STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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January 25, 2012

Mr. Dan Tisoncik
Managing Director Environmental Safety
United Airlines
1200 East Algonquin Road
Elk Grove Village, Illinois 60007

RE: Further Action At The Following Site:

- **Site Name:** United Airlines SeaTac International Airport
- **Site Address:** 2230 South 161st Street
- **Facility/Site No.:** 1623532
- **VCP Project No.:** NW2257

Dear Mr. Tisoncik:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the United Airlines SeaTac International Airport facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Is further remedial action necessary to clean up contamination at the Site?

YES. Ecology has determined that further remedial action is necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and it's implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following release:

- Hydraulic fluid (mineral oil) into the Soil

Enclosure A includes a detailed description and diagram of the Site, as currently known to Ecology.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. Enviro-Sciences, Inc., *Site Characterization Report: United Airlines Hydraulic Lift Sumps, UAL Maintenance Facility, Seattle-Tacoma International Airport,* June 12, 2002.

2. ERM-West, Inc., *Final Hydraulic Oil Line Leak Site Investigation Report, United Airlines Ground Support Equipment Maintenance Facility, Seattle Tacoma International Airport, Seattle, Washington,* November 2009.

3. ERM-West, Inc., *Response to Comments and Regulatory Opinion Request, United Airlines Ground Support Equipment Maintenance Facility, Seattle Tacoma International Airport, Washington,* October 5, 2011.

Those documents are kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. You can make an appointment by calling Sally Perkins, the NWRO resource contact at (425) 649-7190.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action based on the following:

- It has not been determined if ground water beneath the spill location has been impacted. The permeability of the sand and gravel underlying the Site most likely promoted direct downward vertical migration of the hydraulic fluid such that the

borings that have been drilled 6 feet away from the release may not have adequately characterized the vertical extent of contamination. In addition, it is unknown to what extent a gravel lens underlying the spill location may have influenced contaminant migration.

2. Establishment of cleanup standards.

Ecology has determined the cleanup levels and points of compliance you established for the Site do not meet the substantive requirements of MTCA.

Cleanup standards cannot be established until site characterization is completed as described in Section 1.

3. Selection of cleanup action.

Ecology has determined the cleanup action you selected for the Site does not meet the substantive requirements of MTCA.

A final cleanup action cannot be selected until site characterization is completed as described in Section 1.

4. Cleanup.

Ecology has determined the cleanup you performed does not meet any cleanup standards at the Site.

The cleanup action completed to date consisted of removal and off-site disposal of approximately 5 cubic feet of contaminated soil to a total depth of approximately 3 feet below the ground surface. Additional petroleum-contaminated soil remains in place.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. **Opinion does not constitute a determination of substantial equivalence.**

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. **State is immune from liability.**

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (425) 649-7064 or e-mail at hvic461@ecy.wa.gov.

Sincerely,

Heather Vick, LHg
Toxics Cleanup Program

tn

Enclosures: A – Description and Diagrams of the Site

cc: Paul Agrid, Port of Seattle
Mike Arnold, ERM-West, Inc.

Enclosure A

Description and Diagrams of the Site

Site Description

The Site is defined by a release of hydraulic fluid (97% mineral oil and 3% dimethyl sulfoxide) from a subsurface line serving a hydraulic vehicle lift in the United Airlines Ground Support Equipment (GSE) maintenance facility at Seattle Tacoma International Airport in Seattle, Washington. The Site is further described in the figures contained in Appendix A.

The hydraulic lift system is contained completely within the GSE building which is surrounded by paved aircraft operations and parking areas that include several unpaved planting strips.

The release was discovered in February 2009 and found to be related to a loose fitting in the sub-slab piping serving one of the lifts. The duration of the leak is unknown and the total volume of the release has not been estimated. A similar release occurred in 2006 that resulted in the loss of approximately 80 gallons of hydraulic oil, most of which was contained within a concrete lift pit. The oil did not drain to the SeaTac industrial wastewater system because the outlet of the lift pit was blocked with debris.

Geologic materials beneath the GSE maintenance facility consist of medium-grained sand and gravel to a depth of between 20 and 27 feet below the ground surface, below which the soils consist of medium-grained sand. The materials encountered most likely represent the upper (sand and gravel) and lower (medium sand) subunits of the Esperance sand.

A fine gravel lens encountered in soil borings at depths of 9 to 10 feet below the ground surface ranges in thickness from approximately 1 to 5 feet. Based on the boring logs, the gravel lens thickens and slopes to the west and apparently pinches out to the north and south. The gravel lens directly underlies the hoist leak location such that hydraulic oil migrating vertically downward through the sand and gravel may have flowed into this more permeable zone as a preferential pathway. The only soil sample collected from the gravel lens was in boring B-2 at the base of the lens which yielded a total petroleum hydrocarbon heavy oil concentration of 1,200 mg/kg.

Ground water was not encountered in five soil borings ranging in depth from 23 to 30 feet below the ground surface that were advanced to investigate soil potentially impacted by the release. Ground water was also not encountered in three soil borings drilled in 2002 to depths of 60 feet below the ground surface with the exception of a discontinuous perched zone at a depth of 20 to 25 feet in boring Lft-1.

Based on the Port of Seattle's Seattle-Tacoma International Airport (SEA) Phase I Groundwater Study Report (Aspect 2008), the uppermost water bearing zone at the Site has been identified as the C1 aquifer which occurs in Quaternary-aged Vashon advance outwash deposits (i.e. Esperance Sand). The report estimates that the ground water elevation at the Site is approximately 340 feet above mean sea level (msl) based on data from one monitoring well located east of the Site. The elevation of the ground surface is approximately 435 feet above msl (King County IMAP). Based on the above information, ground water is estimated to occur at a depth of approximately 95 feet below the ground surface.

Surface water from the building roof and surroundings is discharged to the airport stormwater collection system.

Site History

In February 2009, UAL employees noticed a loss of hydraulic pressure in the hydraulic system, which was traced to a low fluid level in the hydraulic oil reservoir tank. Since the tank had previously been full, a leak was suspected. A leak was subsequently confirmed by pressure testing.

The hydraulic lift system consists of an above-ground hydraulic oil reservoir tank (approximately 250-gallon capacity) serving two single-ram lifts and one double-ram lift. One pressure line connects the reservoir to both single-ram lifts, and another line serves the double-ram lift. The leak occurred in the pressurized hydraulic line between the reservoir and the two single-ram lifts.

The three hydraulic lifts were taken out of service until leak detection, line repair, and system tightness testing were completed in June and July, 2009. Helium gas and helium detectors were used to locate the leak. The leak was traced to a loosely-threaded fitting in the hydraulic oil line. The leak was repaired and the hydraulic line was pressure-tested before it was returned to service in July 2009. The total volume of the release has not been estimated.

On June 30, 2009, approximately five cubic feet of contaminated soil was removed to a depth of three feet below ground surface using an air knife and vacuum truck. An estimated 50± cubic yards of soil with concentrations above cleanup levels was left in place, because it is not readily accessible for excavation due to the proximity of structural footings and underground infrastructure.

Site Diagrams

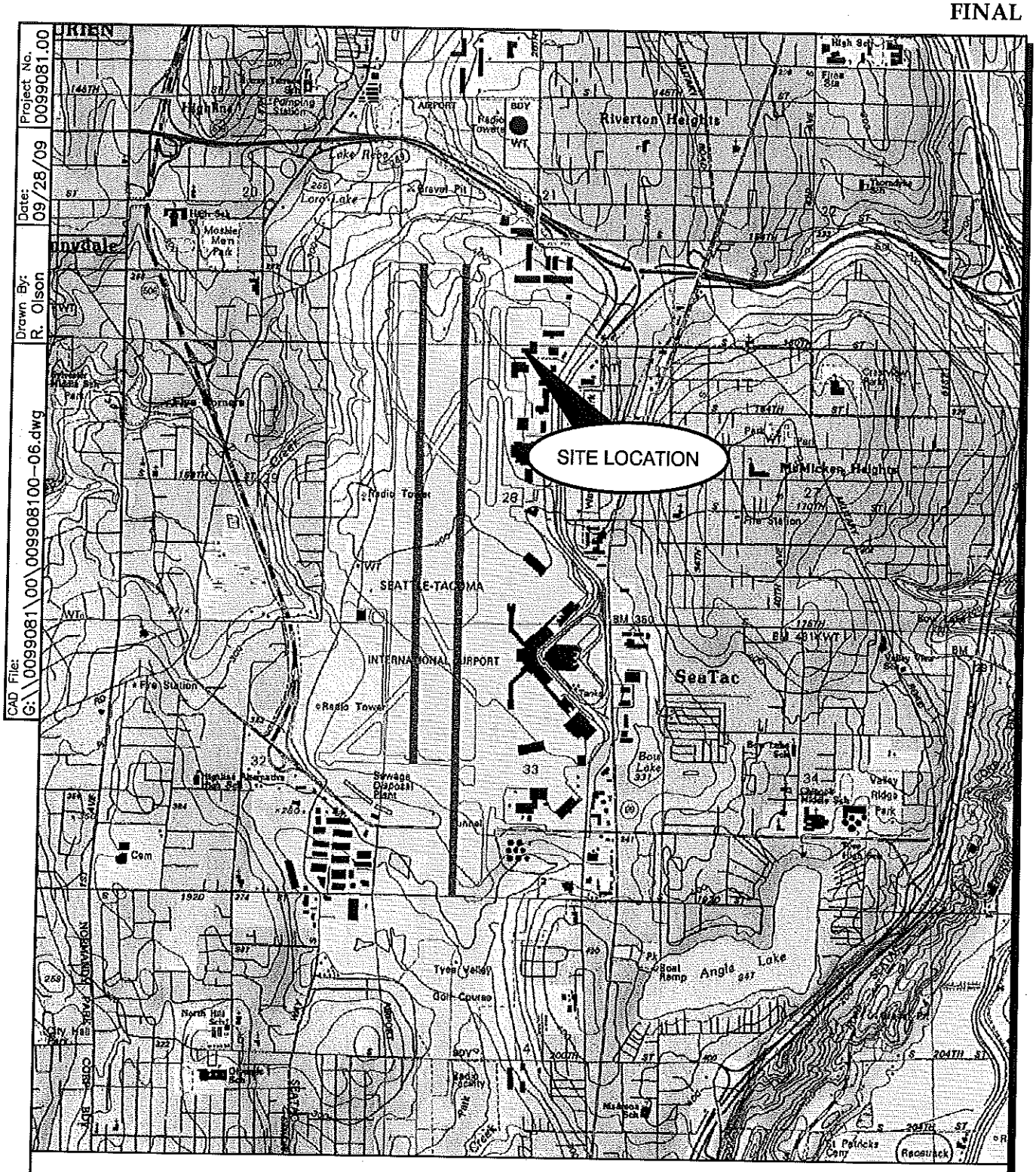

Figure 1
Site Location Map
United Airlines Ground Equipment Facility
Seattle-Tacoma International Airport
Seattle, Washington

References:
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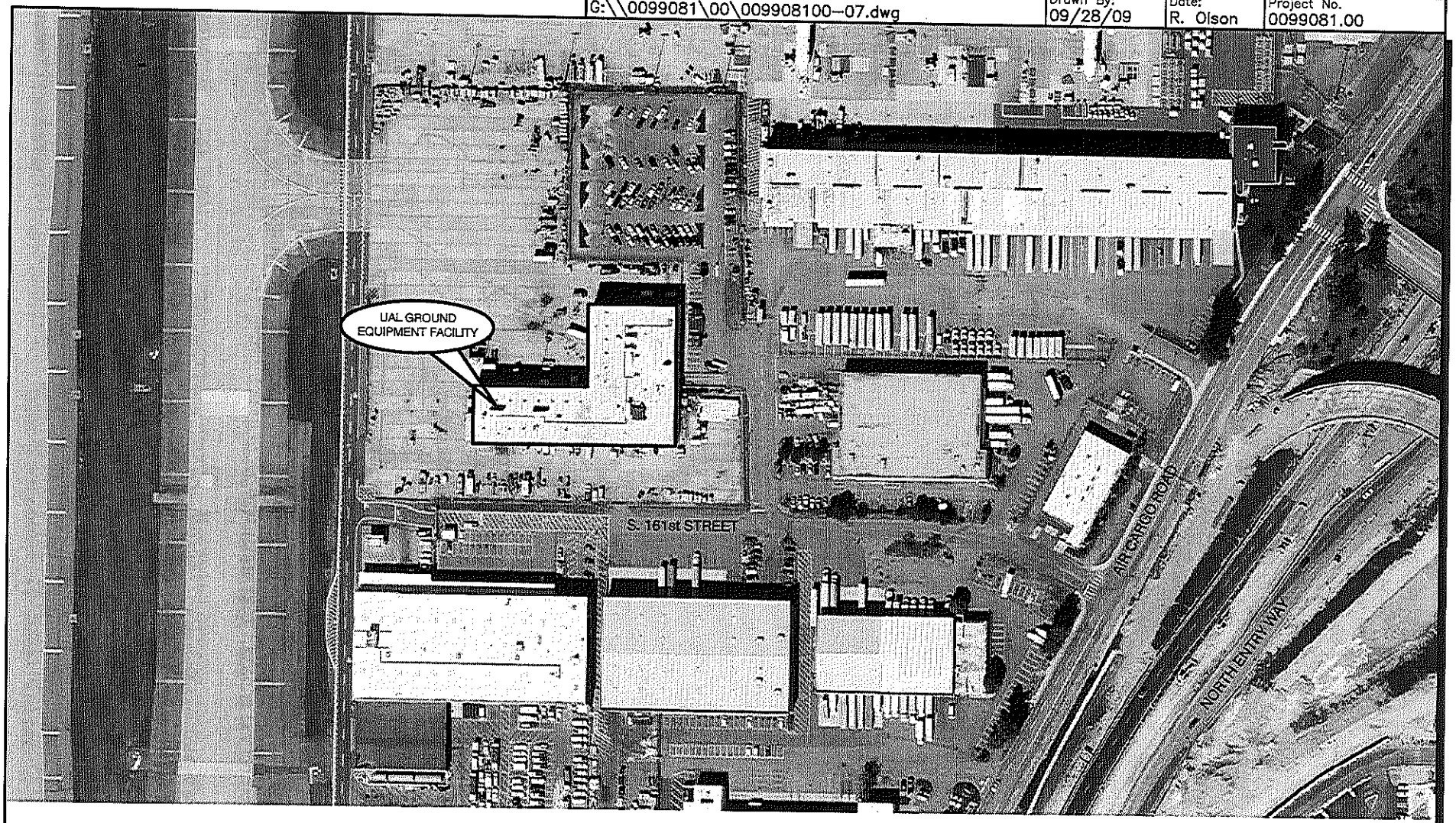

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Figure 2
Site Vicinity
United Airlines Ground Equipment Facility
Seattle-Tacoma International Airport
Seattle, Washington

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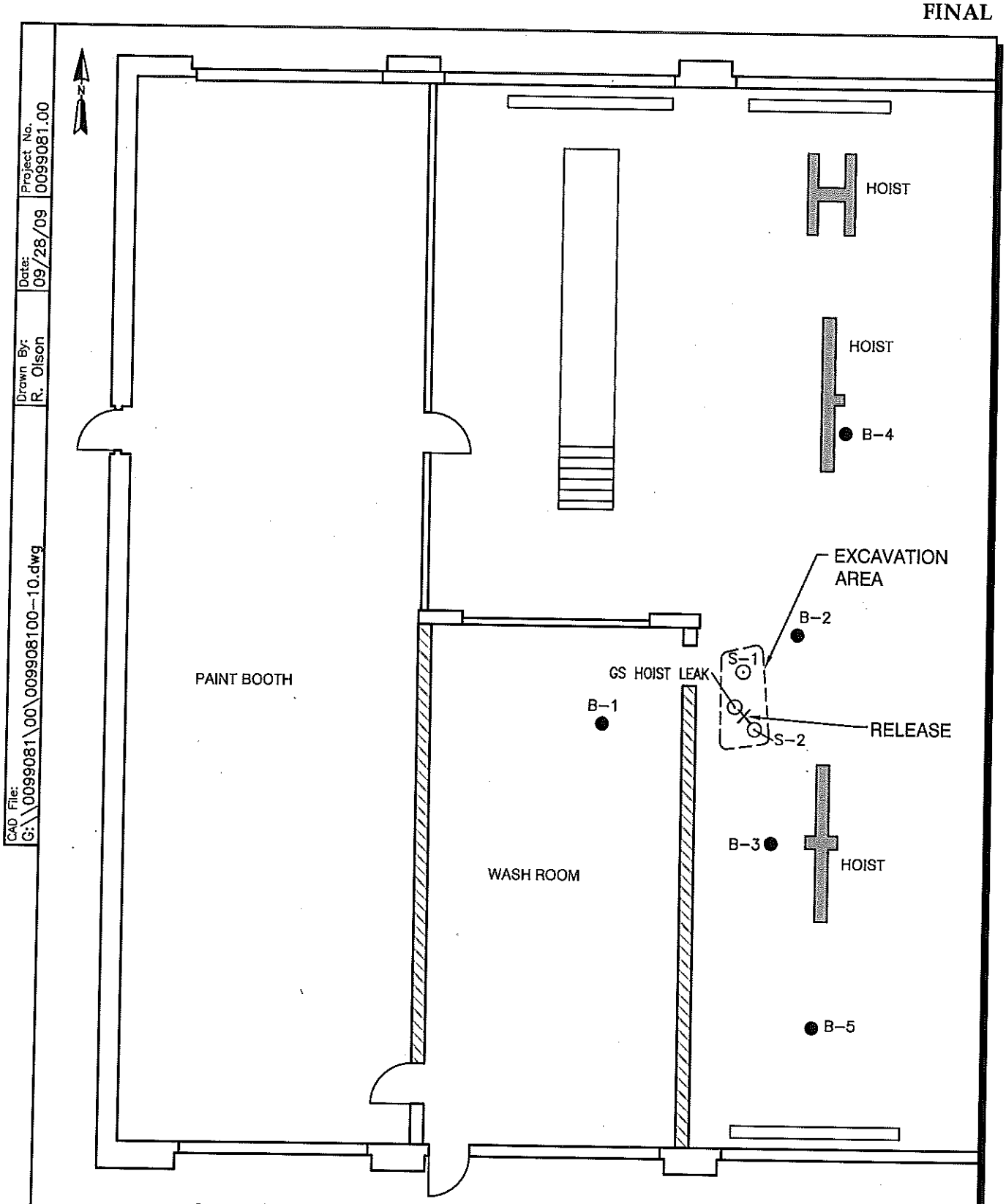

Figure 3
Soil Sample and Boring Locations
United Airlines Ground Equipment Facility
Seattle-Tacoma International Airport
Seattle, Washington

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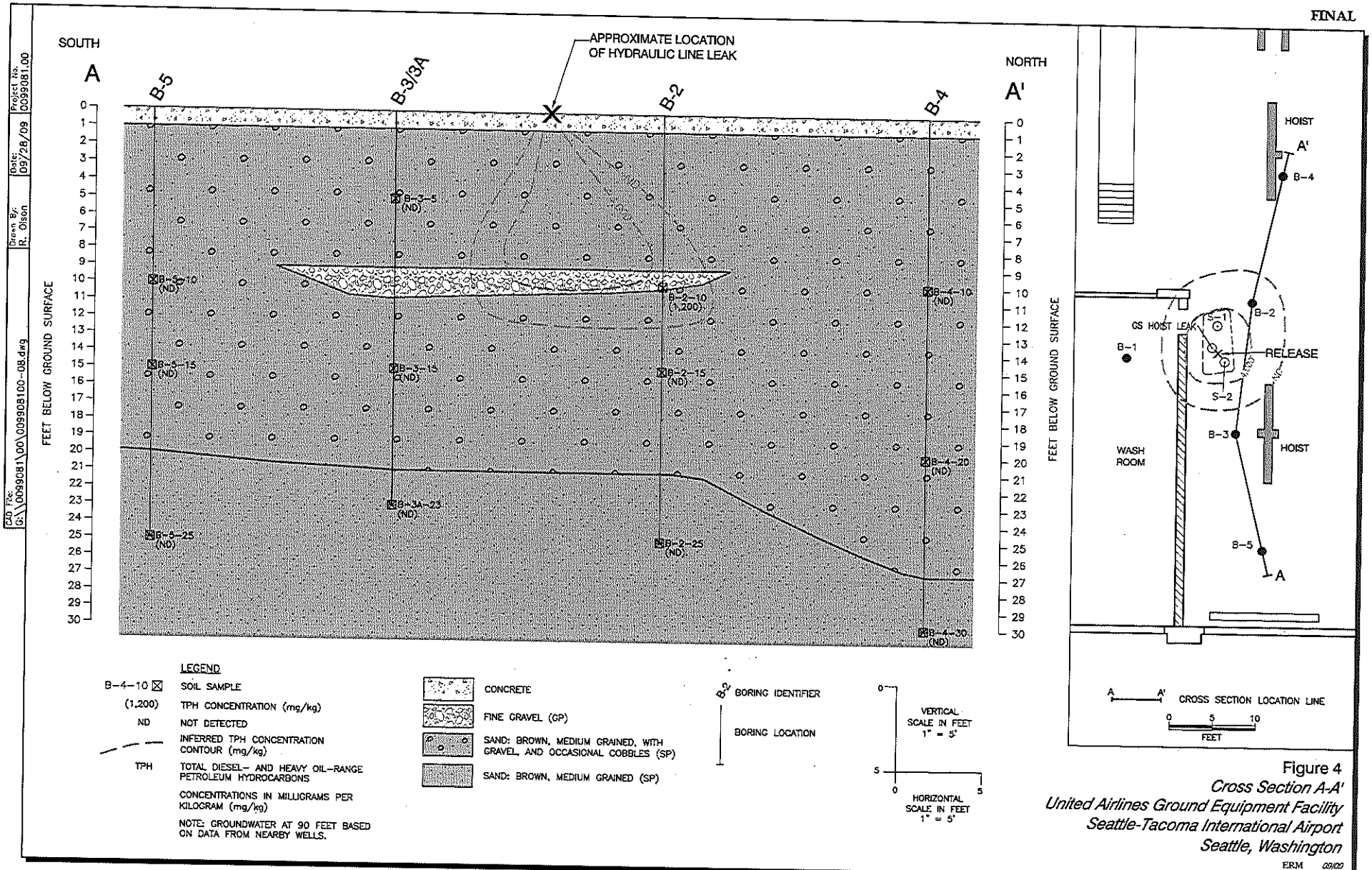

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Date: 09/28/09
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Figure 4
Cross Section A-A'
United Airlines Ground Equipment Facility
Seattle-Tacoma International Airport
Seattle, Washington

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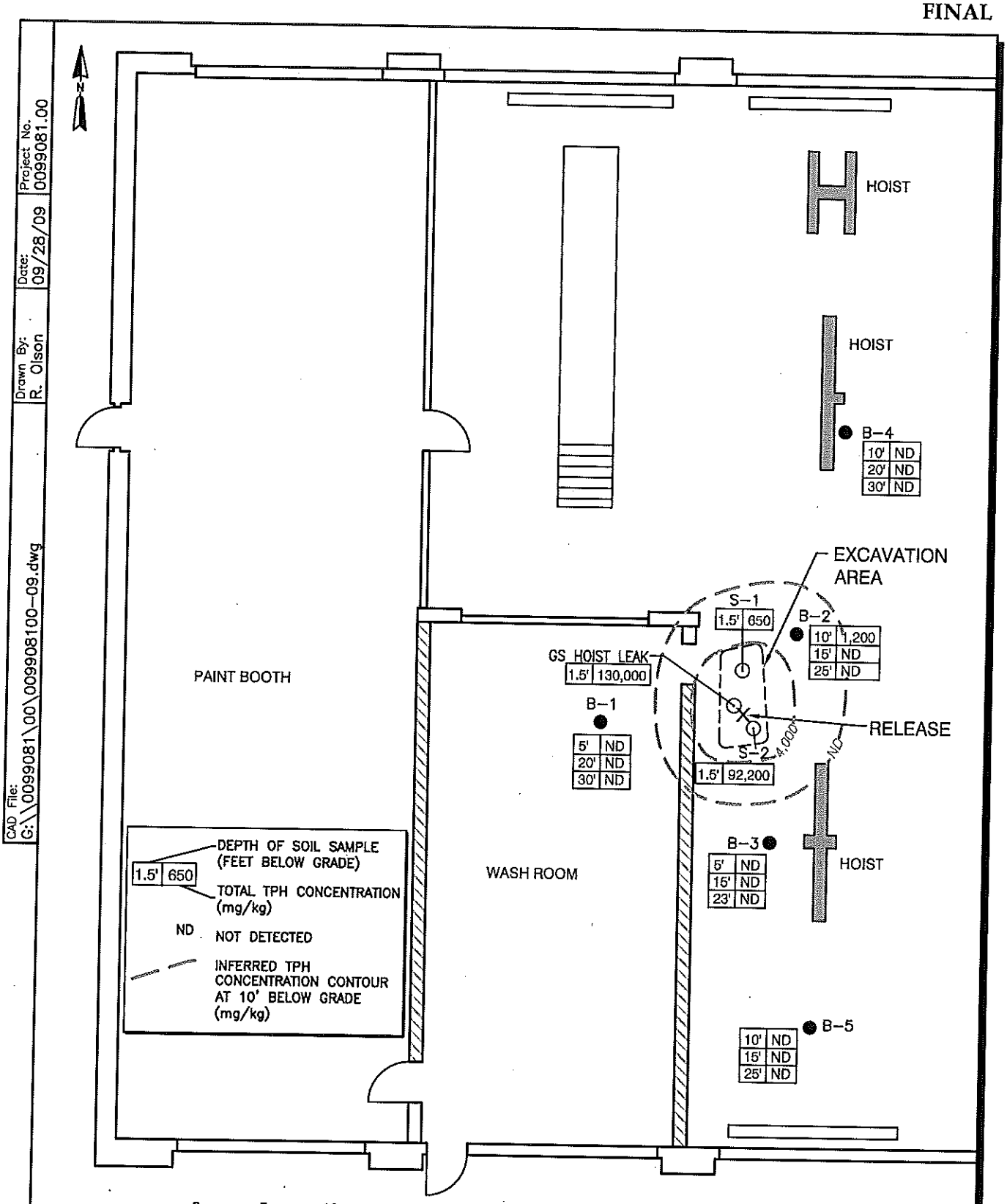

Figure 5
Petroleum Hydrocarbons in Soil
United Airlines Ground Equipment Facility
Seattle-Tacoma International Airport
Seattle, Washington

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