

**Cleanup Action Work Plan
Engineering Design Report
Yakima Air Terminal – Richardson Airways
Washdown Area
Yakima, Washington**

June 23, 2009

Prepared for

**City of Yakima, Washington
Yakima County, Washington**



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1.0 INTRODUCTION

This Cleanup Action Work Plan (CAWP) was prepared for the former Richardson Airways located in Yakima, Washington (site; Figure 1) on behalf of the City of Yakima (City) and Yakima County (County) in accordance with the requirements of Consent Decree No. 08-2-04863-1 (Consent Decree) between the Washington State Department of Ecology (Ecology) and the City and County. The Consent Decree was entered on December 26, 2008. Specifically, this CAWP was prepared in accordance with the Draft Cleanup Action Plan (CAP) prepared by Ecology in July 2008 and accepted as final in December 2008 (Ecology 2008) which states:

WAC 173-340-400(6) outlines the requirements for plans describing the cleanup action, which will be referred to as the "Work Plan." The Work Plan shall include an Engineering Design Report [EDR], per WAC 173-340-400(4)(a), and Construction Plans and Specifications per WAC 173-340-400(4)(b)¹.

The purpose of the CAWP is to establish a plan to help ensure that the cleanup action for the remediation of contaminated soils at the site is designed, constructed, and implemented in a manner that is consistent with the CAP, accepted engineering practices, and the requirements specified in WAC 173-340-360. The CAWP also contains the information that is required in the EDR, including sufficient information for the development of construction plans and specifications, and documentation of the engineering concepts and design criteria used to develop the cleanup action. The construction plans and specifications will be submitted separately after Ecology approval of the conceptual design details presented in this CAWP.

Prior to preparation of the CAWP, a supplemental investigation data report (Landau Associates 2009a) was completed for the site. Additional remedial action documentation and background information is provided in the CAP and the Sample and Analysis Plan (SAP; Landau Associates 2009b) and associated documents.

The responsible parties for overall implementation and maintenance of the cleanup action are the City and County.

¹ Construction Plans and Specifications will be provided under separate cover.

1.1 GOALS AND OBJECTIVES OF THE CLEANUP ACTION

Specific cleanup goals and objectives for the site include the following:

- Excavation and disposal of contaminated soils exceeding the Washington State Model Toxics Control Act (MTCA) Method B soil cleanup levels at a permitted landfill.
- Excavation shall occur during the winter months when groundwater levels, as determined by available groundwater monitoring, are at their lowest. In no case shall the site excavation go lower than the static water level.

The selected remedy to be performed at the site will address each of these goals and objectives.

1.1.1 CLEANUP REQUIREMENTS

Soils at the site containing concentrations of the contaminants of concern (COCs) above the MTCA Method B soil cleanup levels² will be excavated, removed from the site, and disposed at a Subtitle D solid waste landfill. The primary COCs identified at the site include Aldrin, Dieldrin, DDT, DDD, DDE, Dinoseb, Endosulfan I, Endrin, Endrin Aldehyde, Endrin Ketone, and Toxaphene. Method B cleanup levels for soil for the COCs are included in Table 1.

1.1.2 PERFORMANCE REQUIREMENTS

Excavation of contaminated soils will continue until cleanup levels are met in a statistically valid and defensible proportion of confirmation samples as calculated by MTCSTAT and/or other associated procedures identified in WAC 173-340-410. Exceptions to this may include where contaminated soils extend near or beneath utilities or other infrastructure where excavation could compromise the integrity of such structures, or where contaminated soils are determined to be located beneath the groundwater table or at a depth otherwise deemed impractical to excavate. In these instances, institutional controls will be retained at the site contingent upon approval from Ecology per Condition XX of the Consent Decree.

1.2 GENERAL FACILITY INFORMATION

1.2.1 SITE DESCRIPTION

The Richardson Airways site is located at the Yakima Air Terminal (Air Terminal), 2400 West Washington Avenue, in Yakima County, Washington. The site is near the southern edge of the City of

² As developed in the Soil Cleanup Levels Technical Memorandum (Landau Associates 2009c) and subsequent negotiations with Ecology.

Yakima, approximately 2 miles west of Interstate 82. Richardson Airways is located inside the southeast corner of the Air Terminal near the North-South Taxiway. Primary access is from Airport Lane and Ahtanum Road to the south. A site map is provided as Figure 2.

The site includes a 17,000-square foot (ft²) area immediately southeast of the Richardson Airways office and hangar buildings. The site is generally flat, with a ground surface elevation of approximately 1,050 feet (ft) above mean sea level (MSL). A perennial stream, called Bachelor Creek, is located approximately 450 to 500 ft to the north, and the Yakima River is located approximately 3½ miles to the east.

The site includes all areas where soil has come to be contaminated due to the operation of Richardson Airways, Inc. including, but not limited to, the real property legally described as follows:

Commencing at the Northwest corner of Section 2, T. 12N., R. 18E., W.M. Thence S 89°53'29" E along line of the Northwest quarter of said section a distance of 2013.08 feet; thence 00°25'05" E a distance of 1531.05 feet to a point in the North-South fence line West of the North-South Runway, said point being the True Point of Beginning. Then N 00°25'05" W along said fence line, and the extension thereof a distance of 186.27 feet, thence N 89°02'42" E a distance of 62.17 feet, Thence N 03°01'46" E a distance of 77.20 feet, Thence S 88°54'21" E a distance of 27.33 feet, Thence S 03°42'46" E a distance of 263.63 feet, Thence S 89°34'55" W a distance of 109.28 feet, to the point of the beginning.

The area of concern is referred to as the "washdown area." It is located near the southeast corner of the Air Terminal property adjacent to the north/south taxiway of Runway No. 34. At the washdown area, pesticides and herbicides were rinsed off aerial spray equipment. The washdown area is approximately 17,000 ft² in size. A second area, the "burn pit", was sampled and found not contaminated. Ecology issued a No Further Action decision for the "burn pit" area on January 14, 1993. The "burn pit" area was located several hundred yards southwest of the washdown area.

1.2.2 SITE HISTORY AND BACKGROUND

The Air Terminal is currently owned and operated jointly by the City and County. Richardson Airways was operated on the airport property as an aerial pesticide application service for the regional agricultural industry between 1953 and 1992. Mr. Ralph Richardson leased the site from the Air Terminal for crop spraying operations and reportedly used the site for filling, mixing, and routine washing of pesticides and herbicides from spray equipment.

Soil sampling conducted at the site by Ecology in 1988 revealed soil contamination from chlorinated pesticides and herbicides. Ecology, Richardson Airways, and the Air Terminal subsequently entered into an Agreed Order (DE 91 TC-C455) in 1992 to conduct a Remedial Investigation/Feasibility Study (RI/FS) at the site. Ecology accepted the Final RI/FS Work Plan on October 5, 1992; the RI/FS

was accepted by Ecology on December 10, 1993. In 1997, Ecology entered into a Consent Decree with potentially liable parties that required groundwater monitoring and placement of a restrictive covenant on the property. In 2008, Ecology entered into a Consent Decree with the City and County to pursue soil cleanup at the site. The final CAP prepared by Ecology includes a supplemental soil investigation to further characterize the nature and extent of contamination, and the removal and offsite disposal of an estimated 4,000 cubic yards (yd³) of contaminated soil from the site.

1.2.3 SUMMARY OF SITE CONDITIONS

In April 2009, Landau Associates conducted a supplemental investigation at the site. The results of the investigation are summarized in the *Supplemental Investigation Data Report* (Landau Associates 2009a). Based on the results from the supplemental investigation and previous remedial investigation (CH2MHill, Inc. 1993), pesticides are generally present in the upper 1.5 ft of soil across the area of concern, and concentrations generally decreased with depth at each sampling location. Detected concentrations of chlorinated herbicides are generally limited to small discrete areas. These data are evaluated further in Section 2.0 to determine the approximate vertical and lateral extent of chlorinated pesticides and herbicides requiring cleanup.

Sampling results from the initial RI/FS in 1993 showed no pesticide contamination in groundwater. Subsequent groundwater monitoring between 1994 and 1995 also confirmed the absence of impacts to groundwater.

1.2.4 GEOLOGY/HYDROGEOLOGY

According to the United States Department of Agriculture (USDA) *Soil Survey of Yakima County Area Washington* (USDA 1985), local soils are described as Weirman-Ashue type and are considered very deep, somewhat excessively drained soils. Shallow soils consist of alluvium derived from flooding events of the Yakima River. Local rock formations are generally composed of basalt and andesite with some sandstone and siltstone, among others. The soil type is typically located on flood plains and low terraces.

Based on logs of the 13 boreholes drilled in 1992 and the 15 borings drilled in 2009, below the surficial vegetated zone (or pavement) brown silt or sandy silt was encountered to approximately 6 ft below ground surface (BGS). Mottled brown rust colored silt or sandy silt was encountered from 6 ft BGS to the total depth of the borehole (20 to 25 ft). Silty gravel was encountered at approximately 7 to 9 ft BGS in the southern portion of the site.

Depth to groundwater reportedly fluctuates depending on the time of year. Higher water levels occur in the spring and summer, corresponding with an influx of water due to local and regional irrigation practices. Groundwater in the area generally flows east toward the Yakima River with a hydraulic gradient of 0.01 ft/ft. At the Richardson Site, the groundwater flow direction appears to be southeast.

2.0 CHARACTERISTICS OF MATERIALS TO BE CLEANED UP

The section describes the characteristics and locations of contaminated soil to be excavated during the cleanup action. Figure 3 shows the approximate horizontal and vertical extent of contaminated soil above the MTCA Method B cleanup levels. Figures 4 and 5 are cross sections identifying the estimated vertical extent of impacted soils. Soil boring locations with the DP designation were collected during the supplemental site investigation in April 2009, and soil borings with the SB designation were collected during the site RI in 1993. The results from the 2009 investigation indicate some changes in constituent concentrations from 1993; however, the 1993 data still serve as a general indication of the presence or lack of contamination and were incorporated in the evaluation of the extent of contamination as discussed below.

Based on the RI and supplemental investigation results, soil with concentrations of pesticides above the MTCA Method B cleanup levels are generally present in shallow soils across the area of concern, with the exception of the southeastern portion of the washdown area (i.e., in the vicinity of SB-6, SB-12, SB-13, DP9, and DP12) and at the far northern end of the site (i.e., at boring locations SB-10 and DP15), where none of the pesticides or herbicides were detected above cleanup levels. The following pesticides have been detected above their respective cleanup levels in at least one location, typically in the upper 3 ft of soil: Aldrin, DDD, DDE, DDT, Dieldrin, Endosulfan I, Endrin, Endrin Aldehyde, Endrin Ketone, and Toxaphene (Aldrin, Dieldrin, and Toxaphene being the most prevalent). Contamination above cleanup levels extends to at least 3 ft BGS in approximately 1/3 of the sampling locations. Concentrations generally decrease with depth, with exceedences of the cleanup levels generally limited to the upper 3 ft; however, in four locations in the northeast/north-central portion of the site, pesticides have been detected at concentrations above the cleanup level at greater depths: SB-1 (4.5 to 6 ft BGS – Aldrin and Dieldrin), SB-3 (7.5 to 9 ft BGS – Aldrin and Dieldrin), SB-11 (9 to 10.5 ft BGS, DDD, DDE, and Endrin Ketone), and DP4 (4.5 to 6 ft BGS – Toxaphene).

Detected concentrations of chlorinated herbicides are limited to the upper 3 ft of soil at small discrete areas, and none of these contaminants (other than Dinoseb) have been detected above MTCA Method B cleanup levels for soil. Dinoseb was detected above the cleanup level in borings SB-4 and SB-5 at 4.5 to 6 ft BGS and 1.5 to 3 ft BGS, respectively.

More details regarding soil excavation will be provided in the Construction Drawings.

3.0 CLEANUP ACTION CONCEPTUAL DESIGN

The conceptual design for the cleanup action is based on the preferred cleanup alternative defined by Ecology in the CAP and includes excavation of soil containing concentrations of the COCs above the MTCA Method B cleanup levels.

3.1 CONCEPTUAL DESIGN OVERVIEW

The primary components of the site cleanup are as follows:

- Installation of temporary security fencing around the site to allow unrestricted access to site cleanup personnel and to maintain a secure perimeter around the Yakima Air Terminal facility.
- Installation and maintenance of temporary erosion and sediment control (TESC) structures and best management practices (BMPs).
- Removing the top 1.5 to 3 ft of soil across the majority of the washdown area and removing deeper soil as shown on Figure 6. More detailed plans will be provided in the Construction Drawings.
- Confirmation sampling and analysis to document performance of the remedial excavation.
- Loading and transport of contaminated soils to a Subtitle D solid waste landfill for disposal.
- Backfilling and compaction of the excavation with engineered or other approved clean fill, and grading to promote stormwater runoff.
- Site restoration.

Ecology determined that this selected remedy is protective of human health and the environment, and is permanent to the maximum extent practicable.

3.2 ENGINEERING JUSTIFICATION FOR DESIGN

The following sections include the design criteria for the various components of the cleanup action; a description of how cleanup effectiveness will be determined and cleanup standards will be complied with; identification of how release of hazardous materials will be prevented, how worker and public safety will be protected, and how hazardous materials generated will be managed and disposed; and a description of site-specific features that affect the conceptual design.

3.2.1 DESIGN CRITERIA

The primary design criteria for this remedial excavation are:

- MTCA Method B soil cleanup levels
- Airport security regulations and protocols
- Erosion and sediment control regulations and requirements
- Soil sloping and stability for the temporary excavations
- Fill material characteristics
- Subtitle D landfill waste acceptance criteria.

3.2.2 EFFICIENCY AND EFFECTIVENESS OF THE CLEANUP ACTION

Excavation and proper disposal of soils contaminated with pesticides and herbicides above the MTCA Method B cleanup levels is one of the most rapid, efficient, and effective methods of attaining the desired cleanup at the site and is the required cleanup action under the site Consent Decree. Excavation has been demonstrated to be effective at numerous sites under variable conditions.

Soil excavation will reduce the risks posed to human health and the environment by removing potential exposures to human and environmental receptors. The soil used to backfill the excavation will serve to cover any residual low-level contaminants remaining after excavation. If necessary, institutional controls would be implemented to restrict access to contaminated soil that could result in unacceptable risks to human health and the environment.

3.2.3 COMPLIANCE WITH CLEANUP STANDARDS

Site cleanup standards are anticipated to be achieved as long as the cleanup actions are conducted in a manner that is consistent and in compliance with the CAP, SAP, Consent Decree, accepted engineering practices, and the requirements specified in WAC 173-340-360. Compliance monitoring and testing of fill materials, along with implementation of quality assurance/quality control procedures outlined in the site Quality Assurance Project Plan (QAPP; Landau Associates 2009d), will be used to demonstrate compliance with the cleanup standards.

Additional details regarding compliance monitoring and confirmation sampling are discussed in Section 4.4.

3.2.7 FACILITY CHARACTERISTICS AFFECTING DESIGN, CONSTRUCTION, OR OPERATION OF CLEANUP ACTION

The following describe site-specific features and how they affect the cleanup action:

- **Air Terminal Security** – As previously discussed, Air Terminal security requirements affect the design and implementation of the cleanup action, particularly related to site fencing and access.
- **Site Facilities/Infrastructure** – The site is an unimproved area covered in scrub vegetation with a chain-link security fence adjacent to the west, asphalt paving to the north and east, and commercial buildings and associated parking to the south and southeast. An old storm sewer line runs beneath a portion of the site, and a municipal sewer line is located approximately 25 ft east of the site. Future site uses may include construction of commercial building(s).
- **Soil/Groundwater Characteristics** – Based on the presence of irrigation channels proximate to the site, which are typically empty during winter months, the remedial excavation will be conducted during the winter when groundwater elevations are lowest, thereby exposing the most soil in the seasonally saturated soil zone.
- **Flooding** – The site is located in the Yakima River flood plain; however, it is unlikely that flooding will have any impact on site cleanup. In the unlikely event that winter flooding was to temporarily occur, the cleanup schedule would be impacted; however, no other design considerations are likely to be impacted.
- **Topography** – Topographic conditions at the site will affect the grading design and associated volume of fill required to achieve desired final grades. Generally, the site is situated at an approximate elevation of 1,050 ft MSL and is relatively flat with a slight slope down to the south-southwest and southeast. The overall topographic relief across the site is very shallow.

4.0 ENGINEERING AND DESIGN

4.1 CONCEPTUAL DESIGN DETAILS

This section outlines in greater detail the primary elements of the selected cleanup action.

4.1.1 REMEDIAL EXCAVATION

Based on results of the RI and supplemental investigation, soils at the site will be excavated to depths of 1.5 ft to as deep as possibly 10.5 ft BGS. The approximate area of excavation is 18,750 ft² (note this is slightly larger than the 17,000 ft² footprint identified in the RI based on the results of the supplemental site investigations). Based on areas and depths of contaminated soils, an estimated 3,200 to 3,800 yd³ of soil will be excavated for disposal. Excavation will be conducted with standard construction equipment, and it is anticipated that contaminated soil will be loaded directly into dump trucks. In the event that direct loading cannot be conducted, excavated soils will be temporarily stockpiled on site and adequately protected (i.e., placed on and covered with plastic sheeting).

4.1.2 FILLING, COMPACTING, AND GRADING

The excavation will be backfilled with clean engineered fill. The fill will be placed in approximately 8- to 12-inch lifts and compacted to at least 95 percent of its maximum dry density. Filling and compacting will continue until final site grade is approximately equivalent to existing site grades, with a shallow drainage grade to the south-southwest.

4.1.3 SITE RESTORATION

After completion of excavation and filling/grading activities, the site will be restored by seeding with a permanent seed mix. The procedures and design of the restoration will be in general accordance with the applicable guidelines set forth in Ecology's *Stormwater Management Manual for Eastern Washington* (Ecology 2004).

4.2 CONSTRUCTION TESTING TO DEMONSTRATE QUALITY CONTROL

The only construction-related testing will be backfill compaction testing to ensure the site is "development ready" upon completion of the cleanup. Other quality control related testing is compliance monitoring as discussed in Section 4.4. Quality control procedures are outlined in the project QAPP (Landau Associates 2009d).

4.3 CONSTRUCTION PROCEDURES TO ASSURE HEALTH AND SAFETY

A site-specific health and safety plan (HASP) has been prepared in compliance with Occupational Safety and Health Administration (OSHA) requirements to address the specific hazards associated with the remedy implementation. The HASP discusses construction hazards, chemical exposure hazards, onsite worker safety, and makes an assessment of potential offsite impacts. The HASP is included in the project SAP.

The HASP follows the applicable standards referenced in the WAC 173-340-810, including OSHA standards. Contractors used for remedial activities will be required to prepare a HASP that is at least as stringent as the site-specific HASP and may add their own health and safety procedures for the specific hazards of their work.

4.4 COMPLIANCE MONITORING

Compliance monitoring will be conducted per the requirements of WAC 173-340-410 as summarized below.

4.4.1 PROTECTION MONITORING

Monitoring for protection of human health is addressed by the site-specific HASP. The HASP addresses potential physical and chemical hazards associated with site cleanup activities consistent with the requirements of WAC 173-340-810. Anticipated potential physical hazards include working in proximity to heavy equipment and excavations. Anticipated human exposure to site contaminants through various exposure pathways (i.e., direct contact, ingestion, inhalation) include contact with contaminated soil. Personal and perimeter air monitoring will be conducted until such time as monitoring results indicate that no threat to worker or public health and safety is present or anticipated. Personal protective equipment and site security measures will be utilized to prevent dermal contact or other direct exposure.

No significant environmental receptor contact is anticipated; however, the measures to protect human health will provide further assurance of preventing exposures to environmental receptors.

4.4.2 PERFORMANCE MONITORING

Performance monitoring will take the form of confirmation sampling as described in the next section. Additional excavation will be performed as necessary based on the results of the confirmation sampling activities.

4.4.3 CONFIRMATION MONITORING

A SAP has been prepared for the proposed confirmation sampling activities. Specific procedures, analytical parameters, and sampling frequency for the confirmation monitoring program are presented in the SAP with additional details provided below.

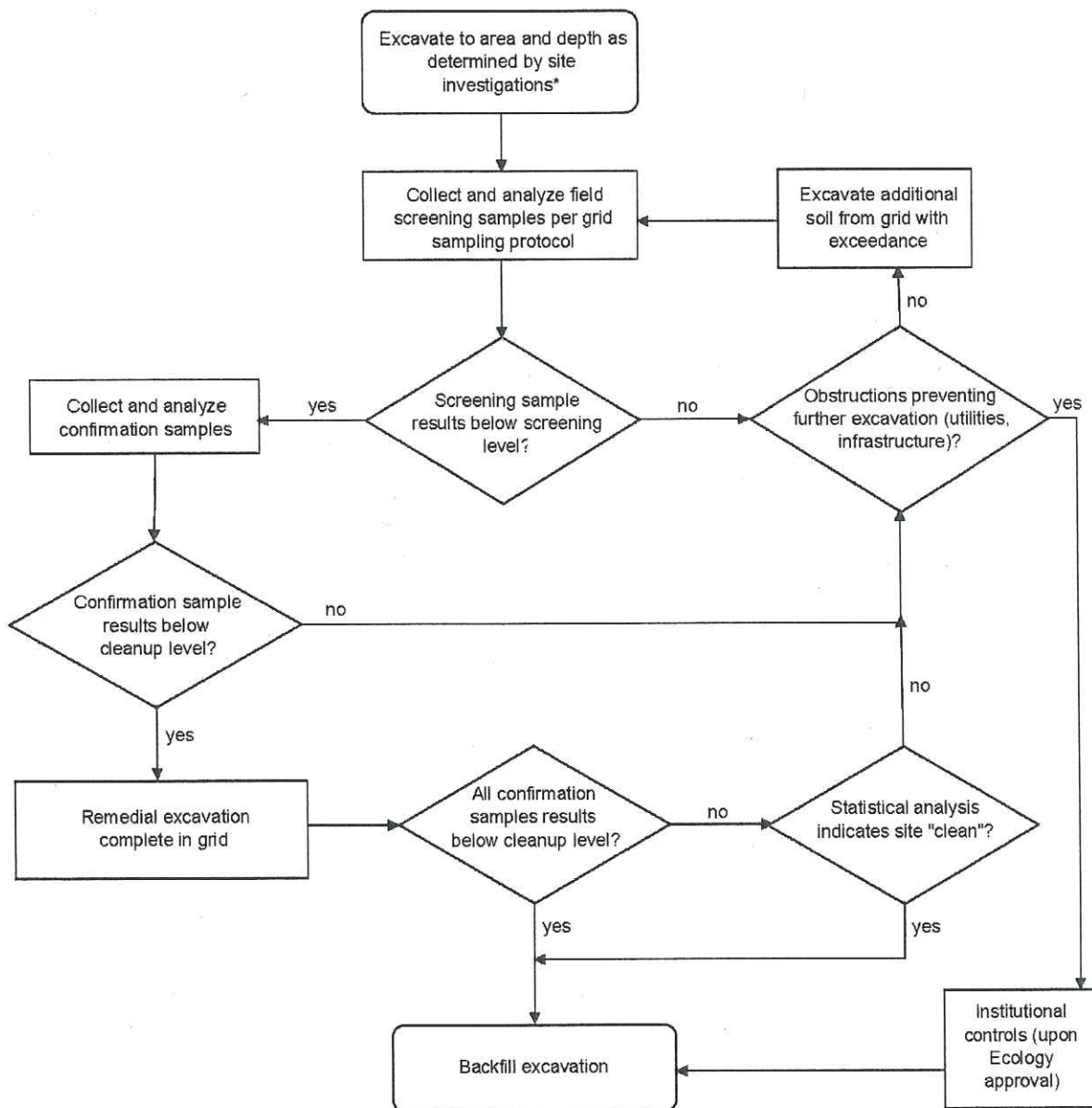
Specifically, systematic confirmation sampling will be conducted to determine the limits of the excavation. The sampling may be done prior to and/or during excavation depending on the specific sampling locations. The proposed excavated area has been divided into a grid with 40 ft by 40 ft squares as shown on Figure 7. A confirmation sample will be collected from the excavation base at the approximate center of the grid area. If the excavation area does not encompass the entire grid area, the sample will be collected at the approximate center of the excavation area within that grid. Additionally, confirmation samples will be collected from the side walls of the excavation at intervals of approximately 50 lineal feet. Figure 7 presents the approximate confirmation sampling locations.

A mobile laboratory or semi-quantitative field test kits may be also used to provide preliminary screening indications as to whether contamination from each area of the excavation has been successfully removed. Based on the results of the field screening, the excavation may be extended vertically or horizontally and additional screening samples analyzed at the discretion of the environmental professional. Confirmation samples will be collected from each grid area upon completion of excavation of that grid (as practicable based on the configuration of the excavation of proximate areas) and submitted to the analytical laboratory for analysis as appropriate.

The remedial excavation will be sequenced such that grid areas are excavated and confirmation samples are collected and sent to the analytical laboratory for analysis on a "rolling" basis so that the confirmation sampling results can be obtained and evaluated as the excavation proceeds. Selected sampling along the anticipated horizontal limits of the excavation and at the base of the 2-ft excavation limit may be performed prior to construction with Ecology's approval to facilitate early sampling activities and to minimize construction delays.

The decision making process on whether site cleanup has been completed and the excavation can be backfilled will be determined based on the flow chart below:

Remedial Excavation Flow Chart



* In some cases, sampling may be done prior to excavation.

4.5 OTHER REQUIREMENTS

4.5.1 STATE ENVIRONMENTAL POLICY ACT

A State Environmental Policy Act (SEPA) review has been completed for this project. One outstanding item not provided for in the RI/FS that is needed to fulfill the applicable requirements of SEPA is a comment from the Yakima Regional Clean Air Agency (YRCAA) indicating that: 1) contractors performing soil remediation/excavation must prepare a dust control plan and file it with YRCAA prior to start of construction, and 2) a new source review may be required for the project.

Preparation and submittal of a dust control plan will be the responsibility of the Contractor and shall meet the requirements of YRCAA Regulation I and the *Construction Dust Control Policy of the Yakima Regional Clean Air Agency* (YRCAA 2008).

Because it is anticipated that well below 1.25 tons per year (TPY) of particulate matter (PM) and 0.75 TPY of PM less than or equal to 10 microns in size (PM10) will be emitted during earthwork activities associated with the cleanup action, the project is exempt from notification requirements per YRCAA Regulation 1, Section 4.01(C).

4.5.2 SUBSTANTIVE REQUIREMENTS OF EXEMPTED PERMITS

No permit exemptions will be sought in conjunction with this project.

4.5.3 FINANCIAL ASSURANCE

Financial assurances will be handled by the City and County as required in the Consent Decree condition XXI.

4.5.4 INSTITUTIONAL CONTROLS

Institutional controls are not currently anticipated for this project; however, if necessary, institutional controls will be retained, contingent upon approval from Ecology, per Condition XX of the Consent Decree.

5.0 RELATED DESIGN DOCUMENTS AND REQUIREMENTS

5.1 CONSTRUCTION DRAWINGS AND SPECIFICATIONS

Construction drawings and specifications will be prepared for this cleanup action under separate cover. The construction specifications will ensure that the Contractor completes the remedial excavation, transport, and disposal of contaminated soil in a manner consistent with industry standards and project-specific requirements. The specifications also help to supplement the construction drawings and provide detail beyond that included on the drawings. The construction drawings and specifications will:

- Be prepared in conformance with currently accepted engineering practice and stamped and signed by a Washington State Registered Professional Engineer.
- Provide a general description of the project which details the cleanup action, including work to be done, an existing facility map, and a copy of permits and approvals.
- Provide detailed plans and specifications necessary for construction.
- Provide a description of construction impact controls (such as dust, traffic, and noise).
- Provide requirements for construction documentation, including specific quality control tests such as backfill compaction, moisture content, material gradation, frequency of tests, and acceptable results.

5.2 CONSTRUCTION QUALITY ASSURANCE AND QUALITY CONTROL

Day-to-day construction quality control will be performed by the Contractor, consistent with the requirements of the construction contract specifications for the cleanup action. Additionally, a qualified Landau Associates technician under the supervision of a professional engineer registered in the State of Washington will provide construction oversight to ensure, with a reasonable degree of certainty, that the completed project meets or exceeds the design criteria, plans, and specifications. During construction, detailed records will be kept of the work performed, including construction techniques, materials removed from and imported to the site, and tests and measurements performed.

5.3 OPERATIONS AND MAINTENANCE PLAN

Assuming that remedial excavation can achieve removal of soils identified above the cleanup level and no institutional controls are needed at the site, an operations and maintenance plan will not be required for the site.

5.4 SCHEDULE OF CLEANUP ACTIVITIES

A preliminary schedule was developed and submitted to Ecology (February 27, 2009) for implementation of the final remedy. The schedule lists the expected order and duration of the main components of the construction work. The actual sequencing and duration of the individual elements may need to be adjusted based on input from the selected remediation contractor and based on the schedule for the City/County's award of the remediation contract..

5.5 PERMITS AND PLANS

The following permits are expected to be obtained for the construction of the site remedy.

- **Grading Permit** – A grading permit for the excavation/disturbance/filling of soil at the site is required by the County.
- **Dust Control Plan** – Submittal of a dust control plan to the YRCAA is required prior to start of construction as discussed in Section 4.5.1.

5.6 ACCESS AGREEMENTS

Based on ownership of the former Richardson Airways property by the City and County, no access agreement will be necessary to perform the cleanup. Note that a City right-of-way, approximately 50 ft in width, is present to the west of the existing site fence line.

6.0 USE OF THIS DESIGN REPORT

This Cleanup Action Work Plan has been prepared for the exclusive use of the City of Yakima and Yakima County for specific application to the Richardson Airways site in Yakima, Washington. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

This document has been prepared under the supervision and direction of the following key staff.

LANDAU ASSOCIATES, INC.



Piper Roelen, P.E.
Senior Engineer

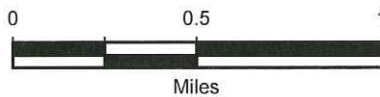
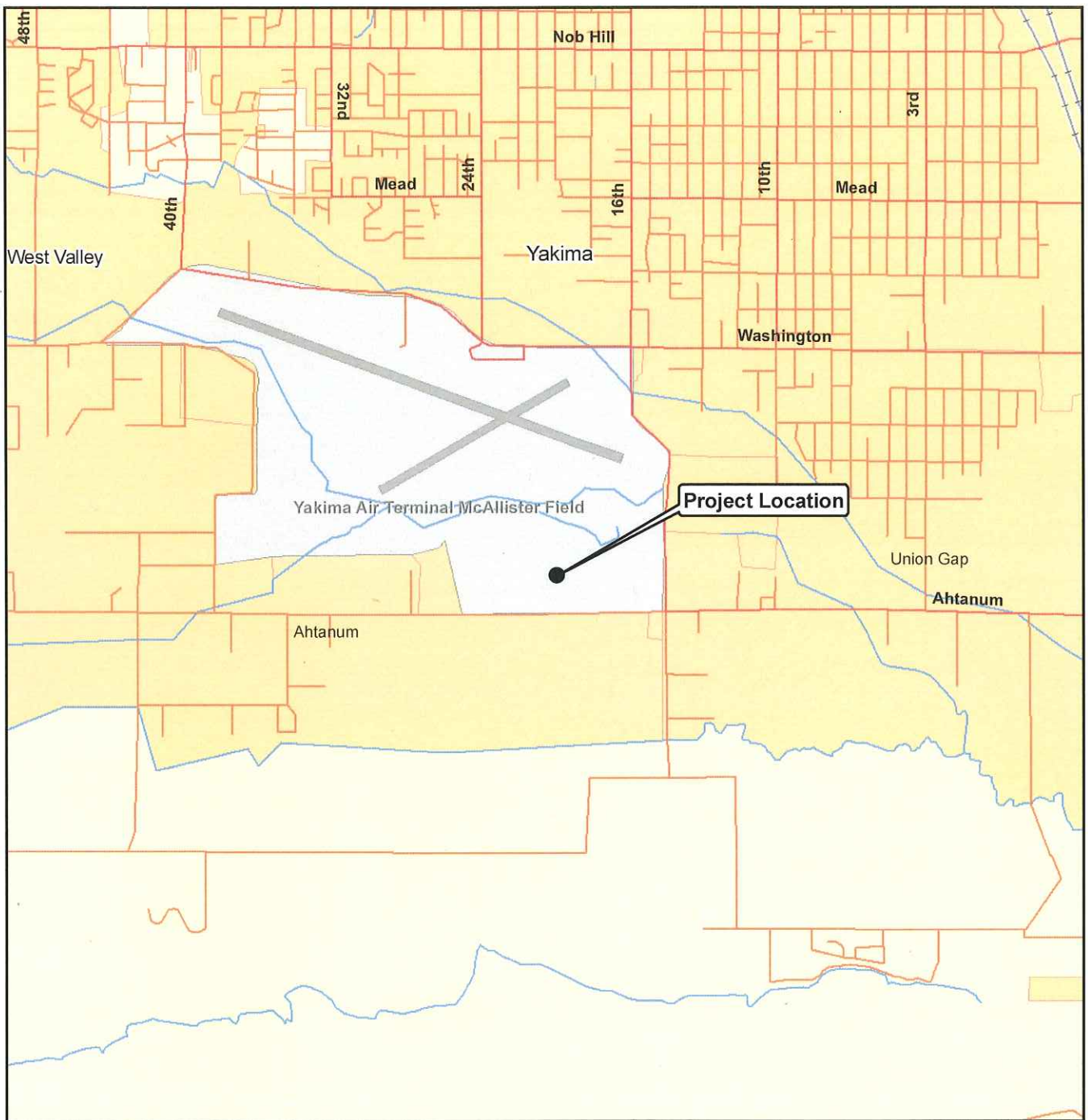


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Data Source: ESRI 2008



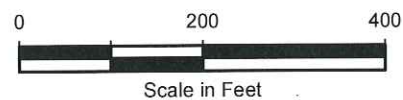
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Yakima Air Terminal -
Richardson Airways
Washdown Site
Yakima, Washington

Vicinity Map

Figure
1



Data Source: Yakima County Aerial Image

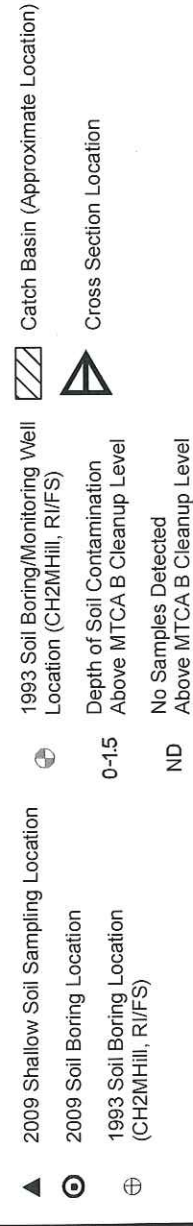
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Yakima Air Terminal -
Richardson Airways
Washdown Site
Yakima, Washington

Site Plan

Figure
2



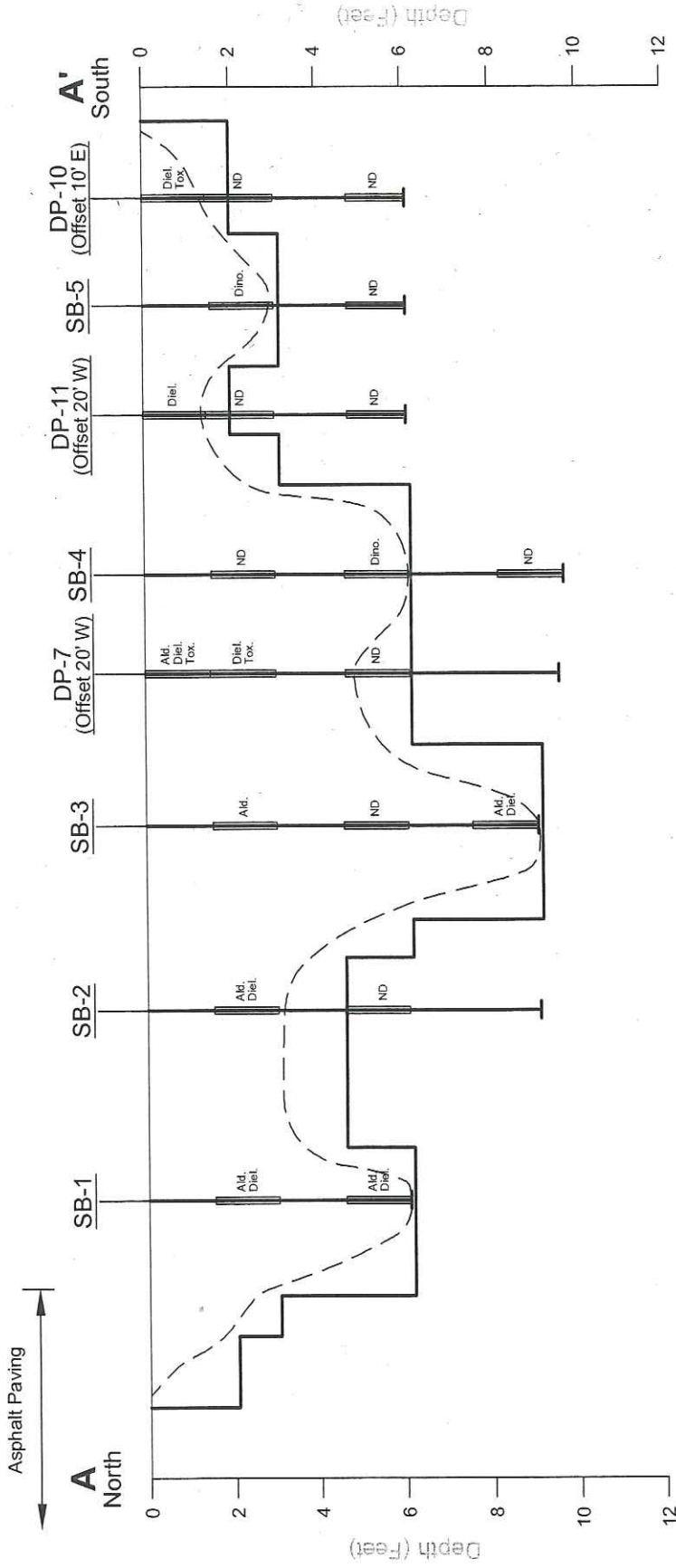
Yakima Air Terminal -
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Washdown Site
Yakima, Washington



LANDAU
ASSOCIATES

Extent of Contaminated Soil

Figure 3

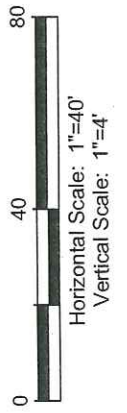


Legend

- SB-1 (Offset 20' W) Project Exploration Designation
- Ground Surface
- Approximate Excavation Limits
- Approximate Extent of Soil Contamination
- Sampling Interval
- Compound Detected Above MTCA B CUL

Abbreviations

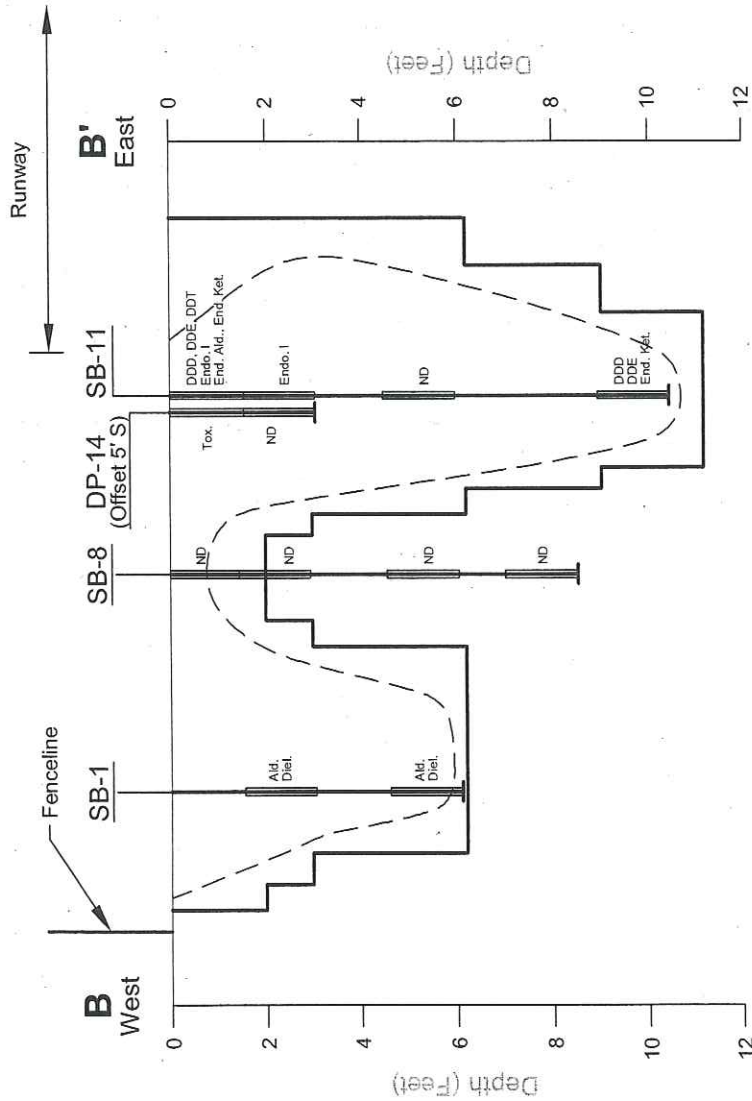
- ND No Detections Above MTCA B CUL
- Ald. Aldrin
- Diel. Dieldrin
- Dino. DDT
- Tox. Toxaphene



Yakima Air Terminal -
Richardson Airways
Washdown Site
Yakima, Washington

Cross Section A-A'

Figure
4

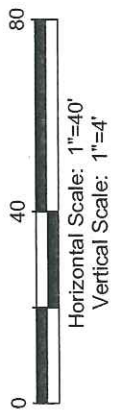


Abbreviations

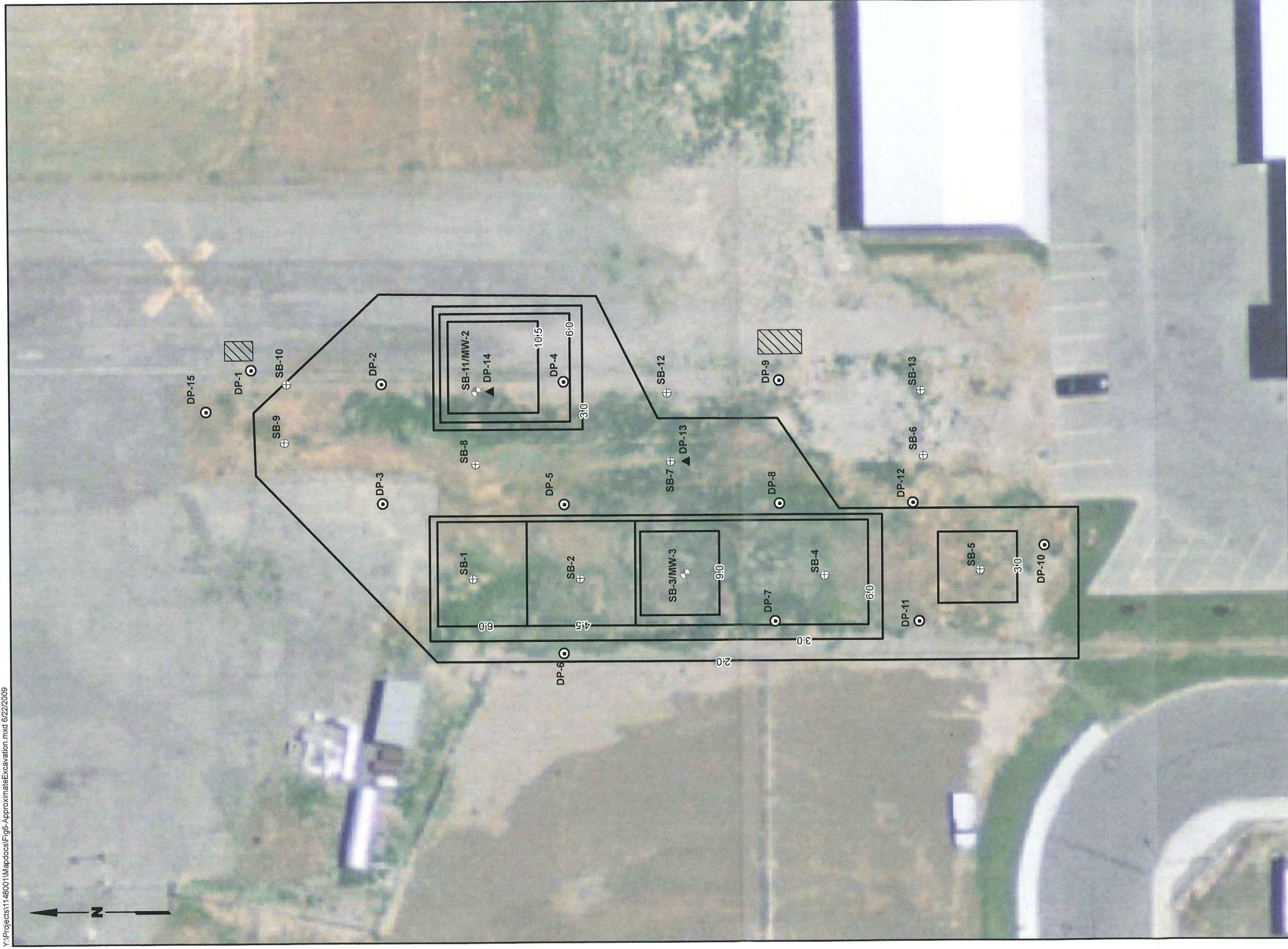
Ald.	Aldrin
Diel.	Dieldrin
DDD	4', 4' - DDD
DDE	4', 4' - DDE
DDT	4', 4' - DDT
Endo. I	Endosulfan I
End. Ald.	Endrin Aldehyde
End. Ket.	Endrin Ketone
Tox.	Toxaphene

Legend

- SB-1 (Offset 20' W) — Project Exploration Designation
- Ground Surface
- Sampling Interval
- Compound Detected Above MTCA B CUL
- Approximate Excavation Limits
- Approximate Extent of Soil Contamination



Yakima Air Terminal -
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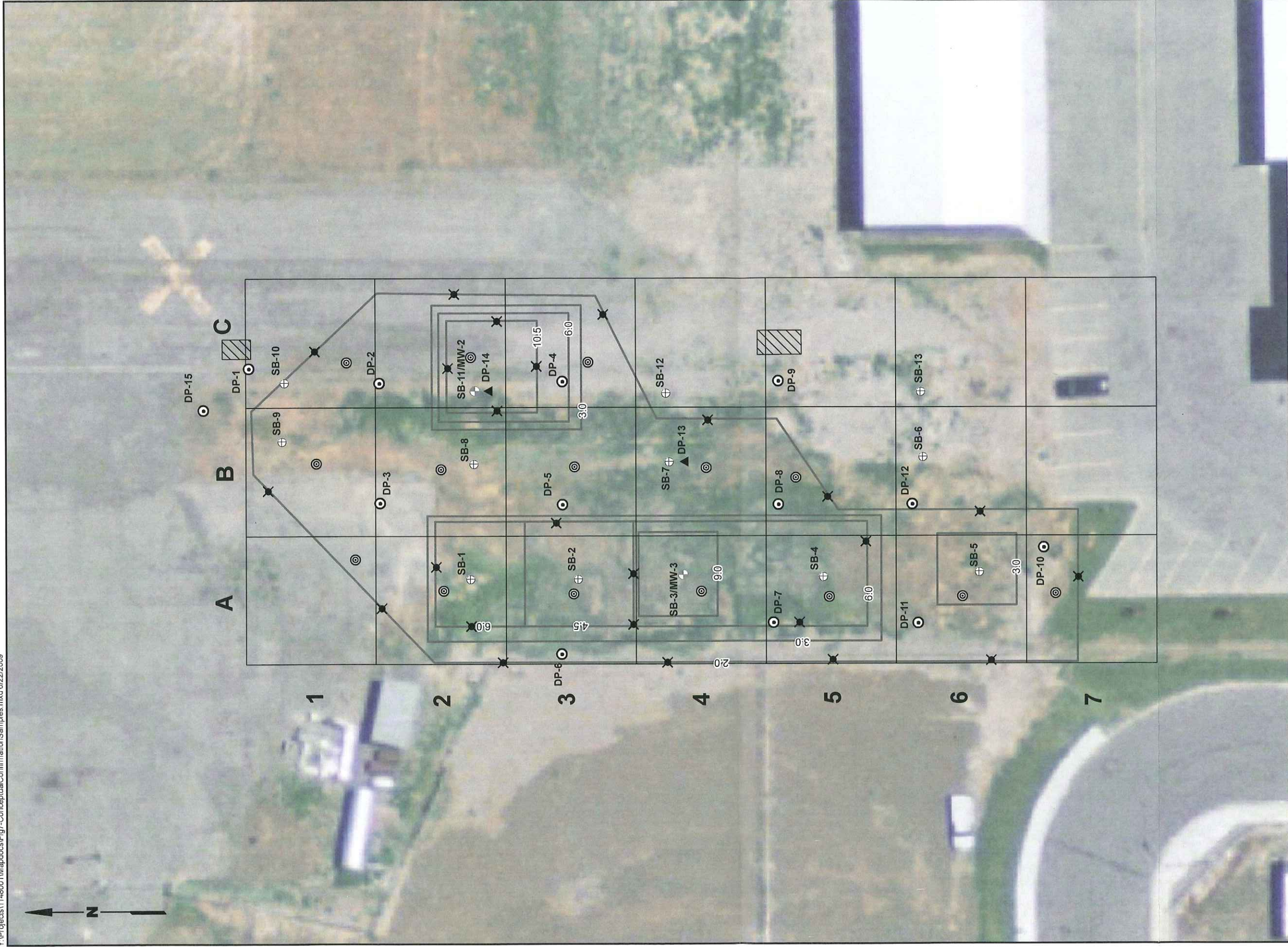
Legend

- ▲ 2009 Shallow Soil Sampling Location
- ⊕ 2009 Soil Boring Location
- ⊕ 1993 Soil Boring Location (CH2MHill, RI/FS)
- ⊕ 1993 Soil Boring/Monitoring Well Location (CH2MHill, RI/FS)
- ▨ Catch Basin (Approximate Location)
- 2.0' - Excavation Depth

Data Source: Yakima County Aerial Image

Yakima Air Terminal -
Richardson Airways
Washdown Site
Yakima, Washington

**Approximate Area and Depth
of Excavation**



Legend

- ▲ Approximate Location of Base Sample
 - ⊗ Approximate Location of Sidewall Sample
 - ⊙ 2009 Shallow Soil Sampling Location
 - ⊕ 2009 Soil Boring Location
 - ⊕ 1993 Soil Boring Location (CH2MHill, RI/FS)
 - ⊕ 1993 Soil Boring/Monitoring Well Location (CH2MHill, RI/FS)
 - ▨ Catch Basin (Approximate Location)
- 2.0' Excavation Depth
- Scale in Feet
- 0 30 60

Data Source: Yakima County Aerial Image

Yakima Air Terminal -
Richardson Airways
Washdown Site
Yakima, Washington

**Approximate Confirmation
Sampling Locations**

TABLE 1
MTCA METHOD B SOIL CLEANUP LEVELS
YAKIMA AIR TERMINAL/RICHARDSON AIRWAYS, INC.
YAKIMA, WASHINGTON

Constituent	Soil Cleanup Level (mg/kg)
Aldrin	0.006
Dieldrin	0.01
alpha Chlordane (a)	0.26
gamma Chlordane (a)	0.26
DDT	2.9
DDD	0.34
DDE	0.45
Dinoseb	1.6
Endosulfan 1 (alpha) (b)	4.3
Endosulfan 2 (beta) (b)	4.3
Endosulfan Sulfate (b)	4.3
Endrin (c)	0.44
Endrin Aldehyde (c)	0.44
Endrin Ketone (c)	0.44
Methoxychlor	64
Toxaphene	0.17
2,4,5-TP (Silvex)	16
2,4-D	16

(a) Listed values are for chlordane.

(b) Listed values are for endosulfan.

(c) Listed values are for endrin.