4/13/95 10:05 | 4/14/95 12:00 | 13 | 6.4 | B | B | B | B | N | N | B | B | B | B | B | DJL | DJL |
| | R-24 | 4/14/95 10:05 | 4/15/95 12:10 | 13 | 5.3 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-25 | 4/15/95 10:05 | 4/16/95 11:50 | 29 | 6.9 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-26 | 4/16/95 10:05 | 4/17/95 12:05 | 13 | 16.7 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-27 | 4/17/95 10:15 | 4/18/95 12:15 | 91 | 21.9 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |

B = Both PM10 and TO-10 Sampling.
N = Not Sampled or Not Submitted.
P = PM10 Sampling Only.
T = TO-10 Sampling Only.

Table 7-1

Ambient Air Monitoring Event Descriptions -- 1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| Monitoring Phase | Event No. | Sampling Period Start | Sampling Period End | LTTD Unit % Capacity | LTTD Unit Duration (Hr) | Type of Monitoring Performed A11 | A12 | A13 | A14 | A15 | A16 | A21 | A22 | A61 | QA Samples Field | QA Samples Trip | Sampling Technician Start | Sampling Technician End |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R-28 | 4/18/95 15:00 | 4/19/95 09:55 | 8 | 2.0 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-29 | 4/19/95 07:45 | 4/20/95 09:30 | 28 | 6.6 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-30 | 4/20/95 07:55 | 4/21/95 09:35 | 43 | 10.3 | B | B | B | B | N | N | B | B | B | B | B | DJL | DJL |
| | R-31 | 4/21/95 07:50 | 4/22/95 08:50 | 75 | 17.9 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-32 | 4/22/95 07:45 | 4/23/95 07:55 | 31 | 7.5 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-33 | 4/23/95 06:50 | 4/24/95 07:30 | 18 | 4.3 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-34 | 4/24/95 06:25 | 4/25/95 08:25 | 40 | 9.7 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-35 | 4/25/95 06:40 | 4/26/95 09:00 | 85 | 20.5 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-36 | 4/26/95 07:20 | 4/27/95 09:00 | 39 | 9.3 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-37 | 4/27/95 07:45 | 4/28/95 09:00 | 65 | 15.7 | B | B | B | B | N | N | B | B | B | B | B | DJL | DJL |
| | R-38 | 4/28/95 07:25 | 4/29/95 08:45 | 37 | 8.9 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-39 | 4/29/95 07:15 | 4/30/95 09:10 | 84 | 20.2 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-40 | 4/30/95 07:50 | 5/1/95 09:12 | 55 | 13.3 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-41 | 5/1/95 07:22 | 5/2/95 10:08 | 64 | 15.4 | B | B | B | B | N | N | B | B | N | N | N | RPM | RPM |
| | R-42 | 5/2/95 08:10 | 5/3/95 09:12 | 22 | 5.3 | B | B | B | B | N | N | B | B | N | N | N | RPM | RPM |
| | R-43 | 5/3/95 07:40 | 5/4/95 10:17 | 16 | 3.8 | B | B | B | B | N | N | B | B | N | N | N | RPM | RPM |
| 3. Soil Treatment | R-44 | 5/4/95 09:15 | 5/5/95 08:13 | 0 | 0.0 | B | N | N | N | N | N | N | N | B | N | N | RPM | RPM |
| Low Intensity | R-45 | 5/5/95 08:17 | 5/6/95 09:45 | 13 | 3.2 | B | N | N | N | N | N | N | B | N | N | N | RPM | RPM |
| (with Mercury) | R-46 | 5/6/95 00:01 | 5/7/95 23:59 | 31 | 7.4 | B | B | B | B | N | N | B | B | N | N | N | RPM | RPM |
| | R-47 | 5/8/95 00:01 | 5/8/95 23:59 | 97 | 23.3 | N | N | N | N | N | N | N | N | B | N | N | RPM | RPM |
| | R-48 | 5/9/95 00:01 | 5/9/95 23:59 | 61 | 14.6 | B | B | B | B | N | N | P | B | N | N | N | RPM | RPM |
| | R-49 | 5/10/95 00:01 | 5/10/95 23:59 | 50 | 12.0 | N | N | N | N | N | N | N | N | B | N | N | RPM | RPM |
| | R-50 | 5/10/95 07:45 | 5/11/95 10:00 | 50 | 12.0 | B | B | B | B | N | N | B | B | N | N | N | RPM | RPM |
| | R-51 | 5/11/95 08:12 | 5/12/95 09:15 | 21 | 5.0 | B | B | B | B | N | N | B | B | B | B | B | RPM | RPM |
| | R-52 | NS | NS | 0 | 0.0 | -------No Activities On Site, Samples Not Submitted. ---------- | | | | | | | | | | | RPM | RPM |
| | R-53 | 5/18/95 08:00 | 5/19/95 07:35 | 0 | 0.0 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-54 | NS | NS | 0 | 0.0 | -------No Activities On Site, Samples Not Submitted. ---------- | | | | | | | | | | | DJL | DJL |
| | R-55 | 5/20/95 00:01 | 5/20/95 23:59 | 64 | 7.6 | B | N | N | N | N | N | N | N | N | N | N | DJL | DJL |
| | R-56 | 5/21/95 00:01 | 5/21/95 23:59 | 14 | 1.7 | N | N | N | N | N | N | N | N | B | N | N | DJL | DJL |
| | R-57 | 5/22/95 00:01 | 5/22/95 23:59 | 37 | 4.5 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-58 | 5/23/95 00:01 | 5/23/95 23:59 | 96 | 11.6 | N | N | N | N | N | N | N | N | B | N | N | DJL | DJL |
| | R-59 | 5/24/95 00:01 | 5/24/95 23:59 | 99 | 11.9 | N | N | N | N | N | N | N | N | N | N | N | DJL | DJL |
| | R-60 | 5/25/95 00:01 | 5/25/95 23:59 | 54 | 13.0 | B | B | B | B | N | N | B | B | B | B | B | DJL | DJL |
| | R-61 | 5/26/95 00:01 | 5/26/95 23:59 | 20 | 4.9 | B | B | B | B | N | N | B | B | N | N | N | DJL | DJL |
| | R-62 | 6/3/95 09:37 | 6/4/95 10:05 | 86 | 19.0 | D | N | N | N | N | N | N | N | N | N | N | MSM | MSM |
| | R-63 | 6/4/95 10:06 | 6/5/95 10:56 | 44 | 18.8 | B | N | N | N | N | N | N | N | N | N | N | MSM | MSM |

B = Both PM10 and TO-10 Sampling.
N = Not Sampled or Not Submitted.
P = PM10 Sampling Only.
T = TO-10 Sampling Only.

Table 7-1

Ambient Air Monitoring Event Descriptions -- 1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| Monitoring Phase | Event No. | Sampling Period Start | Sampling Period End | LTTD Unit % Capacity | LTTD Unit Duration (Hr) | Type of Monitoring Performed A11 | A12 | A13 | A14 | A15 | A16 | A21 | A22 | A61 | QA Samples Field | QA Samples Trip | Sampling Technician Start | Sampling Technician End |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R-64 | 6/5/95 00:01 | 6/5/95 23:59 | 98 | 18.8 | N | B | B | N | B | B | B | B | B | N | N | MSM | MSM |
| | R-65 | 6/6/95 00:01 | 6/6/95 23:59 | 56 | 13.5 | B | N | N | N | N | N | N | N | N | N | N | MSM | MSM |
| | R-66 | 6/7/95 00:01 | 6/7/95 23:59 | 0 | 0.0 | N | N | N | N | N | N | N | N | B | N | N | ALL | ALL |
| | R-67 | 6/8/95 00:01 | 6/8/95 23:59 | 30 | 7.3 | B | B | B | N | B | B | B | B | N | N | N | ALL | ALL |
| | R-68 | 6/9/95 10:01 | 6/10/95 09:59 | 65 | 15.5 | N | N | N | N | N | N | N | N | B | N | N | ALL | ALL |
| | R-69 | 6/10/95 00:01 | 6/10/95 23:59 | 75 | 18.2 | B | N | N | N | N | N | N | N | N | N | N | ALL | ALL |
| | R-70 | 6/11/95 00:01 | 6/11/95 23:59 | 95 | 22.8 | N | B | B | N | B | B | B | B | B | N | N | ALL | ALL |
| | R-71 | 6/13/95 00:01 | 6/13/95 23:59 | 77 | 18.6 | B | N | N | N | N | N | N | N | N | N | N | ALL | ALL |
| | R-72 | 6/14/95 00:01 | 6/14/95 23:59 | 37 | 8.9 | N | B | N | N | B | B | B | B | B | B | B | ALL | ALL |
| | R-73 | NA | NA | ---------- | Event Number not used. ---------- | | | | | | | | | | | | -- | -- |
| | R-74 | 6/15/95 00:01 | 6/15/95 23:59 | 54 | 12.9 | N | N | N | N | N | N | N | N | B | N | N | ALL | ALL |
| | R-75 | 6/16/95 07:30 | 6/17/95 07:30 | 0 | 0.0 | B | N | N | N | N | N | N | N | N | N | N | ALL | ALL |
| | R-76 | 6/17/95 00:01 | 6/17/95 23:59 | 0 | 0.0 | N | B | N | N | B | B | B | B | B | N | N | ALL | ALL |
| | R-77 | 6/18/95 00:01 | 6/18/95 23:59 | 0 | 0.0 | D | N | N | N | N | N | N | N | N | N | N | ALL | ALL |
| | R-78 | 6/19/95 00:01 | 6/19/95 23:59 | 63 | 18.1 | N | N | N | N | N | N | N | N | B | N | N | ALL | ALL |
| | R-79 | 6/20/95 00:01 | 6/20/95 23:59 | 93 | 22.4 | B | B | B | B | B | B | B | B | N | N | N | ALL | ALL |
| 4 Soil Treatment Low Intensity (without Mercury) | R-80 | 6/21/95 00:01 | 6/21/95 23:59 | 100 | 24.0 | N | N | N | N | N | N | N | N | B | N | N | ALL | ALL |
| | R-81 | 6/22/95 00:01 | 6/22/95 23:59 | 100 | 24.0 | B | N | N | N | N | N | N | N | N | N | N | ALL | ALL |
| | R-82 | 6/23/95 00:01 | 6/23/95 23:59 | 27 | 6.5 | N | B | B | B | B | B | B | B | B | N | N | ALL | ALL |
| | R-83 | 6/24/95 00:01 | 6/24/95 23:59 | 36 | 8.5 | B | N | N | N | N | N | N | N | N | N | N | ALL | ALL |
| | R-84 | 6/25/95 00:01 | 6/25/95 23:59 | 100 | 24.0 | N | N | N | N | N | N | N | N | B | N | N | ALL | ALL |
| | R-85 | 6/26/95 00:01 | 6/26/95 23:59 | 100 | 24.0 | B | B | B | B | B | B | B | B | N | N | N | ALL | ALL |
| | R-86 | 6/27/95 00:01 | 6/27/95 23:59 | 96 | 22.9 | N | N | N | N | N | N | N | N | B | N | N | ALL | MSM |
| | R-87 | 6/28/95 00:01 | 6/28/95 23:59 | 99 | 24.0 | B | N | N | N | N | N | N | N | N | N | N | MSM | MSM |
| | R-88 | 6/29/95 00:01 | 6/29/95 23:59 | 100 | 23.9 | N | B | N | N | B | B | B | B | T | N | N | ALL | ALL |
| | R-89 | 6/30/95 00:01 | 6/30/95 23:59 | 83 | 19.9 | I | N | N | N | N | N | N | N | N | N | N | MSM | MSM |
| | R-90 | 7/1/95 00:01 | 7/1/95 23:59 | 88 | 21.2 | N | N | N | N | N | N | N | N | B | N | N | ALL | ALL |
| | R-91 | 7/2/95 08:00 | 7/3/95 10:00 | 93 | 22.2 | B | B | P | P | B | B | B | B | N | N | N | ALL | ALL |
| | R-92 | 7/3/95 00:00 | 7/3/95 00:00 | 0 | 0.0 | ---------- | Thermal Unit Not Operating, No Sampling. ---------- | | | | | | | | | | -- | -- |
| | R-93 | 7/4/95 00:00 | 7/4/95 00:00 | 0 | 0.0 | ---------- | Thermal Unit Not Operating, No Sampling. ---------- | | | | | | | | | | -- | -- |
| | R-94 | 7/5/95 00:00 | 7/5/95 00:00 | 76 | 18.1 | ---------- | Electrical Problems Prevented Sampling. ---------- | | | | | | | | | | -- | -- |
| | R-95 | 7/6/95 00:00 | 7/6/95 00:00 | 77 | 18.5 | ---------- | Electrical Problems Prevented Sampling. ---------- | | | | | | | | | | -- | -- |
| | R-96 | 7/7/95 00:00 | 7/7/95 00:00 | 99 | 23.9 | ---------- | Electrical Problems Prevented Sampling. ---------- | | | | | | | | | | -- | -- |
| | R-97 | 7/7/95 08:00 | 7/8/95 07:50 | 99 | 23.9 | N | N | N | N | N | N | N | N | B | N | N | DJL | DJL |
| | R-98 | 7/8/95 07:40 | 7/9/95 08:30 | 100 | 24.0 | B | B | N | N | B | B | B | B | B | B | B | DJL | DJL |
| | R-99 | 7/9/95 08:05 | 7/10/95 07:45 | 89 | 21.3 | B | N | N | N | N | N | N | N | N | N | N | DJL | DJL |

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P = PM10 Sampling Only.
T = TO-10 Sampling Only.

Table 7-1

Ambient Air Monitoring Event Descriptions -- 1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| Monitoring Phase | Event No. | Sampling Period Start | Sampling Period End | LTTD Unit % Capacity | LTTD Unit Duration (Hr) | Type of Monitoring Performed A11 | A12 | A13 | A14 | A15 | A16 | A21 | A22 | A61 | QA Samples Field | QA Samples Trip | Sampling Technician Start | Sampling Technician End |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R-100 | 7/10/95 07:50 | 7/11/95 07:55 | 91 | 21.6 | N | N | N | N | N | N | N | N | B | N | N | DJL | DJL |
| | R-101 | 7/11/95 08:00 | 7/12/95 08:45 | 41 | 9.7 | B | B | P | P | B | B | B | B | N | N | N | DJL | DJL |
| | R-102 | 7/12/95 07:50 | 7/13/95 07:40 | 74 | 17.6 | N | N | N | N | N | N | N | N | B | N | N | DJL | DJL |
| | R-103 | 7/13/95 07:35 | 7/14/95 08:00 | 0 | 0.0 | B | N | N | N | N | N | N | N | N | N | N | DJL | DJL |
| | R-104 | 7/14/95 08:05 | 7/15/95 08:45 | 72 | 17.3 | B | B | N | N | B | B | B | B | N | N | N | DJL | DJL |
| | R-105 | 7/15/95 08:05 | 7/16/95 08:00 | 93 | 22.4 | N | N | N | N | N | N | N | N | B | N | N | DJL | DJL |
| | R-106 | 7/16/95 08:00 | 7/17/95 08:00 | 94 | 22.5 | B | N | N | N | N | N | N | N | N | N | N | DJL | DJL |
| | R-107 | 7/17/95 08:00 | 7/18/95 09:00 | 94 | 23.9 | B | B | P | P | B | B | B | B | N | N | N | DJL | DJL |
| | R-108 | 7/18/95 08:05 | 7/19/95 07:45 | 66 | 15.8 | N | N | N | N | N | N | N | N | B | N | N | DJL | DJL |
| | R-109 | 7/19/95 07:50 | 7/20/95 07:35 | 96 | 23.0 | B | N | N | N | N | N | N | N | B | B | B | DJL | DJL |
| | R-110 | 7/20/95 07:40 | 7/21/95 09:50 | 86 | 20.7 | B | B | P | P | B | B | B | B | N | N | N | DJL | DJL |
| | R-111 | 7/21/95 08:00 | 7/22/95 08:05 | 96 | 23.0 | N | N | N | N | N | N | N | N | P | N | N | DJL | DJL |
| | R-112 | 7/22/95 08:05 | 7/23/95 08:00 | 66 | 15.9 | B | N | N | N | N | N | N | N | N | N | N | DJL | DJL |
| | R-113 | 7/23/95 08:05 | 7/24/95 09:00 | 5 | 1.2 | B | B | B | B | B | B | B | B | N | N | N | DJL | DJL |
| | R-114 | 7/24/95 08:00 | 7/25/95 07:55 | 0 | 0.0 | ----------Thermal Unit Not Operating, No Sampling.---------- | | | | | | | | | | | -- | -- |
| | R-115 | 7/25/95 08:00 | 7/26/95 08:10 | 8 | 1.8 | B | N | N | N | N | N | N | N | N | N | N | DJL | DJL |
| | R-116 | 7/26/95 08:10 | 7/27/95 07:30 | 81 | 19.5 | N | N | N | N | N | N | N | N | B | N | N | DJL | DJL |
| | R-117 | 7/27/95 07:30 | 7/28/95 08:35 | 100 | 24.0 | B | B | P | P | B | B | B | B | B | B | B | DJL | DJL |
| | R-118 | 7/28/95 07:30 | 7/29/95 08:00 | 100 | 24.0 | B | N | N | N | N | N | N | N | N | N | N | DJL | DJL |
| | R-119 | 7/29/95 08:00 | 7/30/95 08:00 | 88 | 21.1 | N | N | N | N | N | N | N | N | B | N | N | DJL | DJL |
| | R-120 | 7/30/95 08:00 | 7/31/95 07:30 | 72 | 17.3 | B | N | N | N | N | N | N | N | N | N | N | DJL | DJL |
| | R-121 | 7/31/95 07:30 | 8/1/95 08:40 | 72 | 17.3 | N | B | P | P | B | B | B | B | B | N | N | DJL | DJL |
| | R-122 | 8/1/95 07:30 | 8/2/95 07:45 | 100 | 24.0 | B | N | N | N | N | N | N | N | N | N | N | DJL | ALL |
| | R-123 | 8/2/95 07:50 | 8/3/95 07:45 | 100 | 24.0 | N | N | N | N | N | N | N | N | B | N | N | DJL | DJL |
| | R-124 | 8/3/95 07:40 | 8/4/95 08:55 | 40 | 9.5 | B | B | P | P | B | B | B | B | B | B | B | DJL | DJL |
| | R-125 | 8/4/95 07:50 | 8/5/95 07:45 | 92 | 22.2 | B | N | N | N | N | N | N | N | N | N | N | DJL | DJL |
| | R-126 | 8/5/95 07:45 | 8/6/95 07:30 | 76 | 18.3 | N | N | N | N | N | N | N | N | B | N | N | DJL | DJL |
| | R-127 | 8/7/95 07:00 | 8/8/95 07:00 | 13 | 3.2 | B | N | N | N | N | N | N | N | N | N | N | DJL | ALL |
| | R-128 | 8/8/95 07:30 | 8/9/95 09:00 | 13 | 3.2 | N | P | P | P | P | P | B | P | B | N | N | ALL | ALL |
| | R-129 | 8/9/95 07:30 | 8/10/95 07:30 | 51 | 6.1 | B | N | N | N | N | N | N | N | N | N | N | ALL | ALL |
| 5. Treatment Unit Dismantling | R-130 | 8/10/95 08:00 | 8/11/95 08:00 | 0 | 0.0 | N | N | N | N | N | N | N | N | P | N | N | ALL | ALL |
| | R-131 | 8/11/95 07:30 | 8/12/95 08:30 | 0 | 0.0 | P | N | P | P | P | P | N | N | N | N | N | ALL | ALL |
| | R-132 | 8/12/95 07:45 | 8/13/95 07:45 | 0 | 0.0 | N | N | N | N | N | N | N | N | P | N | N | ALL | ALL |
| | R-133 | 8/13/95 00:00 | 8/14/95 00:00 | 0 | 0.0 | ----------No Activities On Site. No Samples Taken.---------- | | | | | | | | | | | -- | -- |
| | R-134 | 8/14/95 08:00 | 8/15/95 07:44 | 0 | 0.0 | P | N | N | N | N | N | N | N | N | N | N | JAK | JAK |
| | R-135 | 8/15/95 08:05 | 8/16/95 07:50 | 0 | 0.0 | N | N | N | N | N | N | N | N | P | N | N | JAK | JAK |

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P = PM10 Sampling Only.
T = TO-10 Sampling Only.

Table 7-1

Ambient Air Monitoring Event Descriptions -- 1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

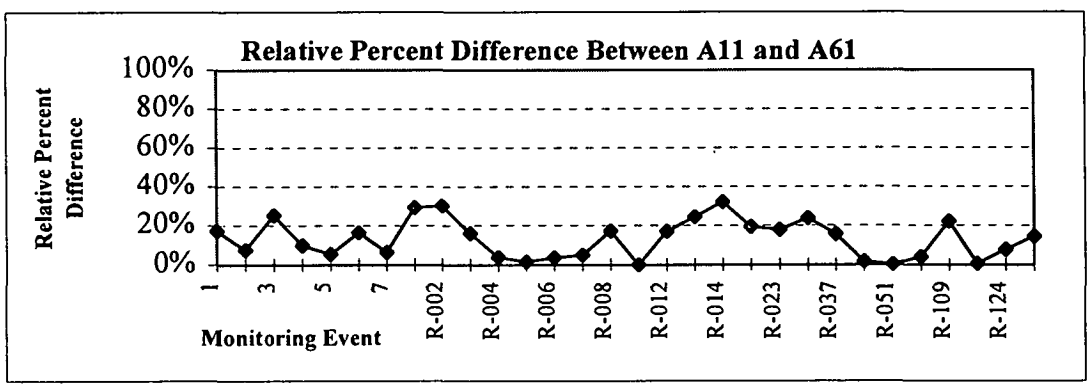
| Monitoring Phase | Event No. | Sampling Period Start | Sampling Period End | LTTD Unit % Capacity | LTTD Unit Duration (Hr) | Type of Monitoring Performed A11 | A12 | A13 | A14 | A15 | A16 | A21 | A22 | A61 | QA Samples Field | QA Samples Trip | Sampling Technician Start | Sampling Technician End |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R-136 | 8/16/95 00:00 | 8/17/95 07:50 | 0 | 0.0 | P | N | N | N | N | N | N | N | N | N | N | JAK | JAK |
| | R-137 | 8/17/95 08:00 | 8/18/95 08:00 | 0 | 0.0 | N | N | N | N | N | N | N | N | P | N | N | JAK | JAK |
| | R-138 | 8/18/95 08:00 | 8/19/95 07:50 | 0 | 0.0 | P | N | N | N | N | N | N | N | N | N | N | JAK | JAK |
| | R-139 | 8/19/95 08:00 | 8/20/95 07:15 | 0 | 0.0 | N | N | N | N | N | N | N | N | P | N | N | JAK | JAK |
| | R-140 | 8/20/95 07:50 | 8/21/95 08:05 | 0 | 0.0 | P | N | N | N | N | N | N | N | N | N | N | JAK | JAK |
| | R-141 | 8/21/95 08:10 | 8/22/95 08:15 | 0 | 0.0 | N | N | N | N | N | N | N | N | P | N | N | JAK | JAK |
| | R-142 | 8/22/95 08:20 | 8/23/95 08:20 | 0 | 0.0 | P | N | N | N | N | N | N | N | N | N | N | JAK | JAK |
| | R-143 | 8/23/95 08:15 | 8/24/95 08:40 | 0 | 0.0 | N | N | N | N | N | N | N | N | P | N | N | JAK | JAK |
| | R-144 | 8/24/95 08:10 | 8/25/95 08:15 | 0 | 0.0 | P | N | N | N | N | N | N | N | N | N | N | JAK | JAK |
| | R-145 | 8/25/95 08:15 | 8/26/95 08:00 | 0 | 0.0 | N | N | N | N | N | N | N | N | P | N | N | JAK | JAK |
| | R-146 | 8/26/95 08:15 | 8/27/95 08:00 | 0 | 0.0 | P | N | N | N | N | N | N | N | N | N | N | JAK | JAK |
| | R-147 | 8/27/95 08:00 | 8/28/95 08:00 | 0 | 0.0 | ----------No Activities On Site. No Samples Taken.---------- | | | | | | | | | | | -- | -- |
| | R-148 | 8/28/95 08:05 | 8/29/95 08:00 | 0 | 0.0 | N | N | N | N | N | N | N | N | P | N | N | JAK | JAK |
| | R-149 | 8/29/95 08:10 | 8/30/95 08:10 | 0 | 0.0 | P | N | N | N | N | N | N | N | N | N | N | JAK | JAK |
| | R-150 | 8/30/95 08:15 | 8/31/95 08:00 | 0 | 0.0 | N | N | N | N | N | N | N | N | P | N | N | JAK | JAK |
| | R-151 | 8/31/95 00:00 | 9/1/95 00:00 | 0 | 0.0 | ---------No Activities On Site-Samples Not Submitted.--------- | | | | | | | | | | | -- | -- |
| 6. Soil Backfilling | R-152 | 9/5/95 08:30 | 9/6/95 08:00 | 0 | 0.0 | N | N | N | N | N | N | N | N | P | N | N | GAK | GAK |
| | R-153 | 9/6/95 08:10 | 9/7/95 08:20 | 0 | 0.0 | P | N | P | P | P | P | N | N | P | P | P | GAK | GAK |
| | R-154 | 9/11/95 08:00 | 9/12/95 08:35 | 0 | 0.0 | P | N | P | P | P | P | N | N | N | N | N | DJL | DJL |
| | R-155 | 9/14/95 08:00 | 9/15/95 08:40 | 0 | 0.0 | P | N | P | P | P | P | N | N | N | N | N | DJL | DJL |

B = Both PM10 and TO-10 Sampling.
N = Not Sampled or Not Submitted.
P = PM10 Sampling Only.
T = TO-10 Sampling Only.

Comparison of Reference Method $PM_{10}$ Concentrations at Collocated Samplers A11 and A61
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| Event Number | Sampling Start Date | $PM_{10}$ Concentration ($\mu g/m^3$) A11 | | $PM_{10}$ Concentration ($\mu g/m^3$) A61 | | Relative Percent Difference |
|---|---|---|---|---|---|---|
| 1 | 2/14/95 | 22.2 | | 26.4 | F | 17% |
| 2 | 2/15/95 | 36.5 | | 39.4 | F | 8% |
| 3 | 2/16/95 | 23.6 | | 30.4 | F | 25% |
| 4 | 2/17/95 | 26.5 | | 29.3 | F | 10% |
| 5 | 2/18/95 | 31.4 | | 33.2 | F | 6% |
| 6 | 2/21/95 | 25.6 | | 30.2 | | 16% |
| 7 | 3/7/95 | 53.6 | | 50.2 | | 7% |
| R-001 | 3/18/95 | 8.1 | | 10.8 | | 29% |
| R-002 | 3/19/95 | 9.6 | | 13.0 | | 30% |
| R-003 | 3/23/95 | 41.0 | | 34.9 | | 16% |
| R-004 | 3/24/95 | 167.3 | D | 173.9 | | 4% |
| R-005 | 3/25/95 | 24.1 | | 23.7 | | 2% |
| R-006 | 3/27/95 | 44.1 | | 42.4 | | 4% |
| R-007 | 3/28/95 | 54.1 | | 51.4 | | 5% |
| R-008 | 3/29/95 | 59.4 | F | 50.0 | | 17% |
| R-010 | 3/31/95 | 58.7 | | 58.7 | | 0% |
| R-012 | 4/2/95 | 45.2 | D | 53.6 | D | 17% |
| R-013 | 4/3/95 | 78.2 | | 99.9 | | 24% |
| R-014 | 4/4/95 | 142.5 | | 196.8 | | 32% |
| R-015 | 4/5/95 | 33.2 | | 40.3 | | 19% |
| R-023 | 4/13/95 | 142.4 | | 170.3 | | 18% |
| R-030 | 4/20/95 | 138.2 | | 175.4 | | 24% |
| R-037 | 4/27/95 | 70.4 | | 82.3 | | 16% |
| R-044 | 5/4/95 | 25.0 | D | 25.4 | | 2% |
| R-051 | 5/11/95 | 66.2 | | 66.4 | | 0% |
| R-098 | 7/8/95 | 108.0 | | 103.8 | | 4% |
| R-109 | 7/19/95 | 193.4 | | 241.3 | | 22% |
| R-117 | 7/27/95 | 87.5 | | 86.8 | | 1% |
| R-124 | 8/3/95 | 81.9 | | 75.8 | | 8% |
| R-153 | 9/6/95 | 59.2 | | 51.2 | | 14% |

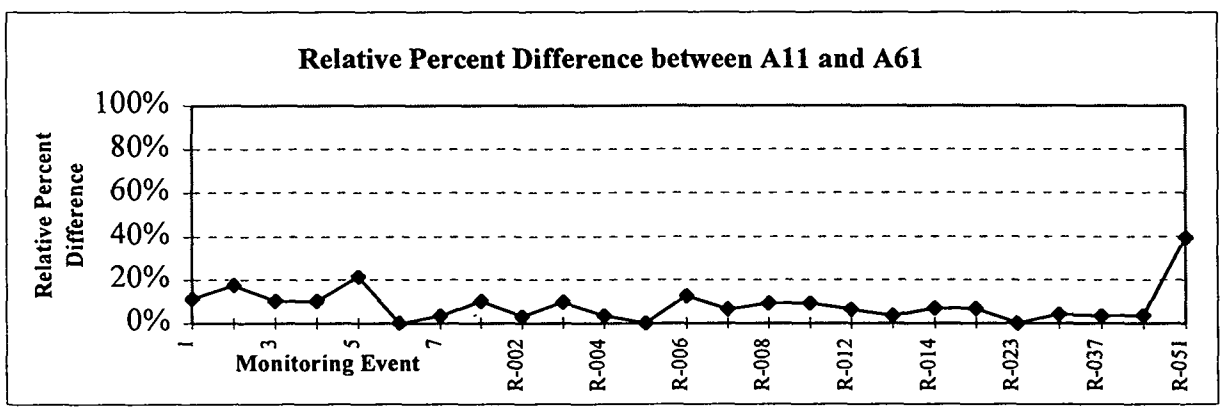
D Duration of sampling outside USEPA-preferred limits.
F Flow outside manufacturer's preferred range.



Comparison of Particulate Mercury Concentrations at Collocated Samplers A11 and A61
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| Event Number | Sampling Start Date | Particulate Mercury Concentration (µg/m$^3$) A11 | | Particulate Mercury Concentration (µg/m$^3$) A61 | | Relative Percent Difference |
|---|---|---|---|---|---|---|
| 1 | 2/14/95 | < 0.00028 | | < 0.00025 | F | 11% |
| 2 | 2/15/95 | < 0.00031 | | < 0.00026 | F | 18% |
| 3 | 2/16/95 | < 0.00031 | | < 0.00028 | F | 10% |
| 4 | 2/17/95 | < 0.00031 | | < 0.00028 | F | 10% |
| 5 | 2/18/95 | < 0.00031 | | < 0.00025 | F | 21% |
| 6 | 2/21/95 | < 0.00029 | | < 0.00029 | | 0% |
| 7 | 3/7/95 | < 0.00029 | | < 0.00030 | | 3% |
| R-001 | 3/18/95 | < 0.00029 | | < 0.00032 | | 10% |
| R-002 | 3/19/95 | < 0.00033 | | < 0.00032 | | 3% |
| R-003 | 3/23/95 | < 0.00029 | | < 0.00032 | | 10% |
| R-004 | 3/24/95 | < 0.00029 | D | < 0.00028 | | 4% |
| R-005 | 3/25/95 | < 0.00033 | | < 0.00033 | | 0% |
| R-006 | 3/27/95 | < 0.00034 | | < 0.00030 | D | 13% |
| R-007 | 3/28/95 | < 0.00032 | | < 0.00030 | D | 6% |
| R-008 | 3/29/95 | < 0.00034 | F | < 0.00031 | | 9% |
| R-010 | 3/31/95 | < 0.00034 | | < 0.00031 | | 9% |
| R-012 | 4/2/95 | < 0.00031 | D | < 0.00033 | | 6% |
| R-013 | 4/3/95 | < 0.00028 | | < 0.00029 | | 4% |
| R-014 | 4/4/95 | < 0.00028 | | < 0.00030 | | 7% |
| R-015 | 4/5/95 | < 0.00029 | | < 0.00031 | | 7% |
| R-023 | 4/13/95 | < 0.00030 | | < 0.00030 | D | 0% |
| R-030 | 4/20/95 | < 0.00029 | | < 0.00031 | | 4% |
| R-037 | 4/27/95 | < 0.00030 | | < 0.00029 | | 3% |
| R-044 | 5/4/95 | < 0.00031 | D | < 0.00030 | | 3% |
| R-051 | 5/11/95 | **0.00056** | | **0.00084** | | 40% |

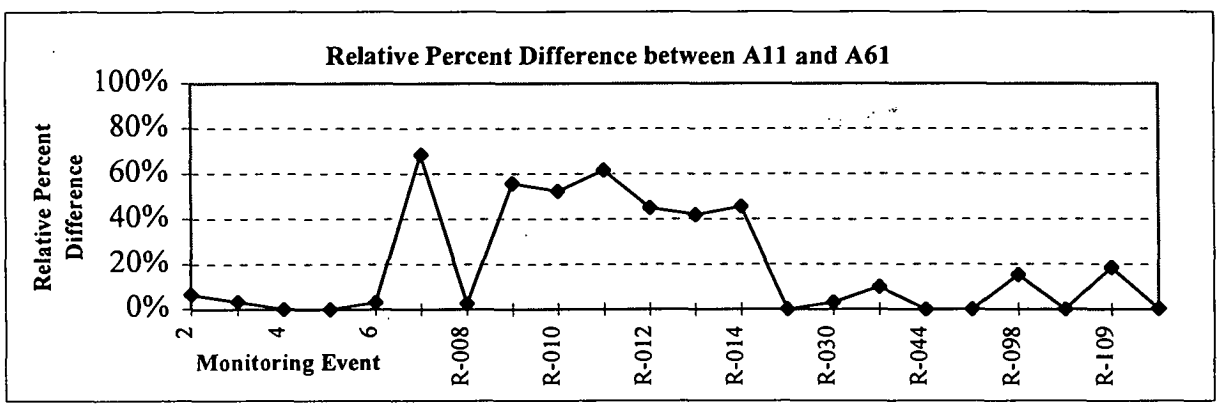
**Bold Type** Concentration above lower detection limit.
D Duration of sampling outside USEPA-preferred limits.
F Flow outside manufacturer's preferred range.



Comparison of DDT Concentrations at Collocated Samplers A11 and A61
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| Event Number | Sampling Start Date | DDT Concentration (µg/m$^3$) A11 | | A61 | | Relative Percent Difference |
|---|---|---|---|---|---|---|
| 2 | 2/15/95 | < 0.029 | | < 0.031 | | 7% |
| 3 | 2/16/95 | < 0.029 | | < 0.030 | | 3% |
| 4 | 2/17/95 | < 0.030 | | < 0.030 | | 0% |
| 5 | 2/18/95 | < 0.030 | | < 0.030 | | 0% |
| 6 | 2/21/95 | < 0.032 | | < 0.033 | | 3% |
| R-007 | 3/28/95 | < 0.039 | | < 0.019 | | 68% |
| R-008 | 3/29/95 | < 0.041 | D | < 0.040 | | 2% |
| R-009 | 3/30/95 | < 0.039 | | < 0.022 | | 56% |
| R-010 | 3/31/95 | < 0.041 | | < 0.024 | | 52% |
| R-011 | 4/1/95 | < 0.034 | | < 0.018 | | 62% |
| R-012 | 4/2/95 | < 0.030 | D | < 0.019 | D | 45% |
| R-013 | 4/3/95 | < 0.026 | | < 0.017 | | 42% |
| R-014 | 4/4/95 | < 0.027 | | < 0.017 | | 45% |
| R-023 | 4/13/95 | < 0.019 | | **0.019** | | 0% |
| R-030 | 4/20/95 | < 0.019 | | **0.019** | | 3% |
| R-037 | 4/27/95 | < 0.019 | | < 0.021 | | 10% |
| R-044 | 5/4/95 | < 0.024 | D | < 0.024 | | 0% |
| R-051 | 5/11/95 | < 0.024 | | < 0.024 | | 0% |
| R-098 | 7/8/95 | < 0.023 | | < 0.020 | | 15% |
| R-105 | 7/15/95 | < 0.023 | | < 0.023 | | 0% |
| R-109 | 7/19/95 | < 0.028 | | < 0.023 | | 19% |
| R-124 | 8/3/95 | < 0.023 | | < 0.023 | | 0% |

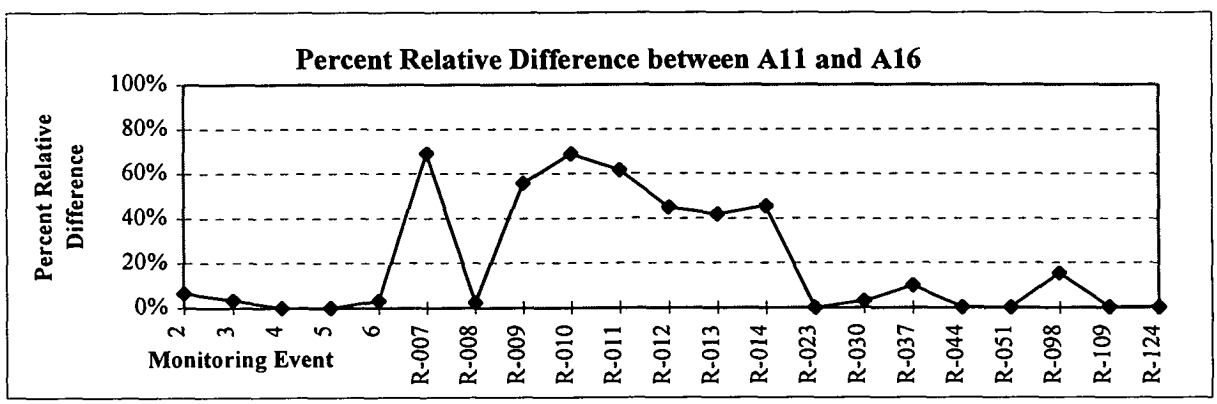
**Bold Type** Concentration above lower detection limit.
D Duration of sampling outside USEPA-preferred limits.
F Flow outside manufacturer's preferred range.



Comparison of Dieldrin Concentrations at Collocated Samplers A11 and A61
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| Event Number | Sampling Start Date | Dieldrin Concentration (µg/m$^3$) A11 | | A61 | | Relative Percent Difference |
|---|---|---|---|---|---|---|
| 2 | 2/16/95 | < 0.029 | | < 0.031 | | 7% |
| 3 | 2/17/95 | < 0.029 | | < 0.030 | | 3% |
| 4 | 2/18/95 | < 0.030 | | < 0.030 | | 0% |
| 5 | 2/21/95 | < 0.030 | | < 0.030 | | 0% |
| 6 | 3/7/95 | < 0.032 | | < 0.033 | | 3% |
| R-007 | 3/29/95 | < 0.039 | | < 0.019 | | 69% |
| R-008 | 3/30/95 | < 0.041 | | < 0.040 | | 2% |
| R-009 | 3/31/95 | < 0.039 | | < 0.022 | | 56% |
| R-010 | 4/1/95 | < 0.041 | | < 0.020 | | 69% |
| R-011 | 4/2/95 | < 0.034 | | < 0.018 | | 62% |
| R-012 | 4/3/95 | < 0.030 | D | < 0.019 | | 45% |
| R-013 | 4/4/95 | < 0.026 | | < 0.017 | D | 42% |
| R-014 | 4/5/95 | < 0.027 | | < 0.017 | | 45% |
| R-023 | 4/14/95 | < 0.019 | | < 0.019 | | 0% |
| R-030 | 4/20/95 | < 0.019 | | < 0.019 | | 3% |
| R-037 | 4/28/95 | < 0.019 | | < 0.021 | | 10% |
| R-044 | 5/4/95 | < 0.024 | D | < 0.024 | | 0% |
| R-051 | 5/11/95 | < 0.024 | | < 0.024 | | 0% |
| R-098 | 7/9/95 | < 0.023 | | < 0.020 | | 15% |
| R-109 | 7/20/95 | < 0.023 | | < 0.023 | | 0% |
| R-124 | 8/4/95 | < 0.023 | | < 0.023 | | 0% |

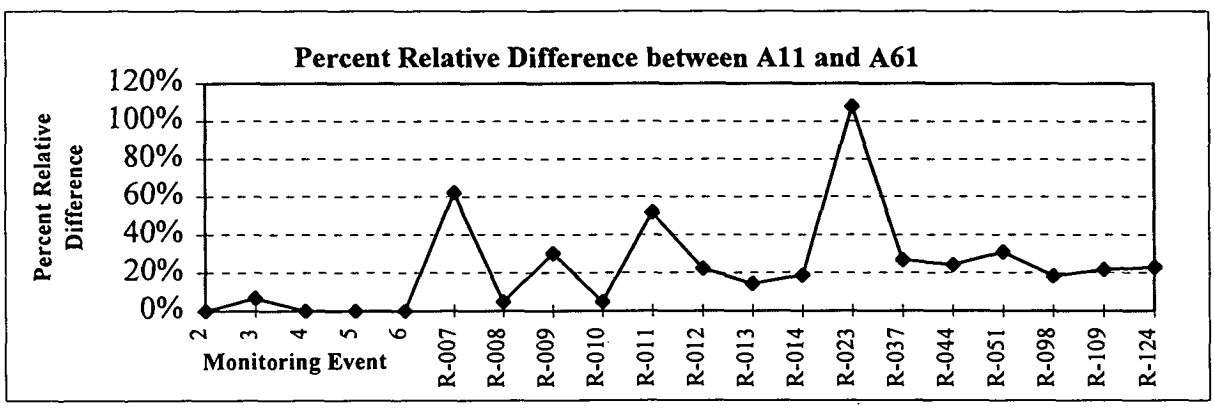
D Duration of sampling outside USEPA-preferred limits.
F Flow outside manufacturer's preferred range.



Comparison of Hexachlorobenzene Concentrations at Collocated Samplers A11 and A61
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| Event Number | Sampling Start Date | Hexachlorobenzene Concentration (µg/m$^3$) A11 | A61 | Relative Percent Difference |
|---|---|---|---|---|
| 2 | 2/15/95 | < 0.015 | < 0.015 | 0% |
| 3 | 2/16/95 | < 0.014 | < 0.015 | 7% |
| 4 | 2/17/95 | < 0.015 | < 0.015 | 0% |
| 5 | 2/18/95 | < 0.015 | < 0.015 | 0% |
| 6 | 2/21/95 | < 0.016 | < 0.016 | 0% |
| R-007 | 3/28/95 | < 0.019 | < 0.010 | 62% |
| R-008 | 3/29/95 | < 0.021 | < 0.020 | 5% |
| R-009 | 3/30/95 | < 0.019 | < 0.014 | 30% |
| R-010 | 3/31/95 | < 0.021 | **0.020** J | 5% |
| R-011 | 4/1/95 | < 0.017 | **0.010** | 52% |
| R-012 | 4/2/95 | < 0.015 D | **0.012** D | 22% |
| R-013 | 4/3/95 | **0.025** | **0.022** | **14%** |
| R-014 | 4/4/95 | **0.039** | **0.047** J | **19%** |
| R-023 | 4/13/95 | **0.030** | < 0.009 | 108% |
| R-037 | 4/27/95 | **0.106** J | **0.081** | **27%** |
| R-044 | 5/4/95 | **0.109** D | **0.139** | **24%** |
| R-051 | 5/11/95 | **0.165** | **0.121** | **31%** |
| R-098 | 7/8/95 | **0.159** | **0.132** | **18%** |
| R-109 | 7/19/95 | **0.133** | **0.107** | **22%** |
| R-124 | 8/3/95 | **0.055** | **0.044** | **23%** |

**Bold Type** Concentration above lower detection limit.
D Duration of sampling outside USEPA-preferred limits.
F Flow outside manufacturer's preferred range.



# Ambient Air Monitoring Quality Assurance Blank Sample Analysis Results

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| Event No. | Mass Detected in Blank | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $PM_{10}$ (mg) | | Particulate Mercury (µg) | | DDT (µg) | | Dieldrin (µg) | | Hexachlorobenzene (µg) | |
| | Field Blank | Trip Blank | Field Blank | Trip Blank | Field Blank | Trip Blank | Field Blank | Trip Blank | Field Blank | Trip Blank |
| 1 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | — | — | — | — | — | — |
| 2 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| 3 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| 4 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| 5 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| 6 | **1.2** | < 0.5 | < 0.48 | < 0.48 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-01 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | 0.005 J | 0.005 J | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-02 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | 0.011 J | — | < 0.10 | — | < 0.050 | — |
| R-03 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | — | — | — | — | — | — |
| R-04 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | — | — | — | — | — | — |
| R-05 | **5.9** | < 0.5 | < 0.48 | < 0.48 | — | — | — | — | — | — |
| R-06 | **3.4** | < 0.5 | < 0.48 | < 0.48 | — | — | — | — | — | — |
| R-07 | — | < 0.5 | — | < 0.48 | < 0.10 | — | < 0.10 | — | < 0.050 | — |
| R-08 | — | — | — | — | < 0.10 | — | < 0.10 | — | < 0.050 | — |
| R-09 | — | < 0.5 | — | < 0.48 | — | — | — | — | — | — |
| R-10 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | < 0.10 | — | < 0.10 | — | < 0.050 | — |
| R-11 | 0.5 | < 0.5 | < 0.48 | < 0.48 | — | — | — | — | — | — |
| R-12 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | — | — | — | — | — | — |
| R-23 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-30 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-37 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-51 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-60 | **0.8** | < 0.5 | < 0.48 | < 0.48 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-72 | < 0.5 | < 0.5 | < 0.48 | < 0.48 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-98 | < 0.5 | < 0.5 | — | — | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-109 | **0.9** | < 0.5 | — | — | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-117 | < 0.5 | < 0.5 | — | — | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-124 | < 0.5 | < 0.5 | — | — | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.050 | < 0.050 |
| R-153 | < 0.5 | < 0.5 | — | — | — | — | — | — | — | — |

Table 7-8

Precipitation in Yakima, Washington, during
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | Precipitation (inches) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Date | February | March | April | May | June | July | August | September |
| 1 | 0.01 | — | — | 0.04 | — | — | — | — |
| 2 | — | — | — | — | — | — | — | — |
| 3 | T | — | — | — | — | — | — | — |
| 4 | — | T | — | 0.02 | 0.05 | — | — | — |
| 5 | — | — | T | T | 0.05 | — | — | — |
| 6 | — | — | — | — | 0.14 | 0.10 | — | 0.40 |
| 7 | 0.03 | — | 0.03 | T | — | 0.06 | — | 0.07 |
| 8 | — | 0.07 | T | 0.22 | — | 0.21 | — | — |
| 9 | — | 0.40 | — | 0.27 | — | 0.27 | — | — |
| 10 | — | 0.41 | T | 0.01 | 0.27 | — | 0.13 | — |
| 11 | 0.18 | T | — | 0.02 | — | — | — | — |
| 12 | T | T | 0.68 | — | — | — | — | — |
| 13 | T | 0.03 | — | 0.02 | T | — | — | — |
| 14 | — | 0.21 | — | — | 0.11 | — | — | — |
| 15 | T | — | — | — | T | — | — | — |
| 16 | T | — | — | — | T | — | — | |
| 17 | T | — | T | — | — | — | 0.01 | |
| 18 | T | 0.04 | — | — | T | — | — | |
| 19 | 0.01 | — | — | — | T | — | — | |
| 20 | — | 0.11 | 0.13 | — | — | — | — | |
| 21 | — | — | — | — | — | — | — | |
| 22 | — | 0.01 | — | — | — | — | — | |
| 23 | — | T | — | — | — | — | — | |
| 24 | — | — | — | — | — | — | — | |
| 25 | — | — | — | 0.02 | — | — | — | |
| 26 | — | — | — | — | — | 0.05 | — | |
| 27 | — | — | 0.16 | — | — | — | — | |
| 28 | — | — | 0.80 | — | — | — | — | |
| 29 | | — | 0.02 | — | — | — | — | |
| 30 | | — | — | — | — | — | — | |
| 31 | | T | | — | | — | — | |

NOTE: Precipitation data was recorded by the National Weather Service at the Yakima Airport, which is less than two miles west of the Woods Industries Site.

T Trace of rain.

Reference Method $PM_{10}$ Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | $PM_{10}$ Concentration ($\mu g/m^3$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event | Sampling | East Perimeter | West Perimeter | East Perimeter | West Perimeter | East Perimeter | West Perimeter | East of Site | West of Site |
| Number | Start Date | A11 or A61 | A12 | A13 | A14 | A15 | A16 | A21 | A22 |
| 1 | 02/14/95 | 22.2 | 19.7 F | 22.5 F | 21.5 | NS | NS | 26.4 | 22.1 |
| 2 | 02/15/95 | 36.5 | 39.9 F | 43.4 F | 35.0 F | NS | NS | 63.6 | 47.1 |
| 3 | 02/16/95 | 23.6 | 16.2 | 21.7 F | 15.3 | NS | NS | 16.2 | 13.5 |
| 4 | 02/17/95 | 26.5 | 27.4 | 24.6 | 30.9 | NS | NS | 41.2 | 29.6 |
| 5 | 02/18/95 | 31.4 | 31.9 | 33.1 | 32.2 | NS | NS | 38.7 | 34.1 |
| 6 | 02/21/95 | 25.6 | 23.1 F | 26.4 | 24.7 | NS | NS | 38.8 F | 30.4 F |
| 7 | 03/07/95 | 53.6 | 53.3 | 57.9 | 54.6 | NS | NS | 88.5 | 93.0 |
| 8 | 03/08/95 | 44.8 D | 33.1 D | 35.3 D | 33.4 D | NS | NS | 40.9 FD | 40.1 FD |
| 9 | 03/10/95 | 11.7 D | 13.6 D | 12.8 D | 10.6 D | NS | NS | 15.2 F | 13.4 F |
| R-01 | 03/18/95 | 8.1 | 5.8 | 6.5 | 7.2 | NS | NS | 12.2 | 10.6 |
| R-02 | 03/19/95 | 9.6 | 12.9 | 10.9 | 14.2 | NS | NS | 13.4 F | 10.3 |
| R-03 | 03/23/95 | 41.0 | 20.7 | 17.8 F | 22.2 | NS | NS | 34.2 F | 25.1 |
| R-04 | 03/24/95 | ***167.3*** D | 22.5 D | 16.1 D | 14.5 D | NS | NS | FD | 25.8 D |
| R-05 | 03/25/95 | 24.1 | 17.4 | 17.7 | 15.5 | NS | NS | 34.1 FD | 30.5 FD |
| R-06 | 03/27/95 | 44.1 | 38.2 | 41.1 | 36.2 | NS | NS | 59.1 FD | 46.5 FD |
| R-07 | 03/28/95 | 54.1 | 53.0 | 51.2 | 68.4 | NS | NS | 83.4 F | 74.3 F |
| R-08 | 03/29/95 | 59.4 F | 56.3 D | 61.0 D | 63.8 D | NS | NS | 121.1 FD | 85.4 FD |
| R-09 | 03/30/95 | R | R | R | R | NS | NS | R | R |
| R-10 | 03/31/95 | 58.7 | 42.7 | 47.7 | 47.7 | NS | NS | 74.2 F | 57.7 F |
| R-11 | 04/01/95 | R | R | R | R | NS | NS | R | R |
| R-12 | 04/02/95 | 45.2 D | 38.7 D | 38.0 D | 36.9 D | NS | NS | 81.6 D | 84.7 D |
| R-13 | 04/03/95 | 78.2 | 59.6 | 63.5 | 55.8 | NS | NS | 82.0 D | 79.3 D |
| R-14 | 04/04/95 | 142.5 | 63.1 | 43.6 | 49.0 | NS | NS | 52.7 | 70.7 |
| R-15 | 04/05/95 | 33.2 | 19.4 D | 24.3 D | 22.7 D | NS | NS | 25.3 D | 23.5 D |
| R-16 | 04/06/95 | 32.1 A | 27.6 | 22.0 D | 21.9 | NS | NS | P | 28.4 |
| R-17 | 04/07/95 | 53.6 | 34.0 D | 23.5 | 12.7 | NS | NS | 12.8 | 11.1 |
| R-18 | 04/08/95 | 43.0 D | 6.3 D | 14.2 D | 6.2 | NS | NS | 9.7 | 15.0 |
| R-19 | 04/09/95 | 4.1 | 19.9 D | 27.5 | 15.4 | NS | NS | 33.3 D | 37.9 |
| R-20 | 04/10/95 | 45.6 | NS | 18.0 | NS | NS | NS | 19.3 | 25.1 |
| R-21 | 04/11/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-22 | 04/12/95 | 15.4 | 6.9 | 6.4 D | 3.7 | NS | NS | 8.0 | 9.7 |
| R-23 | 04/13/95 | 142.4 | 18.6 | 20.2 | 19.0 | NS | NS | 25.7 | 20.1 |
| R-24 | 04/14/95 | ***214.7*** | 23.1 | 16.3 | 16.6 | NS | NS | 22.9 | 21.2 |
| R-25 | 04/15/95 | 44.7 | 19.1 | 19.0 | 17.4 | NS | NS | 24.6 | 21.7 |
| R-26 | 04/16/95 | 48.2 | 27.2 | 25.6 | 29.5 | NS | NS | 44.1 | 39.5 |
| R-27 | 04/17/95 | 6.4 | 10.0 | 15.2 | 11.1 | NS | NS | 17.2 | 17.3 |
| R-28 | 04/18/95 | 105.0 D | 19.1 FD | 21.0 D | 17.3 FD | NS | NS | 31.0 D | 36.6 D |

*Reference Method $PM_{10}$ Concentrations in Ambient Air*

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | $PM_{10}$ Concentration ($\mu g/m^3$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-29 | 04/19/95 | 24.6 | 7.0 | 15.2 | 11.0 | NS | NS | 13.5 | 15.1 |
| R-30 | 04/20/95 | 138.2 | 6.5 | 12.9 | 6.7 | NS | NS | 11.9 | 6.3 |
| R-31 | 04/21/95 | 84.6 | 14.5 | 14.7 | 13.2 | NS | NS | 16.9 | 19.2 |
| R-32 | 04/22/95 | 38.1 | 16.2 | 17.8 | 16.2 | NS | NS | 43.5 | 31.5 |
| R-33 | 04/23/95 | 73.4 | 19.1 | 21 | 18.7 | NS | NS | 41.2 | 32.7 |
| R-34 | 04/24/95 | 111.5 | 31.1 | 59.6 | 54.1 | NS | NS | 54.7 | 53 |
| R-35 | 04/25/95 | 89.6 | 29 | 29 | 31.4 | NS | NS | 53.2 | 42.5 |
| R-36 | 04/26/95 | 74.1 | 32.1 | 33 | 34.6 | NS | NS | 42.2 | 40.1 |
| R-37 | 04/27/95 | 70.4 | 19.9 | 22.3 | 19.4 | NS | NS | 16.3 | 17.2 |
| R-38 | 04/28/95 | 36.4 | 8.4 | 9.7 | 8.9 | NS | NS | 9.0 | 7.8 |
| R-39 | 04/29/95 | 97.7 | 8.1 | 8.4 | 9.4 | NS | NS | 9.9 | 8.4 |
| R-40 | 04/30/95 | 47.7 | 11.9 | 14.4 | 16.1 | NS | NS | 15.2 | 12.8 |
| R-41 | 05/01/95 | 45.9 | 13.7 | 13.7 | 20.4 | NS | NS | 12.6 | 13.1 |
| R-42 | 05/02/95 | 80.8 | 12.4 | 9.7 | 8.2 D | NS | NS | 13.1 D | 11.5 |
| R-43 | 05/03/95 | 46.4 D | 11.9 D | 13.2 D | 9.5 D | NS | NS | 13.5 D | 14.2 |
| R-44 | 05/04/95 | 25.0 D | NS | NS | NS | NS | NS | NS | NS |
| R-45 | 05/05/95 | 46.3 | NS | NS | NS | NS | NS | NS | 16.0 D |
| R-46 | 05/06/95 | 39.1 | 12.7 | 10.9 | 12.2 D | NS | NS | 13.7 | 15.7 |
| R-47 | 05/08/95 | 47.2 A | NS | NS | NS | NS | NS | NS | NS |
| R-48 | 05/09/95 | 42.4 | 17.0 | 9.3 | 11.1 | NS | NS | P | 11.7 |
| R-49 | 05/10/95 | 23.1 A | NS | NS | NS | NS | NS | NS | NS |
| R-50 | 05/10/95 | 18.6 | 5.2 | 11.0 | 7.4 | NS | NS | 5.9 | 3.6 |
| R-51 | 05/11/95 | 66.2 | 6.4 | 10.8 | 8.2 | NS | NS | 12.3 | 10.9 |
| R-52 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| R-53 | 05/18/95 | 30.9 | 14.7 | 16.4 | 14.6 F | NS | NS | 26.6 | 31.0 |
| R-54 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| R-55 | 05/20/95 | 38.9 | NS | NS | NS | NS | NS | NS | NS |
| R-56 | 05/21/95 | 51.9 A | NS | NS | NS | NS | NS | NS | NS |
| R-57 | 05/22/95 | 76.8 | 30.8 | 28.8 | 28.2 | NS | NS | 35.5 | 46.0 |
| R-58 | 05/23/95 | 76.4 A | NS | NS | NS | NS | NS | NS | NS |
| R-59 | 05/24/95 | 85.3 | NS | NS | NS | NS | NS | NS | NS |
| R-60 | 05/25/95 | 110.5 | 34.8 | 38.5 | 42.4 | NS | NS | 42.3 | 50.0 |
| R-61 | 05/26/95 | 27.6 | 23.1 | 29.2 | 24.1 | NS | NS | 33.3 | 29.6 |
| R-62 | 06/03/95 | 129.7 | NS | NS | NS | NS | NS | NS | NS |
| R-63 | 06/04/95 | 36.5 | NS | NS | NS | NS | NS | NS | NS |
| R-64 | 06/05/95 | ***224.2*** DP | 15.7 DP | 16.6 DP | NS | ***197.0*** DP | 26.4 DP | 15.9 DP | 40.2 DP |
| R-65 | 06/06/95 | 83.6 | NS | NS | NS | NS | NS | NS | NS |

Reference Method $PM_{10}$ Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | $PM_{10}$ Concentration ($\mu g/m^3$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-66 | 06/07/95 | 25.1 A | NS | NS | NS | 50.2 | 26.4 | NS | NS |
| R-67 | 06/08/95 | 57.2 | 15.7 | 18.5 | NS | 70.3 | ***220.8*** | 22.2 | 16.6 F |
| R-68 | 06/09/95 | 62.7 A | NS | NS | NS | NS | NS | NS | NS |
| R-69 | 06/10/95 | 73.6 | NS | NS | NS | NS | NS | NS | NS |
| R-70 | 06/11/95 | 115.3 AD | 7.8 D | 10.1 | NS | 50.2 FD | 26.4 | 8.2 | 5.8 |
| R-71 | 06/13/95 | 138.2 | NS | NS | NS | NS | NS | NS | NS |
| R-72 | 06/14/95 | 28.8 A | 9.8 | NS | NS | 12.6 | 9.7 | 16.0 | 14.2 |
| R-73 | 01/00/00 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-74 | 06/15/95 | ***262.6*** A | NS | NS | NS | NS | NS | NS | NS |
| R-75 | 06/16/95 | 38.0 | NS | NS | NS | NS | NS | NS | NS |
| R-76 | 06/17/95 | 119.0 A | 9.3 | NS | NS | 38.1 | 25.5 | 17.2 | 13.1 |
| R-77 | 06/18/95 | 14.9 | NS | NS | NS | NS | NS | NS | NS |
| R-78 | 06/19/95 | 101.8 A | NS | NS | NS | NS | NS | NS | NS |
| R-79 | 06/20/95 | ***213.0*** | 12.9 | 23.6 | 18.2 | ***192.0*** | 22.1 | 31.8 | 25.3 |
| R-80 | 06/21/95 | ***190.0*** A | NS | NS | NS | NS | NS | NS | NS |
| R-81 | 06/22/95 | 108.8 | NS | NS | NS | NS | NS | NS | NS |
| R-82 | 06/23/95 | 149.2 A | 24.2 | 44.4 | 29.2 | 64.7 | 35.8 | 29.1 | 21.1 |
| R-83 | 06/24/95 | 83.6 | NS | NS | NS | NS | NS | NS | NS |
| R-84 | 06/25/95 | 137.7 A | NS | NS | NS | NS | NS | NS | NS |
| R-85 | 06/26/95 | ***286.6*** | 30.8 | 57.1 F | 52.5 | ***358.5*** | ***201.6*** | 72.8 | 66.6 |
| R-86 | 06/27/95 | 144.1 A | NS | NS | NS | NS | NS | NS | NS |
| R-87 | 06/28/95 | ***154.3*** | NS | NS | NS | NS | NS | NS | NS |
| R-88 | 06/29/95 | NS | 53.9 | - | NS | 81.3 | 123.7 | 66.9 | 56.8 |
| R-89 | 06/30/95 | P | NS | NS | NS | NS | NS | NS | NS |
| R-90 | 07/01/95 | 147.7 A | NS | NS | NS | NS | NS | NS | NS |
| R-91 | 07/02/95 | ***441.9*** | 30.3 | 33.0 | 38.1 | ***268.6*** D | 57.9 | 23.9 D | 25.4 |
| R-92 | 07/03/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-93 | 07/04/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-94 | 07/05/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-95 | 07/06/95 | P | NS | NS | NS | NS | NS | NS | NS |
| R-96 | 07/07/95 | P | NS | NS | NS | NS | NS | NS | NS |
| R-97 | 07/07/95 | 80.0 A | NS | NS | NS | NS | NS | NS | NS |
| R-98 | 07/08/95 | 108.0 | 9.2 | NS | NS | 34.7 | 22.1 | 10.8 | 15.5 |
| R-99 | 07/09/95 | ***157.8*** | NS | NS | NS | NS | NS | NS | NS |
| R-100 | 07/10/95 | ***170.9*** A | NS | NS | NS | NS | NS | NS | NS |
| R-101 | 07/11/95 | 126.5 | 12.8 | 12.7 | 13.5 | 96.5 | 39.6 | 18.4 | 24.3 |
| R-102 | 07/12/95 | ***209.5*** A | NS | NS | NS | NS | NS | NS | NS |

Reference Method $PM_{10}$ Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | $PM_{10}$ Concentration ($\mu g/m^3$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-103 | 07/13/95 | 49.5 | NS | NS | NS | NS | NS | NS | NS |
| R-104 | 07/14/95 | ***247.1*** | 14.0 | NS | NS | 56.7 | 31.6 | 22.2 | 19.9 |
| R-105 | 07/15/95 | ***179.0*** A | NS | NS | NS | NS | NS | NS | NS |
| R-106 | 07/16/95 | NS | NS | NS | NS | 104.0 | NS | NS | NS |
| R-107 | 07/17/95 | 90.1 | 25.5 | 33.2 | 29.4 | 41.1 | 32.3 | 54.7 | 34.9 |
| R-108 | 07/18/95 | ***172.3*** A | NS | NS | NS | NS | NS | NS | NS |
| R-109 | 07/19/95 | ***193.4*** | NS | NS | NS | NS | NS | NS | NS |
| R-110 | 07/20/95 | ***165.2*** F | 26.8 | 33.7 | 28.3 | 62.9 | 30.4 | 33.7 | 33.4 |
| R-111 | 07/21/95 | ***158.8*** A | NS | NS | NS | NS | NS | NS | NS |
| R-112 | 07/22/95 | 86.6 | NS | NS | NS | NS | NS | NS | NS |
| R-113 | 07/23/95 | 70.6 | 35.3 | 26.2 | 20.1 | 82.0 | 38.7 | 24.6 | 26.4 |
| R-114 | 07/24/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-115 | 07/25/95 | 42.5 | NS | NS | NS | NS | NS | NS | NS |
| R-116 | 07/26/95 | ***167.4*** A | NS | NS | NS | NS | NS | NS | NS |
| R-117 | 07/27/95 | 87.5 | 16.1 | 17.7 | 15.7 | 25.1 | 37.0 | 20.0 | 19.0 |
| R-118 | 07/28/95 | ***173.7*** | NS | NS | NS | NS | NS | NS | NS |
| R-119 | 07/29/95 | ***199.1*** A | NS | NS | NS | NS | NS | NS | NS |
| R-120 | 07/30/95 | 77.6 | NS | NS | NS | NS | NS | NS | NS |
| R-121 | 07/31/95 | 97.7 A | 22.8 | 28.7 | 26.1 | 39.0 | 32.4 | 37.0 | 34.9 |
| R-122 | 08/01/95 | ***174.2*** | NS | NS | NS | NS | NS | NS | NS |
| R-123 | 08/02/95 | ***154.0*** A | NS | NS | NS | NS | NS | NS | NS |
| R-124 | 08/03/95 | 81.9 | 15.7 | 19.9 | 23.6 | 45.3 | 39.1 | 22.5 | 26.4 |
| R-125 | 08/04/95 | ***232.7*** | NS | NS | NS | NS | NS | NS | NS |
| R-126 | 08/05/95 | ***207.8*** A | NS | NS | NS | NS | NS | NS | NS |
| R-127 | 08/07/95 | ***194.1*** | NS | NS | NS | NS | NS | NS | NS |
| R-128 | 08/08/95 | 9.6 A | 25.1 | 31.8 | 29.7 | 10.6 | 28.1 | 30.9 | 26.6 |
| R-129 | 08/09/95 | 77.8 | NS | NS | NS | NS | NS | NS | NS |
| R-130 | 08/10/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-131 | 08/11/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-132 | 08/12/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-133 | 08/13/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-134 | 08/14/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-135 | 08/15/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-136 | 08/16/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-137 | 08/17/95 | 102.8 A | NS | NS | NS | NS | NS | NS | NS |
| R-138 | 08/18/95 | 36.7 | NS | NS | NS | NS | NS | NS | NS |
| R-139 | 08/19/95 | 17.1 A | NS | NS | NS | NS | NS | NS | NS |

Reference Method $PM_{10}$ Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | $PM_{10}$ Concentration ($\mu g/m^3$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-140 | 08/20/95 | 28.2 | NS | NS | NS | NS | NS | NS | NS |
| R-141 | 08/21/95 | *350.0* A | NS | NS | NS | NS | NS | NS | NS |
| R-142 | 08/22/95 | 84.1 | NS | NS | NS | NS | NS | NS | NS |
| R-143 | 08/23/95 | *253.3* A | NS | NS | NS | NS | NS | NS | NS |
| R-144 | 08/24/95 | 56.7 | NS | NS | NS | NS | NS | NS | NS |
| R-145 | 08/25/95 | 65.5 A | NS | NS | NS | NS | NS | NS | NS |
| R-146 | 08/26/95 | 75.0 | NS | NS | NS | NS | NS | NS | NS |
| R-147 | 08/27/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-148 | 08/28/95 | 99.1 A | NS | NS | NS | NS | NS | NS | NS |
| R-149 | 08/29/95 | 41.9 | NS | NS | NS | NS | NS | NS | NS |
| R-150 | 08/30/95 | 35.0 A | NS | NS | NS | NS | NS | NS | NS |
| R-151 | 08/31/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-152 | 09/05/95 | 21.4 A | NS | NS | NS | NS | NS | NS | NS |
| R-153 | 09/06/95 | 59.2 | NS | 24.8 | 11.6 | 71.6 | 17.5 | NS | NS |
| R-154 | 09/11/95 | 77.5 | NS | 50.5 | 30.9 | 132 | 42.0 | NS | NS |
| R-155 | 09/14/95 | 66.4 | NS | 39.2 | 30.4 | 61.2 | 52.7 | NS | NS |

*Italic* Greater than action level (150 $\mu g/m^3$).

A Sample collected at monitoring location A11 using sampler A61 (not collocated sampling).

NS No Sample Collected or Analyzed.

P Pump fault.

R Rejected lab data because filters were wet upon receipt at laboratory.

Table 7-10

# DataRAM $PM_{10}$ Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

Particulate Matter Concentration (µg/m³)

1-Hour Average Real-Time

| Event Number | Average | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | 22-23 | 23-24 | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 67.8 | | | | | | | | | 74 | 73 | 74 | 72 | 69 | 67 | 69 | 73 | 70 | 66 | 65 | 64 | 66 | 65 | 65 | NA | 63 | 64 | 63 | 65 | 65 | 66 | 69 | 69 | 72 | | | | | | | | |
| 2 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 18.3 | | | | | | | | | | | | | | 7 | 4 | 7 | 15 | 17 | 29 | 28 | 8 | 11 | 13 | 7 | 5 | 21 | 22 | 25 | 25 | 21 | 51 | 25 | 26 | | | | | | | | |
| 5 | 23.6 | | | | | | | | | 40 | 30 | 25 | 16 | 18 | 20 | 20 | 35 | 44 | 35 | 31 | 34 | 32 | 27 | 31 | 17 | 9 | 8 | 7 | 10 | 12 | 17 | | 24 | | | | | | | | | |
| 6 | 15.5 | | | | | | | | | | | | | | | | | 13 | 24 | 26 | 27 | 20 | 18 | 16 | 17 | 16 | 10 | 13 | 11 | 11 | 13 | 12 | 23 | 15 | 11 | 11 | 12 | 12 | 13 | 14 | | |
| 7 | 40.0 | | | | | | | | | 16 | 13 | 13 | 14 | 19 | 26 | 46 | 24 | 54 | 114 | 70 | 72 | 54 | 47 | 62 | 54 | 58 | 57 | 35 | 30 | 25 | 20 | 19 | 20 | | | | | | | | | |
| 8 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 10.6 | | | | | | | | | | 17 | 25 | 13 | 12 | 11 | 14 | 14 | 12 | 8 | 7 | 7 | 10 | 10 | 9 | 5 | 4 | 4 | 3 | 3 | 8 | 10 | 15 | 22 | 14 | 13 | 13 | 7 | 6 | | | | |
| R-01 | 9.9 | | | | | | | | 27 | 32 | 26 | 19 | 17 | 12 | 7 | 7 | 8 | 11 | 11 | 4 | 4 | 3 | 5 | 6 | 8 | 4 | 10 | 5 | 4 | 5 | 2 | 4 | | | | | | | | | | |
| R-02 | 9.4 | | | | | | | | | | | 3 | 4 | 4 | 5 | 7 | 14 | 6 | 8 | 58 | 15 | 7 | 6 | 11 | 14 | 7 | 6 | 5 | 5 | 4 | 3 | 3 | 9 | 19 | 6 | | | | | | | |
| R-03 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-04 | 17.5 | | | | | | | | | | | | | | | | | | 21 | 17 | 12 | 11 | 11 | 10 | 15 | 9 | 10 | 16 | 18 | 30 | 34 | 41 | 26 | 11 | 12 | 10 | | | | | | |
| R-05 | 13.9 | | | | | | | | | | 12 | 10 | 23 | | | | 8 | 5 | 8 | 15 | 25 | 18 | 14 | 18 | 19 | 20 | 13 | 16 | 16 | 14 | 15 | 16 | 12 | 5 | 5 | | | | | | | |
| R-06 | 19.8 | | | | | | | | | 31 | 25 | 13 | | 10 | 14 | 18 | 16 | 16 | 18 | 17 | 17 | 20 | 37 | 18 | 22 | 24 | 21 | 29 | 13 | 14 | 21 | 22 | 22 | | | | | | | | |
| R-07 | 24.1 | | | | | | | | | | | | | 12 | 16 | 18 | 18 | 15 | 16 | 23 | 52 | 44 | 36 | 30 | 23 | 20 | 19 | 16 | 15 | 17 | 17 | 44 | 37 | 36 | 21 | 29 | 21 | 9 | | | | |
| R-08 | 24.1 | | | | | | | | | | | | | | 9 | 12 | 13 | 15 | 16 | 28 | 28 | 41 | 32 | 26 | 23 | 26 | 61 | 29 | 17 | 16 | 22 | 23 | 24 | 25 | 21 | | | | | | | |
| R-09 | 30.8 | | | | | | | | | | | | | | | | | | | | | | | | | 29 | 33 | 28 | 32 | | | | | | | | | | | | | |
| R-10 | 17.7 | | | | | | | | | | | 33 | 28 | 32 | 32 | 23 | 74 | 33 | 11 | 19 | 18 | 20 | 20 | 19 | 13 | 8 | 2 | 2 | 2 | 7 | 6 | 5 | 3 | 13 | 13 | 6 | | | | | | |
| R-11 | 9.1 | | | | | | | | | | | 6 | 13 | 8 | 2 | 2 | 2 | 7 | 6 | 5 | 3 | 13 | 13 | 6 | 8 | 12 | 34 | 36 | 6 | 3 | 9 | 15 | 4 | 8 | 23 | 4 | 4 | 2 | 4 | | | |
| R-12 | 21.7 | | | | | | | | | | | 10 | 3 | 3 | 5 | 6 | 9 | 6 | 12 | 29 | 44 | 40 | 41 | 31 | 17 | 47 | 26 | 29 | 19 | 17 | 26 | 27 | 20 | 13 | 38 | 25 | | | | | | |
| R-13 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-14 | 29.7 | | | | | | | | | | | | | | | | | | | 29 | 85 | 25 | 19 | 55 | 138 | 13 | 13 | 7 | 11 | 11 | 40 | 18 | 27 | 14 | 18 | 14 | 16 | 12 | | | | |
| R-15 | 18.3 | | | | | | | | | | | 14 | 16 | 12 | 15 | 19 | 12 | 25 | 12 | 16 | 16 | 14 | 11 | 15 | 23 | 18 | 44 | 52 | 12 | 12 | 16 | 40 | 20 | 18 | 15 | 12 | 12 | 14 | 11 | | | |
| R-16 | 16.1 | | | | | | | | | | | 15 | 12 | 12 | 14 | 11 | 18 | 13 | 13 | 11 | 17 | 12 | 11 | 9 | 0 | 8 | 7 | 24 | 37 | 31 | 23 | 23 | 33 | 12 | 22 | | | | | | | |
| R-17 | 15.6 | | | | | | | | | | | 24 | 36 | 29 | 19 | 17 | 19 | 9 | 11 | 10 | 8 | 34 | 12 | 5 | 4 | 10 | 5 | 2 | 1 | 11 | 14 | 18 | 17 | 16 | 8 | 52 | | | | | | |
| R-18 | 17.2 | | | | | | | | | | | 52 | 20 | 22 | 24 | 33 | 139 | 4 | 4 | 32 | 1 | 1 | 2 | 3 | 0 | | | 1 | 1 | 0 | 2 | 13 | 14 | 10 | 9 | 9 | | | | | | |
| R-19 | 9.4 | | | | | | | | | | | | | 10 | 9 | 9 | 11 | 15 | 12 | 12 | 14 | 8 | 9 | 10 | 10 | 7 | 8 | 8 | 9 | 9 | 10 | 7 | 9 | 6 | 8 | 8 | 12 | 8 | | | | |
| R-20 | 13.5 | | | | | | | | | | | | | | | | 8 | 7 | 5 | 5 | 5 | 15 | 7 | 23 | 22 | 19 | 17 | 12 | 13 | 12 | 17 | 17 | 27 | 24 | 22 | 19 | 3 | 4 | 3 | 39 | 6 | 3 |
| R-21 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-22 | 10.0 | | | | | | | | | | | 4 | 3 | 5 | 1 | 4 | 30 | 17 | 8 | 7 | 5 | 2 | 4 | 1 | 9 | 5 | 4 | 1 | 2 | 1 | 7 | 20 | 17 | 4 | 61 | 17 | 24 | 89 | | | | |
| R-23 | 64.6 | | | | | | | | | | | 17 | 24 | 89 | 34 | 133 | 75 | 80 | | | | | | | | | | | | | | | | | | | | | | | | |
| R-24 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-25 | 16.8 | | | | | | | | | | | 11 | 6 | 6 | 7 | 7 | 23 | 32 | 36 | 11 | 21 | 53 | 31 | 22 | 31 | 15 | 12 | 10 | 12 | 16 | 17 | 23 | 5 | 6 | 6 | 5 | 13 | 20 | | | | |
| R-26 | 30.6 | | | | | | | | | | | 5 | 13 | 20 | 8 | 9 | 10 | 12 | 11 | 12 | 19 | 24 | 26 | 22 | 216 | 31 | 26 | 25 | 27 | 23 | 36 | 41 | 35 | 33 | 36 | 54 | 24 | | | | | |
| R-27 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-28 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-29 | 11.9 | | | | | | | | | 31 | 16 | 12 | 9 | 22 | 20 | 31 | 12 | 12 | 10 | 9 | 11 | 10 | 9 | 7 | 9 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 9 | 12 | | | | | | | | |
| R-30 | 62.0 | | | | | | | | 9 | 12 | | | | | | | | | 57 | 70 | 28 | 24 | 40 | 46 | 261 | 27 | 101 | 79 | 46 | 61 | 69 | | | | | | | | | | | |
| R-31 | 25.4 | | | | | | | | | 15 | 19 | 19 | 20 | 17 | 23 | 39 | 10 | 9 | 10 | 30 | 36 | 43 | 22 | 47 | 11 | 24 | 28 | 24 | 99 | 21 | 14 | 18 | 38 | 12 | 10 | | | | | | | |
| R-32 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-33 | 32.2 | | | | | | | | 8 | 10 | 8 | 12 | 9 | 12 | 39 | 10 | 10 | | | | | | | 31 | 45 | 26 | 127 | 29 | 35 | 46 | 31 | 91 | | | | | | | | | | |
| R-34 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-35 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-36 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 7-10

# DataRAM $PM_{10}$ Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

Particulate Matter Concentration (µg/m³)

1-Hour Average Real-Time

| Event Number | Average | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | 22-23 | 23-24 | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-37 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-38 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-39 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-40 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-41 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-42 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-43 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-44 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-45 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-46 | 17.7 | | | | | | | | | | | | 19 | 26 | 15 | 18 | 13 | 25 | 27 | 24 | 19 | 14 | 12 | 11 | 10 | | | | | | | | | | | | | | | | | |
| R-47 | 7.8 | 11 | 11 | 11 | 9 | 9 | 10 | 9 | 9 | 6 | 6 | 7 | 6 | 4 | 4 | 8 | 4 | 6 | 6 | 10 | 5 | 13 | 7 | 11 | 6 | | | | | | | | | | | | | | | | | |
| R-48 | 11.2 | 18 | 26 | 5 | 6 | 4 | 6 | 6 | 19 | | 33 | 11 | 8 | 21 | 3 | 5 | 5 | 17 | 11 | 9 | 19 | 5 | 4 | 3 | 11 | | | | | | | | | | | | | | | | | |
| R-49 | 11.9 | 13 | 10 | 12 | 19 | 14 | 19 | 21 | 16 | 20 | 16 | 21 | 16 | 7 | 3 | 3 | 4 | 8 | 19 | 15 | 7 | 8 | 6 | 6 | 5 | | | | | | | | | | | | | | | | | |
| R-50 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-51 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-52 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-53 | 10.7 | | | | | | | | | 9 | 8 | 9 | 10 | 9 | 8 | 9 | 10 | 12 | 9 | 20 | 9 | 10 | 10 | 9 | 7 | 24 | | | | | | | | | | | | | | | | |
| R-54 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-55 | 12.6 | 20 | 8 | 13 | 9 | 13 | 8 | 8 | 7 | 11 | 14 | 11 | 26 | 22 | 12 | 13 | 14 | 17 | 15 | 15 | 9 | 11 | 8 | 7 | | | | | | | | | | | | | | | | | |
| R-56 | 8.4 | 7 | 8 | 8 | 12 | 14 | 9 | 8 | 13 | 39 | 7 | 4 | 6 | 2 | 3 | 4 | 0 | 3 | 3 | 4 | 3 | 3 | 11 | 15 | 15 | | | | | | | | | | | | | | | | | |
| R-57 | 13.9 | 11 | 7 | 5 | 5 | 4 | 4 | 6 | 8 | 8 | 15 | 17 | 13 | 7 | 7 | 0 | 0 | 9 | 11 | 6 | 25 | 24 | 56 | 56 | 30 | | | | | | | | | | | | | | | | | |
| R-58 | 19.0 | 19 | 18 | 17 | 13 | 10 | 11 | 10 | 12 | 12 | 18 | 20 | 19 | 25 | 16 | 20 | 68 | 0 | 35 | 20 | 21 | 15 | 28 | 20 | 11 | | | | | | | | | | | | | | | | | |
| R-59 | 25.4 | 14 | 15 | 10 | 15 | 13 | 11 | 11 | 12 | 18 | 68 | 30 | 28 | 28 | 42 | 27 | 0 | 29 | 42 | 47 | 42 | 11 | 21 | 21 | 28 | | | | | | | | | | | | | | | | | |
| R-60 | 33.5 | 22 | 12 | 6 | 5 | 6 | 16 | 45 | 10 | 49 | 44 | 40 | 61 | 32 | 56 | 26 | 22 | 22 | 12 | 265 | 0 | 8 | 7 | 9 | 9 | | | | | | | | | | | | | | | | | |
| R-61 | 8.1 | 8 | 13 | 9 | 13 | 8 | 7 | 6 | 6 | 10 | 20 | 4 | 4 | 9 | 2 | 3 | 0 | 9 | 7 | 8 | 8 | 8 | 9 | 13 | 12 | | | | | | | | | | | | | | | | | |
| R-62 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-63 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-64 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-65 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-66 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-67 | 31.4 | | | | | | | | | | | | | 45 | 26 | 25 | 36 | 30 | 26 | 23 | 28 | 24 | 26 | 48 | 35 | | | | | | | | | | | | | | | | | |
| R-68 | 19.1 | | | | | | | | | | | | 15 | 13 | 25 | 12 | 26 | 17 | 8 | 16 | 26 | 5 | 13 | 27 | 29 | 26 | 24 | 17 | 11 | 11 | 6 | 8 | 20 | 33 | 32 | 41 | | | | | |
| R-69 | 24.2 | 26 | 24 | 17 | 11 | 11 | 6 | 8 | 20 | 33 | 32 | 41 | 26 | 21 | 13 | 30 | 24 | 12 | 33 | 30 | 29 | 67 | 32 | 15 | 23 | | | | | | | | | | | | | | | | | |
| R-70 | 37.0 | 4 | 3 | 1 | 7 | 22 | 42 | 299 | 14 | 77 | 21 | 11 | 10 | 11 | 66 | 38 | 92 | 21 | 8 | 10 | 10 | 14 | 77 | 21 | 11 | | | | | | | | | | | | | | | | | |
| R-71 | 8.5 | 17 | 43 | 7 | 9 | 1 | 4 | 5 | 4 | 9 | 7 | 7 | 5 | 9 | 13 | 10 | 7 | 8 | 12 | 11 | 2 | 4 | 3 | 5 | 4 | | | | | | | | | | | | | | | | | |
| R-72 | 8.0 | 4 | 4 | 5 | 7 | 6 | 6 | 4 | 6 | 7 | 8 | 10 | 9 | 9 | 6 | 5 | 4 | 7 | 11 | 25 | 27 | 2 | 3 | 5 | 14 | | | | | | | | | | | | | | | | | |
| R-73 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-74 | 54.7 | 65 | 129 | 41 | 40 | 10 | 154 | 36 | 89 | 47 | 46 | 29 | 19 | 12 | 13 | 19 | 13 | 22 | 29 | 92 | 79 | 103 | 97 | 77 | | | | | | | | | | | | | | | | | |
| R-75 | 72.1 | | | | | | | | 76 | 77 | 77 | 74 | 78 | 72 | 72 | 76 | 75 | 70 | 70 | 70 | 71 | 74 | 82 | 79 | 71 | 69 | 67 | 66 | 66 | 66 | 68 | 68 | | | | | | | | | |
| R-76 | 73.5 | 69 | 67 | 66 | 66 | 66 | 68 | 68 | 71 | 73 | 69 | 68 | 68 | 70 | 68 | 75 | 94 | 84 | 86 | 98 | 96 | 74 | 68 | 68 | 67 | | | | | | | | | | | | | | | | | |
| R-77 | 29.4 | 66 | 66 | 65 | 65 | 64 | 64 | 64 | 65 | 65 | 64 | 2 | 3 | 4 | 4 | 6 | 3 | 4 | 5 | 6 | 7 | 5 | 4 | 3 | 2 | | | | | | | | | | | | | | | | | |
| R-78 | 19.3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 4 | 6 | 5 | 4 | 5 | 7 | 7 | 15 | 17 | 22 | 63 | 45 | 62 | 40 | 41 | 40 | 67 | | | | | | | | | | | | | | | | | |
| R-79 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-80 | 36.1 | 31 | 25 | 153 | 36 | 77 | 71 | 26 | 97 | 13 | 10 | 39 | | | | | 11 | 20 | 10 | 14 | 10 | 10 | 6 | 41 | 7 | | | | | | | | | | | | | | | | | |
| R-81 | 47.4 | 24 | 10 | 52 | 00 | 60 | 42 | 60 | 68 | 58 | 84 | 80 | 46 | 37 | 21 | 39 | 21 | 40 | 21 | 45 | 22 | 59 | 63 | 44 | 88 | | | | | | | | | | | | | | | | | |

Table 7-10

# DataRAM $PM_{10}$ Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

Particulate Matter Concentration ($\mu g/m^3$)

| Event Number | Average | 1-Hour Average Real-Time | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | 22-23 | 23-24 | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 |
| R-82 | 31.0 | 55 | 73 | 61 | 51 | 29 | 35 | 15 | 24 | 22 | 26 | 23 | 21 | 47 | 33 | 22 | 44 | 17 | 14 | 17 | 32 | 26 | 29 | 22 | 18 | | | | | | | | | | | | | | | | | |
| R-83 | 29.3 | 15 | 14 | 22 | 29 | 28 | 27 | 48 | 29 | 31 | 28 | 30 | 14 | 12 | 27 | 24 | 20 | 19 | 40 | 55 | 30 | 27 | 56 | 31 | 47 | | | | | | | | | | | | | | | | | |
| R-84 | 19.5 | 8 | 9 | 3 | 2 | 2 | 22 | 12 | 47 | 77 | 21 | 41 | 12 | 8 | 9 | 31 | 25 | 42 | 18 | 14 | 14 | 9 | 9 | 23 | 10 | | | | | | | | | | | | | | | | | |
| R-85 | 11.3 | 11 | 21 | 11 | 13 | 9 | 9 | 9 | 11 | 9 | 9 | 7 | 11 | 9 | 26 | 17 | 11 | 9 | 13 | 11 | 12 | 10 | 9 | 7 | 8 | | | | | | | | | | | | | | | | | |
| R-86 | 47.1 | 8 | 13 | 8 | 7 | 40 | 50 | 203 | 266 | 40 | 10 | 8 | 8 | 11 | 11 | 12 | 10 | 12 | 10 | 10 | 48 | 79 | 74 | 94 | 97 | | | | | | | | | | | | | | | | | |
| R-87 | 94.2 | 107 | 93 | 88 | 71 | 73 | 75 | 71 | 71 | 80 | 95 | 121 | 108 | 102 | 102 | 91 | 102 | 102 | 113 | 115 | 113 | 135 | 75 | 80 | 79 | | | | | | | | | | | | | | | | | |
| R-88 | 80.0 | 102 | 91 | 102 | 102 | 113 | 115 | 113 | 135 | 75 | 80 | 79 | 81 | 66 | 70 | 77 | | 60 | 73 | 76 | 81 | 88 | 110 | 79 | 75 | | | | | | | | | | | | | | | | | |
| R-89 | 47.1 | 72 | 59 | 50 | 52 | 45 | 71 | 62 | 57 | 54 | 66 | 46 | 35 | 33 | 31 | 31 | 28 | 45 | 25 | 23 | 32 | 47 | 39 | 72 | 56 | | | | | | | | | | | | | | | | | |
| R-90 | 50.2 | 48 | 64 | 46 | 43 | 46 | 44 | 41 | 44 | 92 | 60 | 45 | 29 | 32 | 38 | 33 | 33 | 40 | 79 | 37 | 30 | 37 | 91 | 84 | 67 | | | | | | | | | | | | | | | | | |
| R-91 | 79.6 | | | | | | | | | 128 | 110 | 49 | 108 | 81 | 24 | 206 | 154 | 53 | 69 | 44 | 43 | 45 | 65 | 58 | 37 | | | | | | | | | | | | | | | | | |
| R-92 | 29.5 | 80 | 100 | 133 | 84 | 66 | 19 | 22 | 22 | 21 | 21 | 21 | 0 | 13 | 15 | 16 | 10 | | 15 | 4 | 10 | 3 | 3 | 2 | 0 | | | | | | | | | | | | | | | | | |
| R-93 | 30.6 | | | | | | | | 29 | 31 | 28 | 30 | 14 | 12 | 27 | 24 | 20 | 19 | 40 | 55 | 30 | 27 | 56 | 31 | 47 | 36 | 25 | 21 | 21 | 24 | 21 | 66 | | | | | | | | | | |
| R-94 | 16.3 | 4 | 4 | 4 | 3 | 3 | 6 | 10 | 10 | 9 | 18 | 36 | 15 | 14 | 28 | 9 | 11 | 10 | 15 | 11 | 25 | 22 | 55 | 38 | 25 | | | | | | | | | | | | | | | | | |
| R-95 | 41.6 | 92 | 10 | 14 | 14 | 20 | 25 | 20 | 45 | 44 | 54 | 20 | 47 | 35 | 250 | 18 | | 9 | 24 | 14 | 9 | 75 | 18 | 50 | 28 | | | | | | | | | | | | | | | | | |
| R-96 | 29.3 | 15 | 14 | 22 | 29 | 28 | 27 | 48 | 29 | 31 | 28 | 30 | 14 | 12 | 27 | 24 | 20 | 19 | 40 | 55 | 30 | 27 | 56 | 31 | 47 | | | | | | | | | | | | | | | | | |
| R-97 | 30.6 | | | | | | | | 29 | 31 | 28 | 30 | 14 | 12 | 27 | 24 | 20 | 19 | 40 | 55 | 30 | 27 | 56 | 31 | 47 | 36 | 25 | 21 | 21 | 24 | 21 | 66 | | | | | | | | | | |
| R-98 | 32.6 | | | | | | | | | 52 | 56 | 40 | 29 | 8 | 15 | 56 | 35 | 50 | 10 | 11 | 11 | 15 | 13 | 64 | | 75 | 36 | 23 | 24 | 34 | 44 | 15 | 34 | | | | | | | | | |
| R-99 | 50.8 | 75 | 36 | 23 | 24 | 34 | 44 | 15 | 34 | 49 | 209 | 16 | 19 | 53 | 73 | 53 | 102 | 116 | 38 | 14 | 25 | 24 | 19 | 41 | 84 | | | | | | | | | | | | | | | | | |
| R-100 | 46.7 | | | | | | | | | 65 | 69 | 146 | 34 | 14 | 10 | 10 | 12 | 25 | 9 | 9 | 8 | 93 | 84 | 94 | 88 | 59 | 109 | 67 | 44 | 21 | 16 | 20 | 18 | | | | | | | | | |
| R-101 | 38.1 | | | | | | | | | 18 | 13 | 14 | 9 | 12 | 15 | 22 | 56 | 25 | 14 | 18 | 11 | 16 | 28 | 19 | 62 | 19 | 70 | 141 | 71 | 88 | 63 | 44 | 68 | | | | | | | | | |
| R-102 | 18.3 | | | | | | | | 10 | 10 | 14 | 0 | 10 | 15 | 20 | 56 | 26 | 11 | 18 | 11 | 16 | 28 | 19 | 62 | 40 | 1 | | 0 | | 0 | 5 | 4 | | | | | | | | | |
| R-103 | 30.0 | | | | | | | | | 28 | 87 | 49 | 54 | 35 | 18 | 36 | 18 | 33 | 83 | 85 | 47 | 33 | 110 | 64 | 38 | 40 | 1 | | 0 | | 0 | 5 | 4 | | | | | | | | |
| R-104 | 57.1 | | | | | | | | | 15 | 16 | 15 | 32 | 35 | 17 | 21 | 21 | 30 | 22 | 65 | 82 | 22 | 88 | 128 | 83 | 152 | 58 | 110 | 32 | 159 | 74 | 62 | 31 | | | | | | | | | |
| R-105 | 40.8 | | | | | | | | | 46 | 39 | 29 | 30 | 20 | 48 | 78 | 47 | 36 | 21 | 27 | 17 | 55 | 28 | 46 | | 41 | 51 | 40 | 57 | 43 | 35 | 67 | 39 | | | | | | | | | |
| R-106 | 25.0 | | | | | | | | | 28 | 33 | 34 | 22 | 31 | 30 | 13 | 11 | 17 | 13 | 22 | 36 | 34 | 36 | 33 | 32 | 24 | 20 | 22 | 18 | 20 | 24 | 21 | 27 | | | | | | | | | |
| R-107 | 24.1 | | | | | | | | | 26 | 24 | 18 | 12 | 8 | | 13 | 20 | 23 | 15 | 54 | 10 | 18 | 39 | 29 | 33 | 41 | 21 | 21 | 17 | 29 | 30 | 22 | 31 | | | | | | | | | |
| R-108 | 34.9 | | | | | | | | | | | 25 | 14 | 12 | 18 | 16 | 13 | 12 | 13 | 13 | 22 | 26 | 40 | 16 | 23 | 87 | 73 | 39 | 69 | 72 | 48 | 51 | 69 | | | | | | | | | |
| R-109 | 47.8 | | | | | | | | | 40 | 57 | 33 | 16 | 15 | 20 | 23 | 10 | 37 | 31 | 81 | 40 | 49 | 69 | 201 | 93 | 38 | 33 | 62 | 54 | 46 | 50 | 29 | 22 | | | | | | | | | |
| R-110 | 36.5 | | | | | | | | | | | 20 | 25 | 21 | 22 | 30 | 27 | 35 | 36 | 186 | 18 | 12 | 22 | 114 | 19 | 28 | 66 | 34 | 27 | 22 | 17 | 33 | 26 | 18 | 18 | | | | | | | |
| R-111 | 31.7 | | | | | | | | | 26 | 18 | 42 | 19 | 18 | 22 | 40 | 41 | 43 | 34 | 31 | 26 | 33 | 60 | 15 | 21 | 32 | 57 | 30 | 35 | 59 | 32 | 13 | 17 | | | | | | | | | |
| R-112 | 29.7 | | | | | | | | | 8 | | | 9 | 8 | 13 | 11 | 20 | 35 | 25 | 31 | 37 | 52 | 48 | 36 | 50 | 37 | 33 | 40 | 40 | 29 | 40 | 29 | 25 | | | | | | | | | |
| R-113 | 16.3 | | | | | | | | | 9 | 8 | 13 | 13 | | 11 | 10 | 12 | 26 | 41 | 65 | 33 | 22 | 19 | 15 | 12 | 10 | 8 | 7 | 6 | 4 | 5 | 10 | 14 | | | | | | | | | |
| R-114 | 3.8 | | | | | | | | | | | | 3 | 4 | 4 | 3 | 4 | 5 | 4 | 4 | 5 | 4 | 4 | 3 | 3 | 2 | 3 | 3 | 3 | 4 | 6 | 4 | 6 | | | | | | | | | |
| R-115 | 15.7 | | | | | | | | | 14 | 14 | 15 | 10 | 10 | 20 | 10 | 11 | 11 | 13 | 12 | 14 | 18 | 20 | 18 | 18 | 29 | 19 | 19 | 17 | 14 | 25 | 16 | 13 | | | | | | | | | |
| R-116 | 25.6 | | | | | | | | | 11 | 11 | 9 | 9 | 27 | | 29 | 38 | 20 | 35 | 19 | 23 | 20 | 59 | 34 | 8 | 32 | 12 | 22 | 63 | 31 | 51 | 13 | 13 | | | | | | | | | |
| R-117 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-118 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-119 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-120 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-121 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-122 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-123 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-124 | 19.3 | | | | | | | | | | | 25 | 14 | 27 | 20 | 41 | 43 | 22 | 16 | 27 | 23 | 30 | 19 | 13 | 9 | 9 | 10 | 8 | 13 | 14 | 14 | 18 | 12 | | | | | | | | | |
| R-125 | 47.2 | | | | | | | | 12 | 29 | 69 | 72 | 248 | 21 | 22 | 18 | 14 | 16 | 18 | 40 | 77 | 51 | 82 | 37 | 60 | 19 | 77 | 60 | 12 | 24 | 28 | 26 | | | | | | | | | |
| R-126 | 33.3 | | | | | | | | | 30 | 24 | 20 | 17 | 22 | 16 | 25 | 69 | 86 | 76 | 57 | 37 | 66 | 28 | 75 | 31 | 18 | 15 | 13 | 14 | 12 | 15 | 16 | 19 | | | | | | | | | |

Table 7-10

# DataRAM $PM_{10}$ Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

Particulate Matter Concentration ($\mu g/m^3$)

| Event Number | Average | 1-Hour Average Real-Time | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 | 22-23 | 23-24 | 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | 15-16 | 16-17 |
| R-127 | 22.9 | | | | | | | | 13 | 43 | 23 | 22 | 16 | 51 | 45 | 43 | 103 | 66 | 33 | 13 | 7 | 3 | 2 | 3 | 4 | 4 | 5 | 7 | 7 | 4 | 15 | 18 | | | | | | | | | | |
| R-128 | 18.3 | | | | | | | | 33 | 22 | 20 | 15 | 44 | 52 | 30 | 30 | 20 | 20 | 10 | 16 | 17 | 12 | 11 | 9 | 6 | 6 | 3 | 5 | 3 | 4 | 17 | 20 | | | | | | | | | | |
| R-129 | 19.1 | | | | | | | | 54 | 35 | 31 | 41 | 31 | 22 | 10 | 19 | 11 | 10 | 11 | 10 | 22 | 30 | 28 | 14 | 9 | 7 | 5 | 6 | 5 | 8 | 9 | 28 | | | | | | | | | | |
| R-130 | 16.0 | | | | | | | | 43 | 27 | 28 | 31 | 10 | 24 | 17 | 9 | 14 | 15 | 9 | 9 | 13 | 17 | 13 | 14 | 13 | 10 | 9 | 11 | 9 | 12 | 10 | 16 | | | | | | | | | | |
| R-131 | 8.8 | | | | | | | | 23 | 26 | 24 | 8 | 3 | 3 | 4 | 7 | 7 | 17 | 10 | 10 | 6 | 7 | 6 | 5 | 6 | 6 | 4 | 3 | 2 | 2 | 10 | 17 | | | | | | | | | | |
| R-132 | 14.6 | | | | | | | | | 7 | 9 | 12 | 4 | 6 | 31 | 50 | 56 | 62 | 36 | 34 | 10 | 2 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | | | | | | | | | |
| R-133 | 5.9 | | | | | | | | | | | | 0 | 0 | 1 | 2 | 3 | 4 | 4 | 5 | 5 | 9 | 16 | 12 | 9 | 7 | 6 | 6 | 8 | 3 | 2 | 5 | 19 | | | | | | | | | |
| R-134 | 10.3 | | | | | | | | | 14 | 20 | 20 | 9 | 9 | 7 | 10 | 14 | 31 | 27 | 15 | 6 | 3 | 4 | 5 | 5 | 4 | 8 | 3 | 2 | 2 | 2 | 9 | 20 | | | | | | | | | |
| R-135 | 21.0 | | | | | | | | | 13 | 13 | 5 | 14 | 34 | 23 | 137 | 70 | 43 | 36 | 11 | 5 | 7 | 5 | 7 | 6 | 5 | 9 | 8 | 8 | 4 | 4 | 12 | 24 | | | | | | | | | |
| R-136 | 8.9 | | | | | | | | | 11 | 9 | 3 | 1 | 4 | 64 | 40 | 7 | 18 | 12 | 4 | 5 | 5 | 6 | 6 | 4 | 4 | 1 | 4 | 1 | 1 | 1 | 1 | 3 | | | | | | | | | |
| R-137 | 14.8 | | | | | | | | | 3 | 11 | 20 | 2 | 13 | 21 | 73 | 62 | 41 | 13 | 4 | 2 | 1 | 0 | 1 | 1 | 0 | | | | | 3 | 8 | 17 | | | | | | | | | |
| R-138 | 11.7 | | | | | | | | | 23 | | 21 | 13 | 9 | 10 | 13 | 15 | 16 | 13 | 11 | 16 | 20 | 18 | 13 | 11 | 8 | 8 | 7 | 6 | 5 | 4 | 4 | 8 | | | | | | | | | |
| R-139 | 11.9 | | | | | | | | | 21 | 8 | 13 | 7 | 7 | 9 | 10 | 10 | 11 | 11 | 12 | 15 | 23 | 20 | 21 | 17 | 14 | 11 | 10 | 8 | 8 | 7 | 7 | 7 | | | | | | | | | |
| R-140 | 14.0 | | | | | | | | 12 | 7 | 9 | 8 | 10 | 11 | 11 | 13 | 15 | 14 | 17 | 16 | 23 | 34 | 25 | 13 | 15 | 16 | 9 | 7 | 6 | 8 | 12 | 27 | | | | | | | | | |
| R-141 | 40.9 | | | | | | | | 58 | 65 | 44 | 26 | 39 | 87 | 204 | 296 | 37 | 24 | 14 | 15 | 14 | 16 | 12 | 13 | 14 | 12 | 12 | 12 | 11 | 13 | 22 | 66 | | | | | | | | | |
| R-142 | 29.5 | | | | | | | | 47 | 34 | 37 | 66 | 105 | 87 | 41 | 27 | 19 | 18 | 19 | 23 | 21 | 20 | 20 | 17 | 15 | 12 | 10 | 10 | 8 | 11 | 15 | 28 | | | | | | | | | |
| R-143 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-144 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-145 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-146 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-147 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-148 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-149 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-150 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-151 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-152 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-153 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-154 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R-155 | NA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Table 7-11

Particulate Mercury Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Particulate Mercury Concentration (µg/m³) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | | | North End of Site | | | | South End of Site | | Off-Site | | | | | | | | | |
| Event | Sampling | East Perimeter | | West Perimeter | | East Perimeter | | West Perimeter | | East Perimeter | West Perimeter | East of Site | | West of Site | |
| Number | Start Date | A11 or A61 | | A12 | | A13 | | A14 | | A15 | A16 | A21 | | A22 | |
| ϕ | 02/14/95 | < 0.00028 | | < 0.00025 | F | < 0.00024 | F | < 0.00028 | | NS | NS | < 0.00029 | | < 0.00027 | |
| 2 | 02/15/95 | < 0.00031 | | < 0.00027 | F | < 0.00027 | F | < 0.00025 | F | NS | NS | < 0.00029 | | < 0.00033 | |
| 3 | 02/16/95 | < 0.00031 | | < 0.00028 | | < 0.00027 | F | < 0.00031 | | NS | NS | < 0.00031 | | < 0.00029 | |
| 4 | 02/17/95 | < 0.00031 | | < 0.00029 | | < 0.00027 | | < 0.00031 | | NS | NS | < 0.00030 | | < 0.00029 | |
| 5 | 02/18/95 | < 0.00031 | | < 0.00029 | | < 0.00027 | | < 0.00030 | | NS | NS | < 0.00031 | | < 0.00029 | |
| 6 | 02/21/95 | < 0.00029 | | < 0.00027 | F | < 0.00026 | | < 0.00029 | | NS | NS | < 0.00027 | F | < 0.00025 | F |
| 7 | 03/07/95 | < 0.00029 | | < 0.00028 | | < 0.00028 | | < 0.00028 | | NS | NS | < 0.00032 | | < 0.00033 | |
| 8 | 03/08/95 | < 0.00026 | D | < 0.00021 | D | < 0.00023 | D | < 0.00024 | D | NS | NS | < 0.00028 | DF | < 0.00026 | DF |
| 9 | 03/10/95 | < 0.00028 | D | < 0.00025 | D | < 0.00026 | D | < 0.00026 | D | NS | NS | < 0.00035 | F | < 0.00032 | F |
| R-01 | 03/18/95 | < 0.00029 | | < 0.00031 | | < 0.00027 | | < 0.00029 | | NS | NS | < 0.00037 | | < 0.00034 | |
| R-02 | 03/19/95 | < 0.00033 | | < 0.00029 | | < 0.00029 | | < 0.00031 | | NS | NS | < 0.00036 | F | < 0.00034 | |
| R-03 | 03/23/95 | < 0.00029 | | < 0.00027 | | < 0.00025 | F | < 0.00027 | | NS | NS | < 0.00032 | F | < 0.00033 | |
| R-04 | 03/24/95 | < 0.00029 | D | < 0.00025 | D | < 0.00026 | D | < 0.00026 | D | NS | NS | < 0.00031 | FD | < 0.00030 | D |
| R-05 | 03/25/95 | < 0.00033 | | < 0.00030 | | < 0.00032 | | < 0.00029 | | NS | NS | < 0.00038 | FD | < 0.00039 | FD |
| R-06 | 03/27/95 | < 0.00034 | | < 0.00030 | | < 0.00031 | | < 0.00030 | | NS | NS | < 0.00030 | FD | < 0.00030 | FD |
| R-07 | 03/28/95 | < 0.00032 | | < 0.00029 | | < 0.00027 | | < 0.00030 | | NS | NS | < 0.00038 | F | < 0.00036 | F |
| R-08 | 03/29/95 | < 0.00034 | F | < 0.00032 | D | < 0.00031 | D | < 0.00032 | D | NS | NS | < 0.00038 | FD | < 0.00040 | FD |
| R-09 | 03/30/95 | | R | | R | | R | | R | NS | NS | | R | | R |
| R-10 | 03/31/95 | < 0.00034 | | < 0.00030 | | < 0.00030 | | < 0.00030 | | NS | NS | < 0.00037 | F | < 0.00034 | F |
| R-11 | 04/01/95 | | R | | R | | R | | R | NS | NS | | R | | R |
| R-12 | 04/02/95 | < 0.00031 | D | < 0.00032 | D | < 0.00032 | D | < 0.00033 | D | NS | NS | < 0.00035 | D | < 0.00037 | D |
| R-13 | 04/03/95 | < 0.00028 | | < 0.00027 | | < 0.00028 | | < 0.00029 | | NS | NS | < 0.00027 | D | < 0.00028 | D |
| R-14 | 04/04/95 | < 0.00028 | | < 0.00027 | | < 0.00028 | | < 0.00029 | | NS | NS | < 0.00029 | | < 0.00029 | |
| R-15 | 04/05/95 | < 0.00029 | | < 0.00028 | D | < 0.00027 | D | < 0.00028 | D | NS | NS | < 0.00026 | D | < 0.00027 | D |
| R-16 | 04/06/95 | | P | < 0.00029 | | < 0.00031 | D | < 0.00030 | | NS | NS | | P | < 0.00029 | |
| R-17 | 04/07/95 | 0.00029 | | < 0.00030 | D | < 0.00029 | | < 0.00030 | | NS | NS | < 0.00031 | | < 0.00028 | |
| R-18 | 04/08/95 | < 0.00028 | D | < 0.00027 | D | < 0.00028 | D | < 0.00030 | | NS | NS | < 0.00031 | | < 0.00030 | |
| R-19 | 04/09/95 | < 0.00029 | | < 0.00028 | D | < 0.00029 | | < 0.00029 | | NS | NS | < 0.00028 | D | < 0.00028 | |
| R-20 | 04/10/95 | < 0.00030 | | | NS | < 0.00032 | | | NS | NS | NS | < 0.00029 | | < 0.00028 | |
| R-21 | 04/11/95 | | NS | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-22 | 04/12/95 | < 0.00030 | | < 0.00028 | | < 0.00030 | D | < 0.00014 | | NS | NS | < 0.00028 | | < 0.00029 | |
| R-23 | 04/13/95 | < 0.00030 | | < 0.00027 | | < 0.00030 | | < 0.00028 | | NS | NS | < 0.00029 | | < 0.00029 | |
| R-24 | 04/14/95 | < 0.00029 | | < 0.00028 | | < 0.00031 | | < 0.00029 | | NS | NS | < 0.00029 | | < 0.00029 | |
| R-25 | 04/15/95 | < 0.00028 | | < 0.00030 | | < 0.00030 | | < 0.00030 | | NS | NS | < 0.00030 | | < 0.00030 | |
| R-26 | 04/16/95 | < 0.00028 | | < 0.00028 | | < 0.00030 | | < 0.00028 | | NS | NS | < 0.00029 | | < 0.00029 | |
| R-27 | 04/17/95 | < 0.00030 | | < 0.00028 | | < 0.00029 | | < 0.00028 | | NS | NS | < 0.00029 | | < 0.00029 | |
| R-28 | 04/18/95 | < 0.00040 | D | < 0.00037 | FD | < 0.00042 | | < 0.00035 | FD | NS | NS | < 0.00038 | D | < 0.00042 | D |

Particulate Mercury Concentrations in Ambient Air
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Particulate Mercury Concentration (µg/m³) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | | | North End of Site | | | | South End of Site | | | | Off-Site | | | | | | | |
| Event | Sampling | East Perimeter | | West Perimeter | | East Perimeter | | West Perimeter | | East Perimeter | | West Perimeter | | East of Site | | | | West of Site | | | |
| Number | Start Date | A11 or A61 | | A12 | | A13 | | A14 | | A15 | | A16 | | A21 | | | | A22 | | | |
| R-29 | 04/19/95 | < 0.00029 | | < 0.00028 | | < 0.00030 | | < 0.00028 | | | NS | | NS | < 0.00030 | | | | < 0.00029 | | | |
| R-30 | 04/20/95 | < 0.00029 | | < 0.00028 | | < 0.00030 | | < 0.00028 | | | NS | | NS | < 0.00029 | | | | < 0.00028 | | | |
| R-31 | 04/21/95 | < 0.00030 | | < 0.00029 | | < 0.00031 | | < 0.00029 | | | NS | | NS | < 0.00030 | | | | < 0.00029 | | | |
| R-32 | 04/22/95 | < 0.00031 | | < 0.00030 | | < 0.00031 | | < 0.00029 | | | NS | | NS | < 0.00031 | | | | < 0.00030 | | | |
| R-33 | 04/23/95 | < 0.00030 | | < 0.00029 | | < 0.00030 | | < 0.00028 | | | NS | | NS | < 0.00030 | | | | < 0.00029 | | | |
| R-34 | 04/24/95 | < 0.00029 | | < 0.00028 | | < 0.00029 | | < 0.00027 | | | NS | | NS | < 0.00028 | | | | < 0.00027 | | | |
| R-35 | 04/25/95 | < 0.00028 | | < 0.00028 | | < 0.00029 | | < 0.00027 | | | NS | | NS | < 0.00029 | | | | < 0.00028 | | | |
| R-36 | 04/26/95 | < 0.00029 | | < 0.00028 | | < 0.00029 | | < 0.00028 | | | NS | | NS | < 0.00029 | | | | < 0.00028 | | | |
| R-37 | 04/27/95 | < 0.00030 | | < 0.00028 | | < 0.00030 | | < 0.00028 | | | NS | | NS | < 0.00029 | | | | < 0.00027 | | | |
| R-38 | 04/28/95 | < 0.00030 | | < 0.00029 | | < 0.00030 | | < 0.00029 | | | NS | | NS | < 0.00029 | | | | < 0.00029 | | | |
| R-39 | 04/29/95 | < 0.00029 | | < 0.00028 | | < 0.00029 | | < 0.00028 | | | NS | | NS | < 0.00029 | | | | < 0.00028 | | | |
| R-40 | 04/30/95 | < 0.00030 | | < 0.00028 | | < 0.00030 | | < 0.00028 | | | NS | | NS | < 0.00029 | | | | < 0.00031 | | | |
| R-41 | 05/01/95 | < 0.00029 | | < 0.00028 | | < 0.00029 | | < 0.00028 | | | NS | | NS | < 0.00028 | | | | < 0.00029 | | | |
| R-42 | 05/02/95 | < 0.00031 | | < 0.00030 | | < 0.00030 | | < 0.00029 | D | | NS | | NS | < 0.00030 | D | | | < 0.00032 | | | |
| R-43 | 05/03/95 | 0.00028 | D | < 0.00027 | D | < 0.00028 | D | < 0.00026 | D | | NS | | NS | < 0.00028 | D | | | < 0.00029 | | | |
| R-44 | 05/04/95 | < 0.00031 | D | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |
| R-45 | 05/05/95 | < 0.00030 | | | NS | | NS | | NS | | NS | | NS | | NS | | | < 0.00029 | D | | |
| R-46 | 05/06/95 | < 0.00029 | | < 0.00028 | | < 0.00029 | | < 0.00030 | D | | NS | | NS | < 0.00030 | | | | < 0.00031 | | | |
| R-47 | 05/08/95 | 0.00004 | A | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |
| R-48 | 05/09/95 | 0.00035 | | < 0.00030 | | < 0.00030 | | < 0.00029 | | | NS | | NS | | P | | | < 0.00030 | | | |
| R-49 | 05/10/95 | 0.00051 | A | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |
| R-50 | 05/10/95 | 0.00038 | | < 0.00028 | | < 0.00030 | | < 0.00029 | | | NS | | NS | < 0.00028 | | | | < 0.00029 | | | |
| R-51 | 05/11/95 | 0.00056 | | < 0.00030 | | < 0.00030 | | < 0.00028 | | | NS | | NS | < 0.00031 | | | | < 0.00031 | | | |
| R-52 | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |
| R-53 | 05/18/95 | | R | | R | | R | | FR | | NS | | NS | | R | | | | R | | |
| R-54 | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |
| R-55 | 05/20/95 | < 0.00028 | | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |
| R-56 | 05/21/95 | 0.00062 | A | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |
| R-57 | 05/22/95 | 0.00035 | | < 0.00029 | | < 0.00030 | | < 0.00028 | | | NS | | NS | < 0.00029 | | | | < 0.00030 | | | |
| R-58 | 05/23/95 | 0.00030 | A | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |
| R-59 | 05/24/95 | < 0.00028 | | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |
| R-60 | 05/25/95 | < 0.00029 | | < 0.00029 | | < 0.00030 | | < 0.00028 | | | NS | | NS | < 0.00029 | | | | < 0.00030 | | | |
| R-61 | 05/26/95 | < 0.00029 | | < 0.00029 | | < 0.00030 | | < 0.00028 | | | NS | | NS | < 0.00030 | | | | < 0.00030 | | | |
| R-62 | 06/03/95 | < 0.00028 | | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |
| R-63 | 06/04/95 | < 0.00028 | | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |
| R-64 | 06/05/95 | | NS | < 0.00038 | D | < 0.00039 | D | | NS | < 0.00043 | D | < 0.00039 | D | < 0.00042 | D | | | < 0.00042 | D | | |
| R-65 | 06/06/95 | < 0.00029 | | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | |

Particulate Mercury Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Particulate Mercury Concentration ($\mu g/m^3$) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | | | North End of Site | | | | South End of Site | | | | Off-Site | | | |
| Event | Sampling | East Perimeter | | West Perimeter | | East Perimeter | | West Perimeter | | East Perimeter | | West Perimeter | | East of Site | | West of Site | |
| Number | Start Date | A11 or A61 | | A12 | | A13 | | A14 | | A15 | | A16 | | A21 | | A22 | |
| R-66 | 06/07/95 | < 0.00029 | | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-67 | 06/08/95 | < 0.00028 | | < 0.00030 | | < 0.00028 | | | NS | < 0.00030 | | < 0.00032 | | < 0.00030 | | < 0.00036 | F |
| R-68 | 06/09/95 | < 0.00028 | | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-69 | 06/10/95 | < 0.00028 | | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-70 | 06/11/95 | | NS | < 0.00039 | D | < 0.00028 | | | NS | < 0.00048 | FD | < 0.00028 | | < 0.00030 | | < 0.00030 | |
| R-71 | 06/13/95 | < 0.00028 | | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-72 | 06/14/95 | | NS | < 0.00028 | | | NS | | NS | < 0.00028 | | < 0.00028 | | < 0.00030 | | < 0.00030 | |
| R-73 | 01/00/00 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-74 | 06/15/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-75 | 06/16/95 | 0.00034 | | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-76 | 06/17/95 | | NS | < 0.00028 | | | NS | | NS | < 0.00029 | | < 0.00027 | | < 0.00030 | | < 0.00030 | |
| R-77 | 06/18/95 | < 0.00027 | | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-78 | 06/19/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-79 | 06/20/95 | < 0.00028 | | < 0.00028 | | < 0.00028 | | < 0.00027 | | < 0.00029 | | < 0.00027 | | < 0.00030 | | < 0.00030 | |
| R-80 | 06/21/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-81 | 06/22/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-82 | 06/23/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-83 | 06/24/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-84 | 06/25/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-85 | 06/26/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-86 | 06/27/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-87 | 06/28/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-88 | 06/29/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-89 | 06/30/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-90 | 07/01/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-91 | 07/02/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-92 | 07/03/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-93 | 07/04/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-94 | 07/05/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-95 | 07/06/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-96 | 07/07/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-97 | 07/07/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-98 | 07/08/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-99 | 07/09/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-100 | 07/10/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-101 | 07/11/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |
| R-102 | 07/12/95 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | | NS |

Particulate Mercury Concentrations in Ambient Air

*1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington*

| | | Particulate Mercury Concentration ($\mu g/m^3$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-103 | 07/13/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-104 | 07/14/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-105 | 07/15/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-106 | 07/16/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-107 | 07/17/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-108 | 07/18/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-109 | 07/19/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-110 | 07/20/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-111 | 07/21/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-112 | 07/22/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-113 | 07/23/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-114 | 07/24/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-115 | 07/25/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-116 | 07/26/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-117 | 07/27/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-118 | 07/28/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-119 | 07/29/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-120 | 07/30/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-121 | 07/31/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-122 | 08/01/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-123 | 08/02/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-124 | 08/03/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-125 | 08/04/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-126 | 08/05/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-127 | 08/07/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-128 | 08/08/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-129 | 08/09/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-130 | 08/10/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-131 | 08/11/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-132 | 08/12/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-133 | 08/13/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-134 | 08/14/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-135 | 08/15/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-136 | 08/16/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-137 | 08/17/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-138 | 08/18/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-139 | 08/19/95 | NS | NS | NS | NS | NS | NS | NS | NS |

Particulate Mercury Concentrations in Ambient Air
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Particulate Mercury Concentration (µg/m³) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-140 | 08/20/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-141 | 08/21/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-142 | 08/22/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-143 | 08/23/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-144 | 08/24/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-145 | 08/25/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-146 | 08/26/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-147 | 08/27/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-148 | 08/28/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-149 | 08/29/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-150 | 08/30/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-151 | 08/31/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-152 | 09/05/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-153 | 09/06/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-154 | 09/11/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-155 | 09/14/95 | NS | NS | NS | NS | NS | NS | NS | NS |

**Bold Type** Greater than lower detection limit.
A Sample collected at monitoring location A11 using sampler A61 (not collocated sampling).
NS No Sample Collected or Analyzed.
P Pump fault.
R Rejected lab data because filters were wet upon receipt at laboratory.

Table 7-12

DDT Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | DDT Concentration ($\mu g/m^3$) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | | | North End of Site | | | | South End of Site | | Off-Site | | | | | | | | | |
| Event | Sampling | East Perimeter | | West Perimeter | | East Perimeter | | West Perimeter | | East Perimeter | West Perimeter | East of Site | | | | West of Site | | | | | |
| Number | Start Date | A11 or A61 | | A12 | | A13 | | A14 | | A15 | A16 | A21 | | | | A22 | | | | | |
| 1 | 02/14/95 | | NS | | NS | < | 0.032 | | NS | NS | NS | | NS | | | | NS | | | | |
| 2 | 02/15/95 | < | 0.029 | < | 0.028 | < | 0.034 | < | 0.043 | NS | NS | < | 0.030 | | | < | 0.030 | | | | |
| 3 | 02/16/95 | < | 0.029 | < | 0.029 | < | 0.032 | < | 0.029 | NS | NS | < | 0.030 | | | < | 0.026 | | | | |
| 4 | 02/17/95 | < | 0.030 | < | 0.030 | < | 0.032 | < | 0.029 | NS | NS | < | 0.028 | | | < | 0.030 | | | | |
| 5 | 02/18/95 | < | 0.030 | < | 0.030 | < | 0.032 | < | 0.031 | NS | NS | < | 0.030 | | | < | 0.029 | | | | |
| 6 | 02/21/95 | < | 0.032 | < | 0.030 | < | 0.032 | < | 0.030 | NS | NS | < | 0.031 | | | < | 0.031 | | | | |
| 7 | 03/07/95 | < | 0.028 | < | 0.029 | < | 0.029 | < | 0.028 | NS | NS | < | 0.029 | | | < | 0.029 | | | | |
| 8 | 03/08/95 | < | 0.024 | D | < | 0.023 | D | < | 0.027 | D | < | 0.025 | D | NS | NS | < | 0.029 | D | < | 0.024 | D |
| 9 | 03/10/95 | < | 0.031 | D | < | 0.038 | D | < | 0.031 | D | < | 0.031 | D | NS | NS | < | 0.038 | | < | 0.034 | |
| R-01 | 03/18/95 | < | 0.039 | | < | 0.047 | | < | 0.037 | | < | 0.039 | | NS | NS | < | 0.048 | | < | 0.039 | |
| R-02 | 03/19/95 | < | 0.041 | | < | 0.044 | | < | 0.041 | | < | 0.043 | | NS | NS | < | 0.048 | | < | 0.041 | |
| R-03 | 03/23/95 | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | | | NS |
| R-04 | 03/24/95 | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | | | NS |
| R-05 | 03/25/95 | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | | | NS |
| R-06 | 03/27/95 | | NS | | NS | | NS | | NS | | NS | | NS | | | | NS | | | | NS |
| R-07 | 03/28/95 | < | 0.039 | < | 0.049 | < | 0.040 | < | 0.037 | NS | NS | < | 0.034 | | | < | 0.034 | | | | |
| R-08 | 03/29/95 | < | 0.041 | D | < | 0.053 | D | < | 0.039 | D | < | 0.040 | D | NS | NS | < | 0.042 | D | < | 0.042 | D |
| R-09 | 03/30/95 | < | 0.039 | < | 0.048 | < | 0.038 | < | 0.045 | NS | NS | < | 0.045 | | | < | 0.045 | | | | |
| R-10 | 03/31/95 | < | 0.041 | < | 0.048 | < | 0.041 | < | 0.045 | NS | NS | < | 0.040 | | | < | 0.040 | | | | |
| R-11 | 04/01/95 | < | 0.034 | < | 0.040 | < | 0.034 | < | 0.031 | NS | NS | | NS | | | < | 0.030 | | | | |
| R-12 | 04/02/95 | < | 0.030 | D | < | 0.038 | D | < | 0.031 | D | < | 0.032 | D | NS | NS | < | 0.036 | D | < | 0.036 | D |
| R-13 | 04/03/95 | < | 0.026 | < | 0.033 | | 0.026 | < | 0.026 | NS | NS | < | 0.026 | D | < | 0.026 | D | | | | |
| R-14 | 04/04/95 | < | 0.027 | < | 0.032 | < | 0.027 | < | 0.025 | NS | NS | < | 0.026 | | < | 0.026 | | | | | |
| R-15 | 04/05/95 | < | 0.018 | A | < | 0.030 | D | < | 0.026 | D | < | 0.025 | D | NS | NS | | P | | < | 0.026 | D |
| R-16 | 04/06/95 | < | 0.017 | A | < | 0.035 | | < | 0.029 | D | < | 0.028 | D | NS | NS | | P | | < | 0.033 | |
| R-17 | 04/07/95 | < | 0.018 | A | < | 0.028 | D | < | 0.027 | | < | 0.028 | | NS | NS | | P | | < | 0.034 | |
| R-18 | 04/08/95 | < | 0.018 | D | < | 0.033 | D | < | 0.026 | D | < | 0.031 | | NS | NS | < | 0.032 | | < | 0.032 | |
| R-19 | 04/09/95 | < | 0.019 | < | 0.033 | D | < | 0.029 | | < | 0.027 | | NS | NS | < | 0.028 | D | < | 0.028 | | |
| R-20 | 04/10/95 | < | 0.019 | | | NS | < | 0.029 | | | NS | NS | NS | < | 0.027 | | | | P | | |
| R-21 | 04/11/95 | | NS | | NS | | NS | | NS | | NS | NS | | NS | | | | NS | | | |
| R-22 | 04/12/95 | < | 0.018 | < | 0.032 | < | 0.029 | D | < | 0.014 | | NS | NS | < | 0.038 | | < | 0.028 | | | |
| R-23 | 04/13/95 | < | 0.019 | < | 0.026 | < | 0.028 | | < | 0.028 | | NS | NS | < | 0.029 | | < | 0.029 | | | |
| R-24 | 04/14/95 | < | 0.019 | < | 0.020 | < | 0.029 | | < | 0.028 | | NS | NS | < | 0.029 | | < | 0.029 | | | |
| R-25 | 04/15/95 | < | 0.020 | < | 0.020 | < | 0.029 | | < | 0.028 | | NS | NS | < | 0.029 | | < | 0.029 | | | |
| R-26 | 04/16/95 | < | 0.020 | < | 0.023 | < | 0.029 | | < | 0.028 | | NS | NS | < | 0.029 | | < | 0.029 | | | |
| R-27 | 04/17/95 | < | 0.097 | < | 0.023 | < | 0.028 | | < | 0.028 | | NS | NS | < | 0.046 | | < | 0.029 | | | |
| R-28 | 04/18/95 | < | 0.028 | D | < | 0.032 | D | < | 0.040 | | < | 0.040 | D | NS | NS | < | 0.060 | D | < | 0.040 | D |

DDT Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | DDT Concentration ($\mu g/m^3$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-29 | 04/19/95 | < 0.019 | < 0.022 | < 0.028 | < 0.029 | NS | NS | < 0.048 | < 0.031 |
| R-30 | 04/20/95 | < 0.019 | < 0.022 | < 0.028 | < 0.029 | NS | NS | < 0.046 | < 0.030 |
| R-31 | 04/21/95 | < 0.019 | < 0.023 | < 0.028 | **0.032** | NS | NS | < 0.048 | < 0.030 |
| R-32 | 04/22/95 | **0.020** | < 0.023 | < 0.029 | < 0.030 | NS | NS | < 0.048 | < 0.030 |
| R-33 | 04/23/95 | < 0.019 | < 0.023 | < 0.028 | < 0.029 | NS | NS | < 0.047 | < 0.030 |
| R-34 | 04/24/95 | < 0.019 | < 0.022 | < 0.027 | < 0.027 | NS | NS | < 0.045 | < 0.028 |
| R-35 | 04/25/95 | < 0.018 | < 0.023 | < 0.027 | < 0.027 | NS | NS | < 0.045 | < 0.028 |
| R-36 | 04/26/95 | < 0.018 | < 0.023 | < 0.028 | **0.048** | NS | NS | < 0.047 | < 0.029 |
| R-37 | 04/27/95 | < 0.019 | < 0.023 | < 0.028 | < 0.028 | NS | NS | < 0.048 | < 0.028 |
| R-38 | 04/28/95 | < 0.018 | < 0.024 | < 0.028 | < 0.028 | NS | NS | < 0.049 | < 0.029 |
| R-39 | 04/29/95 | < 0.019 | < 0.024 | < 0.027 | < 0.027 | NS | NS | < 0.046 | < 0.031 |
| R-40 | 04/30/95 | < 0.021 | < 0.027 | < 0.028 | < 0.028 | NS | NS | < 0.047 | < 0.030 |
| R-41 | 05/01/95 | < 0.020 | < 0.027 | **0.030** | < 0.028 | NS | NS | < 0.045 | < 0.027 |
| R-42 | 05/02/95 | **0.022** | < 0.029 | < 0.029 | < 0.029 D | NS | NS | < 0.049 D | < 0.032 |
| R-43 | 05/03/95 | < 0.019 D | < 0.026 D | < 0.026 D | < 0.026 D | NS | NS | < 0.044 D | < 0.034 |
| R-44 | 05/04/95 | < 0.024 D | NS | NS | NS | NS | NS | NS | NS |
| R-45 | 05/05/95 | < 0.023 | NS | NS | NS | NS | NS | NS | < 0.022 D |
| R-46 | 05/06/95 | < 0.023 | < 0.028 | < 0.028 | < 0.028 D | NS | NS | < 0.023 | < 0.023 |
| R-47 | 05/08/95 | **0.025** A | NS | NS | NS | NS | NS | NS | NS |
| R-48 | 05/09/95 | **0.030** | < 0.023 | **0.050** | < 0.028 | NS | NS | NS | < 0.023 |
| R-49 | 05/10/95 | < 0.023 A | NS | NS | NS | NS | NS | NS | NS |
| R-50 | 05/10/95 | < 0.023 | < 0.023 | < 0.025 | < 0.027 | NS | NS | < 0.022 | < 0.022 |
| R-51 | 05/11/95 | < 0.024 | < 0.024 | < 0.028 | < 0.029 | NS | NS | < 0.024 | < 0.024 |
| R-52 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| R-53 | 05/18/95 | < 0.025 | < 0.022 | < 0.028 | < 0.028 | NS | NS | < 0.025 | < 0.020 |
| R-54 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| R-55 | 05/20/95 | **0.029** | NS | NS | NS | NS | NS | NS | NS |
| R-56 | 05/21/95 | < 0.018 A | NS | NS | NS | NS | NS | NS | NS |
| R-57 | 05/22/95 | **0.055** | < 0.022 | < 0.028 | < 0.028 | NS | NS | < 0.025 | < 0.020 |
| R-58 | 05/23/95 | < 0.018 A | NS | NS | NS | NS | NS | NS | NS |
| R-59 | 05/24/95 | < 0.024 | NS | NS | NS | NS | NS | NS | NS |
| R-60 | 05/25/95 | < 0.023 | < 0.022 | < 0.028 | < 0.028 | NS | NS | < 0.026 | < 0.020 |
| R-61 | 05/26/95 | < 0.023 | < 0.023 | < 0.028 | < 0.029 | NS | NS | < 0.027 | < 0.021 |
| R-62 | 06/03/95 | **0.061** | NS | NS | NS | NS | NS | NS | NS |
| R-63 | 06/04/95 | < 0.025 | NS | NS | NS | NS | NS | NS | NS |
| R-64 | 06/05/95 | **0.051** AD | < 0.026 D | < 0.031 D | NS | < 0.023 D | **0.024** D | < 0.033 D | < 0.028 D |
| R-65 | 06/06/95 | **0.066** | NS | NS | NS | NS | NS | NS | NS |

DDT Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | DDT Concentration (µg/m³) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | | | North End of Site | | | | South End of Site | | | | Off-Site | | | |
| Event | Sampling | East Perimeter | | West Perimeter | | East Perimeter | | West Perimeter | | East Perimeter | | West Perimeter | | East of Site | | West of Site | |
| Number | Start Date | A11 or A61 | | A12 | | A13 | | A14 | | A15 | | A16 | | A21 | | A22 | |
| R-66 | 06/07/95 | < 0.035 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-67 | 06/08/95 | < 0.035 | | < 0.035 | | < 0.046 | | NS | | < 0.174 | | **0.158** | | < 0.046 | | < 0.035 | |
| R-68 | 06/09/95 | < 0.020 | A | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-69 | 06/10/95 | < 0.028 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-70 | 06/11/95 | < 0.028 | AD | < 0.049 | D | < 0.046 | | NS | | < 0.032 | D | < 0.023 | | < 0.046 | | < 0.035 | |
| R-71 | 06/13/95 | < 0.035 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-72 | 06/14/95 | < 0.035 | A | < 0.035 | | NS | | NS | | < 0.028 | | < 0.023 | | < 0.035 | | < 0.035 | |
| R-73 | 01/00/00 | | NS | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-74 | 06/15/95 | **0.025** | A | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-75 | 06/16/95 | < 0.028 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-76 | 06/17/95 | < 0.023 | A | < 0.035 | | NS | | NS | | < 0.028 | | < 0.023 | | < 0.046 | | < 0.035 | |
| R-77 | 06/18/95 | < 0.028 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-78 | 06/19/95 | < 0.023 | A | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-79 | 06/20/95 | < 0.035 | | < 0.035 | | < 0.046 | | < 0.046 | | < 0.028 | | < 0.023 | | < 0.046 | | < 0.035 | |
| R-80 | 06/21/95 | < 0.023 | A | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-81 | 06/22/95 | < 0.028 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-82 | 06/23/95 | < 0.023 | A | < 0.035 | | < 0.046 | | < 0.046 | | 0.035 | | **0.010** | | < 0.035 | | < 0.035 | |
| R-83 | 06/24/95 | < 0.028 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-84 | 06/25/95 | < 0.020 | A | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-85 | 06/26/95 | < 0.028 | | < 0.035 | | < 0.020 | | < 0.035 | | **0.035** | | **0.028** | | < 0.035 | | < 0.035 | |
| R-86 | 06/27/95 | < 0.023 | A | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-87 | 06/28/95 | < 0.023 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-88 | 06/29/95 | < 0.028 | A | < 0.025 | | NS | | NS | | < 0.020 | | **0.026** | | < 0.025 | | < 0.025 | |
| R-89 | 06/30/95 | < 0.028 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-90 | 07/01/95 | < 0.035 | A | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-91 | 07/02/95 | **0.025** | | < 0.023 | | NS | | NS | | < 0.024 | | < 0.023 | | < 0.021 | | < 0.023 | |
| R-92 | 07/03/95 | | NS | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-93 | 07/04/95 | | NS | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-94 | 07/05/95 | | NS | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-95 | 07/06/95 | | NS | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-96 | 07/07/95 | | NS | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-97 | 07/07/95 | < 0.020 | A | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-98 | 07/08/95 | < 0.023 | | < 0.020 | | NS | | NS | | **0.042** | | **0.040** | | < 0.019 | | < 0.019 | |
| R-99 | 07/09/95 | < 0.023 | | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-100 | 07/10/95 | < 0.020 | A | NS | | NS | | NS | | NS | | NS | | NS | | NS | |
| R-101 | 07/11/95 | < 0.023 | | < 0.020 | | NS | | NS | | < 0.018 | | **0.028** | | < 0.019 | | < 0.019 | |
| R-102 | 07/12/95 | < 0.020 | A | NS | | NS | | NS | | NS | | NS | | NS | | NS | |

DDT Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | DDT Concentration (µg/m³) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-103 | 07/13/95 | **0.091** | NS | NS | NS | NS | NS | NS | NS |
| R-104 | 07/14/95 | < 0.023 | < 0.020 | NS | NS | **0.019** | **0.033** | < 0.019 | < 0.019 |
| R-105 | 07/15/95 | < 0.023 | NS | NS | NS | NS | NS | NS | NS |
| R-106 | 07/16/95 | **0.025** | NS | NS | NS | NS | NS | NS | NS |
| R-107 | 07/17/95 | **0.039** | < 0.020 | NS | NS | **0.065** | **0.017** | < 0.019 | < 0.019 |
| R-108 | 07/18/95 | **0.023** A | NS | NS | NS | NS | NS | NS | NS |
| R-109 | 07/19/95 | < 0.028 | NS | NS | NS | NS | NS | NS | NS |
| R-110 | 07/20/95 | **0.036** | < 0.020 | NS | NS | **0.045** | < 0.019 | < 0.019 | < 0.019 |
| R-111 | 07/21/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-112 | 07/22/95 | < 0.023 | NS | NS | NS | NS | NS | NS | NS |
| R-113 | 07/23/95 | < 0.023 | < 0.020 | < 0.020 | < 0.020 | < 0.018 | < 0.017 | < 0.019 | < 0.019 |
| R-114 | 07/24/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-115 | 07/25/95 | < 0.023 | NS | NS | NS | NS | NS | NS | NS |
| R-116 | 07/26/95 | < 0.024 A | NS | NS | NS | NS | NS | NS | NS |
| R-117 | 07/27/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-118 | 07/28/95 | < 0.023 | NS | NS | NS | NS | NS | NS | NS |
| R-119 | 07/29/95 | < 0.023 A | NS | NS | NS | NS | NS | NS | NS |
| R-120 | 07/30/95 | < 0.024 | NS | NS | NS | NS | NS | NS | NS |
| R-121 | 07/31/95 | < 0.023 A | < 0.020 | NS | NS | **0.047** | **0.038** | < 0.019 | < 0.019 |
| R-122 | 08/01/95 | **0.034** | NS | NS | NS | NS | NS | NS | NS |
| R-123 | 08/02/95 | < 0.023 A | NS | NS | NS | NS | NS | NS | NS |
| R-124 | 08/03/95 | < 0.023 | < 0.020 | NS | NS | **0.018** | **0.020** | < 0.019 | < 0.019 |
| R-125 | 08/04/95 | < 0.023 | NS | NS | NS | NS | NS | NS | NS |
| R-126 | 08/05/95 | < 0.023 A | NS | NS | NS | NS | NS | NS | NS |
| R-127 | 08/07/95 | **0.060** | NS | NS | NS | NS | NS | NS | NS |
| R-128 | 08/08/95 | < 0.023 A | NS | NS | NS | NS | NS | < 0.023 | NS |
| R-129 | 08/09/95 | < 0.035 | NS | NS | NS | NS | NS | NS | NS |
| R-130 | 08/10/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-131 | 08/11/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-132 | 08/12/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-133 | 08/13/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-134 | 08/14/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-135 | 08/15/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-136 | 08/16/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-137 | 08/17/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-138 | 08/18/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-139 | 08/19/95 | NS | NS | NS | NS | NS | NS | NS | NS |

DDT Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | DDT Concentration ($\mu g/m^3$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-140 | 08/20/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-141 | 08/21/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-142 | 08/22/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-143 | 08/23/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-144 | 08/24/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-145 | 08/25/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-146 | 08/26/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-147 | 08/27/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-148 | 08/28/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-149 | 08/29/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-150 | 08/30/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-151 | 08/31/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-152 | 09/05/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-153 | 09/06/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-154 | 09/11/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-155 | 09/14/95 | NS | NS | NS | NS | NS | NS | NS | NS |

**Bold Type** Greater than lower detection limit.
A Sample collected at monitoring location A11 using sampler A61 (not collocated sampling).
NS No Sample Collected or Analyzed.
P Pump fault.

Table 7-13



Dieldrin Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Dieldrin Concentration (µg/m³) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | | | North End of Site | | | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | | West Perimeter A12 | | East Perimeter A13 | | West Perimeter A14 | | East Perimeter A15 | West Perimeter A16 | East of Site A21 | | West of Site A22 | |
| 1 | 02/14/95 | | NS | | NS | < 0.032 | | | NS | NS | NS | | NS | | NS |
| 2 | 02/15/95 | < 0.029 | | < 0.028 | | < 0.034 | | < 0.043 | | NS | NS | < 0.030 | | < 0.030 | |
| 3 | 02/16/95 | < 0.029 | | < 0.029 | | < 0.032 | | < 0.029 | | NS | NS | < 0.030 | | < 0.026 | |
| 4 | 02/17/95 | < 0.030 | | < 0.030 | | < 0.032 | | < 0.029 | | NS | NS | < 0.030 | | < 0.030 | |
| 5 | 02/18/95 | < 0.030 | | < 0.030 | | < 0.032 | | < 0.031 | | NS | NS | < 0.030 | | < 0.029 | |
| 6 | 02/21/95 | < 0.032 | | < 0.030 | | < 0.032 | | < 0.030 | | NS | NS | < 0.031 | | < 0.031 | |
| 7 | 03/07/95 | < 0.028 | | < 0.029 | | < 0.029 | | < 0.028 | | NS | NS | < 0.029 | | < 0.029 | |
| 8 | 03/08/95 | < 0.024 | D | < 0.023 | D | < 0.027 | D | < 0.025 | D | NS | NS | < 0.029 | D | < 0.024 | D |
| 9 | 03/10/95 | < 0.031 | D | < 0.038 | D | < 0.031 | D | < 0.031 | D | NS | NS | < 0.038 | | < 0.034 | |
| R-01 | 03/18/95 | < 0.039 | | < 0.047 | | < 0.037 | | < 0.039 | | NS | NS | < 0.048 | | < 0.039 | |
| R-02 | 03/19/95 | < 0.041 | | < 0.044 | | < 0.041 | | < 0.043 | | NS | NS | < 0.048 | | < 0.041 | |
| R-03 | 03/23/95 | | NS | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-04 | 03/24/95 | | NS | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-05 | 03/25/95 | | NS | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-06 | 03/27/95 | | NS | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-07 | 03/28/95 | < 0.039 | | < 0.049 | | < 0.040 | | < 0.037 | | NS | NS | < 0.037 | | < 0.034 | |
| R-08 | 03/29/95 | < 0.041 | | < 0.053 | D | < 0.039 | D | < 0.040 | D | NS | NS | < 0.043 | D | < 0.042 | D |
| R-09 | 03/30/95 | < 0.039 | | < 0.048 | | < 0.038 | | < 0.045 | | NS | NS | < 0.006 | | < 0.045 | |
| R-10 | 03/31/95 | < 0.041 | | < 0.048 | | < 0.041 | | < 0.045 | | NS | NS | < 0.038 | | < 0.040 | |
| R-11 | 04/01/95 | < 0.034 | | < 0.040 | | < 0.034 | | < 0.031 | | NS | NS | | NS | < 0.030 | |
| R-12 | 04/02/95 | < 0.030 | D | < 0.038 | D | < 0.031 | D | < 0.032 | D | NS | NS | < 0.037 | D | < 0.036 | D |
| R-13 | 04/03/95 | < 0.026 | | < 0.033 | | < 0.026 | | < 0.026 | | NS | NS | < 0.029 | D | < 0.026 | D |
| R-14 | 04/04/95 | < 0.027 | | < 0.032 | | < 0.026 | | < 0.025 | | NS | NS | < 0.030 | | < 0.027 | |
| R-15 | 04/05/95 | < 0.017 | A | < 0.030 | D | < 0.026 | D | < 0.025 | D | NS | NS | | P | < 0.026 | D |
| R-16 | 04/06/95 | < 0.017 | A | < 0.035 | | < 0.029 | D | < 0.028 | | NS | NS | | P | < 0.033 | |
| R-17 | 04/07/95 | < 0.018 | A | < 0.028 | D | < 0.027 | | < 0.028 | | NS | NS | | P | < 0.034 | |
| R-18 | 04/08/95 | < 0.018 | D | < 0.033 | D | < 0.026 | D | < 0.031 | | NS | NS | < 0.040 | | < 0.032 | |
| R-19 | 04/09/95 | < 0.019 | | < 0.033 | D | < 0.029 | | < 0.027 | | NS | NS | < 0.029 | D | < 0.028 | |
| R-20 | 04/10/95 | < 0.019 | | | NS | < 0.029 | | | NS | NS | NS | < 0.027 | | | P |
| R-21 | 04/11/95 | | NS | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-22 | 04/12/95 | < 0.018 | | < 0.032 | | < 0.029 | D | < 0.014 | | NS | NS | < 0.038 | | < 0.028 | |
| R-23 | 04/13/95 | < 0.019 | | < 0.026 | | < 0.028 | | < 0.028 | | NS | NS | < 0.041 | | < 0.029 | |
| R-24 | 04/14/95 | < 0.019 | | < 0.020 | | < 0.028 | | < 0.028 | | NS | NS | < 0.043 | | < 0.029 | |
| R-25 | 04/15/95 | < 0.020 | | < 0.020 | | < 0.028 | | < 0.028 | | NS | NS | < 0.046 | | < 0.029 | |
| R-26 | 04/16/95 | < 0.020 | | < 0.023 | | < 0.028 | | < 0.028 | | NS | NS | < 0.046 | | < 0.029 | |
| R-27 | 04/17/95 | *< 0.097* | | < 0.023 | | < 0.028 | | < 0.028 | | NS | NS | < 0.028 | | < 0.028 | |

Dieldrin Concentrations in Ambient Air
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Dieldrin Concentration (µg/m³) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | | | North End of Site | | | | South End of Site | | Off-Site | | | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | | West Perimeter A12 | | East Perimeter A13 | | West Perimeter A14 | | East Perimeter A15 | West Perimeter A16 | East of Site A21 | | West of Site A22 | |
| R-28 | 04/18/95 | < 0.028 | D | < 0.032 | D | < 0.040 | | < 0.040 | D | NS | NS | < 0.060 | D | < 0.040 | D |
| R-29 | 04/19/95 | < 0.019 | | < 0.022 | | < 0.028 | | < 0.029 | | NS | NS | < 0.048 | | < 0.031 | |
| R-30 | 04/20/95 | < 0.019 | | < 0.022 | | < 0.028 | | < 0.029 | | NS | NS | < 0.046 | | < 0.030 | |
| R-31 | 04/21/95 | < 0.019 | | < 0.023 | | < 0.028 | | < 0.029 | | NS | NS | < 0.048 | | < 0.030 | |
| R-32 | 04/22/95 | < 0.020 | | < 0.023 | | < 0.029 | | < 0.03 | | NS | NS | < 0.048 | | < 0.030 | |
| R-33 | 04/23/95 | < 0.019 | | < 0.023 | | < 0.028 | | < 0.029 | | NS | NS | < 0.047 | | < 0.030 | |
| R-34 | 04/24/95 | < 0.019 | | < 0.022 | | < 0.027 | | < 0.027 | | NS | NS | < 0.045 | | < 0.028 | |
| R-35 | 04/25/95 | < 0.018 | | < 0.023 | | < 0.027 | | < 0.027 | | NS | NS | < 0.045 | | < 0.028 | |
| R-36 | 04/26/95 | < 0.018 | | < 0.023 | | < 0.028 | | < 0.028 | | NS | NS | < 0.047 | | < 0.029 | |
| R-37 | 04/27/95 | < 0.019 | | < 0.023 | | < 0.028 | | < 0.028 | | NS | NS | < 0.048 | | < 0.028 | |
| R-38 | 04/28/95 | < 0.018 | | < 0.024 | | < 0.028 | | < 0.028 | | NS | NS | < 0.049 | | < 0.029 | |
| R-39 | 04/29/95 | < 0.019 | | < 0.024 | | < 0.027 | | < 0.027 | | NS | NS | < 0.046 | | < 0.031 | |
| R-40 | 04/30/95 | < 0.021 | | < 0.027 | | < 0.028 | | < 0.028 | | NS | NS | < 0.047 | | < 0.030 | |
| R-41 | 05/01/95 | < 0.020 | | < 0.027 | | < 0.027 | | < 0.028 | | NS | NS | < 0.045 | | < 0.027 | |
| R-42 | 05/02/95 | ***0.139*** | | < 0.029 | | < 0.029 | | < 0.029 | D | NS | NS | < 0.049 | D | < 0.032 | |
| R-43 | 05/03/95 | < 0.019 | D | < 0.026 | D | < 0.026 | D | < 0.026 | D | NS | NS | < 0.044 | D | < 0.034 | |
| R-44 | 05/04/95 | < 0.024 | D | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-45 | 05/05/95 | < 0.023 | | | NS | | NS | | NS | NS | NS | | NS | < 0.022 | D |
| R-46 | 05/06/95 | < 0.023 | | < 0.028 | | < 0.028 | | < 0.028 | D | NS | NS | < 0.023 | | < 0.023 | |
| R-47 | 05/08/95 | < 0.023 | A | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-48 | 05/09/95 | < 0.023 | | < 0.023 | | < 0.028 | | < 0.028 | | NS | NS | | NS | < 0.023 | |
| R-49 | 05/10/95 | < 0.023 | A | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-50 | 05/10/95 | < 0.023 | | < 0.023 | | < 0.025 | | < 0.027 | | NS | NS | < 0.022 | | < 0.022 | |
| R-51 | 05/11/95 | < 0.024 | | < 0.024 | | < 0.028 | | < 0.029 | | NS | NS | < 0.024 | | < 0.024 | |
| R-52 | NS | | NS | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-53 | 05/18/95 | < 0.025 | | < 0.022 | | < 0.028 | | < 0.028 | | NS | NS | < 0.025 | | < 0.020 | |
| R-54 | NS | | NS | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-55 | 05/20/95 | < 0.024 | | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-56 | 05/21/95 | < 0.018 | A | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-57 | 05/22/95 | < 0.024 | | < 0.022 | | < 0.028 | | < 0.028 | | NS | NS | < 0.025 | | < 0.020 | |
| R-58 | 05/23/95 | ***0.081*** | A | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-59 | 05/24/95 | < 0.024 | | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-60 | 05/25/95 | 0.056 | | < 0.022 | | < 0.028 | | < 0.028 | | NS | NS | < 0.026 | | < 0.020 | |
| R-61 | 05/26/95 | ***0.137*** | | < 0.023 | | < 0.028 | | < 0.029 | | NS | NS | < 0.027 | | < 0.021 | |
| R-62 | 06/03/95 | ***0.104*** | | | NS | | NS | | NS | NS | NS | | NS | | NS |
| R-63 | 06/04/95 | 0.056 | | | NS | | NS | | NS | NS | NS | | NS | | NS |

Dieldrin Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Dieldrin Concentration (µg/m³) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | | | North End of Site | | | | South End of Site | | | | Off-Site | | | |
| Event | Sampling | East Perimeter | | West Perimeter | | East Perimeter | | West Perimeter | | East Perimeter | | West Perimeter | | East of Site | | West of Site | |
| Number | Start Date | A11 or A61 | | A12 | | A13 | | A14 | | A15 | | A16 | | A21 | | A22 | |
| R-64 | 06/05/95 | **0.025** | AD | < 0.026 | D | < 0.031 | D | NS | | **0.035** | D | < 0.020 | D | < 0.033 | D | < 0.028 | D |
| R-65 | 06/06/95 | < 0.032 | | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-66 | 06/07/95 | < 0.035 | A | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-67 | 06/08/95 | < 0.035 | | < 0.035 | | < 0.046 | | NS | | *< 0.174* | | < 0.023 | | < 0.046 | | < 0.035 | |
| R-68 | 06/09/95 | < 0.020 | A | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-69 | 06/10/95 | < 0.028 | | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-70 | 06/11/95 | < 0.028 | AD | < 0.049 | D | < 0.046 | | NS | | < 0.032 | D | < 0.023 | | < 0.046 | | < 0.035 | |
| R-71 | 06/13/95 | < 0.035 | | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-72 | 06/14/95 | < 0.035 | A | < 0.035 | | | NS | NS | | < 0.028 | | < 0.023 | | < 0.035 | | < 0.035 | |
| R-73 | 01/00/00 | | NS | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-74 | 06/15/95 | < 0.023 | A | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-75 | 06/16/95 | < 0.028 | | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-76 | 06/17/95 | < 0.023 | A | < 0.035 | | | NS | NS | | < 0.028 | | < 0.023 | | < 0.046 | | < 0.035 | |
| R-77 | 06/18/95 | < 0.028 | | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-78 | 06/19/95 | < 0.023 | A | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-79 | 06/20/95 | < 0.035 | | < 0.035 | | < 0.046 | | < 0.046 | | < 0.028 | | < 0.023 | | < 0.046 | | < 0.035 | |
| R-80 | 06/21/95 | < 0.023 | A | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-81 | 06/22/95 | < 0.028 | | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-82 | 06/23/95 | < 0.023 | NS | < 0.035 | | < 0.046 | | < 0.046 | | < 0.035 | | < 0.023 | | < 0.035 | | < 0.035 | |
| R-83 | 06/24/95 | < 0.028 | | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-84 | 06/25/95 | < 0.020 | A | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-85 | 06/26/95 | < 0.028 | | < 0.035 | | < 0.020 | | < 0.035 | | < 0.035 | | < 0.020 | | < 0.035 | | < 0.035 | |
| R-86 | 06/27/95 | **0.023** | A | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-87 | 06/28/95 | < 0.023 | | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-88 | 06/29/95 | < 0.028 | A | < 0.025 | | | NS | NS | | < 0.020 | | < 0.015 | | < 0.025 | | < 0.025 | |
| R-89 | 06/30/95 | < 0.028 | | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-90 | 07/01/95 | < 0.035 | A | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-91 | 07/02/95 | < 0.023 | | < 0.023 | | | NS | NS | | < 0.024 | | < 0.023 | | < 0.021 | | < 0.023 | |
| R-92 | 07/03/95 | | NS | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-93 | 07/04/95 | | NS | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-94 | 07/05/95 | | NS | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-95 | 07/06/95 | | NS | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-96 | 07/07/95 | | NS | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-97 | 07/07/95 | < 0.020 | A | | NS | | NS | NS | | | NS | | NS | | NS | | NS |
| R-98 | 07/08/95 | < 0.023 | | < 0.020 | | | NS | NS | | < 0.017 | | < 0.017 | | < 0.019 | | < 0.019 | |
| R-99 | 07/09/95 | < 0.023 | | | NS | | NS | NS | | | NS | | NS | | NS | | NS |

Table 7-13

Dieldrin Concentrations in Ambient Air

*1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington*

| | | Dieldrin Concentration ($\mu g/m^3$) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | | West Perimeter A12 | | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-100 | 07/10/95 | < 0.020 | A | NS | | NS | NS | NS | NS | NS | NS |
| R-101 | 07/11/95 | < 0.023 | | < 0.020 | | NS | NS | < 0.018 | < 0.018 | < 0.019 | < 0.019 |
| R-102 | 07/12/95 | < 0.020 | A | NS | | NS | NS | NS | NS | NS | NS |
| R-103 | 07/13/95 | < 0.023 | | NS | | NS | NS | NS | NS | NS | NS |
| R-104 | 07/14/95 | < 0.023 | | < 0.020 | | NS | NS | < 0.017 | 0.017 | < 0.019 | < 0.019 |
| R-105 | 07/15/95 | < 0.023 | | NS | | NS | NS | NS | NS | NS | NS |
| R-106 | 07/16/95 | < 0.023 | | NS | | NS | NS | NS | NS | NS | NS |
| R-107 | 07/17/95 | < 0.023 | | < 0.020 | | NS | NS | < 0.017 | < 0.017 | < 0.019 | < 0.019 |
| R-108 | 07/18/95 | < 0.023 | A | NS | | NS | NS | NS | NS | NS | NS |
| R-109 | 07/19/95 | < 0.023 | | NS | | NS | NS | NS | NS | NS | NS |
| R-110 | 07/20/95 | < 0.022 | | < 0.020 | | NS | NS | < 0.017 | < 0.019 | < 0.019 | < 0.019 |
| R-111 | 07/21/95 | | NS | NS | | NS | NS | NS | NS | NS | NS |
| R-112 | 07/22/95 | < 0.023 | | NS | | NS | NS | NS | NS | NS | NS |
| R-113 | 07/23/95 | < 0.023 | | < 0.020 | | < 0.020 | < 0.020 | < 0.018 | < 0.017 | < 0.019 | < 0.019 |
| R-114 | 07/24/95 | | NS | NS | | NS | NS | NS | NS | NS | NS |
| R-115 | 07/25/95 | < 0.023 | | NS | | NS | NS | NS | NS | NS | NS |
| R-116 | 07/26/95 | < 0.024 | A | NS | | NS | NS | NS | NS | NS | NS |
| R-117 | 07/27/95 | | NS | NS | | NS | NS | NS | NS | NS | NS |
| R-118 | 07/28/95 | < 0.023 | | NS | | NS | NS | NS | NS | NS | NS |
| R-119 | 07/29/95 | < 0.023 | A | NS | | NS | NS | NS | NS | NS | NS |
| R-120 | 07/30/95 | < 0.024 | | NS | | NS | NS | NS | NS | NS | NS |
| R-121 | 07/31/95 | < 0.023 | A | < 0.020 | | NS | NS | < 0.018 | < 0.018 | < 0.019 | < 0.019 |
| R-122 | 08/01/95 | < 0.023 | | NS | | NS | NS | NS | NS | NS | NS |
| R-123 | 08/02/95 | < 0.023 | A | NS | | NS | NS | NS | NS | NS | NS |
| R-124 | 08/03/95 | < 0.023 | | < 0.020 | | NS | NS | < 0.018 | < 0.018 | < 0.019 | < 0.019 |
| R-125 | 08/04/95 | < 0.023 | | NS | | NS | NS | NS | NS | NS | NS |
| R-126 | 08/05/95 | < 0.023 | A | NS | | NS | NS | NS | NS | NS | NS |
| R-127 | 08/07/95 | < 0.023 | | NS | | NS | NS | NS | NS | NS | NS |
| R-128 | 08/08/95 | < 0.023 | A | NS | | NS | NS | NS | NS | < 0.023 | NS |
| R-129 | 08/09/95 | < 0.035 | | NS | | NS | NS | NS | NS | NS | NS |
| R-130 | 08/10/95 | | NS | NS | | NS | NS | NS | NS | NS | NS |
| R-131 | 08/11/95 | | NS | NS | | NS | NS | NS | NS | NS | NS |
| R-132 | 08/12/95 | | NS | NS | | NS | NS | NS | NS | NS | NS |
| R-133 | 08/13/95 | | NS | NS | | NS | NS | NS | NS | NS | NS |
| R-134 | 08/14/95 | | NS | NS | | NS | NS | NS | NS | NS | NS |
| R-135 | 08/15/95 | | NS | NS | | NS | NS | NS | NS | NS | NS |

Dieldrin Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Dieldrin Concentration (µg/m$^3$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-136 | 08/16/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-137 | 08/17/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-138 | 08/18/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-139 | 08/19/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-140 | 08/20/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-141 | 08/21/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-142 | 08/22/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-143 | 08/23/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-144 | 08/24/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-145 | 08/25/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-146 | 08/26/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-147 | 08/27/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-148 | 08/28/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-149 | 08/29/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-150 | 08/30/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-151 | 08/31/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-152 | 09/05/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-153 | 09/06/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-154 | 09/11/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-155 | 09/14/95 | NS | NS | NS | NS | NS | NS | NS | NS |

**Bold Typ** Greater than lower detection limit.

*Italic* Greater than action level (0.0691 µg/m$^3$).

A Sample collected at monitoring location A11 using sampler A61 (not collocated sampling).

J Surrogate Recovery outside limits.

NS No Sample Collected or Analyzed.

P Pump fault.

R Rejected lab data because filters were wet upon receipt at laboratory.

Hexachlorobenzene Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Hexachlorobenzene Concentration (µg/m³) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| 1 | 02/14/95 | NS | NS | **0.016** | NS | NS | NS | NS | NS |
| 2 | 02/15/95 | < 0.015 | < 0.014 | < 0.017 | < 0.021 | NS | NS | < 0.015 | < 0.015 |
| 3 | 02/16/95 | < 0.014 | < 0.015 | < 0.016 | < 0.015 | NS | NS | < 0.015 | < 0.015 |
| 4 | 02/17/95 | < 0.015 | < 0.015 | < 0.016 | < 0.015 | NS | NS | < 0.014 | < 0.015 |
| 5 | 02/18/95 | < 0.015 | < 0.015 | < 0.015 | < 0.016 | NS | NS | < 0.015 | < 0.015 |
| 6 | 02/21/95 | < 0.016 | < 0.015 | < 0.016 | < 0.015 | NS | NS | < 0.016 | < 0.015 |
| 7 | 03/07/95 | < 0.014 | < 0.014 | < 0.014 | < 0.014 | NS | NS | < 0.015 | < 0.015 |
| 8 | 03/08/95 | < 0.012 D | < 0.012 D | < 0.013 D | < 0.013 D | NS | NS | < 0.015 D | < 0.012 D |
| 9 | 03/10/95 | < 0.016 D | < 0.019 D | < 0.015 D | < 0.016 D | NS | NS | < 0.019 | < 0.017 |
| R-01 | 03/18/95 | < 0.019 | < 0.023 | < 0.019 | < 0.019 | NS | NS | < 0.024 | < 0.019 |
| R-02 | 03/19/95 | < 0.021 | < 0.022 | < 0.021 | < 0.022 | NS | NS | **0.046** | < 0.021 |
| R-03 | 03/23/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-04 | 03/24/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-05 | 03/25/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-06 | 03/27/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-07 | 03/28/95 | < 0.019 | < 0.024 | **0.048** | **0.034** | NS | NS | < 0.019 | < 0.017 |
| R-08 | 03/29/95 | < 0.021 | < 0.026 D | **0.033** D | < 0.020 D | NS | NS | < 0.021 D | < 0.021 D |
| R-09 | 03/30/95 | < 0.019 | < 0.024 | **0.153** | **0.053** | NS | NS | < 0.020 | < 0.023 |
| R-10 | 03/31/95 | < 0.021 | < 0.024 | **0.126** J | **0.045** | NS | NS | < 0.019 | < 0.020 |
| R-11 | 04/01/95 | < 0.017 | < 0.020 | **0.104** J | < 0.016 | NS | NS | NS | < 0.015 |
| R-12 | 04/02/95 | < 0.015 D | **0.118** D | < 0.015 D | < 0.041 D | NS | NS | < 0.019 D | < 0.018 D |
| R-13 | 04/03/95 | **0.025** | < 0.017 | **0.078** J | **0.042** | NS | NS | < 0.014 D | < 0.013 D |
| R-14 | 04/04/95 | **0.039** | < 0.016 D | **0.078** D | < 0.013 D | NS | NS | < 0.015 D | < 0.014 D |
| R-15 | 04/05/95 | **0.023** A | < 0.015 | **0.051** D | **0.022** | NS | NS | P | < 0.013 |
| R-16 | 04/06/95 | **0.022** A | **0.018** D | **0.056** J | < 0.014 | NS | NS | P | < 0.016 |
| R-17 | 04/07/95 | **0.089** A | < 0.014 D | < 0.014 D | **0.063** | NS | NS | P | < 0.017 |
| R-18 | 04/08/95 | **0.082** | < 0.017 | **0.122** | < 0.015 | NS | NS | < 0.020 | < 0.016 |
| R-19 | 04/09/95 | **0.014** | < 0.017 D | **0.048** | **0.021** | NS | NS | < 0.015 D | < 0.014 |
| R-20 | 04/10/95 | **0.040** | NS | **0.036** | NS | NS | NS | < 0.013 | P |
| R-21 | 04/11/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-22 | 04/12/95 | **0.022** | < 0.016 | **0.049** D | < 0.010 | NS | NS | < 0.019 | < 0.014 |
| R-23 | 04/13/95 | **0.030** | < 0.013 | **0.068** | **0.018** | NS | NS | < 0.021 | < 0.014 |
| R-24 | 04/14/95 | **0.037** | < 0.010 | **0.062** | < 0.014 | NS | NS | < 0.022 | < 0.015 |
| R-25 | 04/15/95 | < 0.010 | < 0.010 | **0.036** | < 0.014 | NS | NS | < 0.023 | < 0.015 |
| R-26 | 04/16/95 | **0.020** | < 0.012 | **0.007** | < 0.014 | NS | NS | < 0.023 | < 0.014 |
| R-27 | 04/17/95 | **0.161** | < 0.012 | **0.056** | < 0.014 | NS | NS | < 0.023 | < 0.015 |
| R-28 | 04/18/95 | **0.057** D | < 0.016 D | **0.056** | < 0.020 D | NS | NS | < 0.030 D | < 0.020 D |

Hexachlorobenzene Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Hexachlorobenzene Concentration (µg/m³) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-29 | 04/19/95 | 0.030 | < 0.011 | 0.090 | 0.038 | NS | NS | < 0.024 | < 0.015 |
| R-30 | 04/20/95 | 0.093 | < 0.011 | 0.074 | < 0.015 | NS | NS | < 0.023 | < 0.015 |
| R-31 | 04/21/95 | 0.036 | < 0.011 | 0.042 | 0.029 | NS | NS | < 0.024 | < 0.015 |
| R-32 | 04/22/95 | 0.047 | < 0.012 | 0.139 | 0.019 | NS | NS | < 0.024 | < 0.015 |
| R-33 | 04/23/95 | 0.040 | < 0.011 | 0.136 | 0.018 | NS | NS | < 0.024 | < 0.015 |
| R-34 | 04/24/95 | 0.550 | < 0.011 | 0.140 | 0.066 | NS | NS | < 0.022 | < 0.014 |
| R-35 | 04/25/95 | 0.046 | < 0.011 | 0.085 | 0.020 | NS | NS | < 0.023 | < 0.014 |
| R-36 | 04/26/95 | 0.088 J | 0.018 J | 0.263 | 0.187 | NS | NS | < 0.023 | < 0.015 |
| R-37 | 04/27/95 | 0.106 J | 0.013 J | 0.207 | 0.042 | NS | NS | < 0.024 | < 0.014 |
| R-38 | 04/28/95 | 0.061 | < 0.012 | 0.069 | < 0.014 | NS | NS | < 0.024 | < 0.015 |
| R-39 | 04/29/95 | 0.077 | < 0.012 | 0.189 | 0.024 | NS | NS | < 0.023 | < 0.015 |
| R-40 | 04/30/95 | 0.144 | 0.015 | 0.422 | 0.141 | NS | NS | < 0.024 | < 0.015 |
| R-41 | 05/01/95 | 0.232 | 0.035 | 0.153 | 0.265 | NS | NS | < 0.022 | < 0.014 |
| R-42 | 05/02/95 | 0.353 | < 0.014 | 0.610 | 0.060 D | NS | NS | < 0.024 D | < 0.016 |
| R-43 | 05/03/95 | < 0.009 D | < 0.013 D | 0.063 D | 0.013 D | NS | NS | < 0.022 D | < 0.017 |
| R-44 | 05/04/95 | 0.109 D | NS | NS | NS | NS | NS | NS | NS |
| R-45 | 05/05/95 | 0.159 | NS | NS | NS | NS | NS | NS | < 0.011 D |
| R-46 | 05/06/95 | 0.146 | 0.031 | 0.172 | 0.211 D | NS | NS | < 0.012 | < 0.012 |
| R-47 | 05/08/95 | 0.183 A | NS | NS | NS | NS | NS | NS | NS |
| R-48 | 05/09/95 | 0.322 | 0.017 | 0.570 | 0.083 | NS | NS | NS | < 0.012 |
| R-49 | 05/10/95 | 0.172 A | NS | NS | NS | NS | NS | NS | NS |
| R-50 | 05/10/95 | 0.169 | < 0.011 | 0.313 | 0.118 | NS | NS | < 0.011 | < 0.011 |
| R-51 | 05/11/95 | 0.165 | < 0.012 | 0.130 | 0.099 | NS | NS | < 0.012 | < 0.012 |
| R-52 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| R-53 | 05/18/95 | 0.135 | < 0.011 | 0.318 | 0.052 | NS | NS | < 0.012 | < 0.010 |
| R-54 | NS | NS | NS | NS | NS | NS | NS | NS | NS |
| R-55 | 05/20/95 | 0.237 | NS | NS | NS | NS | NS | NS | NS |
| R-56 | 05/21/95 | 0.107 A | NS | NS | NS | NS | NS | NS | NS |
| R-57 | 05/22/95 | 0.269 | 0.014 | 0.234 | 0.056 | NS | NS | < 0.012 | < 0.010 |
| R-58 | 05/23/95 | 0.129 A | NS | NS | NS | NS | NS | NS | NS |
| R-59 | 05/24/95 | 0.173 | NS | NS | NS | NS | NS | NS | NS |
| R-60 | 05/25/95 | 0.118 | 0.038 | 0.159 | 0.191 | NS | NS | < 0.013 | < 0.010 |
| R-61 | 05/26/95 | 0.234 | 0.014 | 0.491 | 0.090 | NS | NS | < 0.014 | < 0.010 |
| R-62 | 06/03/95 | 0.131 | NS | NS | NS | NS | NS | NS | NS |
| R-63 | 06/04/95 | 0.142 | NS | NS | NS | NS | NS | NS | NS |
| R-64 | 06/05/95 | 0.094 AD | < 0.013 D | 0.055 D | NS | 0.096 D | 0.052 D | < 0.017 D | < 0.014 D |
| R-65 | 06/06/95 | 0.111 | NS | NS | NS | NS | NS | NS | NS |

Hexachlorobenzene Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Hexachlorobenzene Concentration (µg/m³) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-66 | 06/07/95 | **0.063** A | NS | NS | NS | NS | NS | NS | NS |
| R-67 | 06/08/95 | **0.229** | **0.042** | **0.130** | NS | **0.591** | **0.086** | < 0.023 | < 0.017 |
| R-68 | 06/09/95 | **0.105** A | NS | NS | NS | NS | NS | NS | NS |
| R-69 | 06/10/95 | **0.072** | NS | NS | NS | NS | NS | NS | NS |
| R-70 | 06/11/95 | **0.088** AD | < 0.025 D | **0.097** | NS | **0.092** D | **0.067** | < 0.023 | < 0.017 |
| R-71 | 06/13/95 | **0.073** | NS | NS | NS | NS | NS | NS | NS |
| R-72 | 06/14/95 | **0.073** A | < 0.017 | NS | NS | **0.014** | **0.079** | < 0.017 | < 0.017 |
| R-73 | 01/00/00 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-74 | 06/15/95 | **0.137** A | NS | NS | NS | NS | NS | NS | NS |
| R-75 | 06/16/95 | **0.017** | NS | NS | NS | NS | NS | NS | NS |
| R-76 | 06/17/95 | **0.067** A | < 0.017 | NS | NS | **0.139** | < 0.012 | < 0.023 | < 0.017 |
| R-77 | 06/18/95 | **0.058** | NS | NS | NS | NS | NS | NS | NS |
| R-78 | 06/19/95 | **0.107** A | NS | NS | NS | NS | NS | NS | NS |
| R-79 | 06/20/95 | **0.118** | < 0.017 | **0.185** | **0.088** | **0.103** | **0.065** | < 0.023 | < 0.017 |
| R-80 | 06/21/95 | **0.116** A | NS | NS | NS | NS | NS | NS | NS |
| R-81 | 06/22/95 | **0.097** | NS | NS | NS | NS | NS | NS | NS |
| R-82 | 06/23/95 | **0.095** A | < 0.174 | **0.352** | **0.134** | **0.417** | **0.090** | < 0.174 | < 0.174 |
| R-83 | 06/24/95 | **0.111** | NS | NS | NS | NS | NS | NS | NS |
| R-84 | 06/25/95 | **0.062** A | NS | NS | NS | NS | NS | NS | NS |
| R-85 | 06/26/95 | **0.064** | < 0.017 | **0.083** | **0.029** | **0.087** | **0.064** | < 0.017 | < 0.017 |
| R-86 | 06/27/95 | **0.023** A | NS | NS | NS | NS | NS | NS | NS |
| R-87 | 06/28/95 | **0.032** | NS | NS | NS | NS | NS | NS | NS |
| R-88 | 06/29/95 | < 0.014 A | **0.013** | NS | NS | **0.048** | **0.105** | < 0.013 | < 0.013 |
| R-89 | 06/30/95 | **0.061** | NS | NS | NS | NS | NS | NS | NS |
| R-90 | 07/01/95 | **0.097** A | NS | NS | NS | NS | NS | NS | NS |
| R-91 | 07/02/95 | **0.076** | < 0.012 | NS | NS | 0.072 D | **0.075** | < 0.010 | < 0.012 |
| R-92 | 07/03/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-93 | 07/04/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-94 | 07/05/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-95 | 07/06/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-96 | 07/07/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-97 | 07/07/95 | **0.130** A | NS | NS | NS | NS | NS | NS | NS |
| R-98 | 07/08/95 | **0.159** | **0.022** | NS | NS | **0.451** | ***1.458*** | < 0.010 | < 0.010 |
| R-99 | 07/09/95 | **0.143** | NS | NS | NS | NS | NS | NS | NS |
| R-100 | 07/10/95 | **0.117** A | NS | NS | NS | NS | NS | NS | NS |
| R-101 | 07/11/95 | **0.054** | < 0.010 | NS | NS | **0.126** | **0.281** | < 0.010 | < 0.010 |
| R-102 | 07/12/95 | NS | NS | NS | NS | NS | NS | NS | NS |

Hexachlorobenzene Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Hexachlorobenzene Concentration (µg/m$^3$) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-103 | 07/13/95 | **0.159** | NS | NS | NS | NS | NS | NS | NS |
| R-104 | 07/14/95 | **0.348** | < **0.010** | NS | NS | **0.174** | **0.226** | < **0.010** | < **0.009** |
| R-105 | 07/15/95 | **0.214** | NS | NS | NS | NS | NS | NS | NS |
| R-106 | 07/16/95 | **0.160** | NS | NS | NS | NS | NS | NS | NS |
| R-107 | 07/17/95 | **0.065** | < **0.010** | NS | NS | **0.646** | **0.172** | < **0.010** | < **0.009** |
| R-108 | 07/18/95 | **0.122** A | NS | NS | NS | NS | NS | NS | NS |
| R-109 | 07/19/95 | **0.133** | NS | NS | NS | NS | NS | NS | NS |
| R-110 | 07/20/95 | **0.161** | < 0.010 | NS | NS | **0.224** | **0.067** | < **0.009** | < 0.009 |
| R-111 | 07/21/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-112 | 07/22/95 | **0.137** | NS | NS | NS | NS | NS | NS | NS |
| R-113 | 07/23/95 | **0.100** | < 0.010 | **0.057** | < 0.010 | **0.135** | **0.076** | < **0.010** | < **0.010** |
| R-114 | 07/24/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-115 | 07/25/95 | **0.133** | NS | NS | NS | NS | NS | NS | NS |
| R-116 | 07/26/95 | **0.107** A | NS | NS | NS | NS | NS | NS | NS |
| R-117 | 07/27/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-118 | 07/28/95 | **0.059** | NS | NS | NS | NS | NS | NS | NS |
| R-119 | 07/29/95 | **0.039** A | NS | NS | NS | NS | NS | NS | NS |
| R-120 | 07/30/95 | **0.095** | NS | NS | NS | NS | NS | NS | NS |
| R-121 | 07/31/95 | **0.060** A | < 0.010 | NS | NS | **0.138** | **0.100** | < 0.009 | < **0.010** |
| R-122 | 08/01/95 | **0.044** | NS | NS | NS | NS | NS | NS | NS |
| R-123 | 08/02/95 | **0.042** A | NS | NS | NS | NS | NS | NS | NS |
| R-124 | 08/03/95 | **0.055** | < 0.010 | NS | NS | **0.062** | **0.025** | < 0.009 | < 0.010 |
| R-125 | 08/04/95 | **0.046** | NS | NS | NS | NS | NS | NS | NS |
| R-126 | 08/05/95 | **0.042** A | NS | NS | NS | NS | NS | NS | NS |
| R-127 | 08/07/95 | **0.049** | NS | NS | NS | NS | NS | NS | NS |
| R-128 | 08/08/95 | **0.028** A | NS | NS | NS | NS | NS | < 0.012 | NS |
| R-129 | 08/09/95 | **0.038** | NS | NS | NS | NS | NS | NS | NS |
| R-130 | 08/10/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-131 | 08/11/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-132 | 08/12/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-133 | 08/13/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-134 | 08/14/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-135 | 08/15/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-136 | 08/16/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-137 | 08/17/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-138 | 08/18/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-139 | 08/19/95 | NS | NS | NS | NS | NS | NS | NS | NS |

*Hexachlorobenzene Concentrations in Ambient Air*

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

| | | Hexachlorobenzene Concentration (µg/m³) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Center of Site | | North End of Site | | South End of Site | | Off-Site | |
| Event Number | Sampling Start Date | East Perimeter A11 or A61 | West Perimeter A12 | East Perimeter A13 | West Perimeter A14 | East Perimeter A15 | West Perimeter A16 | East of Site A21 | West of Site A22 |
| R-140 | 08/20/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-141 | 08/21/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-142 | 08/22/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-143 | 08/23/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-144 | 08/24/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-145 | 08/25/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-146 | 08/26/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-147 | 08/27/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-148 | 08/28/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-149 | 08/29/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-150 | 08/30/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-151 | 08/31/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-152 | 09/05/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-153 | 09/06/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-154 | 09/11/95 | NS | NS | NS | NS | NS | NS | NS | NS |
| R-155 | 09/14/95 | NS | NS | NS | NS | NS | NS | NS | NS |

**Bold Type** Greater than lower detection limit.
***Italic*** Greater than action level (0.726 µg/m³).
A Sample collected at monitoring location A11 using sampler A61 (not collocated sampling).
J Surrogate Recovery outside limits.
NS No Sample Collected or Analyzed.
P Pump fault.
R Rejected lab data because filters were wet upon receipt at laboratory.

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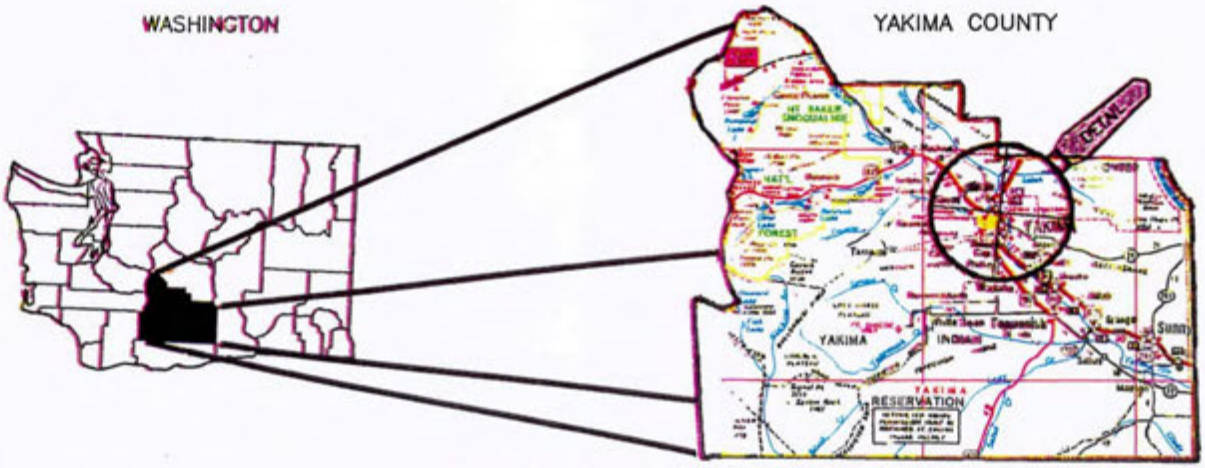
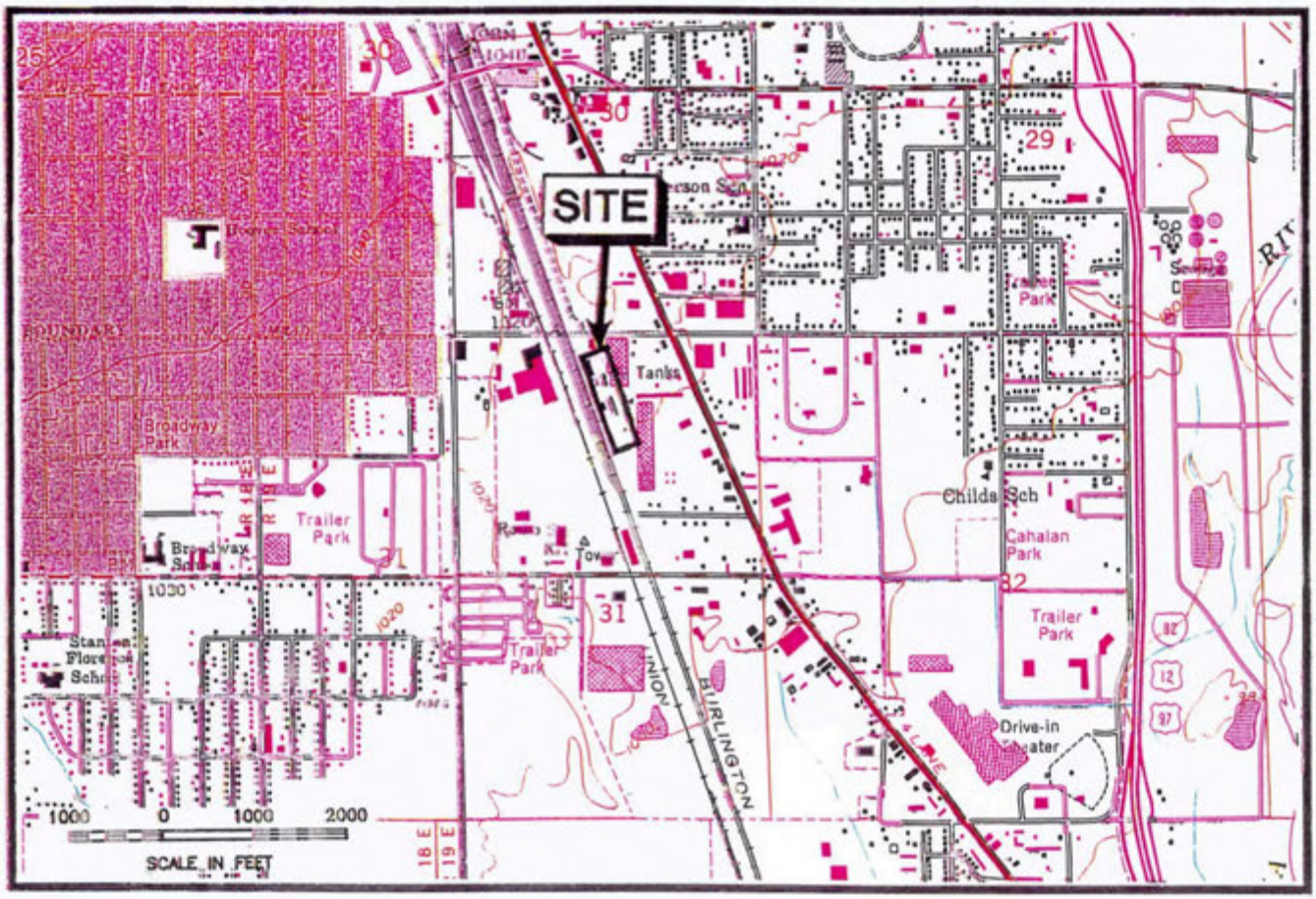
Figure 7–12 — DDT Concentrations in Ambient Air
Figure 7–13 — Dieldrin Concentrations in Ambient Air
Figure 7–14 — Hexachlorobenzene Concentrations in Ambient Air




DETAIL OF SITE VICINITY




SCALE IS VARIABLE

Modified from U.S. Geological Survey, Yakima East, Washington, quadrangle, Photo revised 1985.

PHILIP ENVIRONMENTAL

TITLE: SITE LOCATION MAP

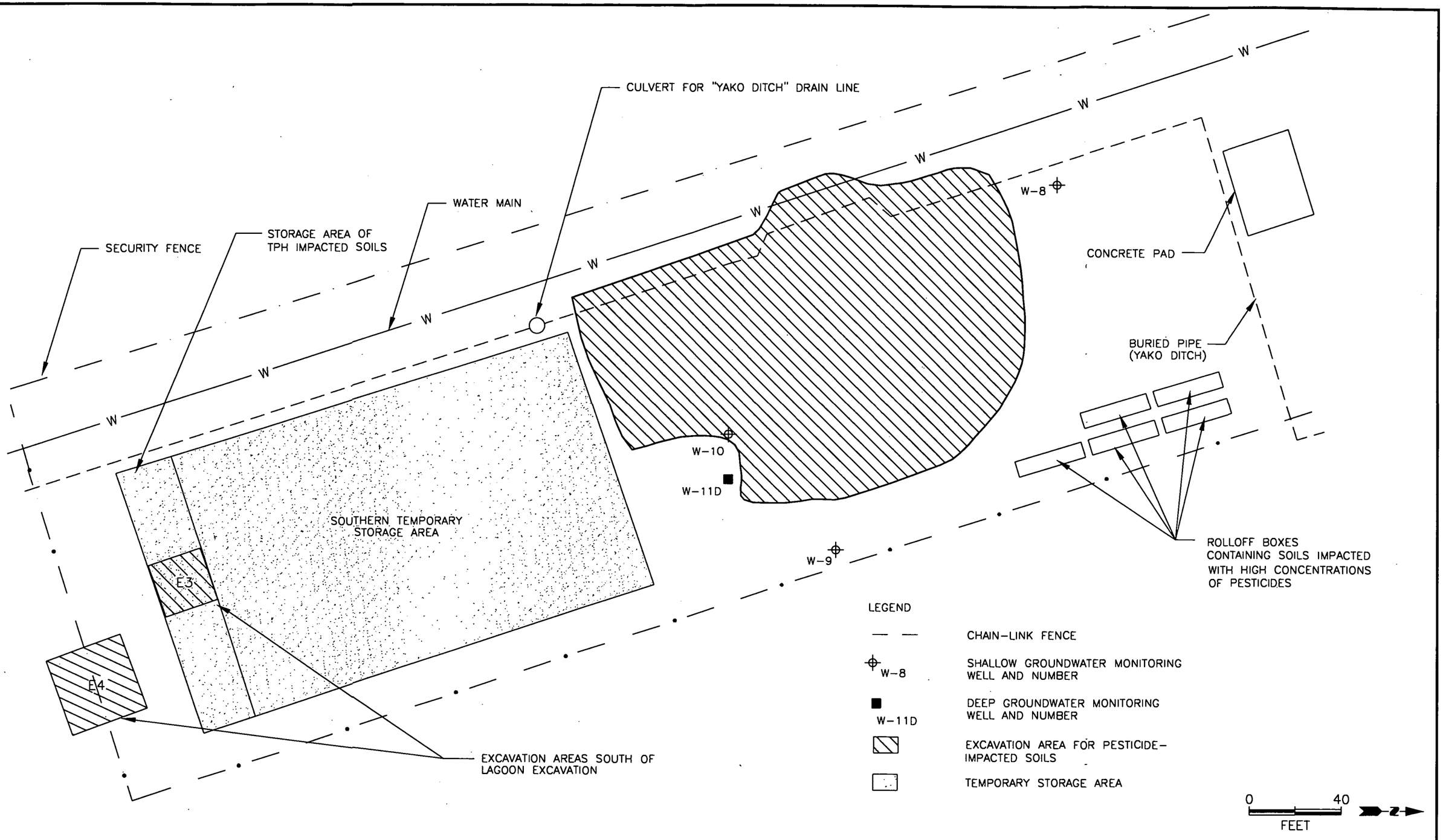
| SCALE | AS NOTED | DATE |
|---|---|---|
| DWN: | HLM | 1/17/96 |
| DES: | | |
| CHKD: | | |
| APPD: | | |

PROJECT NO: 12883088
WOODS INDUSTRIES SITE
YAKIMA, WASHINGTON

Figure 1-1 REV: 0



COL J:\12883088\12830BAD




PHILIP ENVIRONMENTAL

TITLE:
Site Features After 1993
Soil Removal Activities
South Portion of Site

| NO. | REVISION | BY | APPR. | DATE |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| △ | | | | |

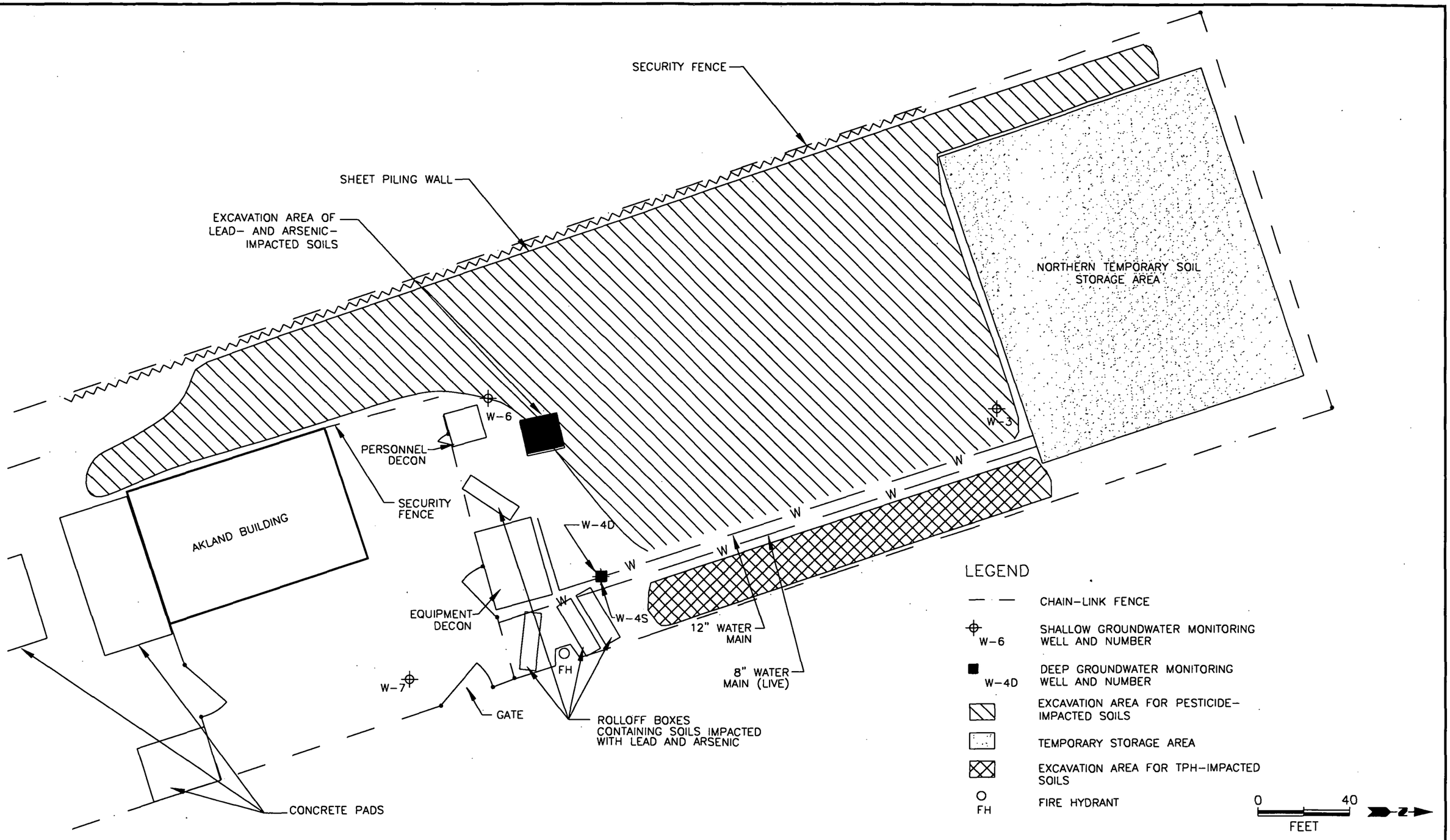
| | | | | |
|---|---|---|---|---|
| SCALE 1=40 | DATE: | | DATE: | PROJECT NO: 12883088 |
| DWN: TMM | 9/29/95 | CHKO: | | WOODS INDUSTRIES SITE YAKIMA, WASHINGTON |
| DES: | | APPD: | | |



FIGURE 1-2

REV:

COL. 12883088\12830BAA-011




PHILIP ENVIRONMENTAL

TITLE:
Site Features After 1993
Soil Removal Activities
North Portion of Site

| NO. | REVISION | BY | APPR. | DATE |
|---|---|---|---|---|
| | | | | |
| | | | | |
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| | | | | |
|---|---|---|---|---|
| SCALE 1=40 | DATE: | | DATE: | PROJECT NO: 12883088 |
| DWN: TMM | 9/29/95 | CHKD: | | WOODS INDUSTRIES SITE YAKIMA, WASHINGTON |
| DES: | | APPD: | | |



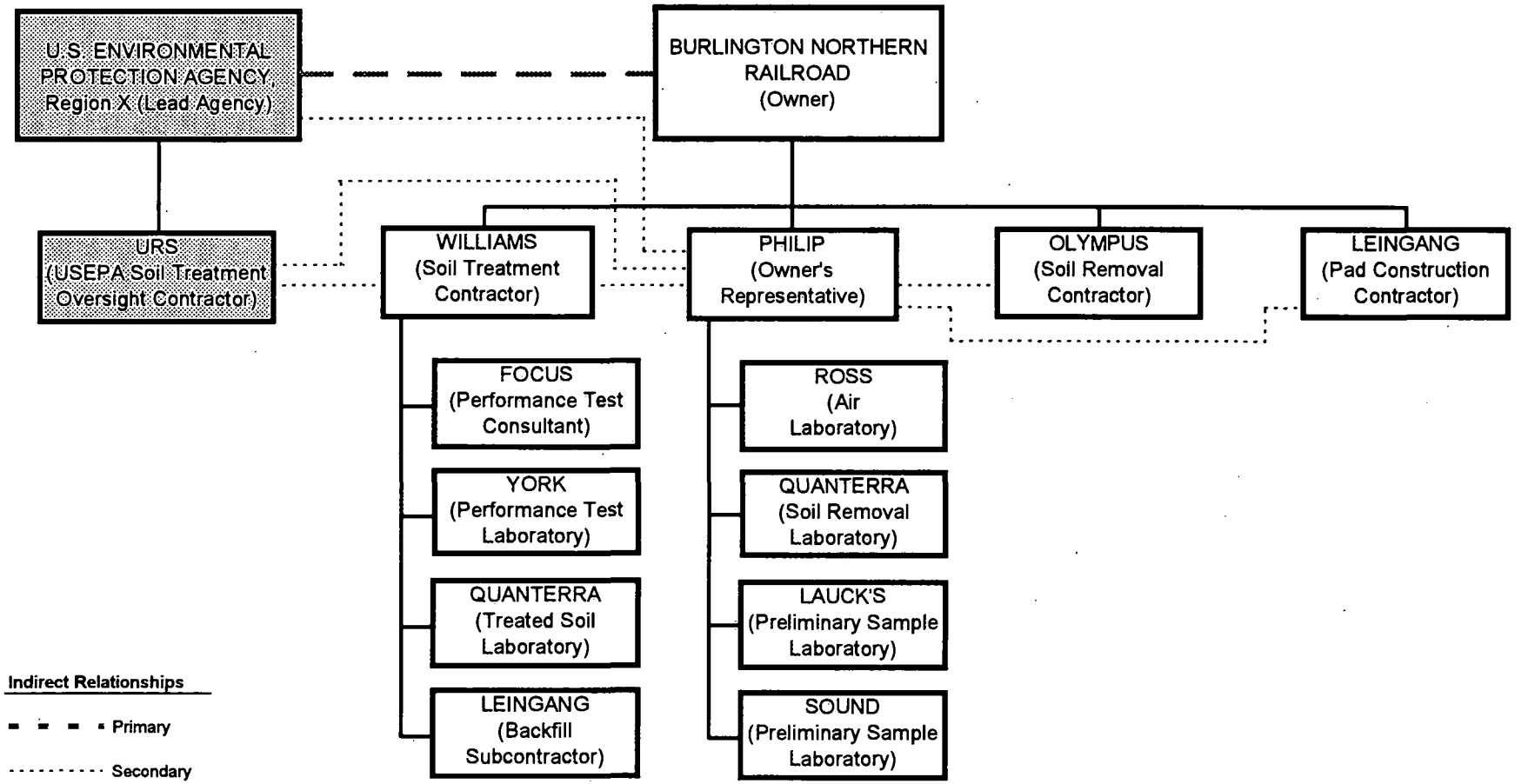
FIGURE 1-3 REV:

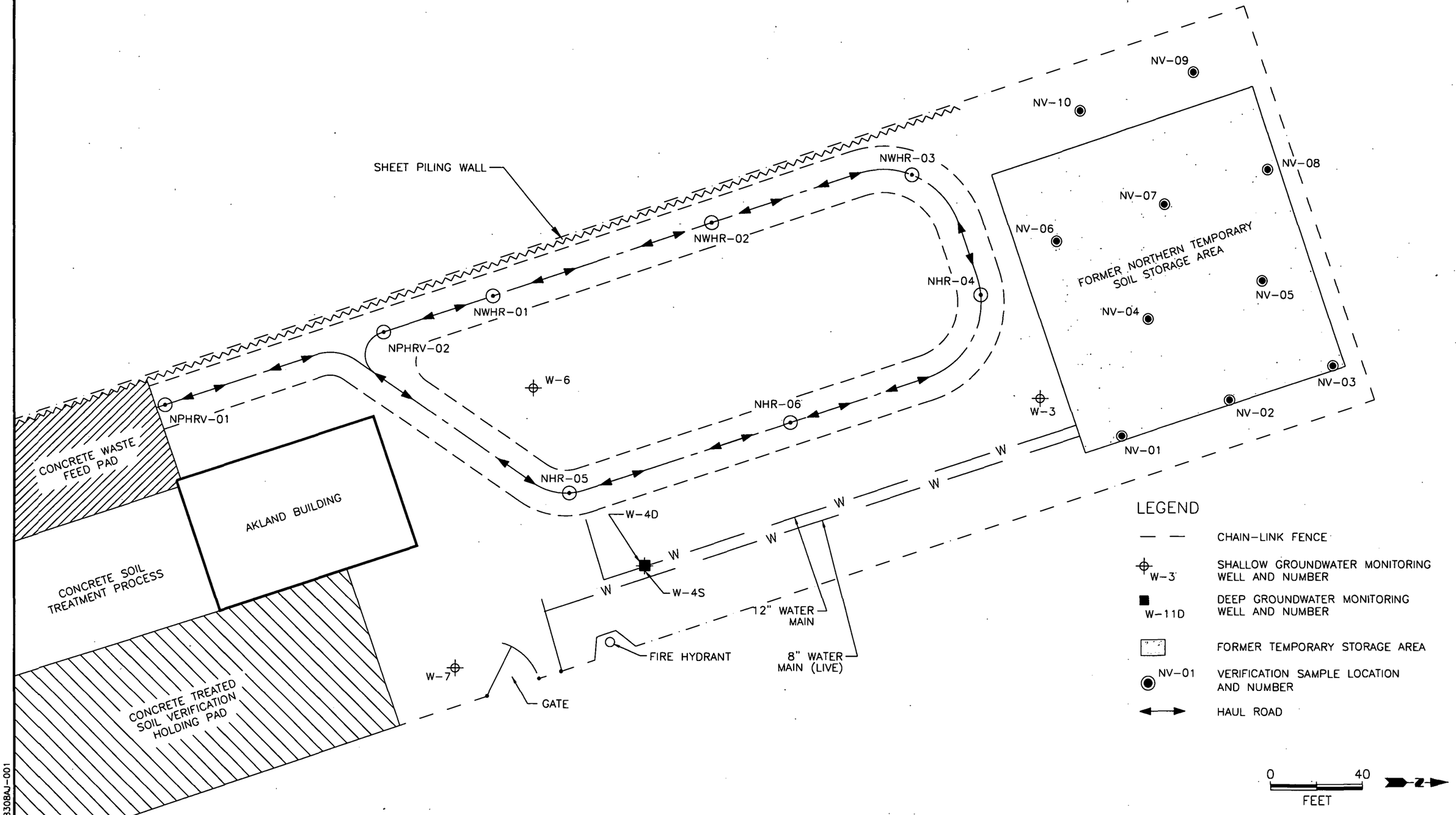
COL. 12883088\128308AA-010

Figure 1-4

# SOIL TREATMENT ORGANIZATION

**Woods Industries Site, Yakima, Washington**






COL. J:\12883088\128308AJ-001

PHILIP ENVIRONMENTAL

TITLE:
Woods Industries
Verification Sample Location Map
for North Protion of Site

| NO. | REVISION | BY | APPR. | DATE |
|---|---|---|---|---|
| 1 | GENERAL REVISIONS | M.R.W. | | 7/9/96 |

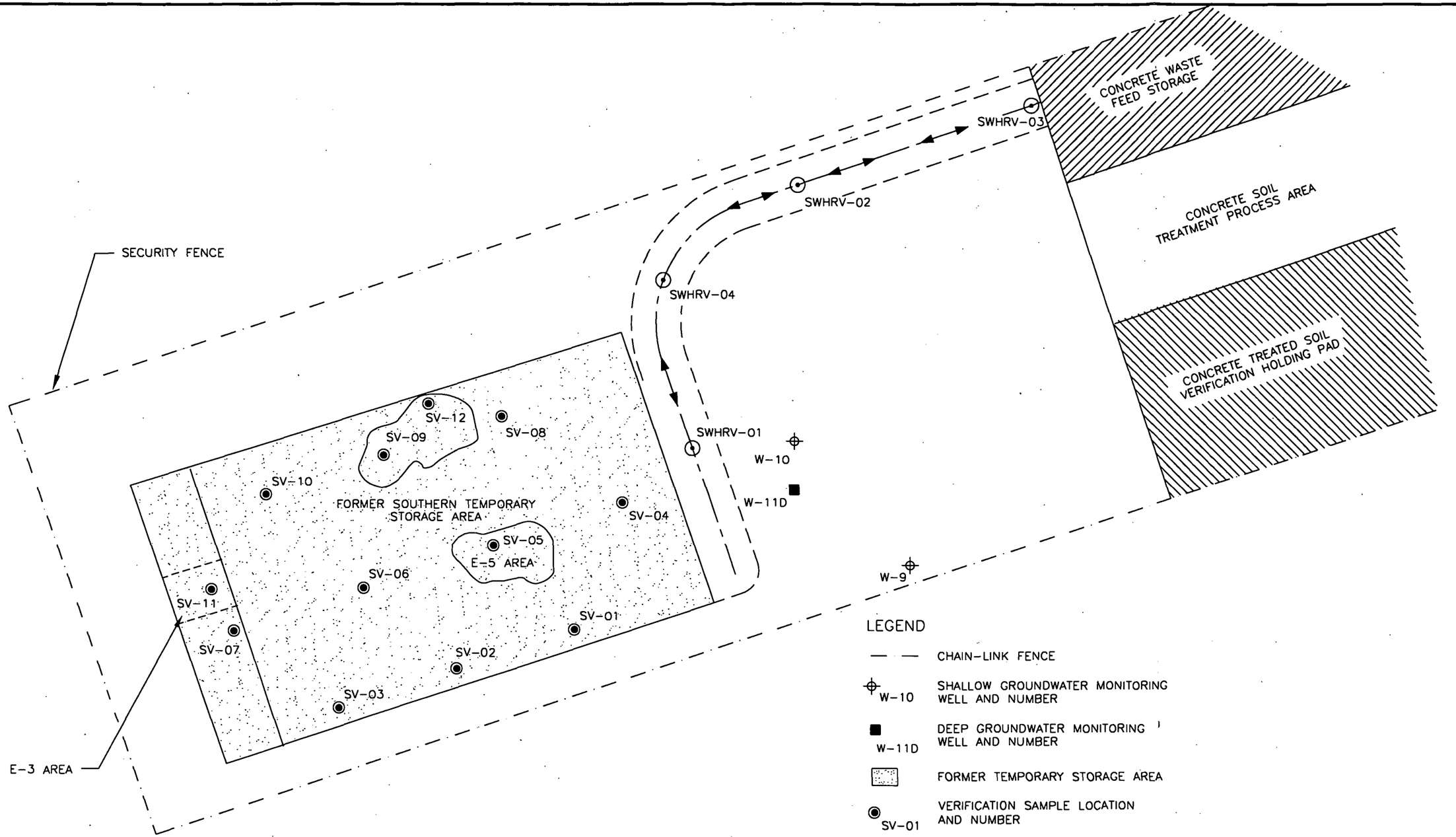
| | | | |
|---|---|---|---|
| SCALE 1=40 | DATE: | | DATE: |
| DWN: TMM | 9/29/95 | CHKD: | |
| DES: | | APPD: | |

PROJECT NO: 12883088
WOODS INDUSTRIES SITE
YAKIMA, WASHINGTON



FIGURE 6-1

REV: 1




COL. J:\12883088\128308AK-001

PHILIP ENVIRONMENTAL

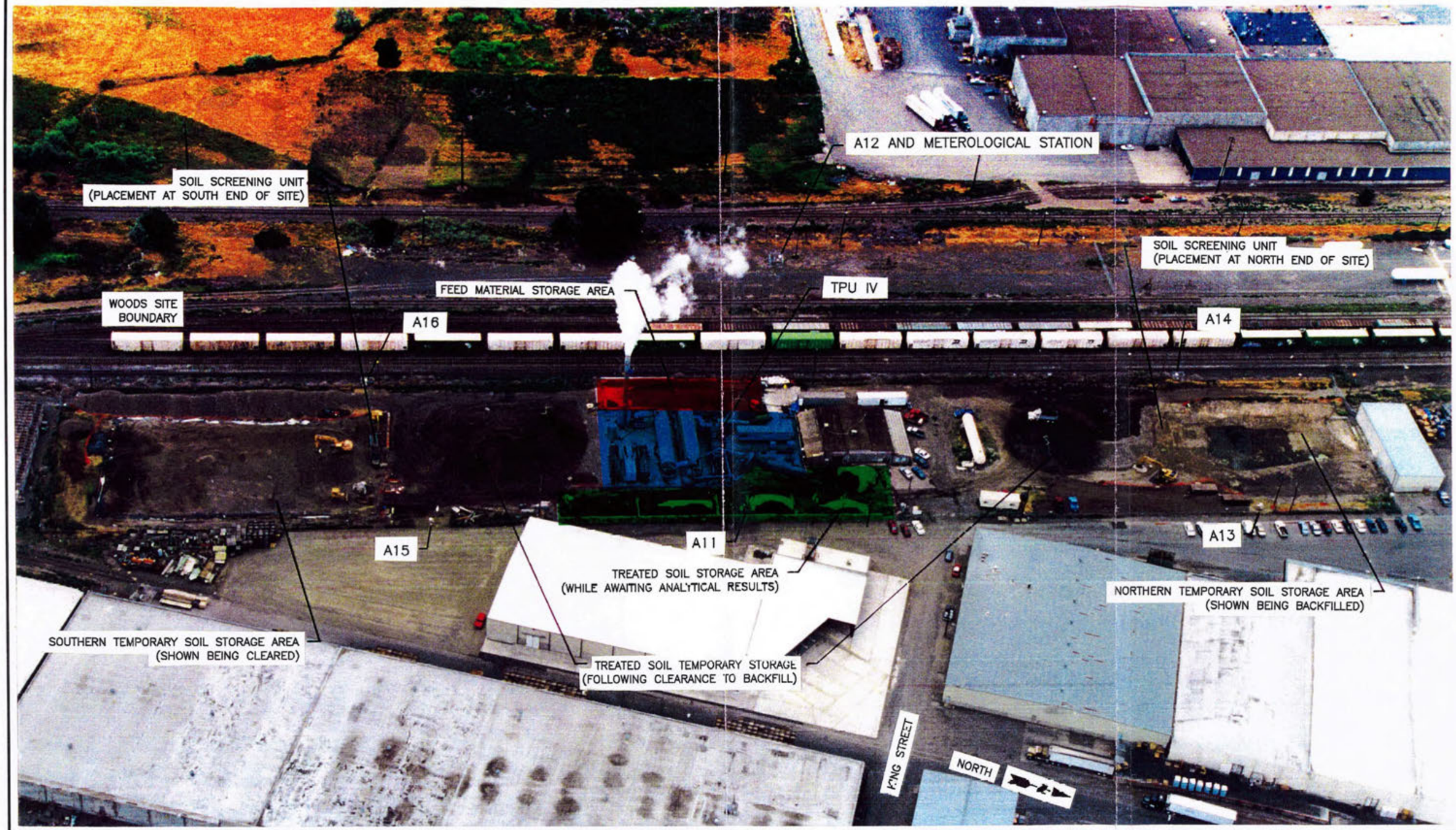
TITLE:
Woods Industries
Verification Sample Location Map
for South Portion of Site

| NO. | REVISION | BY | APPR. | DATE |
|---|---|---|---|---|
| 1 | GENERAL REVISION | M.R.W. | | 7/9/96 |

| | | | | |
|---|---|---|---|---|
| SCALE 1=40 | DATE: | | DATE: | PROJECT NO: 12883088 |
| DWN: TMM | 9/29/95 | CHKD: | | WOODS INDUSTRIAL SITE YAKIMA, WASHINGTON |
| DES: | | APPD: | | |



FIGURE 6-2 | REV: 1




COL 12830BM-001

PHILIP ENVIRONMENTAL

TITLE:
Ambient Air Monitoring Locations and Soil Treatment Activity Fugitive Emission Sources

| NO. | REVISION | BY | APPR. | DATE |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
|---|---|---|---|---|
| SCALE NONE | DATE: | | DATE: | PROJECT NO: 12883088 |
| DWN: TMM | 9/29/95 | CHKD: | | WOOODS INDUSTRIES SITE YAKIMA, WASHINGTON |
| DES: | | APPD: | | |



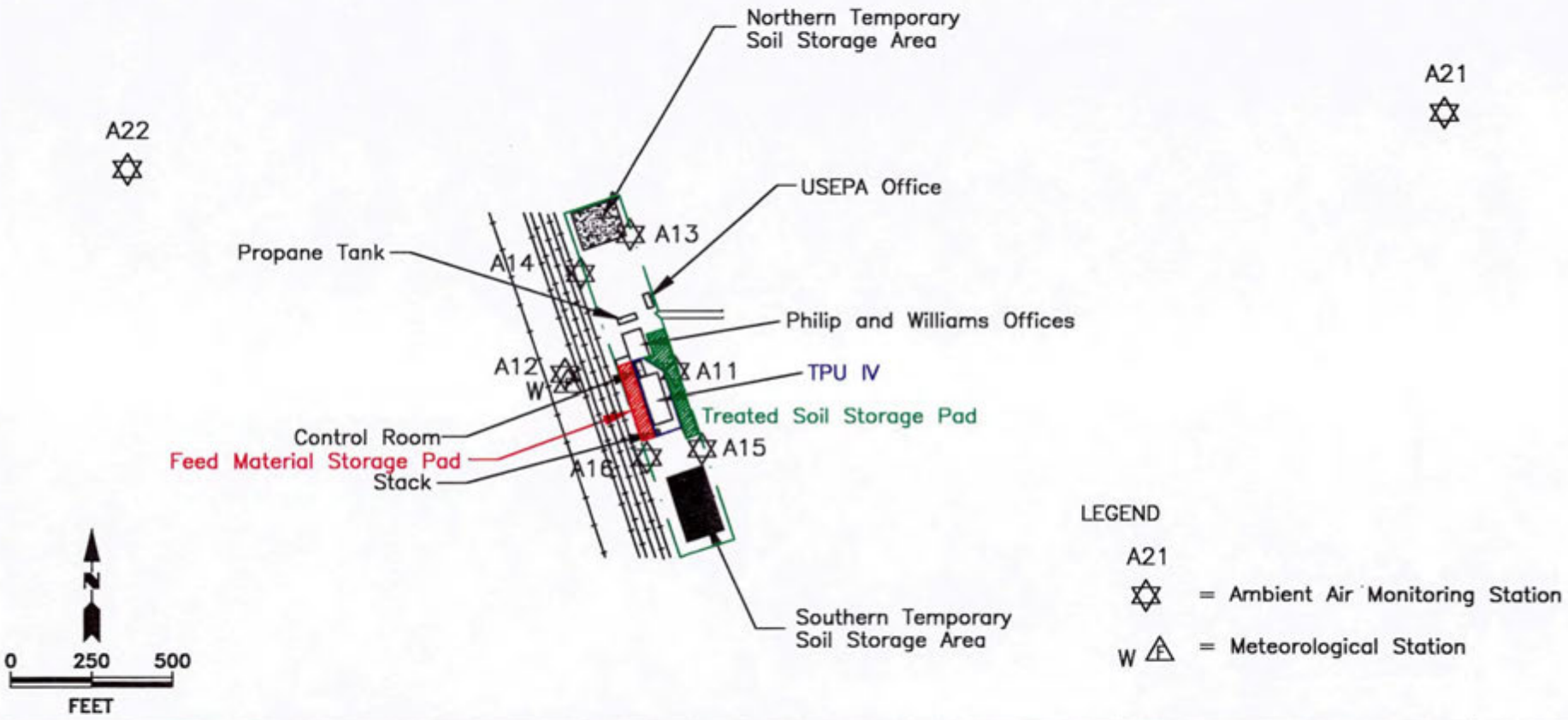
FIGURE 7-1

REV:


Aerial Photo Looking West Toward Ambient Air Monitoring Location A22 Figure 7-2


Aerial Photo Looking East Toward Ambient Air Monitoring Location A2.1

Figure 7-3




PHILIP ENVIRONMENTAL



| NO. | REVISION | BY | APPR. | DATE |
|---|---|---|---|---|
| | | | | |
| | | | | |
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TITLE:

# Ambient Air Monitoring Stations and Meteorological Station Approximate Location Map

| | | |
|---|---|---|
| SCALE | AS NOTED | DATE |
| DWN: | TMM | 9/29/95 |
| DES: | KDM | |
| CHKD: | | |
| APPD: | | |

PROJECT NO: 12883088
Woods Industries Site
Yakima, WA

Figure 7-4

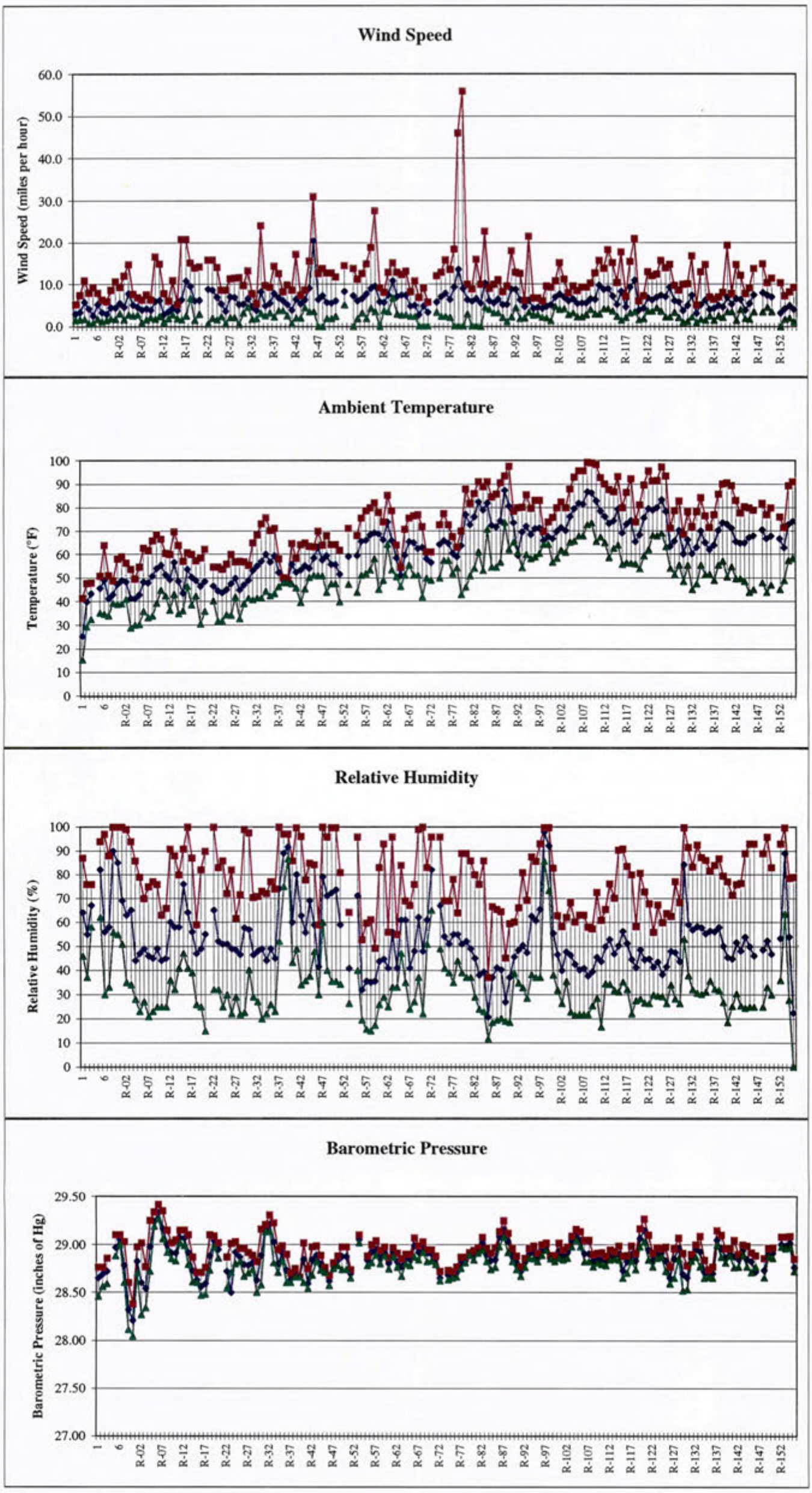
REV. 0

COL J:\12883083\12883080-001

Figure 7-5

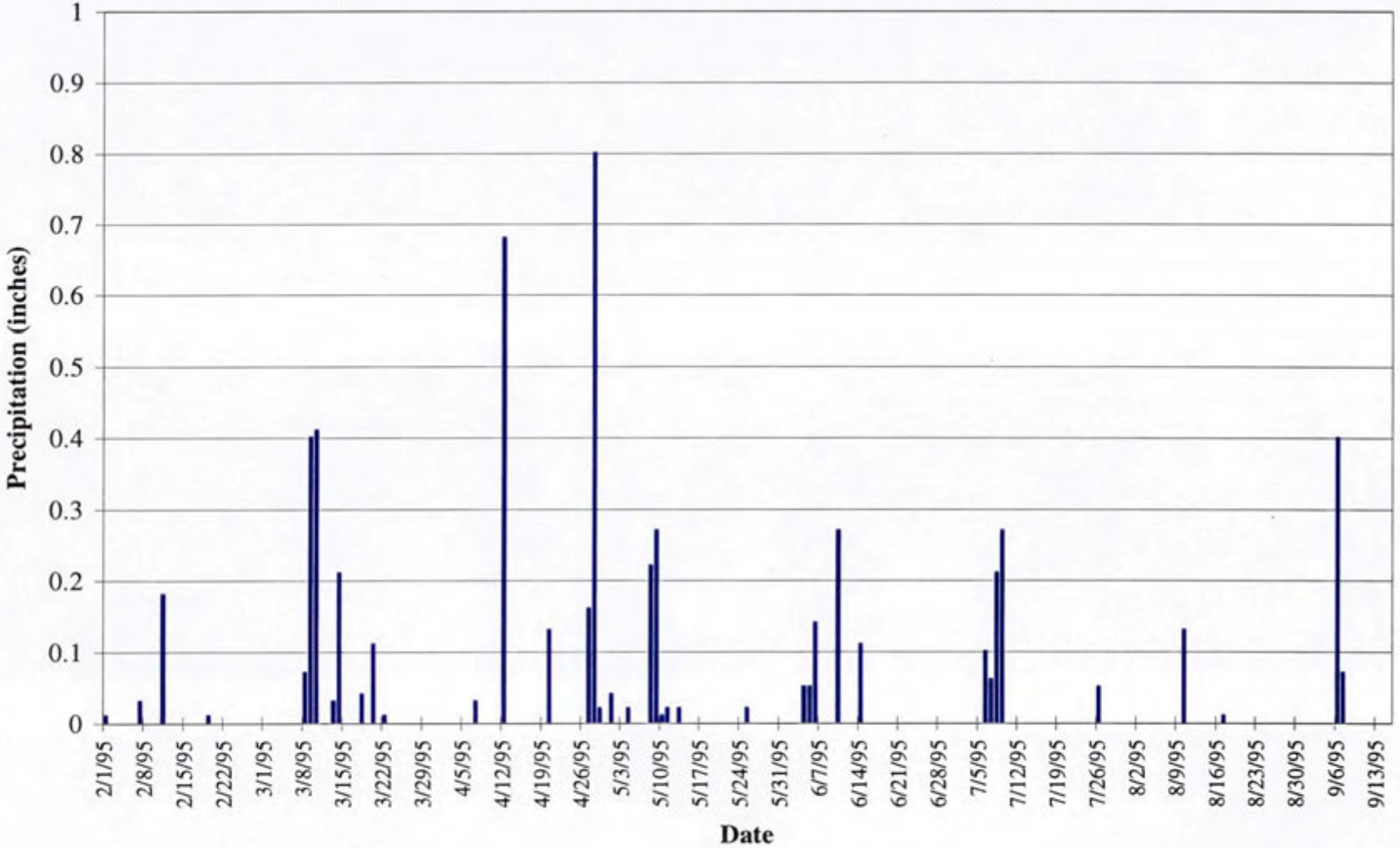
# Meteorological Conditions during Ambient Air Monitoring Events

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington



# Precipitation in Yakima, Washington, during 1995 Soil Treatment Activities at the Woods Industries Site

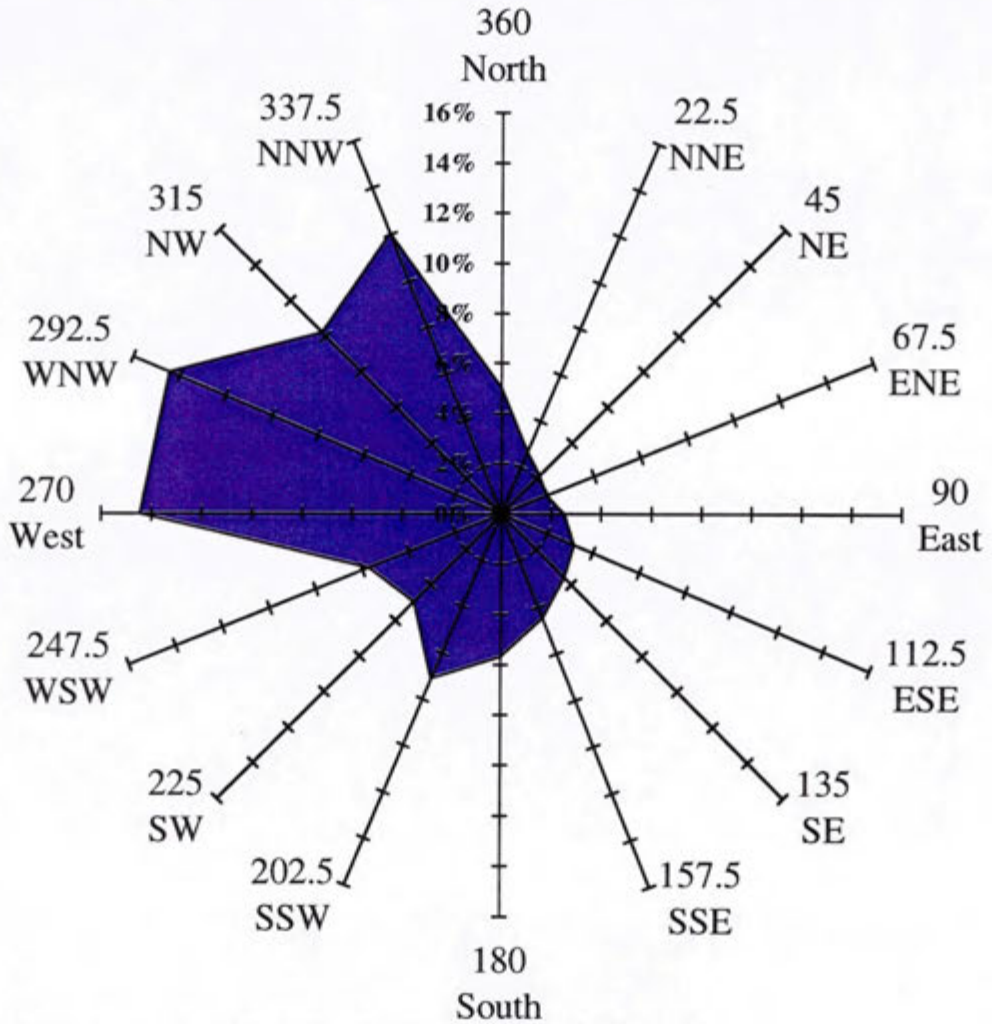
(Measured by the National Weather Service at the Yakima Airport)




PRECIP.XLS Chart2

# Wind Direction Frequency during Ambient Air Monitoring Events

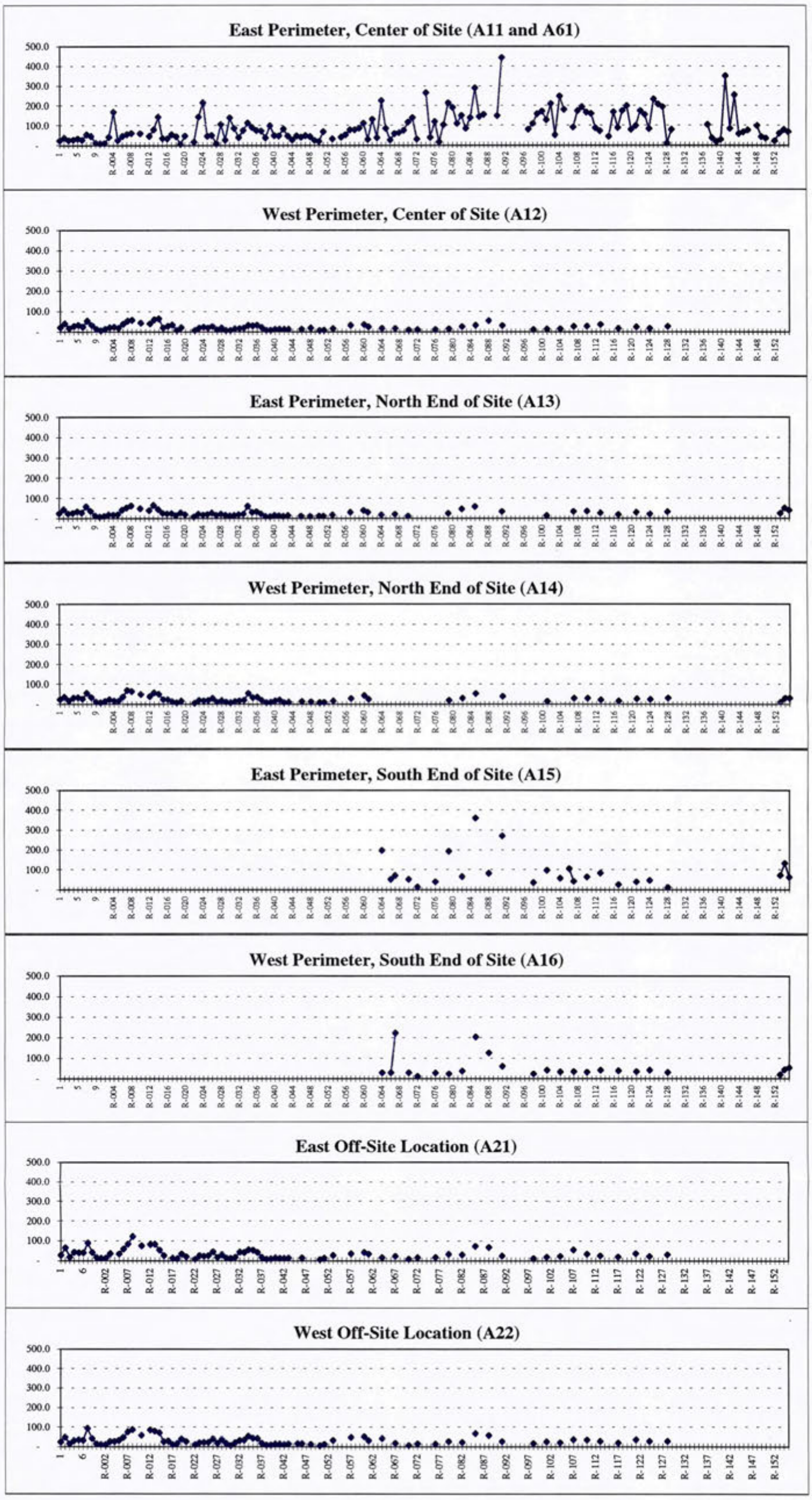
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington




NOTE: Graph shows relative proportion of time the wind blew **from** each direction .

# $PM_{10}$ Concentrations in Ambient Air

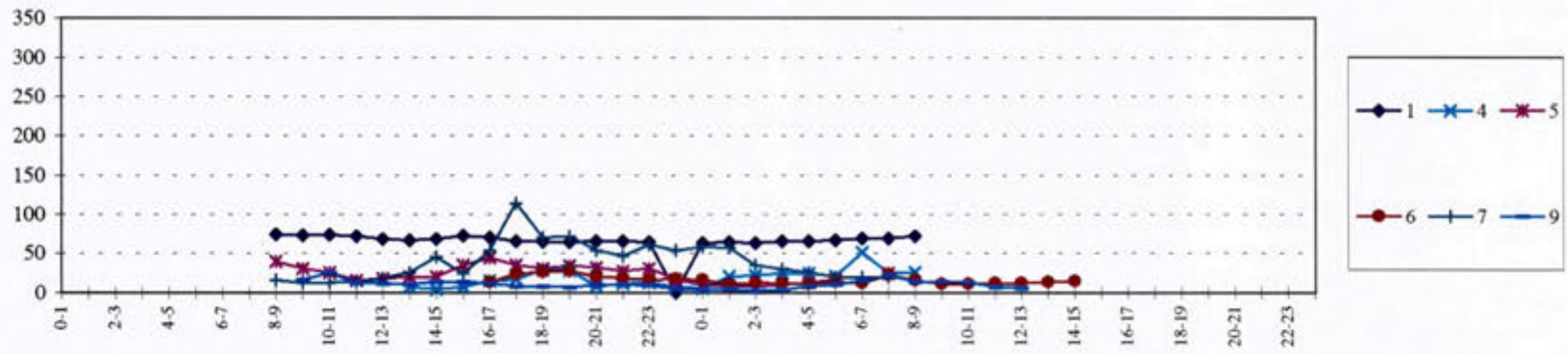
Soil Treatment Activities, Woods Industries Site, Yakima, Washington



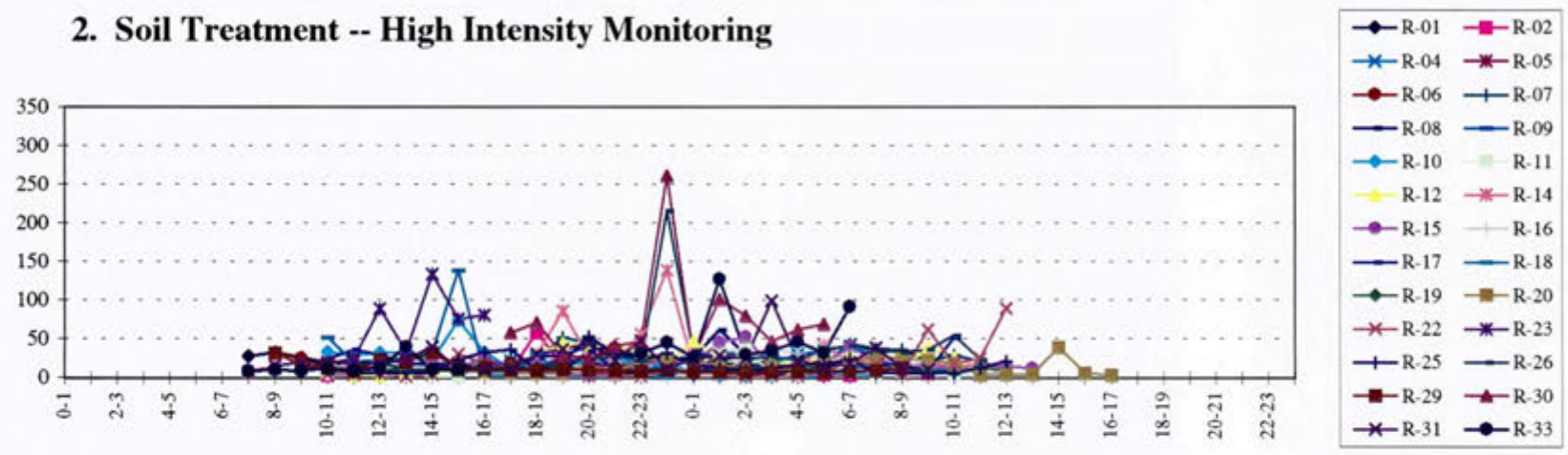
# DataRAM Real-Time $PM_{10}$ Hourly Concentrations

1995 Soil Treatment, Woods Industries Site, Yakima, Washington

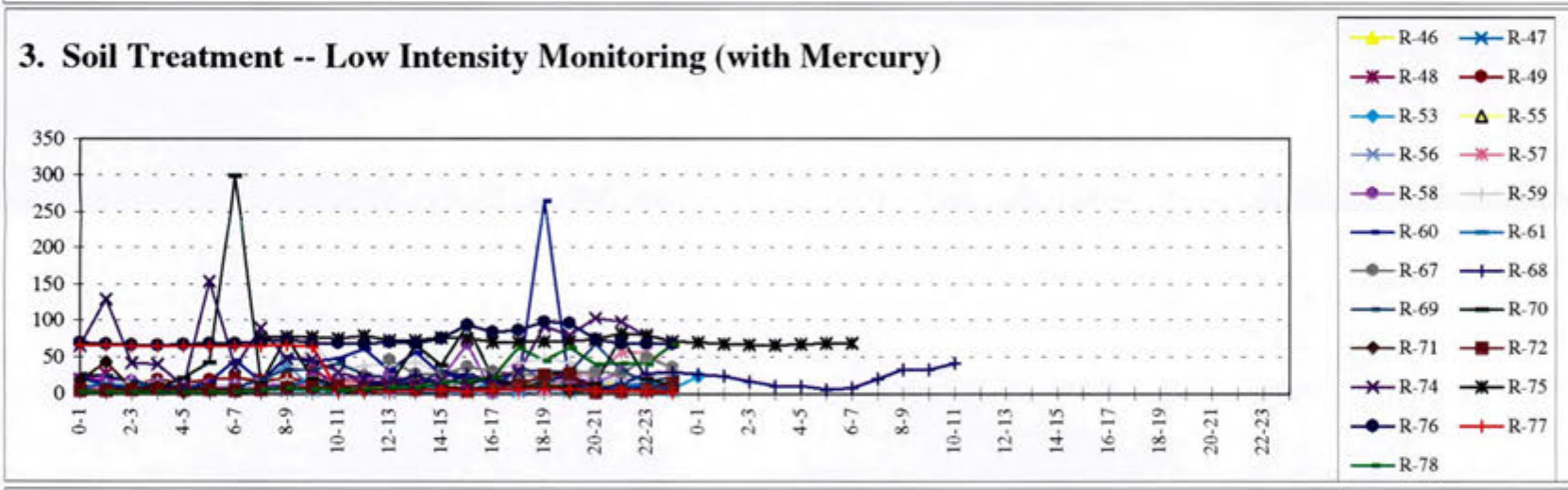
## 1. Background Monitoring



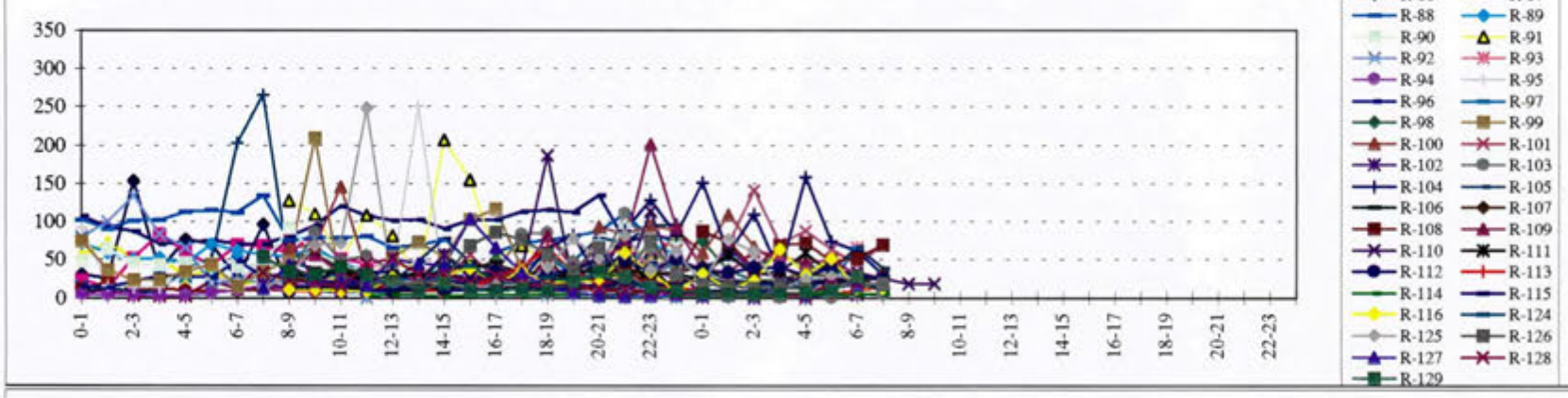

## 2. Soil Treatment -- High Intensity Monitoring



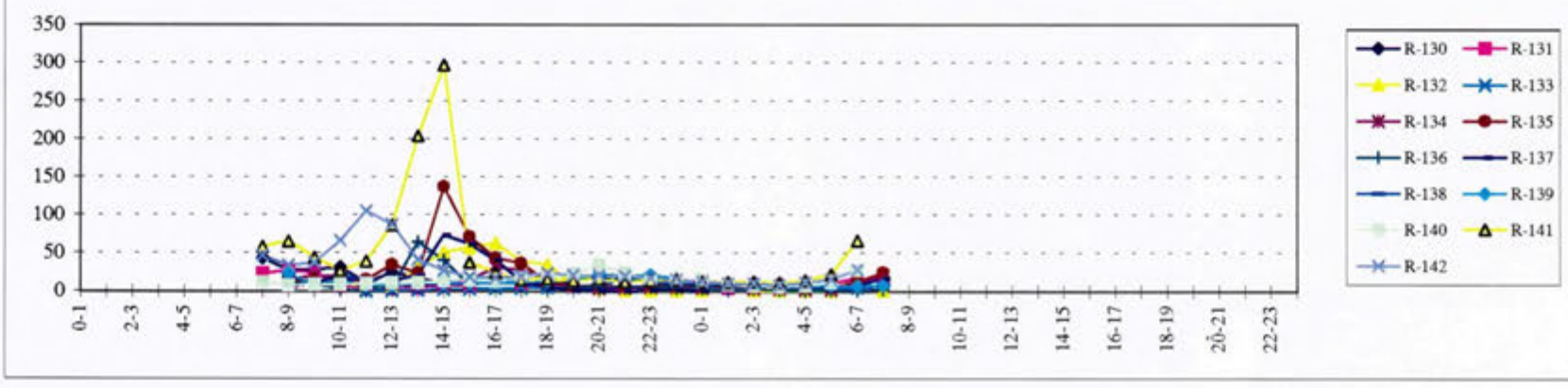

## 3. Soil Treatment -- Low Intensity Monitoring (with Mercury)




## 4. Soil Treatment -- Low Intensity Monitoring (without Mercury)




## 5. Treatment Unit Dismantling and Soil Backfilling Monitoring




Real-Time PM10 Concentration (µg/m3)

**Time (24-hour clock)**

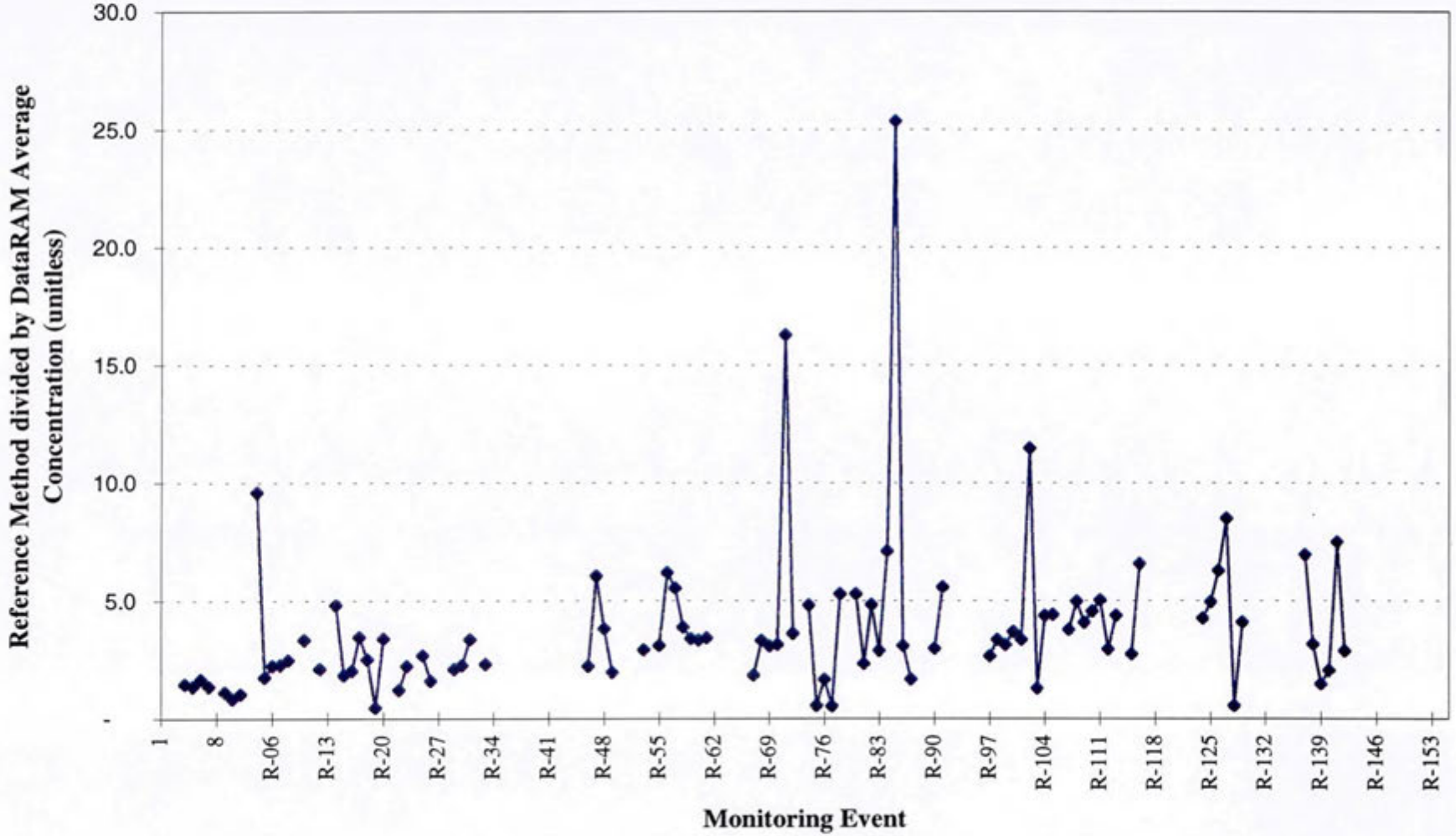
NOTE: Phase 6 did not include real-time PM10 monitoring.

Figure 7-10



# Reference Method / DataRAM $PM_{10}$ Concentration at Monitoring Location A11

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington

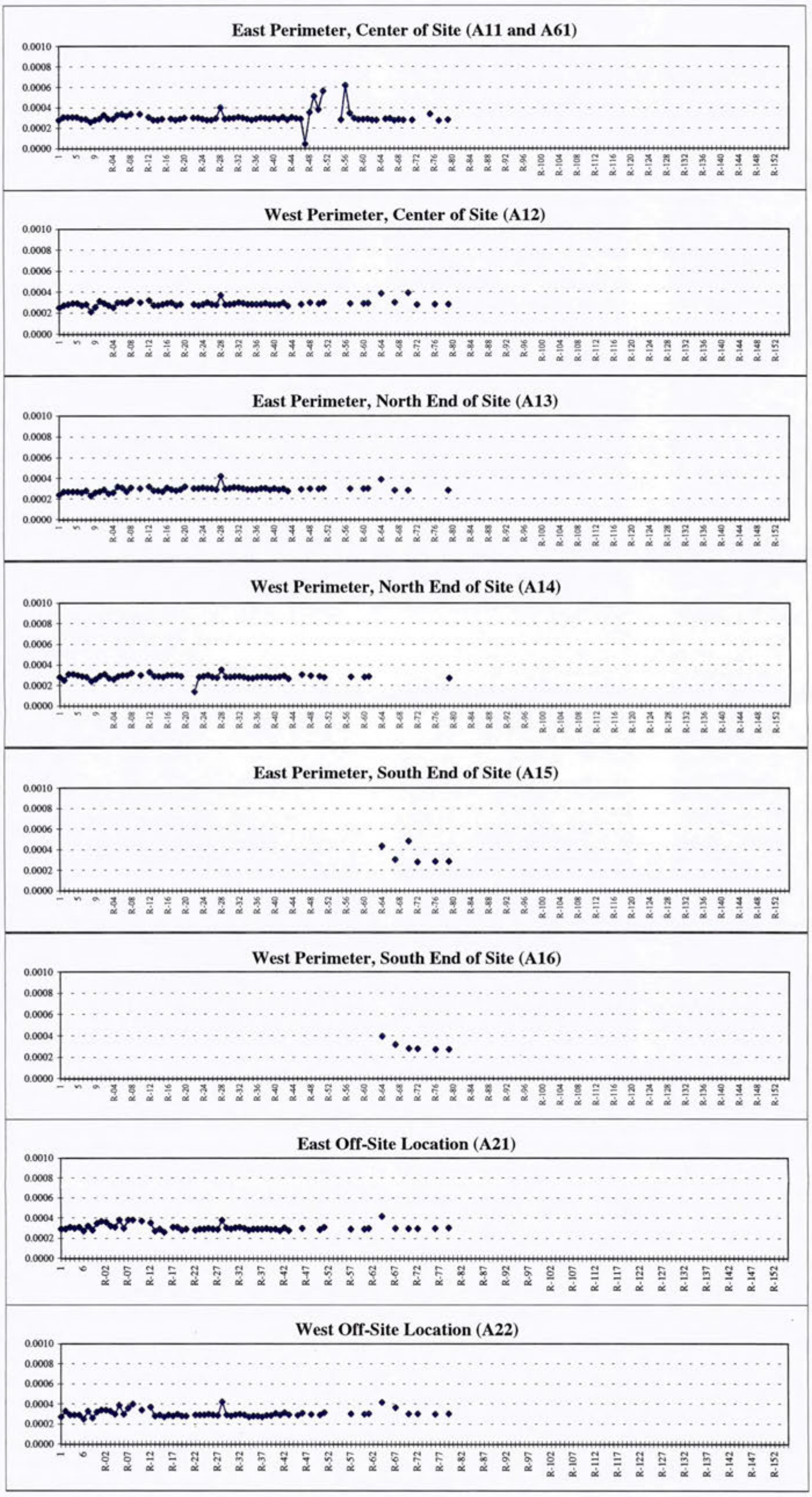



]DATARAMC.XLS Chart1

Figure 7-11

# Mercury Particulate Concentrations in Ambient Air

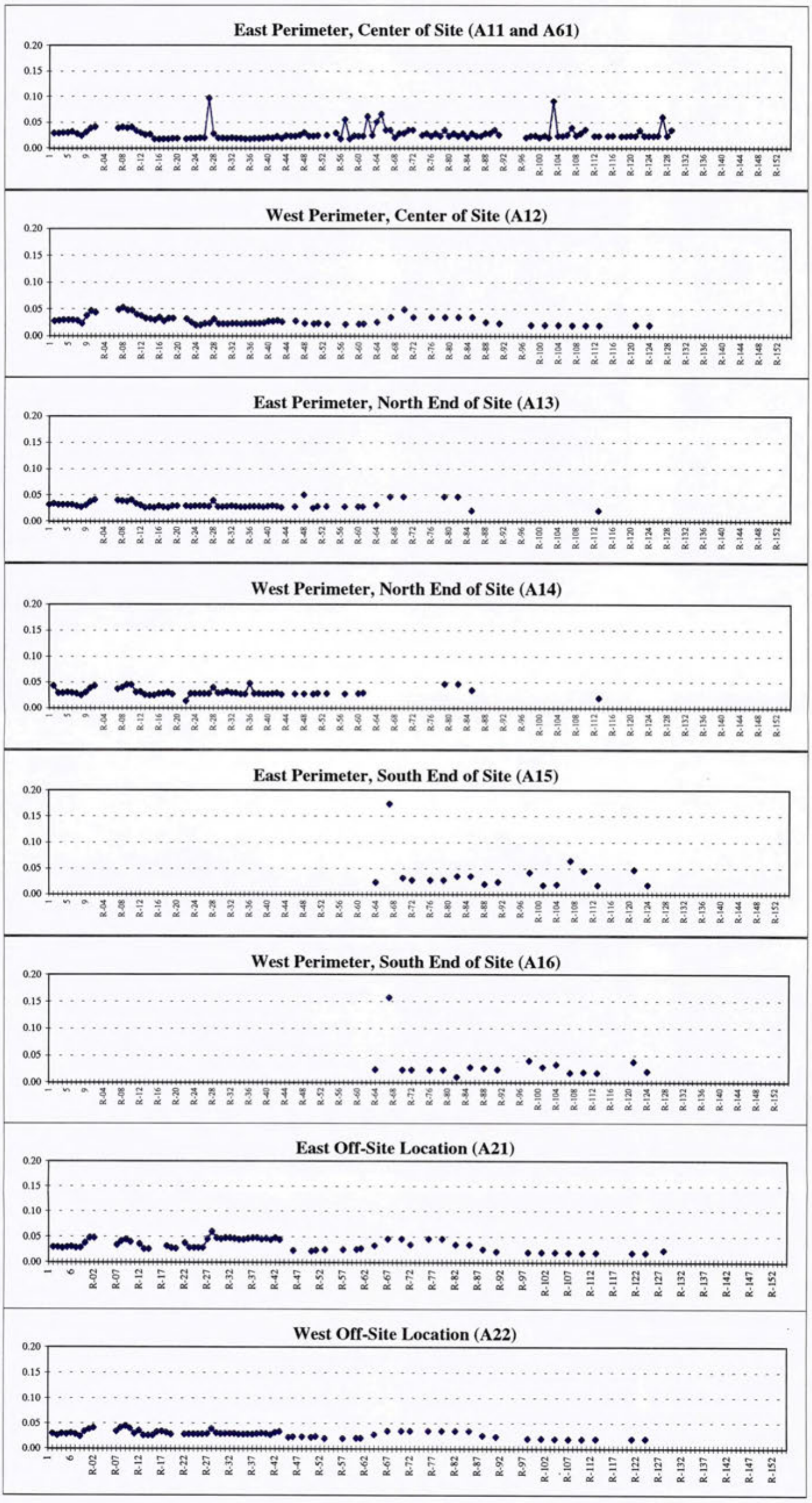
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington




NOTE: Most values shown in these graphs are less than the detection limit.

# DDT Concentrations in Ambient Air

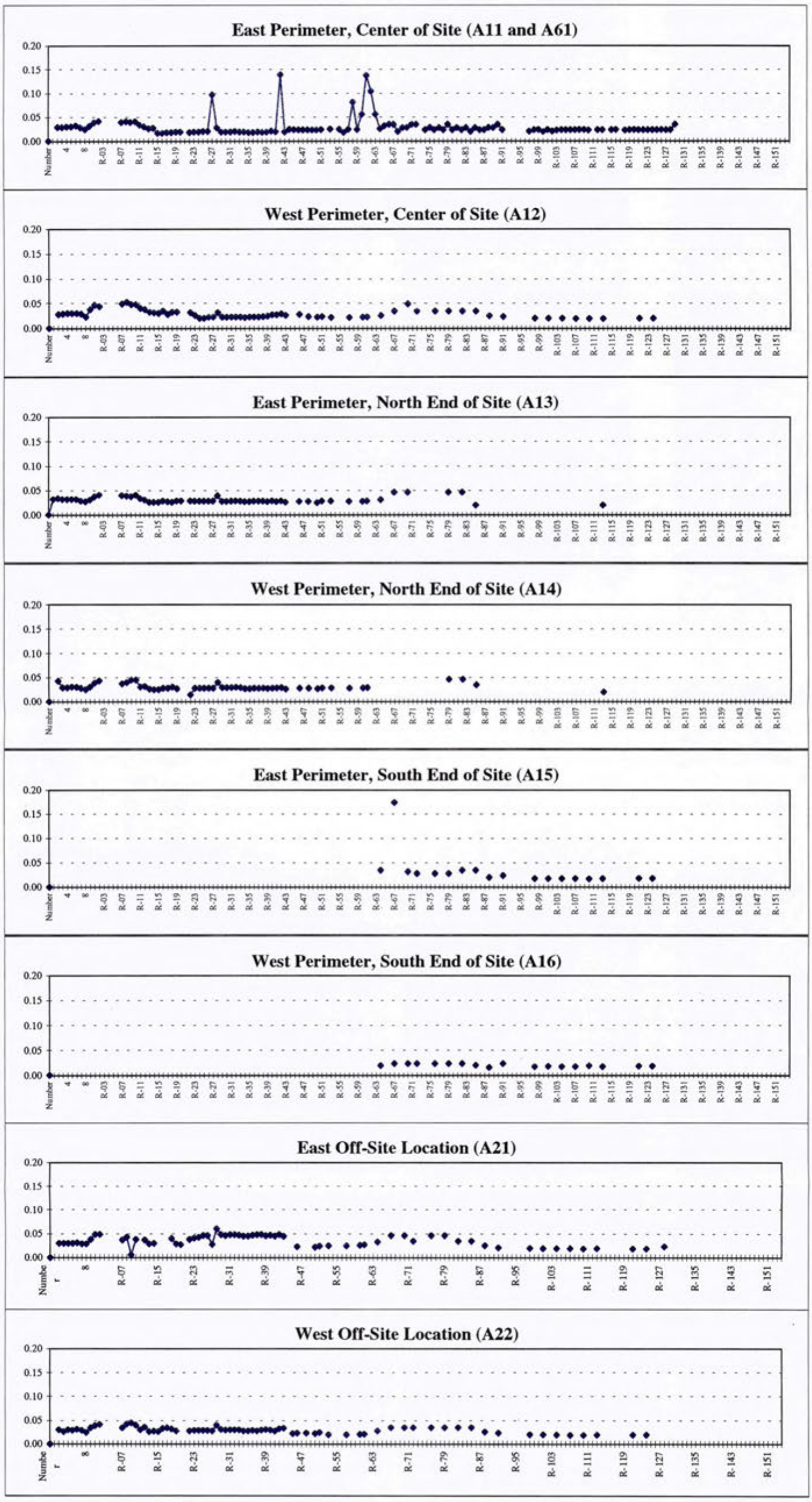
1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington




NOTE: Most values shown in these graphs are less than the detection limit.

# Dieldrin Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington




NOTE: Most values shown in these graphs are less than the detection limit.

Figure 7-14

# Hexachlorobenzene Concentrations in Ambient Air

1995 Soil Treatment Activities, Woods Industries Site, Yakima, Washington