FINAL PRELIMINARY ASSESSMENT

WSU TREE FRUIT RESEARCH UNIT

WENATCHEE, WASHINGTON

Prepared For

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

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1.0 INTRODUCTION

PRC Environmental Management, Inc. (PRC) was requested by the U.S. Environmental Protection Agency (U.S. EPA) to perform a Preliminary Assessment/Site Inspection (PA/SI) at the Washington State University Tree Fruit Research Unit (WSU TFRU), located in Wenatchee, Washington (U.S. EPA identification number WAD 980833156). The work was performed as part of Work Assignment No. C10022, under the Technical Enforcement Support contract (TES 12). This report presents the results of the PA, which was conducted during March and April 1990 and included a site reconnaissance performed on April 24 and 25. A previous investigation revealed pesticide-contaminated soil within the former U.S. EPA test plot area.

1.1 PURPOSE

A PA is the initial step under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) to determine what, if any, clean up actions should be taken at uncontrolled hazardous waste sites. Information collected during the PA is used to determine whether a site should be placed on the National Priorities List (NPL) for Superfund-financed cleanups. The PA consists of analyzing existing information and making a site reconnaissance to determine whether a release of hazardous substances may be serious enough to require additional investigation or other action. Specifically, the goals of a PA are to:

- Gather existing data to facilitate later evaluation of the release(s) pursuant to the Hazard Ranking System (HRS), if warranted.
- Eliminate from further consideration those sites that pose no threat to public health or the environment.
- Determine whether there is any potential need for removal action.
- Set priorities for the SI.

1.2 REPORT DESCRIPTION

This report presents the results of previous investigations and summarizes the site information collected during file reviews, interviews, and a one-day site reconnaissance. The report concludes with SI task recommendations designed to establish the potential for environmental release of contaminants. Appendix A contains the completed PA Data Collection Form which will be used by U.S. EPA to develop the HRS scores for the WSU TFRU. A site reconnaissance report and photographs are included in Appendix B.

This PA was performed in accordance with the following documents:

- *National Oil and Hazardous Substances Pollution Contingency Plan*, § 300.420(b), Federal Register, Volume 55, Number 46, March 8, 1990, pages 8666-8865.
- *Preliminary Assessment Guidance, Fiscal Year 1988*, U.S. Environmental Protection Agency, OSWER Directive 9345.0-01, January 1988.
- *Hazard Ranking System (HRS) for Uncontrolled Hazardous Substance Releases; Appendix A of the National Oil and Hazardous Substances Contingency Plan; Proposed Rule*, Federal Register, Volume 53, Number 247, December 23, 1988, pages 51962-52081.

1.3 PREVIOUS INVESTIGATIONS

Previous investigations performed at the WSU TFRU include soil sampling by WSU personnel from 1985 through 1987 (Hagihara, 1987) and an inspection by U.S. EPA personnel in 1987.

Dwight Hagihara of WSU collected composite soil samples to a depth of approximately 1 foot inside the test plot area in May 1985 and April 1986 and 1987. Soil samples were also collected during 1986 and 1987, approximately 2 feet downgradient of the test plot area, outside of the fenced area. Within the fenced area, p,p'-DDE and p,p'-DDT were found at concentrations 1,459 mg/kg and 3,077 mg/kg, respectively. The highest concentration detected outside of the fenced area was p,p'-DDT at 4.1 mg/kg .

During the 1987 U.S. EPA inspection, Stanley Hoyt, Superintendent of the WSU Tree Fruit Research Center, was interviewed about the history of the site. Dr. Hoyt concluded that human exposure was not a major concern, and that the cleanup of the site should be the responsibility of U.S. EPA and not WSU. Dr. Hoyt suggested that Homer Wolfe, the former Director of the U.S. EPA laboratory, and Mr. Hagihara, who is responsible for hazardous waste handling at WSU, be contacted for more information. Several photographs were taken during the 1987 inspection, and a narrative description of the test plot area was included in the inspection report memorandum (Boys, 1987).

2.0 PRELIMINARY ASSESSMENT RESULTS AND DISCUSSION

2.1 SITE HISTORY

The WSU TFRU test plot area is located at 1100 North Western Avenue, approximately 1/2 mile west of the city limit of Wenatchee, Washington (latitude 47° 26' 22" North, 122° 20' 55"

West) (Figure 1). The 2100 ft^2 (0.05 acre) test plot area and adjacent chemical storage shed is part of the 55-acre WSU Tree Fruit Research Center, which WSU acquired in 1937 (Hoyt, 1990). Research on pesticide degradation was conducted at the test plot area by the U.S. Public Health Service, which leased the area from WSU, beginning in 1966. The U.S. EPA Health Effects Research Laboratory, based in Research Triangle Park, North Carolina, continued the research at the test plot area from the early 1970s until the early 1980s.

The studies performed at the test plot area by the U.S. Public Health Service and U.S. EPA included the persistence of parathion and azinphosmethyl (guthion) residues in soil (Wolfe and Durham, 1966; Wolfe et al., 1973; Staiff et al., 1975); the degradation of small quantities of methyl parathion in soil using acidified zinc (Butler et al., 1981a; Staiff et al. 1977); and the reductive degradation of dieldrin and endrin using acidified zinc (Butler et al., 1981b). Table 1 presents a list of pesticides used in research at the test plot area.

In 1985, WSU expressed concern that U.S. EPA had apparently abandoned the site without properly disposing of pesticide-contaminated soils. The site is currently covered with grass and surrounded by a locked, 7 foot high, chain-linked fence with a 2-foot barbed wire extension. Warning signs are posted on the fence indicating the site contains pesticides. A 12-foot by 8-foot storage shed is located adjacent to the test plot area. This shed contains chemicals used by U.S. EPA during the research and currently being used, at least partially, by U.S. Department of Agriculture personnel. Table 2 presents an inventory of these chemicals. Several chemicals in the shed (for example, methyl ethyl ketone and heptane) pose a risk due to their incompatibility with oxidizing agents (such as sulfuric acid). This incompatibility could result in explosions (Genium, 1986, 1987).

The nearest residence is a trailer home located approximately 45 feet south of the fenced boundary. Approximately 37,000 people live within a 4 mile radius of the site; 84 percent of those live within 1/2 to 3 miles.

A laboratory that is used to support the research at the test plot area is located approximately 1000 feet southeast of the plot (Figure B-1, Appendix B). During site reconnaissance, it was discovered that the laboratory was used by the U.S. Public Health Service, the U.S. Department of Agriculture, and the U.S. EPA from 1952 to 1985. The laboratory is currently used by WSU graduate students. Waste from the sinks in this laboratory flowed to a drain field adjacent to the building until 1979, when a new 1000 gallon septic tank was installed and connected to the laboratory sink drain line. The outlet to this tank was connected to the existing sanitary sewage drain field.

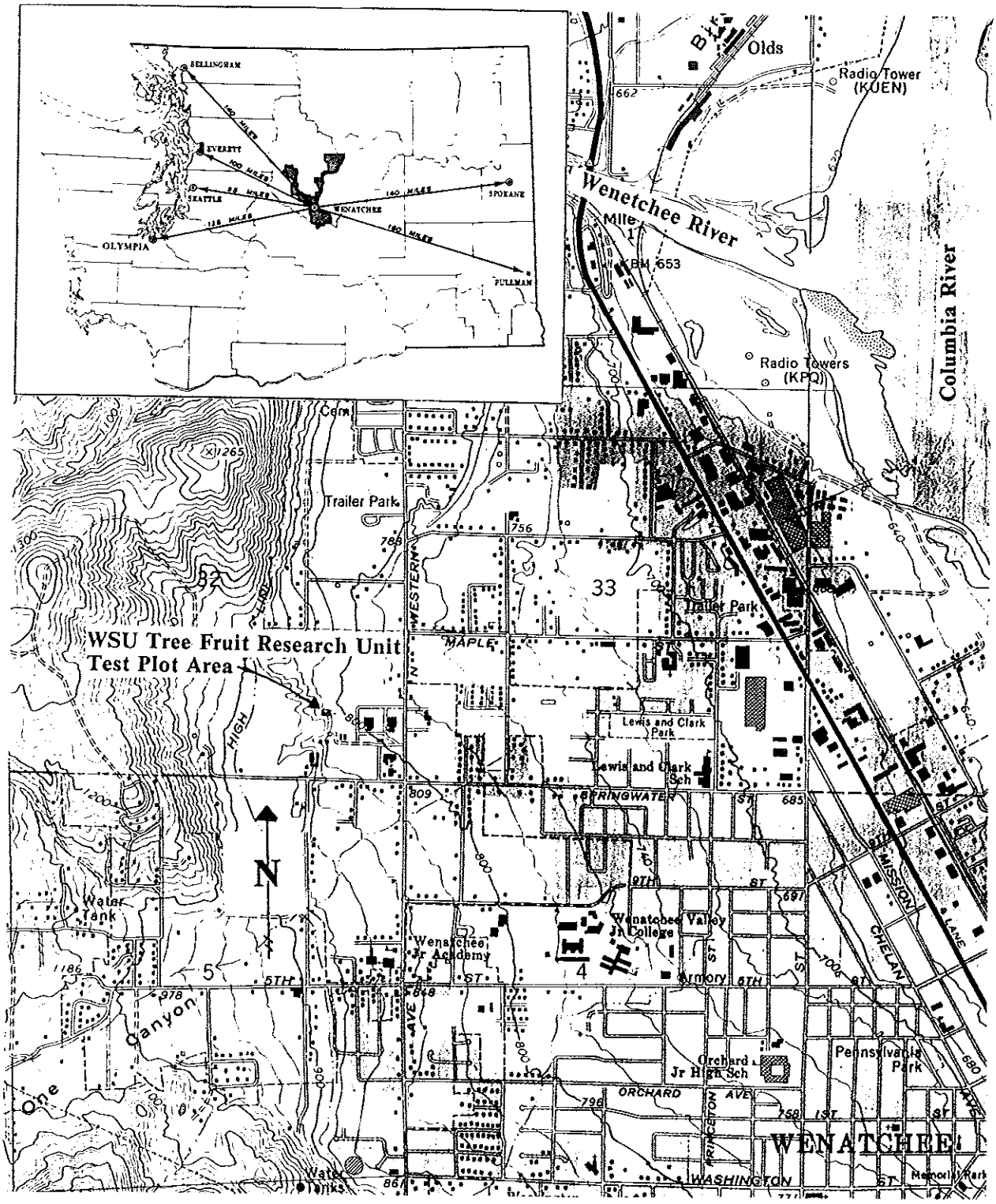

Figure 1. Location Map for the WSU Tree Fruit Research Unit, Wenatchee, Washington (elevations in feet)

0 ═══ 2000ft

Source: USGS, 1987; SCS/USDA, undated

TABLE 1

PESTICIDES USED IN RESEARCH AT THE TEST PLOT AREA
(Hagihara 1987, 1990; Loiselle, 1990a)

Carbaryl
DDT
DDE
Dieldrin
Disyston
Endrin
Furadan
Guthion
Paroxon
Paraquat
Parathion

TABLE 2

CHEMICAL INVENTORY OF FORMER U.S. EPA
STORAGE SHED (Schaff, 1989)

Chemical	Quantity
Acetic Anhydride	5 pints
Acetic Acid	20 pounds
Acetone	unknown
Amyl Acetate	9 pints
Iso-Amyl Acetate	1 gallon and 5 pints
Acetonitrile	6 gallons
Benzene	13 gallons
1-Butanol	6 kilograms
Carbon Tetrachloride	7 pints
Chloroform	Unknown
2-Chloro-2-methylpropane	1 Kg
1,2-Dichloroethane	23 pints
Dioxane	6 pints
Ethyl Acetate	11 gallons and 11 pints
Ethylene Glycol	17 gallons
Heptane	3 gallons
Hexane	88 gallons
Iso-Octane	50 gallons
Isopropylamine	1 liter
Isopropyl alcohol	17 gallons
Methylene Chloride	7 gallons
Methyl Ethyl Ketone (2-Butanone)	3 gallons and 25 pints
2-Methyl-2,4-Pentandiol	4 gallons
1-(2-Methoxypropoxy)-2-Propanol	5 kilograms
Monoethanol Amine	1 gallon
N,N-Dimethylformamide	11 pints
Petroleum Ether	33 gallons
Propylene Glycol	5 gallons
Pyridine	5 pints
Sulfuric Acid	72 lbs
Tetrahydrofuran	8 pints
Toluene	21 gallons
Xylene	8 gallons and 17 pints

2.2 SITE GEOLOGY

The WSU TFRU is located near the border between two major physiographic divisions, the Columbia Basin division to the east, and the Cascade Mountains on the west. The Cascade Mountains are composed of a variety of volcanic rocks and sediments which are being eroded while sporadically active volcanism is still taking place in certain areas. The Columbia Basin is a structural and topographic basin which has a thick accumulation of flood-type basalt flows and intercalated sediments (DNR, 1978).

The site itself is situated approximately 800 feet above sea level, on the western side of the Columbia River. The eastern foothills of the Cascades rise approximately 1000 to 1500 feet above the site and lie one-half mile west of the site (USGS, 1987). In this area, the mountains are composed of Chumstick Formation volcaniclastic sediments consisting of sandstone, shale, and conglomerate. Interspersed with the sediments are Tertiary-aged intrusive rocks of intermediate to acidic composition, occurring as plugs, dikes, and sills (USGS, 1982).

The site lies on the northern, medial portion of an alluvial fan deposited from a steep, ephemeral drainage known as Number One Canyon, which flows east northeast. This canyon drains an area west of the site. The fan is composed of poorly-sorted, boulder gravel and gravelly sand. The clasts which are generally subangular, are composed of volcanic and sedimentary rocks typical of the drainage basin. The fan has a relatively steep gradient of approximately 200 feet per mile. The fan grades laterally eastward into the Columbia River alluvium, which has a much flatter gradient.

Soils developed on the Number One Canyon fan are of the Burch-Cashmont Association. These soils are medium to moderately coarse textured sandy loams to gravelly loams. The soil was formed on terraces, alluvial fans and foot slopes along the river valleys. Permeability is rated at moderate (0.63 to 2.0 inches per hour) to moderately rapid (2.0 to 6.3 inches per hour). Runoff is generally very small, most of it occurs during severe thunderstorms and spring snow melt. The slopes in the immediate area of the site are generally less than three percent (USDA/SCS, undated).

2.3 SITE HYDROGEOLOGY

There is little data concerning the hydrogeology at the site itself. However, inferences taken from the regional geology, the site's location, and water well reports from borings within two miles of the site can be used to characterize the hydrogeology in a conceptual manner.

Based on the 1987 topographic map of the Wenatchee quadrangle (USGS, 1987), the site lies approximately 194 feet above the Columbia River's normal pool elevation. Well logs from the Department of Ecology (Ecology, 1990) indicate that the water table in the alluvial materials along the west side of the river rises in elevation above mean sea level as it approaches the mountains. The primary recharge to the ground water is from infiltration and subsurface flow from the higher elevations, which receive more precipitation. Infiltration of ephemeral flow in Number One Canyon Creek probably also acts as a source of recharge. Irrigation and direct infiltration of precipitation acts as an on-site source of recharge. A surface water diversion called the High Line Ditch lies approximately one-half mile to the west, upgradient of the site. It is not known whether this ditch is lined or whether there is any leakage from it that could create recharge to the ground water.

Ground-water flow at the site is probably east-southeast to southeast. However, the depositional axis of the Number One Canyon alluvial fan runs to the northeast at the site. Because of the heterogeneous nature of fan deposits and the consequent heterogeneity of their hydraulic conductivities, ground-water flow may follow the highest conductivity units in a direction contrary to the expected gradient. Preferential permeability would coincide with the depositional axis of the fan, so it is possible that some flow components near the site flow more northeasterly than might be expected.

A water well report for a domestic well drilled in the SW 1/4, SW 1/4 Section 4, Township 22 North, Range 20 West (approximately one mile south of the site), indicates a hard pan layer from 9 to 21 feet below ground surface and a 17-foot-thick clay layer starting at 38 feet below ground level. The materials encountered ranged from gravel to clay, which is typical of alluvial fan deposits. One implication of the hard pan and clay layers is the potential for existence of localized perched water tables. These would affect ground water movement and any transport of contaminants. The well was dry at a depth of 120 feet below ground surface and is located along the depositional strike of the fan deposits.

Two wells located in the NE 1/4, SE 1/4 Section 4, Township 22 North, Range 20 West had static water levels of 110.5 feet and 113 feet below ground surface. These wells lie approximately one mile to the southeast toward the river from the site. By extrapolation from these wells in relation to the site, it is anticipated that the water level at the site would lie approximately 150 feet below ground surface (with the exception of any perched zones). None of the existing wells penetrate the full saturated thickness of the aquifer. There is no available geologic information about the thickness of the fan and river alluvium deposits.

There are no water quality data for the site. Nevertheless, site water quality can reasonably be expected to differ from that of the Columbia River because if its proximity to recharge areas in the mountains and its distance upgradient from the river.

The potential for contamination via leaching of pesticides into the ground water appears to be low. This is due to pesticide tendency to adsorb onto clays and organic matter in the soils. Moreover, these pesticides generally have a low solubility in water. These factors, combined with the suspected great depth to water, create a situation with relatively low potential for ground-water contamination. On the other hand, the unknown chemicals discharged from the laboratory to the adjacent drain field could behave differently.

The test plot is not located in the flood plain of any water body, but the drain field for the former U.S. EPA laboratory is located within the flood plain of Number One Canyon Creek. The maximum flood there is predicted to be 1 foot of water during the 100-year flood (FEMA, 1989).

3.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the information collected during this preliminary assessment, the WSU TFRU test plot area appears to pose no immediate threat to ground water or surface water in the area. On the other hand there is some possibility for airborne transport of contaminated soil. The site is surrounded by a locked chain-link fence with a barbed wire extension, making direct access very difficult. Very little information is available on the potential for release from the laboratory septic tank and drain field.

Further investigation is needed to verify any releases to the environment from the test plot and the laboratory septic tank and drain field. It is recommended that a site inspection be conducted, and that it include the following:

- Collection of soil samples in the surrounding orchards and non-orchard area to determine the background levels of the pesticides of interest.
- Collection of soil samples outside the fenced area and adjacent to the nearby mobile home to determine whether any contaminants are migrating off-site.
- Collection of soil samples (from boreholes) upgradient and downgradient of the septic tank drain field to verify any releases to the environment.

Whether or not these sites should be eliminated from further consideration, and whether removal or remedial action is needed, are questions to be decided after the SI data are evaluated.

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APPENDIX A

Completed PA Data Collection Form

DRAFT

PA DATA COLLECTION FORM

GENERAL INFORMATION

1) Site Record Number: (fill in) ----

2) Coordinates 47°26'22" N. Latitude 122°20'55" W. Longitude

3) EPA ID #: WAD 980833156

SITE DESCRIPTION

1) Site Name: (fill in) Washington State University (WSU) Tree Fruit Research Unit

2) Site Address: 1100 North Western Avenue

City/County/State Wenatchee, Chelan, Washington Zip 98801

3) Site Operating History (describe): In 1966 the U.S. Public Health Service initiated pesticide degradation studies using this property leased from WSU. EPA Research Triangle Park conducted further pesticide related studies from 1975 through the early 80s.

4) Site Operator

Name U.S. EPA Health Effects Research Laboratory Phone: (919) 541-4303

Address

City/County/State Research Triangle Park, Durham, North Carolina Zip 27711

SITE OWNERSHIP

1) Current Owner

Name Washington State U. Tree Fruit Research Center Phone: (509) 663-8181

Address 1100 North Western Avenue

City/County/State Wenatchee, Chelan, Washington Zip 98801

Dates of Ownership: from 1937 to present

Type of Ownership: (Check one)

- ☐ Private
- ☐ Federal
- ☒ State
- ☐ County
- ☐ Municipal
- ☐ Other (describe)

2) Previous Owner

Name Unknown Phone:

Address

City/County/State Zip

Dates of Ownership: from ____ to ____

Type of Ownership: (Check one)

- ☐ Private
- ☐ Federal
- ☐ State
- ☐ County
- ☐ Municipal
- ☐ Other (describe)

Source of information: Loiselle, 1990; Hoyt, 1990; Shuster, 1990

Data Type (Check One): ☒ H ☐ E ☐ D

REGULATORY AND RESPONSE HISTORY

1) Regulatory Activities Prior to CERCLA Involvement (check all that apply)

- ☐ RCRA
- ☐ NPDES
- ☐ Other Federal Programs
- ☐ State/Local Regulations
- ☒ None
- ☐ Unknown
- ☐ Other (describe)

2) RCRA Status

- ☐ Underground Storage tank
- ☐ Very Small Quantity Generator
- ☐ Small Quantity Generator
- ☐ 90-Day Accumulator
- ☐ Permitted Facility - Final
- ☐ Permitted Facility - Interim
- ☐ Unpermitted Facility
- ☐ Unknown
- ☒ Not Applicable

Source of information: Loiselle, 1990b

Data Type (Check One): ☐ H ☐ E ☐ D

PA DATA COLLECTION FORM

WASTE/SOURCE INFORMATION (COMPLETE ONE PAGE FOR EACH SOURCE)

1) *Source Name:* Test Plot Area

2) *Source Type (Check One):*

☐ Drums ☐ Land Treatment ☐ Waste Pile
☐ Nondrum Containers ☐ Landfill ☐ Other (describe) _____
☒ Contaminated Soil ☐ Surface Impoundment

Source of Information: Hagihara, 1987

Data Type (Check One): ☒ H ☐ E ☐ D

VOLUME/AREA INFORMATION

1) *Fire Site?* Y/N N 2) *Volume (if applicable):* Unknown yd^3 3) *Area (if applicable):* 2100 ft^2

Is this information complete? _____ Is this area "readily attainable"? NO

Source of Information: _____ Source of Information: Shuster, 1990

Volume Calculation: _____ Area Calculation: _____

Site surrounded by a 7 ft. chain link fence & 2 additional feet of barbed wire.

4) *List all contaminants actually or potentially detectable in this source:*

Parathion	Guthion	DDT	
Dieldrin	Endrin	DDE	breakdown products of
Paroxon	Disyston	Carbaryl	these pesticides
Paraquat	Furadan		

Source of Information: Hagihara, 1987; 1990; Loiselle, 1990a

Data Type (Check One): ☒ H ☐ E ☐ D

WASTESTREAM INFORMATION

Instructions: Complete the following for each wastestream known to have been deposited in this source.

1) Wastestream #1 (Name): Pesticides used in soil degradation research

Quantity Deposited (WQD): unknown Complete? YES

List constituents and concentrations (if known):

Constituent	maximum Concentration (ppm)	Constituent	maximum Concentration (ppm)
Ethyl Parathion	0.2	p,p'DDD	126
p,p'DDE	1,458	p,p'DDT	3,077
o,p'DDT	816.	Dieldrin	0.020

Source of information: Hagihara, 1987

Data Type (Check One): ☒ H ☐ E ☐ D

2) Wastestream #2 (Name): _____

Quantity Deposited (WQD): _____ Complete? _____

List constituents and concentrations (if known):

Constituent	Concentration	Constituent	Concentration

Source of information: _____

Data Type (Check One): ☐ H ☐ E ☐ D

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PA DATA COLLECTION FORM

CONTAINMENT

Source Type — *Air Pathway Gaseous and Particulate Emissions (Check one per category for each source type above, use default of 3 if containment for each source is unknown)*

N/A

Fire Site Status: ☐ Active ☐ Inactive

Fire Site Type: ☐ Above Ground ☐ Below-ground soil cover thickness _____ ☐ Soil resistant to gas migration? Y____ N____

N/A

Container Condition: ☐ Intact, sealed ☐ Open, unsealed, or non-intact

Container Cover: ☐ Maintained ☐ Unmaintained ☐ Uncovered

Landfill/Contaminated soil

Source Condition: ☐ Intact, synthetic cover ☐ Waste totally enclosed in an intact building

☐ Waste totally enclosed in non-intact building ☒ Source exposed

Soil Cover: ☐ Uncontaminated soil cover thickness _____ ☒ Contaminated cover soil or waste uncovered or exposed ☐ Cover soil resistant to gas migration? Y____ N____

Gas Collection System: ☐ Functioning ☐ Non-Functioning ☒ None

Vegetation: ☐ Heavy ☒ Light ☐ Substantially devoid of vegetation

Windbreak: ☒ Site surrounded by windbreak (e.g. fence, trees, etc.) ☐ No windbreak

Surface Impoundment (if dry, evaluate as a landfill)

N/A

Enclosure: ☐ Enclosed ☐ Non-enclosed ☐ None

Cover: ☐ Totally covered ☐ maintained ☐ unmaintained ☐ Partially covered ☐ maintained ☐ unmaintained

Source of information: Boys, 1987; Shuster, 1990

Data Type (Check One): ☒ H ☐ E ☐ D

Source Type — **Ground Water and Surface Water Pathways (Check all applicable items, use default of 10 if containment for each source is unknown)**

N/A

Containers
Tanks
Land Treatment
Pile

☐ All containers buried

☐ Evidence of hazardous substance migration, or no liner and diking surrounding containment, tank, land treatment, or pile area

☐ No evidence of hazardous substance migration
- ☐ Is there a single or double liner? _____
- ☐ Is the container area surrounded by sound diking? Y/N ____
- ☐ Is there a liquids collection and removal system? Y/N _____
- ☐ Adequate freeboard? Y/N ____
- ☐ Is there run-on control? Y/N ____
- ☐ Vegetative cover for land treatment area? Y/N ____

N/A = Not Applicable to this site.

DRAFT

PA DATA COLLECTION FORM

CONTAINMENT (continued)

Source Type — *Ground Water and Surface Water Pathways (Check all applicable items, use default of 10 if containment for each source is unknown) (Continued)*

Landfill / Contaminated Soil

- ☒ Evidence of hazardous substance migration from the landfill, or no liner or none of the following present: engineered cover, functioning and maintained run-on control system and run-off management system, or leachate collection and removal system.
- ☐ No evidence of hazardous substance migration
  - ☐ Is there an engineered cover? Y/N ____
  - ☐ Is there a functioning and maintained run-on control and run-off management system? Y/N ____
  - ☐ Is there a single or double liner? ____
  - ☐ Is there a leachate collection and removal system? Y/N ____

Surface Impoundment

N/A

- ☐ Evidence of hazardous substance migration; or no liner; or free liquids present with either no diking, unsound diking, or diking that is not regularly maintained.
- ☐ No evidence of hazardous substance migration
  - ☐ Is there a single or double liner? ____
  - ☐ Is there sound diking? Y/N ____
  - ☐ Is there adequate freeboard? Y/N ____
  - ☐ Have all free liquids been eliminated at closure? Y/N ____

Source of information: Boys, 1987; Shuster, 1990

Data Type (Check One): ☑ H ☐ E ☐ D

SURFACE WATER CONTAINMENT (Flood)

1) Determine the flood frequency (annually, 10 year, 100 year, 500 year) in which this source is partially or fully located.

Not located in flood area

2) Is the containment at the source adequate to prevent any washout of hazardous substances by a flood (must be certified by a professional engineer)? Y ____ N ____

Source of information: FEMA, 1989

Data Type (Check One): ☒ H ☐ E ☐ D

ACCESSIBILITY/FREQUENCY OF USE

1) Does quantitative or qualitative information exist to indicate site-related soil contamination on the property of a park, playground, school, or other areas designated for use by the public?

Y/N N (If no, assign a default value of 75)

Source of information: Shuster, 1990

Data Type (Check One): ☒ H ☐ E ☐ D

AIR MIGRATION PATHWAY

LIKELIHOOD OF RELEASE

1) Does any qualitative or quantitative information exist to indicate a release to air? Y/N Y

Describe: The site is covered with grass and one 10 ft. elm tree. During the summer, this area is expected to get very dry and possibly become a source of airborne particles.

Source of information: Shuster, 1990

Data Type (Check One): ☐ H ☒ E ☐ D

2) If particulates are present at the site, assign a Thornthwaite P-E Index (See Figure 2-3 on page FR52011 in proposed rule): 25

AIR MIGRATION PATHWAY(continued)

TARGETS

1) *Determine the distance from the emission source to the nearest individual (includes closest residence or regularly occupied building or area):* NOTE - If unknown or not readily attainable, assign default value of 50.

45 feet

Source of information: Shuster, 1990

Data Type (Check One): [X] H [ ] E [ ] D

2) *Determine the population within a four-mile radius of the onsite emission source (use of online databases is encouraged)*

Distance	Population
onsite	-0-
0-1/4	92
1/4-1/2	626
1/2-1	3,285
1-2	10,126
2-3	17,917
3-4	5,147

Source of information: U.S. Dept. of Commerce, 1982; USGS, 1987; Hughes, 1990

Data Type (Check One): [ ] H [X] E [ ] D

Determine the shortest distance between an onsite emission source and each of the following types of land uses:
NOTE - If unknown, or not readily attainable, assign default value of 10.

Land Use Categories	Distance (miles)
Commercial/industrial/institutional	0.095 (500 feet)
Single-family residential	0.009 (45 feet)
Multi-family residential	0.663 (3,500 feet)
Parks	0.7 (3,700 feet)
Prime agricultural	0.0004 (20 feet)
Non-prime agricultural	unknown

Source of information: Shuster, 1990; USGS, 1987; Hughes, 1990

Data Type (Check One): [X] H [ ] E [ ] D

4) *Determine the distance to each sensitive environment within the 2-mile target distance limit (see Attachment A for list of sensitive environments).*

Sensitive Environment	Distance (miles)
Habitat known to be used by Federal designated threatened or endangered species	within two miles

Source of information: Fielder, 1990

Data Type (Check One): [ ] H [X] E [ ] D

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GROUND WATER MIGRATION PATHWAY

LIKELIHOOD OF RELEASE

1) *Is there any positive or circumstantial evidence of a release to ground water?* Y/N NO

Describe: There are no wells within 1-1/3 miles of the site. It is unknown if pesticide scans have been conducted on any wells in the area.

Source of information: Ecology, 1990

Data Type (Check One): ☐ H ☒ E ☐ D

2) *Provide the aquifer name and determine whether the aquifer is Karst on Table 1.*

Source of information: Wengreen, 1990; Ecology, 1990

Data Type (Check One): ☐ H ☐ E ☐ D

TABLE 1 - Aquifer Selection

No.	Aquifer Name	Karst (Y/N)
1	Columbia River Alluvial Aquifer	N
2		
3		

3) *On Table 2, provide a description for each geologic/hydrologic unit underlying the site from the surface to the aquifer of concern.*

Source of information: ---

Data Type (Check One): ☐ H ☐ E ☐ D

TABLE 2 - Description of Geologic/Hydrologic Units

Depth of Contamination (ft) unknown Depth to Aquifer (ft) _____

Layer Description	Layer Thickness	Hydraulic Conductivity	Sorbent Content (%) (See Table 3)
Unknown			

TABLE 3 - Sorbent Content of Geologic Materials

Type of Material	Average sorbent content (percent clays plus percent organic carbon)
Coal seams, peat or organic-rich sediments	77
Clays, silts, till, loesses, par, sands, sediments that are predominantly clay or silt, claystones, mudstones, shales (including oil shales or siltstones)	64
Sands, sediments that are predominantly sands, sandstones, or argillaceous limestones and dolomites	15
Limestones and dolomites, limey sediments or gravels	9

4) Determine net precipitation: 0 inches/year (9 inches precipitation, 27 in. evapotranspiration)
Source of information: SCS, 1990; Donaldson and Ruscha, 1975

Data Type (Check One): ☒ H ☐ E ☐ D

GROUND WATER MIGRATION PATHWAY (continued)

GROUND WATER TARGETS

1) What is the distance from the source area to the nearest drinking water well (MEI)? _____

Source of information: _____

Data Type (Check One): ☐ H ☐ E ☐ D

2) For each distance ring, provide the population served by ground water (NOTE: For those wells with positive or circumstantial evidence of a release, assume actual contamination).

Distance (miles)	Actual Contamination Population Served	Potential Contamination Population Served
onsite	0	0
0-1/4	0	0
1/4-1/2	0	0
1/2-1	0	0
1-2	0	0
2-3	0	0
3-4	0	0

Source of information: Wengreen, 1990

Data Type (Check One): ☐ H ☒ E ☐ D

3) Determine drinking water use within a 4-mile radius of the site (Check the highest item from the list).

a. ☐ Public supply, no water from alternate unthreatened sources available _____

b. ☐ Private supply, no water from alternate unthreatened sources available

c. ☒ Public water supply, alternative unthreatened source readily available _____

d. ☐ Private water supply, alternative unthreatened source readily available

e. ☐ Standby well, used less than annually but used in past 10 years _____

f. ☐ Standby well, maintained but not used in past 10 years _____

g. ☐ Not currently used, but usable

h. ☐ Unusable (e.g., extremely saline aquifer as defined in the SDWA)

i. ☐ Other (describe): _____

Source of information: Wengreen, 1990; Smith, 1990

Data Type (Check One): ☐ H ☒ E ☐ D

4) Identify and describe other water use (agricultural, commercial, institutional) within a 4-mile radius of the site (check the highest item from the list).

a. ☒ Used for irrigation (5 acre min.) of commercial food crops or forage commercial crops _____

b. ☐ Used for commercial livestock watering _____

c. ☐ Used for commercial food preparation _____

d. ☐ Commercial/industrial purposes other than drinking water _____

e. ☐ Not used for any of the above _____

Source of information: Crane, 1990

Data Type (Check One): ☐ H ☐ E ☐ D

5) Is the site located within a Wellhead Protection Area? Yes ___ No X

Source of information: Crane, 1990

Data Type (Check One): ☒ H ☐ E ☐ D

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SURFACE WATER MIGRATION PATHWAY

Instructions: Obtain the following information only if there is a surface water body within 2 miles of the site. (See FR52040 or section 4.0.3 for definition of surface water body)

LIKELIHOOD OF RELEASE

1) Enter the following information into Table 4 for all surface water bodies within 15 downstream miles of the site.

- Segment name (i.e., Potomac River, Meddybemps Lake, etc.)
- Segment type (see Table 5)
- Start and end point for each segment in downstream miles from probable point of entry (PPE)
- Average annual stream flow (cubic feet per second (cfs)) NOTE - Define a new segment where there is a change in stream flow or surface water body type

Source of information: USGS, 1987; Hughes, 1990; Shuster, 1990

Data Type (Check One): ☐ H ☐ E ☐ D

2) Attach a simplified sketch of surface runoff and surface water flow system for 15 downstream miles. Also, locate intakes, fisheries, sensitive environments, and gauging stations.

3) Is there any positive or circumstantial evidence of surface water contamination ? Y/N N (If yes, proceed to surface water targets section) Describe: _____

Source of information: Shuster, 1990

Data Type (Check One): ☐ H ☒ E ☐ D

TABLE 4 - Watershed Description

No.	Segment Name	Segment Type from Table 5	Start Point (miles)	End Point (miles)	Flow (cfs)
1	Columbia River	1	1.6	2	119,900
2					
3					
4					
5					

TABLE 5 - Segment Type

#1	River	
#2	Small Pond	0-5 Acres
#3	Large Pond	5-500 Acres
#4	Small Lake	500-1,000 Acres
#5	Medium Lake	1,000-5,000 Acres
#6	Large Lake	5,000> Acres
#7	Great Lake	
#8	Ocean (Salt Water)	
#9	Mixing Area	

POTENTIAL TO RELEASE

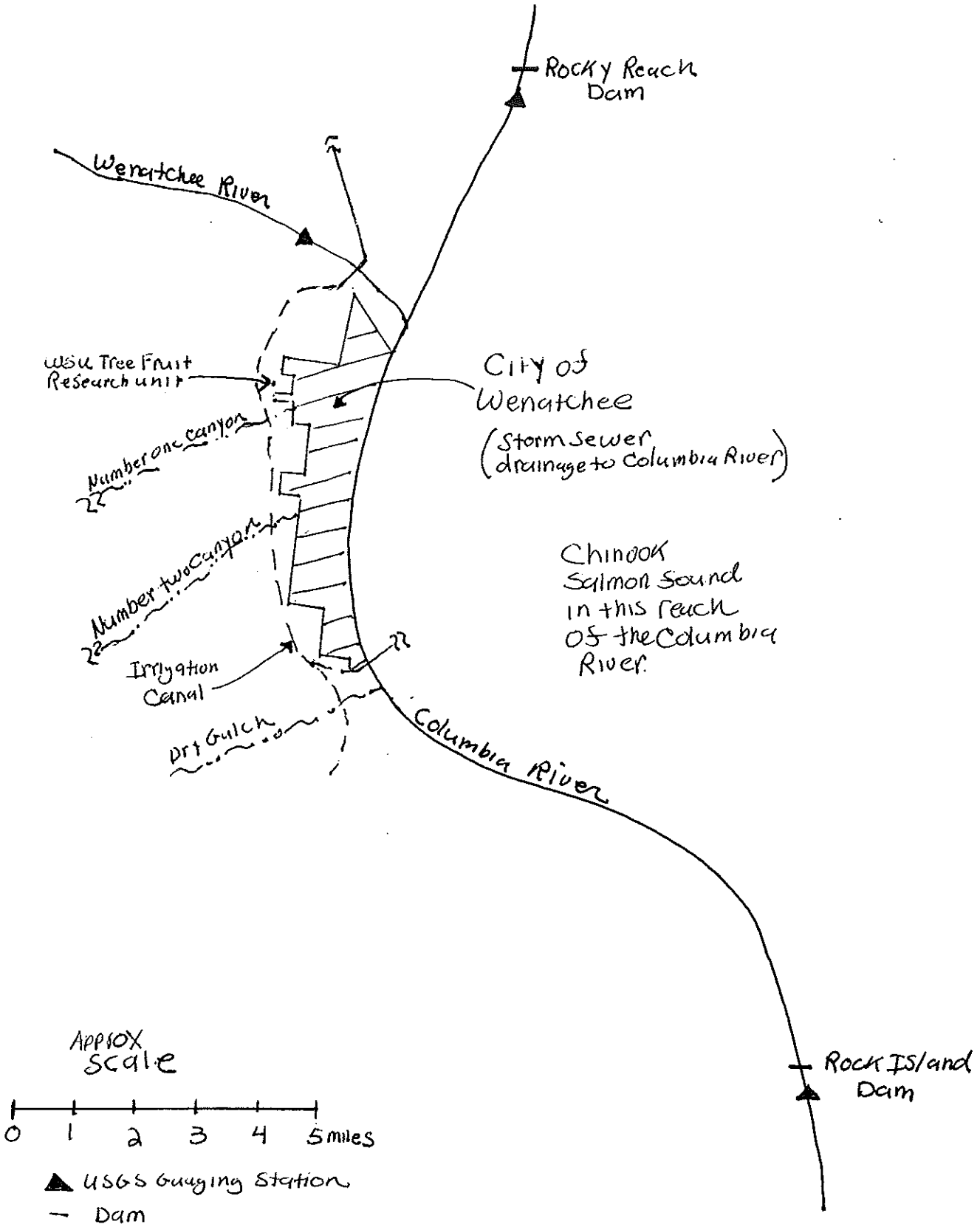
1) Determine the following and enter into corresponding space below:

- 2 yr., 24 hour rainfall 1.5 inches
- Drainage area in acres (site area and area upgradient of the site). Do not include any portion of the drainage area where runoff is diverted away by storm sewers or run-on control and/or runoff management systems 0 runoff, if any, gets picked up by city storm sewer
- Runoff curve number based on the predominant land use (within the drainage area) and the hydrologic soil group that is found within the predominant land use category. (see Attachment B) 70, type B
- Distance to surface water (measure from the nearest source to the probable point of entry (PPE)). 1.6 miles

Source of information: NOAA, 1973; USGS, 1987; USDA/SCS, undated

Data Type (Check One): ☒ H ☐ E ☐ D

Surface wa rs 15 miles downstream of WSU
Tree Fruit Research Unit, Wenatchee, Washington



SURFACE WATER MIGRATION PATHWAY(continued)

DRINKING TARGETS

1) For each drinking water intake located within 15 miles of the site determine the population served (NOTE - for those intakes with positive or circumstantial evidence of a release, assume actual contamination).

Intake	Distance	Population Served	Level of Contamination	
Atwood, P.W.	5.5 miles	4	☐ Actual	☒ LOW Potential
Lockwood, C.	6 miles	multiple households	☐ Actual	☒ LOW Potential
Schmoker, W.	6 miles	4	☐ Actual	☒ LOW Potential

Source of information: Ecology, Recorded water rights, Region 4

Data Type (Check One): ☒ H ☐ E ☐ D 9 other "domestic, single" water rights on the Columbia River within 15 miles of the site.

2) From the list above, determine the nearest drinking water intake (MEI)? Atwood, P.W.

Source of information: Ecology, 1990

Data Type (Check One): ☒ H ☐ E ☐ D

3) Determine surface water drinking water use and other water use within 15 miles downstream of the site (check the highest item on the list).

Surface Water Drinking Water Use

- ☒ No adequate alternative supply, and no feasibility study completed
- ☐ No adequate alternative supply, could be developed, threatened by site
- ☐ No adequate alternative supply, could be developed, unthreatened by site
- ☐ Alternative source is developed and threatened by site
- ☐ Alternative source is developed and unthreatened by site
- ☐ Standby water intake, used less than annually, used in past 10 years
- ☐ Standby water intake, maintained but not used in past 10 years
- ☐ Private water supply and no alternative is readily available
- ☐ Private water supply, alternative unthreatened source readily available
- ☐ Designated by state for drinking water use, but not currently used
- ☐ Not currently used
- ☐ Not usable without extensive treatment because of natural quality problems

Other Water Use

- ☒ Used for irrigation (5 acre min.) of commercial food/forage crops
- ☐ Used for commercial livestock watering
- ☐ Used for commercial food preparation
- ☐ Used for commercial/industrial purposes other than drinking water, recreation or fishery
- ☐ Not used or unusable

Source of information: Crane, 1990; Smith 1990.

Data Type (Check One): ☐ H ☒ E ☐ D

HUMAN FOOD CHAIN TARGETS

1) For each segment in Table 4 describe fisheries within 15 miles downstream of the site (i.e., acreage, production).

Segment	Acres	Production		Level of Contamination (Actual or Potential)
		Standing Crop (lbs/acres)	Actual Harvest (lbs)	
Columbia River	2,100	Unknown	4,100 Lbs.	Unknown

Source of information: Lavoy, 1990; Zook, 1990

Data Type (Check One): ☐ H ☒ E ☐ D

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SURFACE WATER MIGRATION PATHWAY (continued)

HUMAN RECREATION TARGETS No Information Gathered.

1) For each recreation area within 15 downstream miles provide the following information in Table 6:

- Distance from the PPE to recreation area
- Recreation Area Category (see page FR52059 or section 4.3.3.1.1.1 in proposed rule for definitions)
  - ☐ Capital use and access improvements (assigned radius = 125 miles)
  - ☐ Access improvements only (assigned radius = 80 miles)
  - ☐ Observed use only (assigned radius = 40 miles)
  - ☐ None of the above criteria apply and access is not restricted (assigned radius = 10 miles)
- Level of contamination (assume actual contamination if there is positive or circumstantial evidence of a release to the recreation area)

Source of information: _____

Data Type (Check One): ☐ H ☐ E ☐ D

TABLE 6 - Human Recreation Targets

Recreation Area ID	Distance (miles)	Recreation Area Category (See above)	Level of Contamination (Actual or Potential)

2) For each recreation area, determine the population residing within each applicable distance category (Use of GEMS is recommended).

Distance (miles)	Recreation Area #1	Recreation Area #2	Recreation Area #3
0-5	_____	_____	_____
5-10	_____	_____	_____
10-20	_____	_____	_____
20-40	_____	_____	_____
40-60	_____	_____	_____
60-80	_____	_____	_____
80-100	_____	_____	_____
100-125	_____	_____	_____

Source of information: _____

Data Type (Check One): ☐ H ☐ E ☐ D

SURFACE WATER MIGRATION PATHWAY(continued)

ENVIRONMENTAL TARGETS

1) For each sensitive environment within 15 downstream miles, provide the following information in Table 7:

- o Distance from the PPE
- o Value for sensitive environment (See Table 2-18 on page FR52019 or section 2.3.4 in the proposed rule)
- o Level of contamination (Assume actual contamination if there is evidence of a release)
- o Whether the ecosystem is saltwater or freshwater

Source of information: Fielder, 1990

Data Type (Check One): ☐ H ☒ E ☐ D

TABLE 7- SENSITIVE ENVIRONMENTS TARGETS

Sensitive Environment ID	Distance (miles)	Environment Value	Level of Contamination	Salt/Fresh
Bald Eagles in the vicinity WA designated threatened species.	within 15 mi.	.50	Unknown	Fresh

ONSITE EXPOSURE PATHWAY

RESIDENT POPULATION THREAT - LIKELIHOOD OF EXPOSURE

1) Does any qualitative or quantitative information exist to confirm that people live or attend school on contaminated property?
Y ___ N X (If no, do not complete remainder of section) Describe: But, it is unknown whether pesticide contamination extends outside the fenced area near the adjacent trailer.

Source of information: Shuster, 1990

Data Type (Check One): ☐ H ☒ E ☐ D

RESIDENT POPULATION THREAT - TARGETS

1) Estimate the number of children (less than 7 years old) that potentially live or attend school or day care on contaminated property.

Source of information:

Data Type (Check One): ☐ H ☐ E ☐ D

2) Estimate the total number of individuals that potentially live or attend school or day care on contaminated property (NOTE - Exclude population counted in item #1)

Source of information:

Data Type (Check One): ☐ H ☐ E ☐ D

ONSITE EXPOSURE PATHWAY (continued)

3) From the following list, check off and identify those terrestrial sensitive environments located onsite.

TERRESTRIAL SENSITIVE ENVIRONMENTS None

- ☐ Terrestrial critical habitat for federally designated endangered or threatened species _____
- ☐ National Park _____
- ☐ Designated Federal wilderness area _____
- ☐ Terrestrial habitat known to be used by Federally designated or proposed threatened or endangered species _____
- ☐ National preserve (terrestrial) _____
- ☐ National or State wildlife refuge _____
- ☐ Federal land designated for protection of natural ecosystems _____
- ☐ Administratively proposed Federal wilderness areas _____
- ☐ Terrestrial habitat known to be used by State-designated endangered or threatened species _____

Source of information: Shuster, 1990

Data Type (Check One): ☒ H ☐ E ☐ D

NEARBY POPULATION THREAT

1) Determine the population within a one-mile travel distance from the site (See Section 5.2.3 on page FR52068 to determine travel distance): 4,003

Distance	Population
0-1/4	92
1/4-1/2	626
1/2-1	3,285

Source of information: U.S. Dept. of Commerce; USGS, 1987; Hughes 1990

Data Type (Check One): ☒ H ☐ E ☐ D

ATTACHMENT A - LIST OF SENSITIVE ENVIRONMENTS

A. Critical habitat for Federal designated endangered or threatened species

B. Marine Sanctuary

C. National Park

D. Designated Federal Wilderness Area

E. Areas identified under the Coastal Zone Management Act

F. Sensitive areas identified under the National Estuary Program or Near Coastal Waters Program

G. Critical Areas identified under the Clean Lakes Program

H. Water segments designated by State as not attaining toxic water quality standards

I. National Monument

J. National Seashore Recreational Area

K. National Lakeshore Recreational Area

X L. Habitat known to be used by Federal designated or proposed endangered or threatened species

M. Wetlands (freshwater, estuarine or coastal - 5 acre minimum)

N. National Preserve

O. National or State Wildlife Refuge

P. Unit of the Coastal Barrier Resources System

Q. Coastal Barrier (undeveloped)

R. Federal land designated for protection of natural ecosystems

S. Administratively Proposed Federal Wildnemess Area

T. Spawning areas critical for the maintenance of fish species within a river system, coastal embayment, or estuary

U. Feeding areas critical for the maintenance of fish species within a river system, coastal embayment, or estuary

V. National river reach designated as recreational

W. Habitat known to be used by State designated endangered or threatened species

X. Habitat known to be used by a species under river as to its Federal endangered or threatened status.

Y. State designated areas for the protectio or maintenance of aquatic life (coastal, estuarine, or freshwater area)

Z. Coastal Barrier (partially developed)

AA. Federal designated Scenic or Wild River

BB. State Land designated for wildlife or game management

CC. State designated Scenic or Wild River

DD. State designated Natural Areas

EE. Particular areas, relatively small in size, important to the maintenance of unique biotic communities (e.g., prairie pot hoes, buffalo wallows, alligator holes, desert springs)

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ATTACHMENT B - RUNOFF CURVE NUMBER (Circle runoff curve number selected)

Predominant Land Use	Burch loan, Burch sandy Hydrologic Soil Group A	B	C	D
Cultivated Land				
With runoff control (e.g., contour farming, sod, waterways, terraces)	60	60	80	80
Without runoff control	70	80	89	90
Pasture or Range Land				
Poor condition (exposed soil, erosion evident)	70	80	85	90
Good condition	40	60	75	80
Meadow	30	60	70	80
Wood or Forest Land				
Thin stand or little soil cover	45	85	75	85
Normal stand or good soil cover	25	55	70	75
Open grass-covered areas (lawns, parks, golf courses, cemeteries, etc.)				
Good grass cover (75% or more coverage)	40	60	75	80
Poor grass cover (less than 75% coverage)	50	70	80	85
Industrial Districts	80	90	90	95
Residential lots	60	75	85	90
Paved Lots (parking lots, driveways, large roofs)	100	100	100	100
Streets and Roads				
Paved with curbs and storm sewers	100	100	100	100
Gravel	75	85	90	90
Dirt	70	80	85	90
Landfills				
Surface composed of clay	—	---	---	90
Surface composed of debris	70	---	---	---
Surface composed of sod				
Good sod cover (75% or more)	40	---	---	---
Poor sod cover (less than 75%)	50	---	---	---

APPENDIX B

Site Reconnaissance Report and Photographs

On Tuesday, April 24, 1990, Jerry Shuster of PRC arrived in Wenatchee, Washington at 3:30 pm and drove to the former U.S. EPA test plot area in the WSU Tree Fruit Research Center. Mr. Shuster took photographs of the site and walked the surrounding area.

On Wednesday, April 25, Mr. Shuster arrived at the WSU Tree Fruit Research Center and met with Dr. Hoyt, Superintendent of the Center, Mr. Hagihara, Environmental Service Supervisor from WSU, and Craig Root, Hazardous Waste Specialist, WSU. Mr. Shuster explained the reason for the site reconnaissance under the PA/SI and asked about major concerns at the site.

Mr. Hagihara cited three major areas of concern: (1) the test plot area, (2) the chemicals left by U.S. EPA, and (3) the septic tank and drain field that serviced the former U.S. EPA laboratory building (Figure B-1). The party then toured the former U.S. EPA laboratory building. This laboratory building is currently used by WSU graduate students for fruit maturity research when space in the other WSU labs is unavailable. According to former U.S. EPA lab personnel Don Staiff and Jim Davis, they used zinc, boron (sodium boralhydrate) and "just about everything else" at the lab and used the lab sinks for disposal.

A search of the WSU files turned up diagrams of the septic tank and drain fields for the lab. In 1968, a 1000-gallon septic tank and drain field were installed to replace the original tanks, which were failing. The sink drains flowed directly to the drain field, bypassing the septic tank (sanitary sewage only). In 1977, the sewer and sink drain lines were moved east to make room for the new building addition. In October 1979, U.S. EPA requested the emergency installation of a new 1000-gallon septic in the sink drain line, because water was backing up into the sinks, making it necessary to cease research and posing health and safety hazards to employees. The drawings indicate that the tank was installed. WSU personnel did not recall its installation.

The lab had a chemical storage area that in the site tour was thought to be owned by U.S. EPA. However, after discussions with WSU and USDA personnel, the majority of these chemicals belong to WSU and USDA, with some U.S. EPA chemicals transferred from the storage shed located near the test plot area for USDA use (see below).

The party next toured the test plot area. According to Dr. Hoyt, the site was fenced in the early 1970s. A definite pesticide odor was present but it was unclear whether the odor was from the test plot area or the adjacent orchards. A mobile home trailer is located about 45 feet south of the test plot area. Residents in the trailer, as well as all of the WSU Tree Fruit Research Center, use water provided by the Chelan County P.U.D. The source of this water is an aquifer located 12 miles north near the Rocky Reach Dam on the Columbia River (upstream).

The storage shed adjacent to the test plot area was locked and none of the WSU staff had the key. WSU personnel did not know what was in this shed but speculated that it contained "some old drums". The WSU personnel forcibly opened the door of the shed. The shed contained a wide variety of organic chemicals in their original packaging. The forced entry of the shed was subsequently noticed by USDA personnel who work at the Center. Apparently, this shed contained the chemicals used by U.S. EPA and were "given" to the USDA for their use. The USDA is currently using some of the chemicals in this shed. At the request of Mr. Hagihara, USDA will inventory the chemicals and furnish the unneeded chemicals to the U.S. EPA for disposal. USDA will give a list of the inventoried chemicals to Dr. Hoyt.

Following a wrap-up meeting, Mr. Shuster left the site Center at 1:30 pm.

Figure B-1. WSU Tree Fruit Research Center vicinity map.