FINAL CLEANUP ACTION PLAN

U-Haul - Yakima Valley Spray
Yakima, Washington

Prepared by

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1.0 INTRODUCTION

Chapter 173-340 Washington Administrative Code (WAC), the Model Toxics Control Act (MTCA), specifies the criteria for approving cleanup at Facilities (sites) contaminated with hazardous substances. The MTCA requires that contaminated sites be investigated and Cleanup Action Plans be written and available for public review and comment prior to implementation. This draft Cleanup Action Plan (CAP) provides for site soil remediation and the monitoring of contaminated groundwater at the U-Haul Facility. Facility is defined, per 70.105D.020(4) RCW, as "... any site or area where a hazardous substance,... has been deposited, stored, disposed of, or placed, or otherwise come to be located." The facility (interchangeably called site) is located at 1108-1122 South First Street in Yakima, Washington.

Ecology has identified U-Haul of Inland Northwest (U-Haul), the current property owner, as a potentially liable person (PLP) for the site. U-Haul was named a PLP per 70.105D.040(1) RCW. To date, Ecology has not identified any other parties as PLPs.

In 1991, under Enforcement Order #91TC-C453, Ecology required that U-Haul conduct a Remedial Investigation/Feasibility Study (RI/FS) of the site. U-Haul's consultant performed the RI work and Ecology approved the RI in August 1995.

U-Haul submitted a draft FS on March 10, 1995 that identified various cleanup alternatives for the remediation of the site. Ecology provided comments to U-Haul on the draft FS in November 1995. In October 1995, the U-Haul facility was selected as a demonstration pilot project under the Washington State House Bill 1810. During the pilot project period, October 1995 through December 1996, U-Haul submitted several theoretical cleanup scenarios to Ecology for consideration. Ecology thoroughly reviewed and evaluated these submittals and found them less protective than MTCA requirements. On November 25, 1997, Ecology required U-Haul to submit the final FS by February 2, 1998. U-Haul did not submit a final FS by this date.

Ecology and U-Haul continued to correspond and meet. There was sufficient information in the draft FS, combined with meetings and U-Haul submittals after February 2, 1998, to allow Ecology to make a cleanup action decision for the site. Therefore, Ecology prepared this draft cleanup action plan without requiring completion of a final FS.

2.0 BACKGROUND

2.1 Site History

The U-Haul (Yakima Valley Spray) facility is a 3.7-acre commercial-zoned tract in south central Yakima. The property was acquired by U-Haul of Inland Northwest in 1984 and is a combination of several real estate parcels. Each of these parcels had its own commercial history. U-Haul divided the property into three parcels (parcels C, B, A; Attachment 1) to describe past ownership of each parcel and sources of historical contamination on each parcel. Brief details of the site histories of these parcels are below.

2.1.1 Parcel C. Yakima Valley Spray operated a pesticide business for 65 years, from 1909 to 1974. Sanborn Fire Insurance Maps and historic aerial photos show many large-volumed oil tanks, both within and off the property boundaries. A site history search of the U-Haul property identified a 6000-gallon aboveground perchloroethylene (PCE) tank just inside the northern boundary. This tank was operational for five years, from 1968 to 1973.

In the center of this parcel is a waste disposal pit. This pit was continually filled with waste from the pesticide manufacturing process. When full, the pit was emptied and its contents disposed of at local Yakima County dumps (now solid waste landfills). The pit is an area of concentrated contamination. The disposal pit is located adjacent to the west side of the Shell Oil Building.

2.1.2 Parcel B. This parcel occupies the center east-west third of the U-Haul property. Two bulk petroleum products distributing businesses operated on this parcel. They were the Washington Refining Company (1912-1955) and the Shell Oil Company (1955-1971). Historic aerial photographs confirm the presence of seven aboveground 50,000-gallon tanks on the property.

2.1.3 Parcel A. The Webb parcel is located in the southern third of the U-Haul property. Historically,businesses consisting of a salvage yard and farm and heavy equipment sales and service occupied this parcel. This parcel has drywells and sumps contaminated mostly with gasoline, diesel, waste oil, and lead.

2.2 Site Hydrogeology

During the site Remedial Investigation twelve monitoring wells were installed on the property and its periphery. Their purpose was to determine the site hydrogeology and groundwater quality. All are constructed to depths of 29 feet.

Monitoring results presented in the RI show that the distance to groundwater at the site varies both seasonally and spatially. The groundwater level is consistently 5-6 feet higher at U-Haul's northern boundary than its southern boundary. The lateral distance between the two boundaries is approximately 400 feet. Seasonally, groundwater level varies from approximately 13-14 feet (late summer) to approximately 18-20 feet below ground surface (late winter). Due to the irrigation influences, groundwater flow direction varies as much as ninety degrees. The summer flow direction is predominantly to the southeast while the winter flow direction is more to the south.

The shallow aquifer beneath the site is composed of alluvial gravel that was deposited by the Yakima River. It has intercalated discontinuous lenses of silt and clay. It has an estimated conductivity of at least 10^{-2} cm/sec. Horizontal groundwater flow was calculated and reported in the RI to be 345 feet/year.

2.3 Contaminants of Concern

Sixty-two (62) contaminants have been identified at the site, 49 are found in the soil and 37 in the groundwater. There are 24 contaminants common to both soil and groundwater. Table 1 shows contaminants and their occurrence in either soil or groundwater.

Table 1 - Contaminants found in soil/groundwater at U-Haul

Chlorinated Pesticides	Found Soil	Found Groundwater	Chlorinated Pesticides	Found Soil	Found Groundwater
DDT	X	X	Heptachlor	X	
DDD	X	X	Hep. Epoxide	X	
DDE	X		Endrin	X	
Endosulfan 1 (alpha)	X		Endrin Ketone	X	
Endosulfan 2 (beta)	X		Endrin Aldehyde	X	
Endosulfan SO_4	X	X	Methoxychlor	X	
Alpha BHC	X		Aldrin	X	
Beta BHC	X	X	Chlordane	X	
Delta BHC	X		Dieldrin	X	
Gamma BHC (Lindane)	X	X	Perthane	X	
Phosphate Pesticides			**Chlorinated Herbicides**		
Guthion	X		2,4,5-TP	X	X
Ethion	X		2,4-D	X	X
Parathion	X				
Methyl Parathion	X				
Volatile Organic Compounds			**Volatile Organic Compounds**		
1,1-Dichloroethane		X	Acetone		X
1,2-Dichloropropane		X	Toluene	X	X
1,1,1-TCE	X	X	Total Xylenes	X	X
2-Butanone (MEK)	X		Vinyl Chloride	X	
Carbon Disulfide	X	X	1,3,5-TMB		X
Carbon Tetrachloride	X		1,2,4-TMB		X
Benzene		X	Isopropylbenzene		X
Ethylbenzene	X	X	n-propylbenzene		X
Methylene Chloride	X		sec butylbenzene		X
Chloroform	X	X	n-butylbenzene		X
Dichlorobromomethane	X		Naphthalene		X
Tetrachloroethene	X	X	Isopropyltoluene		X
Trichloroethene	X	X	1,2-DCE		X
Total Metals			**TPH**		
Arsenic	X	X	TPH as gasoline	X	X
Cadmium	X	X	TPH as diesel	X	X
Chromium (total)	X	X	TPH as hydraulic oil	X	
Copper	X	X			
Lead	X	X			
Mercury	X	X			
Zinc	X	X			

2.3.1 Discussion of Risks. The contaminants of concern at the U-Haul site have carcinogenic and non-carcinogenic health risks associated with them. A carcinogen "means any substance or agent that produces or tends to produce cancer in humans" (WAC 173-340-200). A noncarcinogenic contaminant is toxic to various human organs. Noncarcinogenic health risks are measured and defined according to a Hazard Index. The Hazard Index is defined as "... the sum of two or more hazard quotients for multiple hazardous substances and/or multiple exposure pathways" (WAC 173-340-200).

Attachment 2 lists the contaminants, their highest concentrations in soil and/or groundwater at the site, and their calculated cancer risk and Hazard Index as determined by both U-Haul, in their draft FS, and Ecology. In determining these values and selecting contaminant cleanup levels, WAC 173-340-705, -708, -720, and -740 were used.

2.3.2 Soil Risks. The total risk calculated for soil carcinogens in Attachment 2 ranges from $3.20X10^{-3}$ (U-Haul sum) to $4.29X10^{-3}$ (Ecology sum). These numbers mean that between 320 and 429 individuals out of 100,000 might be expected to contract cancer from exposure to the site. The difference in the U-Haul and Ecology estimates is due to different input figures into the risk equations. Both U-Haul and Ecology agree that the risk associated with the site exceeds the MTCA acceptable lifetime cancer risk of 1 in 100,000 ($1.0X10^{-5}$)[WAC 173-340-705(4)].

Attachment 2 indicates that the calculated cumulative Hazard Index for the site soil ranges from 75.21 (U-Haul sum) to 114.88 (Ecology sum). Again, the difference in the U-Haul and Ecology estimates is due to different input figures into the risk equations. Both U-Haul and Ecology agree that the cumulative Hazard Index associated with the site exceed the MTCA cumulative index of 1 [WAC 173-360-705(4)].

Attachment 3 shows that three contaminants account for more than 95 percent of the soil cancer risk at the site. This was determined from highest carcinogenic risk values in Attachment 2. The contaminants posing the highest risk for cancer due to exposure to soil are: aldrin, dieldrin, and arsenic.

2.3.3 Groundwater Risks. The total calculated groundwater cancer risk (Attachment 2) ranges from $1.4X10^{-3}$ (U-Haul sum) to $2.00X10^{-3}$ (Ecology sum). Attachment 3 indicates that U-Haul and Ecology agree that arsenic and benzene account for more than 97 percent of the calculated cancer risk associated with exposure to groundwater. Both U-Haul and Ecology agree that the site risk associated with contaminated groundwater exceeds the MTCA acceptable lifetime cancer risk of 1 in 100,000 ($1X10^{-5}$).

The cumulative Hazard Index calculated for site groundwater (Attachment 2) ranges from 8.57 (U-Haul sum) to 51.3 (Ecology sum). The difference in U-Haul and Ecology estimates is due to different input figures into the risk equations. Both U-Haul and Ecology agree that the cumulative Hazard Index associated with the site groundwater exceeds the MTCA cumulative index of 1.

3.0 REGULATORY REQUIREMENTS

Regulatory requirements (WAC 173-340-360) for cleanup actions at contaminated sites are: The protection of public health and the environment through compliance with cleanup standards established in WAC 173-340-700 through 750, and compliance with applicable state and federal laws and provisions for compliance monitoring. In addition, the regulation requires permanent solutions to the maximum extent practicable, provision for a reasonable restoration time frame, and consideration of any concerns raised during public comment on the draft cleanup action plan.

3.1 Applicable State and Federal Laws

WAC 173-340-710 requires that cleanup actions comply with "all relevant and applicable regulations" (ARARs). ARARs will be established prior to implementation of the CAP. Ecology shall issue a threshold SEPA determination with this draft CAP.

Prior to implementation of the CAP, any required construction and demolition permits must be determined and obtained. To avoid delays, they shall be obtained at least two weeks before site cleanup action [WAC 173-340-400(6)]. Ecology will be notified in the Work Plan of the permits not covered by the MTCA permit exemption.

3.2 Protection of Public Health and the Environment

Site specific data collected during the RI/FS indicates that there were area homes and businesses downgradient from the U-Haul facility that used the shallow groundwater aquifer for a drinking water source and other needs. As a result of this and other Yakima Railroad contaminated sites, Ecology provided a remedial action grant to the Cities of Yakima and Union Gap to provide safe drinking water. Businesses were notified, and private homes that requested a safe drinking water source were provided with city water through the installation of new water mains and home hookups.

The area groundwater remains a potential source of drinking water. Groundwater cleanup standards to the concentrations consistent with MTCA Method A, MTCA Method B, and WAC 173-340-720(1)(a) will be met by contaminated soil removal actions and by bioventing. A minimum five-year groundwater monitored program will verify the effectiveness of the soil/source removal.

3.3 Cleanup Standards

Cleanup standards are a combination of cleanup levels which protect public health and the environment and points of compliance (locations where these cleanup levels must be attained). These standards are established in accordance with WAC 173-340-700 through 760.

Cleanup standards are identified for the particular hazardous substances at a site and the specific areas or pathways where humans and the environment can become exposed to these substances [WAC 173-340-700(2)(a)]. Contaminants of concern are identified in Table 1 and Attachments 2 and 3. Exposure pathways identified in the RI, draft FS, and by Ecology include:

a. direct contact with contaminated soils to the general public and workers at or near the facility;
b. soil ingestion;
c. drinking and/or washing from groundwater from wells located downgradient from the facility and;
d. breathing or contact with the fumes, vapors, and dust that emanate from the site.

3.4 Soil Cleanup Levels (Indicator Hazardous Substances)

There are 62 contaminants found in the soil and groundwater at the site (Table 1). Because of this, Ecology has selected nine (9) indicator hazardous substances to represent and control the cleanup of the entire site. The MTCA Regulation defines indicator hazardous substances as, "... the subset of hazardous substances present at a site selected under WAC 173-340-708(2) for monitoring and analysis during any phase of remedial action for the purpose of characterizing the site or establishing cleanup requirements for that site". Attachment 4 provides a detailed methodology [WAC 173-340-708(2)] for the selection of indicator hazardous substances and specific reasons for each selection. The nine (9) indicator hazardous substances chosen by Ecology for the U-Haul site are shown in Table 2.

Table 2 - U-Haul Indicator Hazardous Substances with Soil Cleanup Levels, milligrams per kilogram (mg/kg)

Contaminant	Cleanup Level (mg/kg)	MTCA Method
DDT	2.94	B
Aldrin	0.0588	B
Dieldrin	0.0625	B
Beta BHC	0.556	B
Gamma BHC (Lindane)	0.769	B
Arsenic	20.0	A
PCE	0.02	Site Specific
TPH(gas)	1500.0	Site Specific
TPH(diesel)	3500.0	Site Specific

There are three exceptions to the established MTCA soil cleanup levels. (1) PCE (perchloroethylene). PCE's site-specific soil cleanup level at the U-Haul site will be 0.02 mg/kg. This site-specific soil cleanup level is more stringent than the MTCA Method A soil cleanup level (0.50 mg/kg). The site-specific PCE cleanup level was developed by Ecology based on other contaminated PCE sites within the Yakima Railroad Area. This cleanup level is consistent with all other PCE contaminated site cleanups in the Yakima Railroad Area; (2) TPH gasoline and; (3) TPH diesel. Ecology accepted the U-Haul's conclusion (May 20, 1999 submittal, ThermoRetec) that Residual Saturation Values for gasoline and diesel, as determined by soil type, would comply with acceptable health risk levels and Ecology's 1998 Interim TPH Policy. Therefore, the U-Haul soil cleanup levels for TPH gasoline and TPH diesel will be 1500 mg/kg and 3500 mg/kg, respectively.

3.5 Points of Compliance

a. Soil. "For soil cleanup levels based on the protection of groundwater, the point of compliance shall be established in the soils throughout the site." [WAC 173-340-740(6)(b)].

b. Groundwater. Twelve monitoring wells have been installed on the facility periphery to measure groundwater contamination and its potential to migrate towards off-site receptors. The additional five new wells will be installed and monitored by U-Haul after cleanup and backfill.

The groundwater point of compliance shall be "... as close as practicable to the source of hazardous substances not to exceed the property boundary" [WAC 173-340-720(6)(c)].

4.0 SELECTION OF CLEANUP ACTIONS

The Model Toxics Control Act specifies (1) the criteria for approving cleanup actions, (2) the order of preference for cleanup technologies, (3) policies for permanent solutions, (4) the application of these criteria to particular situations, and (5) the process for making these decisions [WAC 173-340-360(1)(a)].

Cleanup technologies at state contaminated sites are prioritized to minimize the amount of untreated hazardous substances remaining at a site. The priority of treating hazardous substances are, in descending order of preference: (1) reuse or recycling, (2) destruction or detoxification, (3) immobilization, (4) disposal, (5) isolation or containment, (6) institutional controls and monitoring.

4.1 Feasibility Study Cleanup Alternatives

The draft Feasibility Study presented 42 technology combinations for soil and groundwater cleanup. From these 42 alternatives U-Haul proposed 9 for discussion (Table 6-4; Feasibility Report, RETEC, March/1995). Below is a discussion of the 9 alternatives together with Ecology's assessment of the protectiveness of each alternative.

- Alternative 42 – No action alternative. This option is not acceptable since it is not protective.

- Alternative 41 – This alternative contains institutional controls only with no cleanup. U-Haul described this option as providing only low protection for human health and the environment. Ecology agrees with this assessment.

- Alternative 35C – This is U-Haul's preferred alternative. This alternative includes off-site disposal of 2,000-3,400 cubic yards of contaminated soil, soil bioventing, groundwater air sparging, longterm groundwater monitoring, and an asphalt cap. U-Haul also asks the State to designate the waste as a 'State Special Waste' (see Section 4.2).

Ecology finds this alternative inadequate for site cleanup for the following reasons:

1. It uses industrial cleanup values (MTCA Method C) for a commercial-zoned site where MTCA Method B and MTCA Method A cleanup levels are applicable;
2. This alternative addresses a maximum removal of 3,400 cubic yards. U-Haul's own estimate of on-site contaminated soils is 51,000 cubic yards. The 3,400 yards would not address the entire site.

- Alternative 38C – This alternative is similar to alternative 35C except that it would involve disposal of 3,400 cubic yards if designated a 'State Dangerous Waste'. This alternative is not protective for the same reasons as alternative 35C.

- Alternative 26C – This cleanup alternative is similar to 35C and 38C in terms of the proposed cleanup levels and volumes of soil removal. It is different in that it uses on-site thermal desorption as a remediation method instead of an off-site disposal method. This alternative is not protective for the same reasons as alternative 35C.

- Alternatives 17B, 15B, 5B, and 16T. These alternatives all increase the off-site disposal volume of contaminated soils. They use a variety of remediation measures. Alternatives 17B, 15B, and 5B address volumes of 15,000-25,000 cubic yards. Alternative 16T addresses a volume of 30,000-51,000 cubic yards. These and other U-Haul alternatives are summarized in Attachment 5. The details of the proposed cleanup decision chosen by Ecology are set forth in section 4.2.

4.2 Cleanup Alternative Selected by Ecology

Ecology has selected a modified version of alternative 17B as the cleanup action. This alternative includes excavation, screening, disposal, and bioventing. These technologies are applicable for site remediation and comply with the requirements of Chapter 173-340 WAC. In addition, the technologies provide solutions as directed by WAC 173-340-360(5).

In alternative 17B U-Haul requested that Ecology designate the waste from the entire site as a State Special Waste. Ecology believes that some of the contaminated soil at the site might designate as a Dangerous Waste per Chapter 173-303 WAC. If the soil does designate as a Dangerous Waste, it could not be designated as a State Special Waste. Further, it is U-Haul's responsibility to properly designate the soil and submit this to Ecology for review.

In addition, before waste designation occurs, the excavated site soil contaminants must be sampled and characterized in accordance with Chapter 173-303 WAC. If the wastes from the site designate as a Dangerous Waste, they must be disposed of in accordance with Chapter 173-303 WAC.

The disposal 'pit' area will be excavated to the seasonal low groundwater level, or about 18-20 feet below ground surface. For the rest of the site, with the exception of TPH contaminated areas (see

next paragraph), excavation will be to five (5) feet.

For site areas of exclusively high TPH concentrations, excavation will be to a minimum depth of five feet or the concentration levels of Table 3, whichever is deeper. At the TPH concentration levels of Table 3, U-Haul will have the option of either continuing to excavate or to biovent until the compliance cleanup levels of Table 2 or Table 3 are attained.

Following backfill and replacement and new monitoring well installation, a five-year groundwater monitored program will be implemented. At the same time institutional controls will be implemented. Institutional controls will include a deed restriction (Section 5.5) prepared and filed by U-Haul.

5.0 WORK TO BE PERFORMED

5.1 Soil Excavation. Areas to be excavated at the U-Haul site include all areas where soil contaminant concentrations exceed the cleanup levels of Table 2. This includes contaminated soils on the U-Haul property and adjoining properties to the west and north. Below are contaminated soils that will be encountered.

a. Mixed (all contaminants) soils. These soils are common in the northwest quarter of the property, especially the historic Yakima Valley Spray disposal 'pit'. This pit was described in a March 17, 1992 deposition (Mr. Sid Martin; p. 71) as up to 100 feet in diameter.

   Contaminated soils extend laterally and vertically from this pit. The more mobile contaminants in the disposal pit are found deeper (to 18-20 feet) in the soil profile, and in groundwater. The disposal pit will be extensively excavated to the cleanup levels of Table 2.

b. TPH (gasoline/diesel/hydraulic oil/waste oil) contaminated soils. TPH contaminated soils are ubiquitous to the entire site. The greatest accumulations of high-concentration TPH contamination occur (1) where historic YVS tanks were either buried or above ground, (2) near the historic seven 50,000-gallon Shell oil tanks, and (3) in the drywells and sumps of the Webb property.

   Excavation of all contaminated soils will be to a minimum of five feet or deeper until the cleanup levels of Table 3 (gasoline, 15,675 mg/kg; diesel, 14,950 mg/kg) are attained. When these cleanup levels (Table 3) are met, excavation may continue, or alternatively, the remaining contaminated soils may be biovented until TPH gasoline and TPH diesel (hydraulic/waste oils also) fractions reach the cleanup levels of 1,500 mg/kg and 3,500 mg/kg, respectively.

Table 3 – U-Haul TPH Soil Cleanup Levels, milligrams per kilogram (mg/kg)

TPH Contaminant	Minimum TPH Levels Required Before Using Option to Biovent	Cleanup Level TPH Values Left After Excavation/Bioventing
Gasoline	15,675 mg/kg or less	1,500 mg/kg
Diesel	14,950 mg/kg or less	3,500 mg/kg
Hydraulic or Waste Oils	14,950 mg/kg or less	3,500 mg/kg

c. Pure Product. These wastes are to be expected at the U-Haul site because they have been found at other Yakima pesticide cleanup sites. RCRA listed wastes are pure product, and if encountered at the site will be disposed of at a permitted RCRA facility. Further, if pure product is encountered, the Ecology site manager will be notified within 12 hours.

d. Perchloroethylene (PCE) contaminated soil. PCE is the contaminant of concern for the six square mile Yakima Railroad Area (YRRA) cleanup. U-Haul of Inland Northwest is within the YRRA and has been named a Potentially Liable Person (PLP) for the cleanup of PCE at the U-Haul site.

During the site Remedial Investigation PCE was found in U-Haul property soils at all depths. Concentrations up to 4 mg/kg were found. The contaminant was also found in soils of properties to the west and north immediately adjoining U-Haul.

U-Haul is responsible for the cleanup of all PCE soil contamination on its property and on the adjoining properties. The cleanup level for PCE is 0.02 mg/kg (Table 2). This cleanup level concentration is consistent with and is required at all Yakima Railroad Area sites.

The presence of PCE on adjoining property soils attributable to the Yakima Valley Spray operations has been questioned by U-Haul. The RI shows that the distribution of DDT was a part of the Yakima Valley Spray formulation operations. DDT and PCE contamination is similar at the U-Haul site. Based on this information, U-Haul will be responsible for PCE soil cleanup on adjoining properties to the cleanup level of 0.02 mg/kg in any area where DDT concentrations are equal to or exceed 2.94 mg/kg (Table 2). The PCE cleanup level on adjoining properties will be tied only to the cleanup level of DDT. The nine other Table 2 indicator hazardous substances cleanup levels will remain the same on the adjoining properties.

5.1.1 Excavation. Disposal pit excavation will be planned so that excavation reaches its deepest (18-20 feet) during low groundwater (February to mid-April). If complete excavation is not accomplished in year 2002, the site will be safely secured for renewed excavation for the next year's low groundwater. Pit excavation will then resume until low groundwater is reached and cleanup levels established in Table 2 are attained.

5.1.2 Soil Screening. Excavated soils whose contamination exceeds cleanup levels in Table 2 and are less than 1.0 inch in diameter will be designated under WAC 173-303 and disposed of at an appropriate licensed facility.

Contaminated soils equal to or greater than 1.0 inch in diameter may either be disposed of at an offsite permitted facility or, they may be screened (more than 1.0 inch) for backfill if sampling analyses indicate the contaminant levels are less than Table 2.

Another excavation issue is unearthed concrete slabs. The slabs may be heavily contaminated. If the analyses of the slabs show contamination less than Table 2, they may be used as backfill.

5.1.3 Site Buildings. Soil contamination is present under two site buildings, the Shell Oil building and the Webb building (RI file). The Shell Oil building is located at the eastern end of the former Yakima Valley Spray disposal pit. The Webb building is located south of the former seven 50,000-gallon aboveground tanks used by Washington Refining, Shell Oil, and Yakima Valley Spray.

Contaminated soil next to and under the site buildings will be remediated. Demolished buildings and floors will be sampled and characterized for hazardous substances. If the buildings and floor(s) contain contaminants above established cleanup levels of Table 2, they will be disposed of at an appropriate permitted waste disposal facility.

Bioventing will be implemented for TPH contamination under any building floor(s) left in place. For nonTPH contaminants under floor(s) that are above the cleanup levels of Table 2, the floor(s) will act as containment as long as their integrity is maintained. The floor(s) integrity will be annually inspected and maintained until floor demolition takes place. At that time the nonTPH contaminants under the floor(s) will be addressed to the cleanup levels of that time.

If either of the two buildings (Shell, Webb) or their floors are left standing during excavation, then their foundations will require structural support. If structural support is used, then all Federal and State regulations (WAC 296-155 is one) that involve building shoring support will be addressed.

5.1.4 BNSF Railroad Tracks. Soil contamination extends beyond the U-Haul property boundary to the west and north and the existing BNSF spur tracks in those directions (RI file). Soil contamination greater than the cleanup levels in Table 2 from the property boundaries to the offset zone (integrity zone to the east of the centerline of the first set of active north-south tracks, and to the south of the unused north track centerline) will be remediated by excavation. Within the off-set zones, TPH and PCE contaminated soils greater than the cleanup levels in Table 2 will be remediated by bioventing. The first pair of active tracks to the west of the U-Haul property boundary are the north-south tracks to the concrete batch plant south of the U-Haul property.

Good communication between U-Haul and the BNSF is essential. U-Haul will coordinate with the BNSF to resolve access, safety, construction, rail-line excavation off-set locations, vehicle traffic, stockpiling, and bioventing construction and timing issues. All issues will be addressed

in the draft and final Work Plans.

5.1.5 Shanno Ditch/Sewer Line/Utilities. The Shanno Ditch may be encountered during excavation in the southeastern third of the property. An operating eight-inch sewer line will be encountered during the excavation of the disposal pit area (Attachment 1). And, a 5- or 6-foot diameter buried concrete irrigation ditch may be encountered next to the west edge of the Shell Oil building (Mr. Sid Martin 07/17/90 deposition, page 56).

Rerouting and reinstallation planning of ditches and utilities will be addressed in the Work Plan. Contamination around and under these structures will be excavated, especially in the 'disposal pit' area. U-Haul is responsible for the permanence, structural integrity, and repair of these on-site structures.

5.1.6 Soil Stockpiling and Cleanup Logistics. The Work Plan will address site staging, soil screening, and the stockpiling of contaminated and treated soils. The Plan must address how these activities will not adversely affect vehicle or pedestrian traffic, or adjacent businesses. Runoff control from rain or snowmelt will be addressed in the Plan. The Plan will include the logistics for truck or railcar loading, turnarounds, and heavy truck traffic entering and exiting the site.

5.1.7 Backfill. Excavated pits, or parts thereof, will not be backfilled until the results of confirmational sampling have been reviewed and analyzed by Ecology. In the Yakima Valley disposal pit, backfill in the surface to five-foot depth and below twelve feet in depth (high groundwater) shall be analyzed to ensure it contains no hazardous substances exceeding MTCA method A or B cleanup levels. Backfill placed between five and twelve feet below ground surface may have contaminant concentrations between method B and method C Commercial cleanup levels. In TPH excavations, backfill will not contain hazardous substances that exceed MTCA method A or B cleanup levels. The Work Plan will address the compaction and analytical testing of the backfill.

Relic concrete floors and walls may be encountered during excavation. These concrete slabs may be used for backfill if, after sampling and analysis, they are found to contain contamination less than MTCA cleanup standards. To minimize subsurface voids and slumping, slabs will be broken into pieces no larger than one foot in diameter.

5.1.8 Bioventing. An engineering plan that addresses bioventing and in compliance with WAC 173-340-400(4)(a) will be included in U-Haul's Work Plan. It will address depth, spacing, emission controls, performance monitoring and other parameters affecting bioventing installation, operation and monitoring.

Bioventing will be implemented for TPH remediation in areas that were not fully excavated to the compliance cleanup levels of Table 2. Following backfill and monitoring well construction, quarterly submittals of bioventing data and analyses will be submitted to Ecology. They will be submitted to Ecology with the quarterly groundwater monitoring analyses. Site bioventing will continue throughout the remediation process (after June 1, 2002) until the compliance cleanup levels of Table 2 are met.

The Bioventing system will be installed, tested, and operational by final backfill, or June 1, 2002. Bioventing as-builts will be required and must be submitted to Ecology by July 1, 2002 (Attachment 6).

5.2 Groundwater

5.2.1 Replacement monitoring wells. To minimize monitoring well loss, all existing monitoring wells will be flagged prior to site activities. During site excavation Monitoring Well 7 (MW-7) may have to be abandoned and destroyed. Likewise, other existing monitoring wells may be destroyed during excavation. Replacement wells will be required for all destroyed wells and will be installed within 30 days after final backfill (Attachment 6). Replacement wells will be installed as close to the original well location as possible. Replacement wells are in addition to the five new monitoring wells.

5.2.2 Five new downgradient monitoring wells. Within 30 days after final pit backfill, or by June 1, 2002, five new monitoring wells will be installed and developed downgradient from the Yakima Valley Spray disposal pit (Attachment 6). Three of the new wells will be shallow (29 feet). The remaining two new wells will be developed deeper, one to 60 feet and one to 90 feet. The two deeper wells are consistent with other deep monitoring wells in the Yakima Railroad Area. The five new monitoring well locations will be determined in consultation with Ecology.

5.2.3 As-builts. As-builts of all site groundwater monitoring wells will be required and will be submitted to Ecology by July 1, 2002 (Attachment 6).

5.3 Sampling and Analysis Plan

The Work Plan will contain a Sampling and Analysis Plan in compliance with WAC 173-340-410, -820, -830, and -840 that address soil, groundwater, and air analyses.

5.4 Engineering Controls

5.4.1 Containment of Site Pollutants. Between 80-120 people, depending on season, work within 150 yards of the site. The Work Plan will address all potential site releases. Contaminant releases during active remediation include, but are not limited to; site excavation, building demolition, equipment use, access construction and grading, heavy truck traffic, soil screening and stockpiling, and backfill.

Methods to minimize all releases will be developed in the Work Plan and will be implemented during active and passive remediation site activities.

Air Releases. As part of the Work Plan, U-Haul will develop air quality standards WAC 173-340-750 in cooperation with the Yakima County Clean Air Authority for on-site and off-site workers and the general public. Standards will be based on human health risks from toxic releases. Local weather factors will be considered.

Airborne releases will occur during active remediation and passive remediation (bioventing). These releases must be detected, measured, evaluated and, if a human health risk to cleanup workers or workers at local businesses, controlled at the site. An air monitoring system will be installed and operational prior to any site work. Samples of ambient air quality will be taken and analyzed prior to any site work.

Liquid Releases. The Work Plan will address stormwater management. This includes surface flow into excavations or off-site runoff. The Work Plan will include procedures to secure the site in the event of extended inclement weather or site shutdown of periods longer than one week.

On-site Storage. Drums of contaminated monitoring well purge water are presently located inside the Shell Oil building. They will be characterized and properly disposed of to a permitted facility. All newly created wastes will be characterized, contained as necessary, and disposed of to a permitted facility.

5.4.2 Surface Cap. The Work Plan will address the surface cap. After final backfill, a surface cap will be installed to the pre-existing grade. Compaction of the surface cap will be addressed. The cap will require an annual inspection and maintenance as long as U-Haul is required to sample monitoring wells.

5.5 Institutional Controls

Institutional controls will be established and implemented for the facility. The controls will include a deed restriction prepared and filed by U-Haul. The deed restriction will prohibit future site use that may endanger the public. It will restrict the site to commercial-zoned uses. This deed restriction will require additional soil cleanup or removal if, at any time during the life of the site, there is construction that exposes any contaminated soils. Also, the deed restriction will restrict future use of the site groundwater that may be withdrawn from it.

5.6 Periodic Review

5.6.1 Remediation prior to June 1, 2002. From the beginning of excavation to the installation of the last monitoring well or June 1, 2002, whichever is sooner, U-Haul will submit regular monthly cleanup progress reports to Ecology. These reports will be available for public review at the Yakima Department of Ecology office.

5.6.2 Long-term Compliance Monitoring after June 1, 2002. U-Haul will submit reports to Ecology that include quarterly groundwater monitoring analyses and quarterly bioventing analyses in accordance with WAC 173-340-410(1)(c). The purpose of these reports is to review site cleanup action and to assure that human health and the environment are being protected (WAC 173-340-420). The quarterly Groundwater Monitoring Program and Bioventing Program sampling will begin no later than September 1, 2002 (Attachment 6). Groundwater and bioventing sampling analyses will be submitted to Ecology within 30 days of site sampling. These reports will be available for public review at the Yakima Department of Ecology office.

6.0 RESTORATION TIMEFRAME

Soil excavation and disposal is expected to start in February 2002 and will continue through the low groundwater period of February to mid-April. Attachment 6 is a schedule that U-Haul will meet. Any deviation from this schedule must be requested in writing with the appropriate justification and postmarked to Ecology ten (10) days prior to that timeline. Approval or disapproval by Ecology of these requests will be in writing.

Remediation completion (completed excavation/backfill, installed engineered cap, all monitoring wells installed and developed, all institutional controls in place) is anticipated by June 1, 2002. The only site work not completed by this date will be the scheduled five-year groundwater monitoring sampling program and the bioventing program. The bioventing system will be installed and operational by June 1, 2002.

7.0 PUBLIC COMMENT

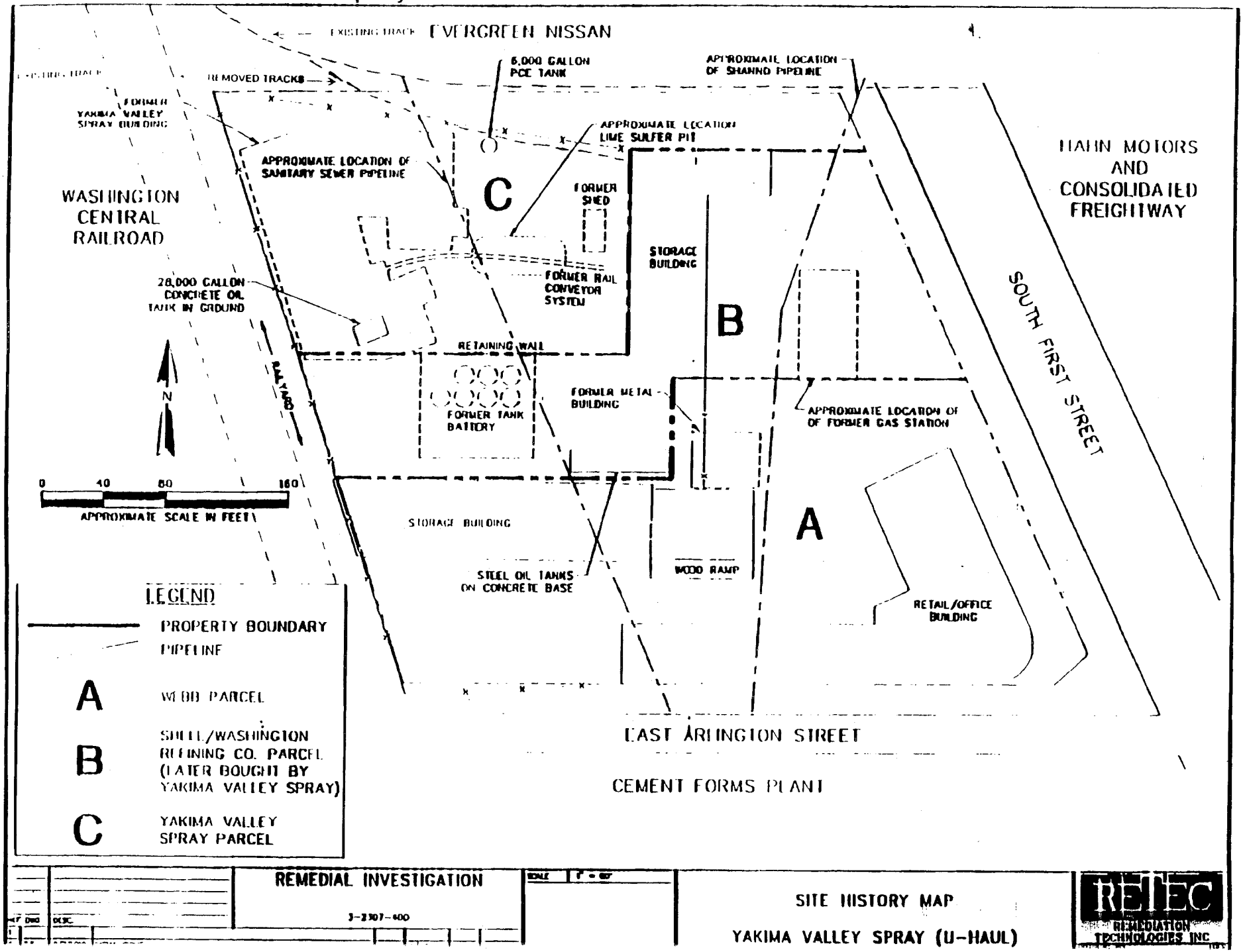
This draft Cleanup Action Plan document is available for public comment from July 8, 2001 through August 7, 2001. Comments will be directed to the U-Haul site manager at the Department of Ecology. Comments will be incorporated into the final Cleanup Action Plan as deemed appropriate by Ecology and as required in WAC 173-340-600(13).

The Cleanup Action Plan will be available at the Yakima Valley Regional Library and the Department of Ecology files for a thirty (30) day period from July 8, 2001 through August 7, 2001. This availability is published in a legal advertisement in the Yakima-Herald Republic daily newspaper.

Fact sheets have been sent to concerned citizens and local governmental agencies.

ATTACHMENT 1

U-Haul Property Parcels and Historical Structures Prior to 1971



ATTACHMENT 2
Hazardous Substance Risks at the U-Haul Facility

	CHEMICAL	Soil High Conc (mg/kg)*	GW High Conc (ug/kg)*	CARCINOGENIC RISKS				HAZARD INDEX			
				SOIL		GROUNDWATER		SOIL		GROUNDWATER	
				U-HAUL	ECOLOGY	U-HAUL	ECOLOGY	U-HAUL	ECOLOGY	U-HAUL	ECOLOGY
Chlorine Pesticides	DDT	300	0.41	2.74E-06	1.02E-04	1.06E-06	1.59E-06	0.2	7.5	0.02	0.1025
	DDD	110	0.82	5.66E-07	2.64E-05	1.54E-05	4.50E-06				
	DDE	30	-	3.52E-07	1.02E-06						
	Endosulfan 1 (alpha)	0.54	-						0.0002		
	Endosulfan 2 (beta)	0.39	-						0.0163		
	Endosulfan Sulfate	0.91	0.27						0.0001		0.0003
	Alpha BHC	0.076	-	4.59E-07	4.79E-07				0.0001		
	Beta BHC	2.4	0.11	4.14E-06	4.32E-06	1.55E-06	2.26E-06				
	Delta BHC	0.79	-						0.3292		
	Gamma BHC (Lindane)	2.3	0.42	2.87E-06	2.99E-06	4.27E-06	1.25E-05	0.09		0.03	0.0001
	Heptachlor	6.5	-	2.80E-05	2.93E-05			0.16	0.1625		
	Heptachlor Epoxide	0.62	-	5.41E-06	5.64E-06			0.57			
	Endrin	11.3	-					0.4			
	Endrin Ketone	3.3	-								
	Endrin Aldehyde	0.14	-								
	Methoxychlor	31	-					0.07	0.0775		
	Aldrin	150	-	2.45E-03	2.55E-03			59.93	62.5		
	Chlordane	6.9	-	4.36E-06	8.97E-06			0.42	1.4375		
	Dieldrin	37.7	-	5.78E-04	6.03E-04			4.52	9.425		
	Perthane	112	-	3.11E-08	3.70E-08			0.43	0.4667		
Phosphate Pesticides	Azinphos Methyl (Guthion)	0.25	-								
	Ethion	180	-					4.32	4.5		
	Parathion	220	-					0.44	0.4583		
	Methyl Parathion	0.35	-					0.01	0.0175		
Chlorine Herbicides	2,4,5-TP (Silvex)	0.85	0.19						0.0013	0.46	0.003
	2,4-D	0.028	0.26							0.51	0.0033
Metals	Arsenic	630	93	1.09E-04	9.45E-04	1.27E-03	1.59E-03	2.59	26.25	6.07	38.75
	Cadmium	11	6.5	6.43E-05				0.13	0.275		1.625
	Chromium (total)	420	160					0.08	1.05	0.63	4
	Copper	490	700					0.02	0.1655	0.37	2.3649
	Lead	1000	150								
	Mercury	4.9	1					0.2	0.2042	0.13	0.4167
	Zinc	800	2100					0.01	0.0333	0.14	0.875

ATTACHMENT 2
Hazardous Substance Risks at the U-Haul Facility

	CHEMICAL	Soil High Conc (mg/kg)*	GW High Conc (ug/kg)*	CARCINOGENIC RISKS SOIL U-HAUL	CARCINOGENIC RISKS SOIL ECOLOGY	CARCINOGENIC RISKS GROUNDWATER U-HAUL	CARCINOGENIC RISKS GROUNDWATER ECOLOGY	HAZARD INDEX SOIL U-HAUL	HAZARD INDEX SOIL ECOLOGY	HAZARD INDEX GROUNDWATER U-HAUL	HAZARD INDEX GROUNDWATER ECOLOGY
Volatile Organic Compounds (VOCs)	1,1-Dichloroethane	-	7								0.0175
	1,2-Dichloroethene	-	6							0.01	
	1,2-Dichloropropane	-	6			3.19E-06	9.33E-06				
	2-Butanone (MEK)	1	-								0.0038
	1,1,1-Trichloroethane	0.1	9								
	Acetone	-	56							0.01	0.14
	Benzene	-	500			1.14E-04	3.31E-04				
	Carbon Disulfide	1.9	49						0.0002	0.01	0.1225
	Carbon Tetrachloride	0.12	-		1.56E-08				0.0021		
	Chloroform	0.13	15	7.60E-10	7.93E-10	1.43E-07	2.09E-06		0.0002	0.01	0.375
	Dichlorobromomethane	0.28	-		1.74E-08				0.0002		
	Ethylbenzene	31	490						0.0039	0.1	1.225
	Methylene Chloride	0.67	-	4.82E-09	5.03E-09				0.0001		
	Tetrachloroethene (PCE)	4	34	1.99E-07	2.04E-07	1.10E-05	3.96E-05		0.005	0.05	0.85
	Trichloroethene (TCE)	0.22	9	2.74E-10	2.42E-09	5.34E-07	2.26E-06			0.02	
	Toluene	2.7	88						0.0002	0.01	0.11
	Total Xylenes	0.358	470								0.0588
	Vinyl Chloride	0.39	-	7.11E-07	7.41E-07						
	1,3,5 Trimethylbenzene	-	22								
	1,2,4 Trimethylbenzene	-	97								
	Isopropylbenzene	-	3.7								0.0116
	n-propylbenzene	-	16								
	sec butylbenzene	-	1.7								
	n-butylbenzene	-	7.7								
	phthalene	-	37								0.2313
	4-Isopropyltoluene	-	3.9								
Total Petroleum Hydrocarbons (TPH)	TPH as Diesel	27000	70000								
	TPH as Hydraulic Oil	6100	-								
	TPH as Gasoline	26000	51000								
TOTALS				3.20E-03	4.29E-03	1.40E-03	2.00E-03	75.21	114.8821	8.57	51.3
				3.20×10^{-3}	4.29×10^{-3}	1.40×10^{-3}	2.00×10^{-3}				
				320 / 100,000	429 / 100,000	140 / 100,000	200 / 100,000				

* mg/kg - milligrams per kilogram; ug/kg - micrograms per kilogram

ATTACHMENT 3 - PREDOMINANT RISK CONTAMINANTS AT THE U-HAUL FACILITY*

	CANCER RISKS						HAZARD INDICES					
	SOIL			GROUNDWATER			SOIL			GROUNDWATER		
CLARC II Ecology (1996)	(1)	Aldrin	(59.4%)	(1)	Arsenic	(79.7%)	(1)	Aldrin	(54.4%)	(1)	Arsenic	(75.6%)
	(2)	Arsenic	(22.0%)	(2)	Benzene	(16.6%)	(2)	Arsenic	(22.8%)	(2)	Chromium	(7.8%)
	(3)	Dieldrin	(14.1%)	(3)	PCE	(2.0%)	(3)	Dieldrin	(8.2%)	(3)	Copper	(4.6%)
Total of Risk Represented at the Facility			95.5%			98.3%			85.4%			88.0%
U-Haul Submittal (1993)	(1)	Aldrin	(75.3%)	(1)	Arsenic	(89.4%)	(1)	Aldrin	(79.7%)	(1)	Arsenic	(70.8%)
	(2)	Dieldrin	(17.8%)	(2)	Benzene	(8.0%)	(2)	Dieldrin	(6.0%)	(2)	Chromium	(7.3%)
	(3)	Arsenic	(3.4%)	(3)	DDD	(1.1%)	(3)	Ethion	(5.7%)	(3)	2,4-D	(5.9%)
Total of Risk Represented at the Facility			96.5%			98.5%			91.4%			84.0%

* Both the CLARC II (Ecology) and the U-Haul risk comparisons (from Attachment 2) are based on incidental ingestion of surface soils and groundwater. In both comparisons, neither cancer risk or the hazard indices evaluate real or potential risks from lead or the hydrocarbons (gasoline, diesel, hydraulic, waste oil). Lead and the hydrocarbons are suspected carcinogens and are very common contaminants at the U-Haul Facility.

ATTACHMENT 4 - METHODOLOGY AND SELECTION OF SOIL INDICATOR HAZARDOUS SUBSTANCES AT THE U-HAUL FACILITY [MTCA 173-340-708(2)]

When selecting 'indicator hazardous substances' MTCA requires:

"(2) Selection of indicator hazardous substances.

(a) When defining cleanup requirements at a site that is contaminated with a large number of hazardous substances, the department may eliminate from consideration those hazardous substances that contribute a small percentage of the overall threat to human health and the environment. The remaining hazardous substances shall serve as indicator hazardous substances for purposes of defining site cleanup requirements.

(b) If the department considers this approach appropriate for a particular site, the factors evaluated when eliminating individual hazardous substances from further consideration shall include:

(i) The toxicological characteristics of the hazardous substance which govern its tendency to persist in the environment;

(ii) The chemical and physical characteristics of the hazardous substances which govern its tendency to persist in the environment;

(iii) The chemical and physical characteristics of the hazardous substances which govern its tendency to move into and through the environmental media;

(iv) The natural background concentrations of the hazardous substance;

(v) The thoroughness of testing for the hazardous substance at the site;

(vi) The frequency that the hazardous substance has been detected at the site; and

(vii) Degradation by-products of the hazardous substance."

U-Haul Facility Indicator Hazardous Substances and their selection rationale:

Indicator Hazardous Substance	Rationale
Arsenic	Metal is toxic, persistent, carcinogenic, wide distribution at site.*
Aldrin	Pesticide is toxic, most common carcinogen at facility.*
Dieldrin	Pesticide is toxic, 2nd most common carcinogen at facility.*
DDT	Pesticide is toxic, carcinogenic, has daughter products, common to site.
Beta BHC	Pesticide is toxic, carcinogenic, common to Yakima Valley 'Pit'.
Gamma BHC (Lindane)	Pesticide is toxic, carcinogenic, common to Yakima Valley 'Pit'.
PCE	VOC** is toxic, carcinogenic, found in facility soil and groundwater.
TPH (Gasoline)	Wide contamination in the facility soil and groundwater.
TPH (Diesel)	Wide contamination in the facility soil and groundwater.

* see Attachment 3

** volatile organic compound

ATTACHMENT 5 - PROPOSED CLEANUP METHODS AND TECHNICAL BACKGROUND DATA AS SUBMITTED BY U-HAUL

METHOD #	CLASSES OF* CONTAMINANTS	CLEANUP LEVELS SUGGESTED BY U-HAUL*	EXCAVATION TREATMENT ON-SITE*	EXCAVATION DISPOSAL OFF-SITE*	OTHER REMEDIATION PLANNED**	IMPLEMENT-ABILITY	TIME INVOLVED	COST (MILLION)	COMMENT
42	Pest/Metals TPHD/TPHG VOCs	No Cleanup	NONE	NONE	Nothing	easy	xxxxxxxx	0	No Action Alternative
41	Pest/Metals TPHD/TPHG VOCs	No Cleanup	NONE	NONE	(a), (b), (f), (g)	easy	xxxxxxxx	0.6M	Institutional Controls and Groundwater
35C	Pest/Metals TPHD/TPHG VOCs	Method C – MTCA 1800/900 ppm MCL or 100X Meth. B	NONE	YES 2-3.4K yds^3	(a), (c), (e), (f)	very high; no problems	within 3 years	1.6M	Ecology desig. as State special waste
38C	Pest/Metals TPHD/TPHG VOCs	Method C – MTCA 1800/900 ppm MCL or 100X Meth. B	NONE	YES 2-3.4K yds^3	(a), (c), (e), (f)	very high; no problems	within 3 years	2.0M	Ecology desig. as State dangerous waste
26C	Pest/Metals TPHD/TPHG VOCs	Method C – MTCA 1800/900 ppm MCL or 100X Meth. B	YES 2-3.4K yds^3	NONE	(a), (b), (c), (d), (e), (f)	moderately high	within 3 years	2.3M	xxxxxxx
17B	Pest/Metals TPHD/TPHG VOCs	Method B – MTCA 1800/900 ppm MCL or 100X Meth. B	NONE	YES 15-25K yds^3	(c), (f)	high; but building is challenge	within 3 years	4.4M	Ecology desig. as State special waste
15B	Pest/Metals TPHD/TPHG VOCs	Method B – MTCA 1800/900 ppm MCL or 100X Meth. B	NONE	YES 15-25K yds^3	(c), (e)	high; but building is challenge	within 3 years	4.6M	Ecology desig. as State special waste
5B	Pest/Metals TPHD/TPHG VOCs	Method B – MTCA 1800/900 ppm MCL or 100X Meth. B	YES 15-25K yds^3	NONE	(c), (d), (e)	moderate; building is challenge	within 3 years	6.7M	xxxxxxx
16T	Pest/Metals TPHD/TPHG VOCs	Method B – MTCA 200/100 ppm MCL or 100X Meth. B	NONE	YES 30-51K yds^3	(e), (f)	mod. low; building is challenge	within 3 years	8.2M	Ecology desig. as State special waste

* TPHD/TPHG – Total Petroleum Hydrocarbons (Diesel and Gasoline); VOCs – Volatile Organic Compounds; ppm – parts per million; MCL – Maximum Contaminant Level; K = 1000

** (a) asphalt cap; (b) deed/access restrictions; (c) soil bioventing; (d) low-temperature thermal desorption; (e) groundwater air sparging; (f) long-term groundwater monitoring; (g) groundwater natural attenuation

ATTACHMENT 6 - U-HAUL CLEANUP ISSUES

AND IMPLEMENTATION DATES

ISSUES	DATES
Air Monitoring System Installed/Tested/Operating	Beginning of Excavation
Deepest Site Excavation (18-20 Feet)	During Low Groundwater at Site (February to midApril)
Backfill/Compaction Completed	by June 1, 2002
Replacement Monitoring Wells Installed and Developed	by June 1, 2002
Five New Downgradient Monitoring Wells Installed and Developed	by June 1, 2002
Bioventing System Installed and Operational	by June 1, 2002
Monitoring Well As-builts Submitted to Ecology	by July 1, 2002
Bioventing As-builts Submitted to Ecology	by July 1, 2002
1st Quarterly Groundwater and Bioventing Report (Data and Analyses) Submittal to Ecology	September 1, 2002
2nd Quarterly Groundwater and Bioventing Report (Data and Analyses) Submittal to Ecology	December 1, 2002
3rd Quarterly etc.	March 1, 2003

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