
Final

U.S. Army BRAC 2005 Environmental Condition of Property Phase I Report Vancouver Barracks, Vancouver, Washington



Prepared for
United States Army

November 10, 2006



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Final

**U.S. Army BRAC 2005
Environmental Condition of Property
Phase I Report
Vancouver Barracks,
Vancouver, Washington**

Submitted to
United States Army

November 10, 2006

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Acronyms and Abbreviations

μg/ft ²	microgram per square foot
μg/L	micrograms per liter
ACM	asbestos-containing material
AEDB-R	Army Environmental Database Restoration
AMSA	Army Maintenance Support Activity
AR	Army Regulation
ARIM	Army Reserve Installation Management
AST	aboveground storage tank
bgs	below ground surface
BMA	Base maintenance activities
BRAC	Base Realignment and Closure
CC	Compliance-related cleanup
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
City	City of Vancouver
CORRACTS	Corrective Action Report
CSH	combat support hospital
DOD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EBS	Environmental Baseline Survey
Ecology	Washington State Department of Ecology
ECP	Environmental Condition of Property
EPA	United States Environmental Protection Agency
EQR	Environmental Quality Report

FORSCOM	United States Army Forces Command
FSA	Farm Service Agency, U.S. Department of Agriculture
ft ²	square foot
GPS	global positioning system
HBC	Hudson's Bay Company
HEPA	high-efficiency particulate air (filter)
HRR	historic records review
I-5	Interstate 5
ICRMP	Integrated Cultural Resource Management Plan
IRP	Installation Restoration Program
LBP	lead-based paint
MEC	munitions and explosives of concern
MEDCOM	Medical Command
mg/kg	milligrams per kilogram
MMRP	Military Munitions Response Program
MR	Munition Response
MSGP	Multi-Sector General Permit
MTCA	Model Toxics Control Action
NARA	National Archives and Records Administration
NOI	Notice of Intent
NOS	National Geodetic Information Center
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
PA	Preliminary Assessment
PCB	polychlorinated biphenyl
pCi/L	picocuries per liter
POL	petroleum, oils, and lubricants
Property	Vancouver Barracks
RC	Response Complete
RCRA	Resource Conservation and Recovery Act

RRC	Regional Readiness Command
SCS	Soil Conservation Service
SI	Site Inspection
SVOC	semivolatile organic compound
SWCAA	Southwest Clean Air Agency
TCLP	toxicity characteristic leaching procedure
TPH	total petroleum hydrocarbon
TSD	treatment, storage, and disposal
U.S.	United States
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Center
USAR	United States Army Reserve
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tank
UXO	unexploded ordinance
VA	Veterans Administration
VOC	volatile organic compound
VSI	visual site inspection
WSDOT	Washington State Department of Transportation

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Executive Summary

The United States Army Corps of Engineers (USACE) Louisville District has prepared this Environmental Condition of Property (ECP) report for the Vancouver Barracks, hereafter referred to as the "Property." The Property is situated approximately 0.25 mile north of the Columbia River immediately east of Interstate 5 (I-5) in Vancouver, Washington. The parcel is approximately 47.46 acres.

This ECP report was prepared to support the Department of Defense (DOD) mission to dispose of Base Realignment and Closure (BRAC) 2005 real property in a timely manner. Prior to out-grant or transfer, a reliable assessment of the current environmental condition of the real property must be completed. The assessment is in accordance with United States (U.S.) Army Regulation (AR) 200-1, Environmental Protection and Enhancement. As part of the report preparation, the Property and adjacent properties were inspected (July 6 through July 11, 2006, and July 24, 2006).

This Executive Summary briefly describes the current and former uses of the Property, the areas of potential environmental concern that were evaluated during the ECP process and the DOD Environmental ECP category for this Property.

Site Description and Historical Use

The property is situated approximately 0.25 mile north of the Columbia River immediately east of I-5 in Vancouver, Washington, at the following coordinates: Latitude 45°37'30.0" N, Longitude 122°39'56.5" W. The property is bounded by the West Barracks to the west and the Vancouver Barracks National Historic Reserve on all other sides.

The property is owned by the U.S. government and is managed by the U.S. Army Reserve (USAR) 70th Regional Readiness Command (RRC) at Fort Lawton, Washington. Current uses include activities conducted by the USAR, the Washington Army National Guard, and a variety of other governmental and public nonprofit organizations. In general, these activities include administrative functions, storage of materials, motor pool activities, community group meetings, and educational programs.

Vancouver Barracks is an open post without a secured perimeter, with the exception of the 400 Series buildings at the South Barracks. When Vancouver Barracks was initially established in 1850, it comprised 640 acres.

The property consists of 47.46 acres of landscaped land and military facilities, including 30 wood frame and brick buildings totaling approximately 242,367 square feet.

Methodology

Methods employed in conducting the ECP assessment were as follows:

- Specific study sections for the presentation of data in the body of this report were developed, as well as the appropriate category designation in the conclusions of this report.
- A visual site inspection of the Property was conducted (from July 6 through July 11, 2006, and on July 24, 2006).
- A summary of past aerial photographs has been reviewed and incorporated into the findings of this report.
- A review of relevant environmental records and investigations was performed and the findings incorporated into this report.
- A search of local, state, and federal environmental databases for listed facilities within a standard search distance was undertaken for the property.
- Interviews were conducted with key past and current facility employees identified by the U.S. Army Environmental Center (USAEC) and the Louisville District USACE, and with Vancouver Barracks personnel.
- A record of the documents reviewed and individuals contacted was maintained.

Based on analysis of the available data, the Property was classified into one of seven categories

- Category 1** Areas where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)
- Category 2** Areas where only release or disposal of petroleum products has occurred
- Category 3** Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response
- Category 4** Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken
- Category 5** Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken
- Category 6** Areas where release, disposal, and/or migration of hazardous substances have occurred, but where required actions have not yet been implemented
- Category 7** Areas that are not evaluated or that require additional evaluation

Property Categorization

The findings of this ECP report were based on readily available environmental information; interviews with site, state, and local personnel; review of previous environmental studies; and federal and state database and file information related to the storage, release, treatment, or disposal of hazardous substances or petroleum products. Results also were based on visual observations of the site and adjacent properties.

Figure ES-1 provides a map of the ECP categories at the Property.

Category 1 Property

All parcels listed as a Category 1 are considered “uncontaminated property” (as amended by the Fiscal Year 1997 Defense Authorization Act) where no release or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas). The Community Environmental Response Facilitation Act Sections 120(h)(4)(iii) and (iv), an amendment to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, Section 120[h]), was enacted to facilitate the rapid return of uncontaminated properties identified during the BRAC process to the local communities. The following parcels have been classified as Category 1 properties:

- Buildings 400, 401, 402, 404, 405, 406, 408, 409, 410, 422, 704, 710, 721, 722, 725, 728, 733, 746, 749, 750, 752, 753, 754, 786, 787, 987, 989, 991, and 993
- Storage trailers associated with Buildings 400, 402, and 404
- Former Veterans Administration (VA) Laundry Area
- East Barracks Open Areas – This includes parking lots, roadways, and landscaped areas not associated with buildings. Based on available information, there have been no releases reported at these areas.
- Antifreeze and Hydraulic Oil Spill area
- Generator Fuel Spill area
- Building 748, Former Maintenance Facility (VABA-01)

Category 2 through Category 7 Property

Category 2 Areas

The following areas are considered Category 2 properties; these are areas where release or disposal of petroleum products only has occurred:

- Location of former underground storage tanks (USTs) VB-1, VB-2, VB-3, VB-4, 404-1, 404-2, VB-5, VB-6, VB-7, VC-1, VC-2, VC-3, and V-1-A
- Building 402 Storm Drain
- Former UST V-1-B

- Former UST V-1-C
- VABA-02, Former Vehicle Wash Rack
- South Barracks Open Areas – This includes parking lots, roadways, and landscaped areas not associated with buildings.
- Building 408, Former Vehicle Wash Rack
- Building 410, Used Oil Sump

Category 3 Area

No properties are considered Category 3.

Category 4 Areas

No properties are considered Category 4.

Category 5 Areas

No properties are considered Category 5.

Category 6 Areas

No properties are considered Category 6.

Category 7 Areas

The following areas are considered Category 7 Properties. These are areas that have not been evaluated or that require additional evaluation:

- Building 410, Battery Room Drain and associated area



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1. Purpose

As a result of the 2005 Base Realignment and Closure (BRAC) recommendations, the Vancouver Barracks were selected for closure and property transfer. As required by United States (U.S.) Army Regulation (AR) 200-1, an Environmental Condition of Property (ECP) must be prepared for locations that are being considered for acquisition, out-grants, or disposal. This process was formerly referred to as an Environmental Baseline Survey (EBS). The ECP will allow the U.S. Army to meet its obligation under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 United States Code Section 9620(h), as amended by the Community Environmental Response Facilitation Act (Public Law 102-426).

The BRAC 2005 Property for Vancouver Barracks constitutes a part of Vancouver Barracks. Throughout this report, the BRAC 2005 Property for Vancouver Barracks is referred to as the "Property." When "Vancouver Barracks" is discussed, the information applies to Vancouver Barracks as a whole, including the Property.

1.1 General

The primary purpose of the ECP is to describe the environmental conditions of the Property to assist in determining the suitability of a lease or transfer of excess BRAC property. This ECP report for the Property meets the Department of Defense (DOD) requirements under Title 40, Code of Federal Regulations (CFR), Part 373, Section 373.1, and the BRAC Supplement to AR 200-1, Environmental Protection and Enhancement. The purpose of the ECP includes the following:

- Provide the Military Department with information it may use to make disposal decisions regarding the property.
- Provide the public with information relative to the environmental condition of the property.
- Assist in community planning for the reuse of BRAC property.
- Assist federal agencies during the property screening process.
- Provide information for prospective buyers.
- Assist prospective new owners in meeting the requirements under Environmental Protection Agency (EPA) "All Appropriate Inquiry" regulations when they become final.
- Provide information about completed remedial and corrective actions at the property.
- Assist in determining appropriate responsibilities, asset valuation, and livability with other parties to a transaction.

The ECP contains the information needed to comply with the provisions of 40 CFR 373, which requires that a notice accompany contracts for the sale of, and deeds entered into for

the transfer of, federal property on which hazardous substances may have been stored, released, or disposed. CERCLA Section 120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the Property for one year or more—specifically, quantities exceeding (1) 1,000 kilograms or the reportable quantity, whichever is greater, of the substances specified in 40 CFR 302.4; or (2) 1 kilogram of acutely hazardous waste as defined in 40 CFR 261.5 and 261.30. A notice also is required if hazardous substances have been disposed or released on the Property in an amount greater than or equal to the reportable quantity. AR 200-1 requires that an ECP report address asbestos, lead-based paint, radon, and other substances potentially hazardous to health.

The ECP report is not prepared to satisfy the duty of a real property purchaser to conduct an “appropriate inquiry” to establish an “innocent purchaser defense” to CERCLA 107 liability. Any such use of the ECP report by any party is outside the control of the U.S. Army and beyond the scope of the ECP. The U.S. Army, its officers, employees, or contractors, including CH2M HILL, make no warranties or representations that any ECP report satisfies any such requirements for any party.

1.2 Scope

This ECP was prepared by CH2M HILL under contract with the U.S. Army Corps of Engineers (USACE), Louisville District. The scope of work for this ECP was performed in general conformance with Army Regulation “Environmental Quality, Environmental Protection and Enhancements, AR 200-1 (paragraph 15-6), dated February 21, 1997, and CERCLA 120.

This ECP covers the 47.46 acres of the eastern and southern portions of Vancouver Barracks. Vancouver Barracks are located in Vancouver Washington. The site is approximately 0.25 mile north of the Columbia River, immediately east of Interstate 5 (I-5) in Vancouver, Washington. The Property is bounded by the West Barracks to the west and the Vancouver Barracks National Historic Reserve on all other sides. A vicinity map showing the general location of the Property is presented in Figure 1-1; a Property layout map is presented in Figure 1-2. A legal description of the Property is provided in Section 3.1.

1.3 Assumptions

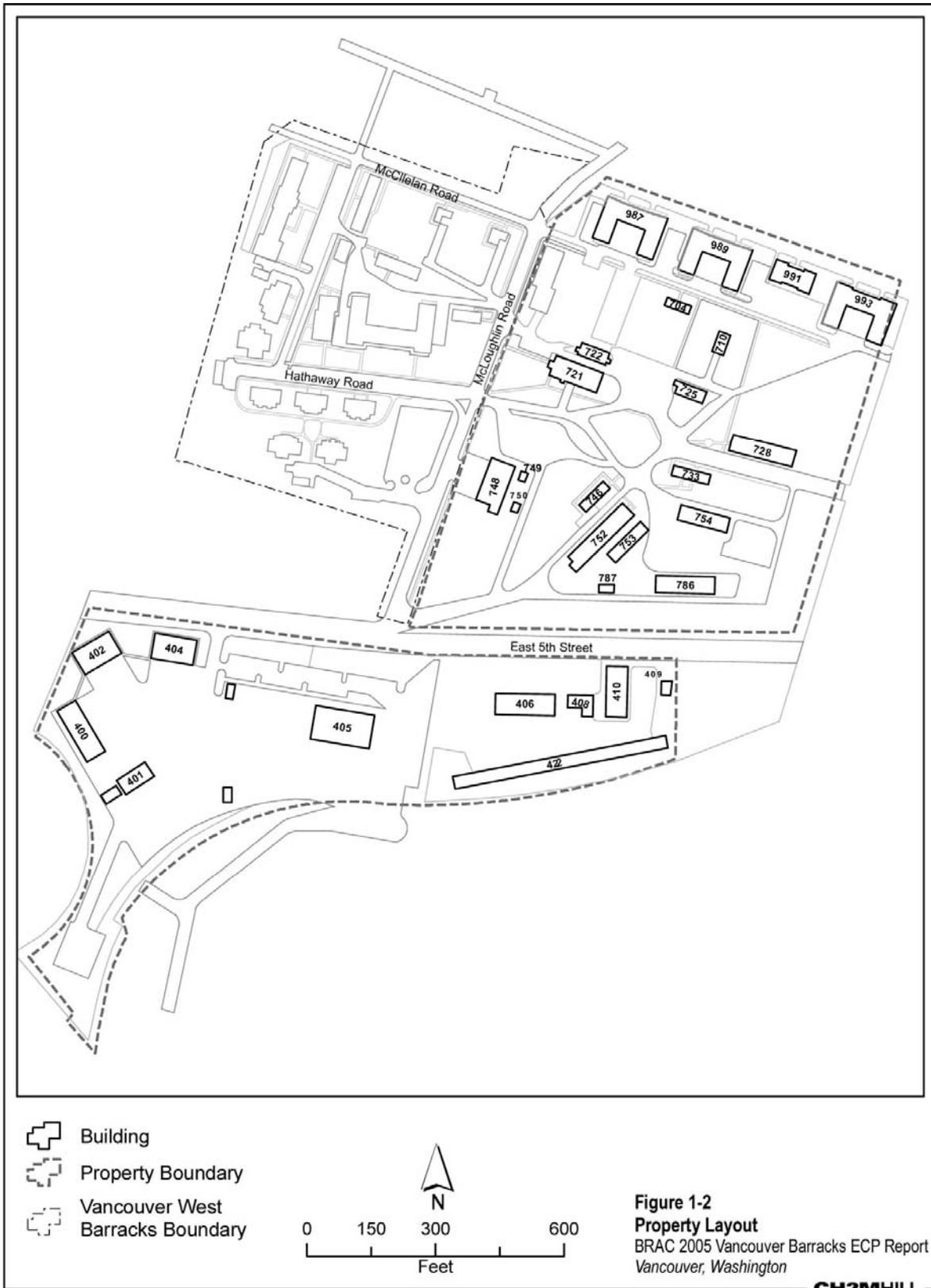
The conclusions drawn in this document are based on the following assumptions:

- The Vancouver Barracks Cemetery, which is located approximately 1 mile north of Vancouver Barracks, is not a part of the Property.
- If a historical document reached the conclusion of “No Further Remedial Action” but the supporting documentation was unavailable for review during this ECP, the “No Further Remedial Action” conclusion was carried forward and not critically reviewed in this report.



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1.4 Limitations

This ECP Report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets at the BRAC 2005 Property of Vancouver Barracks. Its findings are based on a records search and thorough review of documents, and a visual site inspection (VSI) conducted between July 6 and July 12, 2006, and on July 24, 2006. Extensive environmental investigation reports and site historical documents were reviewed in support of this ECP. Information obtained from these studies is reflected within this ECP report by reference. A list of references is provided in Section 8.

Regulatory interaction and involvement were not conducted in this ECP as directed by the U.S. Army. The U.S. Army will continue to perform coordination with the regulatory agencies and other stakeholders.

The interior and exterior of installation buildings, except the interior of Building 749 and the interior of the arms room in Building 993, were visually inspected during the VSI. No sampling or analysis was conducted during this survey.

1.5 Report Organization

The remainder of this report describes the ECP methods and findings. The report is organized into the following sections:

- **Section 2, Survey Methodology:** Describes the methods used to conduct the ECP.
- **Section 3, Property Description:** Describes the Property environment, provides an overview of facility operations and history, and contains a summary of previous environmental investigations on the BRAC portion of the Property.
- **Section 4, Environmental Conditions:** Identifies the environmental condition of the Property including permits, cleanup history, and other environmental regulatory issues. The ECP findings in Section 4 are organized by relevant environmental “issues” (for example, contaminant, contamination matrix, facility, or operation) and include a summary of findings for the buildings and real property.
- **Section 5, Conclusions:** Concludes with a summary of ECP Property categorizations.
- **Section 6, Certification:** Includes a list of preparers.
- **Section 7, References:** Contains a list of references used in the preparation of this report.

The appendixes to this document are as follows:

- Appendix A, Site Photographs
- Appendix B, Historic Aerial Photographs
- Appendix C, Environmental Database Report
- Appendix D, Title Search
- Appendix E, Interview Questionnaires
- Appendix F, Hazardous Materials Inventory
- Appendix G, Environmental Documentation

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2. Survey Methodology

This section describes the methods used to assess the environmental condition of the Property.

2.1 Development of Study Sections

To assist in the completion of this report, the Property was organized into *study sections*. Each building and associated environmental feature (i.e., underground storage tank [UST] location) constitutes a study section. The Property contains 30 buildings, 2 Installation Restoration Program (IRP) sites, and 1 Military Munitions Response Program (MMRP) site. Each of the IRP and MMRP sites also constitute a study section. Additional study sections at the Property are characterized as open areas that are not associated with a building or other environmental feature.

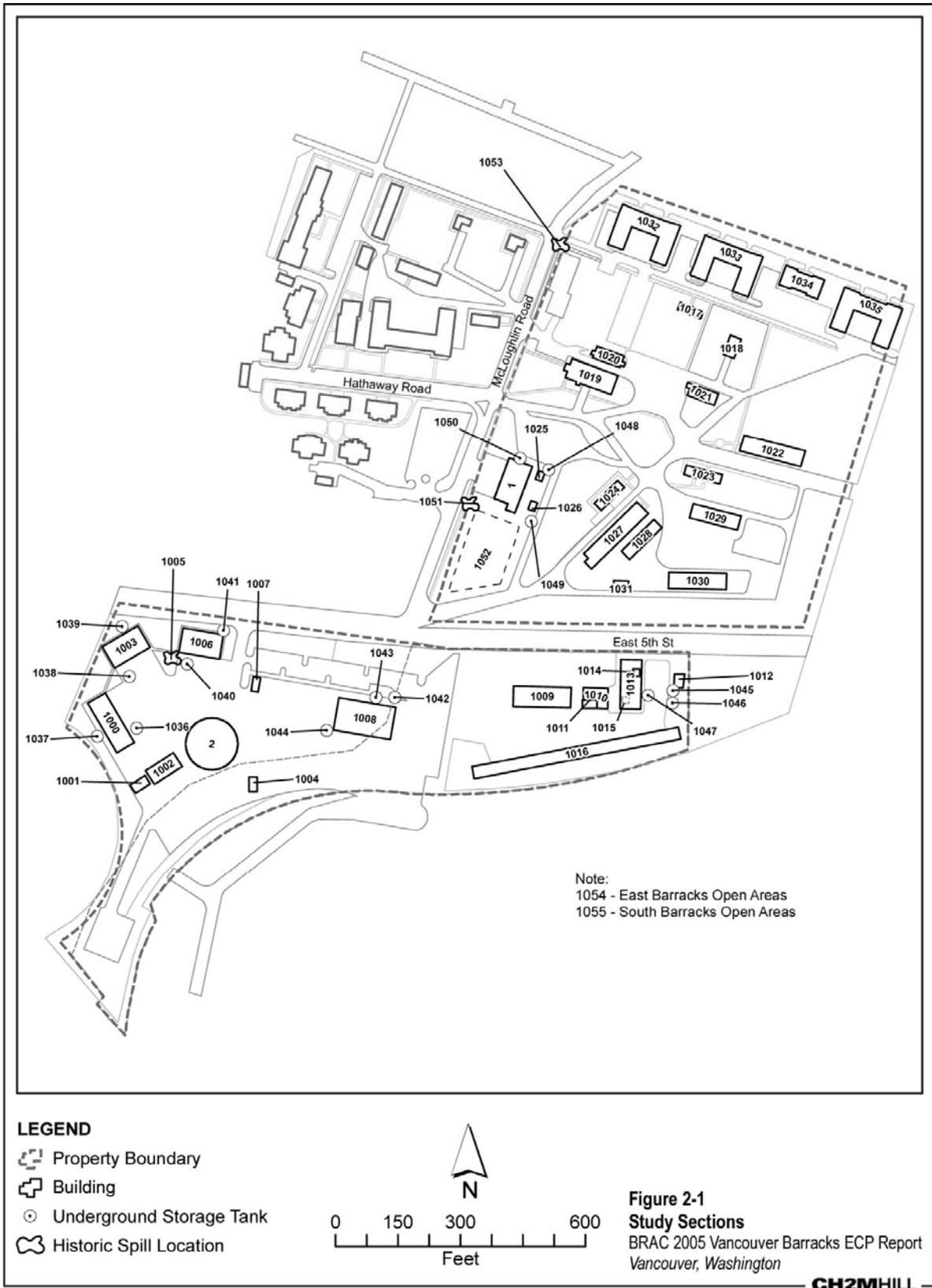
There are three series of buildings on the Property, including the 400 Series, 700 Series, and 900 Series. Most of the buildings in the 400 Series are used for vehicle maintenance and storage; most of the buildings in the 700 and 900 Series buildings are used for administrative offices. Because the functions of most buildings in a series are similar, this report will refer to building series when appropriate, rather than to specific buildings. Open areas that are not associated with a building or other environmental feature have been assigned a study section. Table 2-1 lists the study section associated with each building series. Figure 2-1 shows the study section associated with each building series.

2.2 Visual Site Inspection

A VSI was conducted by CH2M HILL staff from July 6 through July 12, 2006, and on July 24, 2006. The purpose of the VSI was to confirm Property documentation and to identify new environmental concerns. The VSI included a walk-through of areas around the exterior of each building, as well as the interior of each building, except Building 749. The interior walk was limited to rooms with areas of potential environmental concern (for example, boiler rooms, hazardous materials storage). The VSI also included a walk-through of open areas around the site. Selections of site photographs are shown in Appendix A.

A representative from each of the following Property tenants accompanied CH2M HILL staff on the VSI of their study area:

- U.S. Army Reserve (USAR) 70th Regional Readiness Command (RRC)
- Washington Army National Guard
- U.S. Army Air Force Exchange Service



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Table 2.1 redacted.

One primary objective of the VSI was to note signs of potential contamination sources, including leaks, spills, and other observable evidence of releases. During VSI activities, information was recorded on forms detailing issues related specifically to the building visited. Environmental conditions observed during the VSI are incorporated into Section 4 (Environmental Conditions) of this report.

Environmental features have been entered into a Geographic Information System, and figures showing the location of these features are currently available. Therefore, CH2M HILL was directed by the USACE Louisville District global positioning system (GPS) to the locations of new environmental features only, not previously identified features. No new environmental features were identified during the VSI; thus, GPS coordinates are not included in this ECP.

A VSI of adjacent properties was conducted on July 12, 2006, to evaluate adjacent property uses that could be a potential source of environmental contamination on the Property. CH2M HILL staff drove on roadways and walked along the perimeter of the Property.

Adjacent properties were identified on a site plan and photographs of adjacent properties were taken. The findings of the adjacent property VSI are presented in Section 4.17.

2.3 Aerial Photograph Analysis

Information in this section was obtained from an existing aerial photograph analysis conducted for the EBS (ENSR, 2002) and an aerial photograph analysis conducted by Environmental Research, Inc. (ERI) (2006). Available Results of the aerial photograph analyses and copies of the aerial photographs reviewed are contained in Appendix B. The remainder of this section describes the two aerial photograph analyses.

During the EBS, aerial photographs depicting the areas surrounding Vancouver Barracks were reviewed at the Washington State Department of Transportation office in Tumwater, Washington, on November 28, 2001. The process used to analyze aerial photographs was not documented in the EBS. The aerial photograph review presented in the EBS includes information regarding the presence or absence of buildings, railroad line, and storage areas. Aerial photographs were available from 1966 to 1996 (Table 2-2).

ERI performed an aerial photographic analysis on aerial photographs spanning the period from 1943 to 1960. Photographs were stereoscopically analyzed to locate and document potential contamination sources. Information presented in these photographs includes buildings, building foundations, dark-toned material/stain, probable stain, ground scar, excavation, mounded materials, open storage, possible pads, probable disturbed ground, and railroads. Aerial photographs reviewed by ERI (2006) dated 1943 to 1960 are summarized in Table 2-2.

TABLE 2-2
Aerial Photographs Depicting Areas Surrounding Vancouver Barracks
Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Year	Source	Details	Scale
1943	NARA	Aerial photographic site analysis ERI, 2006	1" = 30,000
1945	NOS	Aerial photographic site analysis ERI, 2006	1" = 17,000
1952	NARA	Aerial photographic site analysis ERI, 2006	1" = 25,000
1960	FSI	Aerial photographic site analysis ERI, 2006	1" = 20,000
1966	WSDOT	Aerial photographs were reviewed in ENSR, 2002	1" = 750'
1972	WSDOT	Aerial photographs were reviewed in ENSR, 2002	1" = 750'
1984	WSDOT	Aerial photographs were reviewed in ENSR, 2002	1" = 750'
1988	WSDOT	Aerial photographs were reviewed in ENSR, 2002	1" = 750'
1993	WSDOT	Aerial photographs were reviewed in ENSR, 2002	1" = 750'
1996	WSDOT	Aerial photographs were reviewed in ENSR, 2002	1" = 750'

NARA – National Archives and Records Administration, College Park, Maryland

NOS – National Geodetic Information Center, Silver Spring, Maryland

FSA – Farm Service Agency, U.S. Department of Agriculture, Salt Lake City, Utah

WSDOT – Washington State Department of Transportation

Environmental findings identified in the EBS (ENSR, 2002) and by the preliminary analysis (ERI 2006) are summarized briefly below.

The EBS aerial photograph review indicated that about 12 of the buildings were removed throughout the Property between 1966 and 1984. The EBS noted that building foundations were exposed and evidence of disturbed ground appeared in the form of excavations and material mounds, presumably related to building removal activities. Photographs from 1966 show a railroad spur ending on the southern portion of the 400 Series. The photographs also indicate construction of new buildings and vehicle parking areas, as well as replacement of the 400 Series rail spur with a paved parking area.

The ERI (2006) interpretation of photographs reviewed photographs from 1943 to 1960. Following is a summary of the ERI interpretation of aerial photographs at the Property.

In the July 4, 1943, aerial photograph, probable soil staining was seen within and adjacent to a former vehicle storage area located in the South Barracks north of Building 422. Visible soil staining was seen in soils adjacent to a building that was formerly located in the vicinity of current Building 400. In this photograph of the East Barracks, just north of East 5th Street two areas of open storage were visible. Two additional areas of open storage were visible east and south of current Building 753.

In the June 30, 1945, aerial photograph, soil staining, and light-toned material were seen adjacent to a building located in the vacant lot southeast of current Building 728. Probable soil staining emanates from a building formerly located in the vicinity of Building 748. In the South Barracks, probable staining was seen in the former vehicle storage area north of Building 422, where the staining previously was noted in 1943. Areas of liquid were visible in the vicinity of the probable staining. On the western half of the South Barracks, three vehicle storage areas were seen. Dark-toned materials and staining were visible in the easternmost vehicle storage area. Staining was seen in the westernmost vehicle storage area and on dirt access roads to its north and east.

In the October 2, 1952, aerial photograph, a number of buildings in the East Barracks had been removed since 1945. Features noted in the locations of some of these former buildings included mounded material, disturbed ground, and a pit with liquid. In the South Barracks, the probable staining noted in 1943 and 1945 was no longer visible. To the west, probable staining is seen in the vicinity of the building where staining was previously noted in 1943 and 1945.

In the June 4, 1960, aerial photograph, additional buildings in the East Barracks had been removed since 1952. In the South Barracks, two building foundations were noted where buildings had been removed since 1952. Also in this vicinity, dark-toned material and/or staining is visible adjacent to a building where probable staining and staining had been noted since 1943.

2.4 Records Review

This ECP uses the historical records reviewed and obtained as a part of the EBS (ENSR, 2002). These historical records were reviewed in order to perform the VSI and were not reviewed to determine the accuracy of the EBS. The EBS had been thoroughly reviewed by

the U.S. Army and is considered accurate. The library records reviewed as a part of the EBS process are summarized in Table 2-3.

TABLE 2-3
2002 EBS Records Reviewed
Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Location Visited	Date of Visit
Vancouver Barracks, Washington	October 23 and November 5, 2001
Fort Lawton, Washington	October 23 and November 5, 2001
Fort Lewis, Washington	October 23 and November 5, 2001
Washington State Department of Ecology, Southwest Regional Office, Lacey, Washington	November 6, 2001
National Archives and Records Administration Offices Washington, D.C.	Unknown
National Archives and Records Administration Offices, College Park, Maryland	Unknown
Archaeology and Historical Preservation Olympia, Washington	October 30, 2001

Source: ENSR, 2002

CH2M HILL obtained and reviewed recent (2002-present) documentation published after the EBS was written in 2002. Additional information for features of concern on the Property was gathered through interviews with individuals familiar with the Property. Archived documents relating to the areas of concern on the Property were reviewed at the USACE Seattle District on July 26, 2006.

As the ECP process progressed, additional information was obtained from the following agencies:

- USAR, 70th RRC, Vancouver, Washington
- USACE, Louisville District, Louisville, Kentucky
- USACE, Seattle District, Seattle, Washington
- U.S. Army Environmental Center (USAEC)
- USAR, 70th RRC, Fort Lawton, Washington
- Washington National Guard, Vancouver, Washington

Relevant primary documents that were reviewed and used for this ECP are presented in Table 2-4. A list of references is included in Section 7.

TABLE 2-4
 Primary Documents Reviewed
Draft Environmental Condition of Property Report, Vancouver Barracks

Document Title	Author	Date
Lead Investigation Results and Recommendations, Former Indoor Firing Ranges, United States Army Reserve Centers, Vancouver, Washington and Salem, Oregon	Shaw Environmental Research, Inc.	July 2006
Final Historical Records Review, Vancouver Barracks, Vancouver, WA	TechLaw, Inc.	February 2006
Final PCB-Containing Equipment Inventory Summary Report, Vancouver	Engineering Environmental Management, Inc.	March 2005
Draft Survey of Drains, Pollution Control Equipment, and Discharge Points	ICI LLC	September 2004
Environmental Baseline Survey	ENSR	November 2002
Vancouver Barracks Site Inspection	Woodward-Clyde	October 1998
Preliminary Assessment	USACE	March 1996

2.4.1 Standard Environmental Record Sources

A search of state and federal environmental databases for listed facilities within standard search distances was undertaken for the Property (Environmental Data Resources, Inc. [EDR], 2006). The findings of the search are summarized in Table 2-5 and subsequent text. The complete search results are provided in Appendix C.

The Property was listed on one database in the record sources, the Washington Underground Storage Tank (UST) Database. The USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the Washington Department of Ecology (Ecology).

TABLE 2-5
 Summary of Environmental Database Search
Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Record(s) Source	Number of Sites	ASTM E1527-00 Minimum Search Distance (miles)
Federal NPL Sites	2	1.125
Federal CERCLIS List	1	0.625
Federal CERCLIS No Further Remedial Action Planned List	0	0.625
Federal RCRA CORRACTS Facilities List	2	1.125
Federal RCRA non-CORRACTSTSD Facilities List	0	0.625
Federal RCRA Generators List	20	0.375
Federal Emergency Response Notification System List	0	0.125
WA Washington Confirmed and Suspected Contaminated Sites List	5	1.125
WA State Landfill	1	0.625

TABLE 2-5

Summary of Environmental Database Search

Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Record(s) Source	Number of Sites	ASTM E1527-00 Minimum Search Distance (miles)
Washington Leaking UST Lists	8	0.625
Washington UST Lists	23	0.375

CERCLIS - Comprehensive Environmental Response, Compensation, and Liability Information System

CORRACTS - Corrective Action Report

NPL – National Priorities List

TSD – Treatment, Storage and Disposal

Facilities located within a 1-mile radius of the Property and listed on one or more databases during the record search are listed below. A map and a description of these facilities are contained in Appendix C. The following facilities have a low potential to pose a threat to the Property because groundwater contamination has not been reported and the site is either down gradient or cross-gradient from the facility, contamination was isolated in soil, cleanup actions have been taken or initiated, or a combination of these reasons.

- Admiral Distributing
- Bill Copps, Inc.
- Boise Cascade Vancouver
- Capital Tackel MFG
- Chuck's Tire & Auto Service
- Faulkner USA
- From the Kennels
- General Brewing Company
- Hannah Motor Company
- Hannah Motor Company
- Hannah Motor Company VW
- Hillman Properties
- Hillman Properties Northeast Maritime
- Hoesly Auto Service Individual
- Industrial Fiberglass SVCS, Inc.
- Kyungshin Cho/Matthieu's Car
- Lucky Lager Brewery
- Marshall Vancouver Ford
- Metro Buick Olds Vancouver
- National Park Service Fort Vancouver
- Oltmann's Mobil Service
- Pacific Telecom Corporate Office
- Pearson Airfield
- Quad Investment
- Southwest Deliver Co., Inc.
- Southwest Delivery Co., Inc
- Storage Place
- Texaco-Frank Brickey Aviation
- The Academy
- The Automotive Services, Inc. Carwash
- The City of Vancouver (the City)
- The Whatley Decant Station (Vactor Waste Processing)
- U.S. Department of Transportation Federal Highway Administration
- Vancouver Aviation
- Vancouver Chevron
- Wolf Supply Co. Vancouver

The following sites are located up gradient of the Property's assumed groundwater flow direction. These sites likely have a low potential to pose a threat to the Property because groundwater contamination has not been reported, contamination was isolated in soil, cleanup actions have been taken or initiated, or a combination of these reasons.

- Clark Public Utility District
- Fort Vancouver Regional Library

- Washington State Patrol Vancouver
- Vancouver Police Building

The following facilities are located less than 1 mile from the Property and were listed on the NPL database and/or the Confirmed and Suspected Contaminated Sites List database. Environmental conditions at these facilities have a low potential to pose a threat to the Property because groundwater was affected by site activities and the sites are regulated in a cleanup program. However, given the nature and extent of environmental contamination at these facilities, further details are provided in Section 4.17.

- Brazier Forest Industry
- Emerald Petroleum Services
- PRI Northwest, Inc.
- Frontier Hard Chrome
- Vancouver Water Station No. 1

2.4.2 Additional Record Sources

The following agencies were contacted during this review:

- USAR, 70th RRC, Vancouver, Washington
- USACE Seattle District, Seattle, Washington
- USAEC
- USAR, 70th RRC, Fort Lawton, Washington
- Washington National Guard, Vancouver, Washington

During the site visit, a radiological materials warning sign was observed posted in Building 400. This observation prompted further inquiry regarding radiological materials stored on the Property.

Documentation of hazardous materials stored onsite was not readily available. This information has been requested of SFC Spencer Marks, USAR, 70th RRC, Fort Lawton, Washington.

Historical real property records at Seattle District, USACE, Real Estate Division were reviewed on September 16, 2006. According to this review, the current owner of the Property is the War Department, Army Service Forces Corps of Engineers. A summary of actions impacting Army accountability for property at Vancouver Barracks are contained in Appendix D.

In addition to this review, a Chain of Title company prepared a summary to document the historic use of the Property. Records were searched at the Clark County Recorder's office back to 1940, and no conveyances of record transferring fee title ownership were found. This summary identified the current property owner as the USA War Assets Administration. However, the USA War Assets Administration is not the current property owner; the U.S. War Assets Administration owns 512.20 acres of the original 640 acre parcel owned by the USACE. The USACE acquired the 640 parcel prior to 1940 and this information was not obtainable by the Chain of Title company.

The U.S. government has owned the Property for more than 60 years. The past uses of the Property during this time are documented in this ECP Report. No other property uses were identified during the Chain of Title review. Thus, there is a low potential that unknown past property use by others would have affected the environmental quality at the Property.

2.5 Interviews

Interviews with key past and current facility employees identified by the USAEC and the Louisville District USACE, and interviews with Vancouver Barracks personnel were conducted to aid in identifying environmental conditions at the installation. The interviews included topics of general environmental interest and specific areas of interest identified during the records review and VSI.

A standard form was used to conduct interviews with the organizations listed below. Interview forms completed during the ECP are provided in Appendix E.

- 70th RRC Army Reserve Installation Management (ARIM)
- National Park Service
- Seattle District USACE

2.6 Data Management

The reference documents used in developing the ECP will be placed in the Property's information repository, at the completion of the project. Pertinent environmental information, such as interview forms and VSI records, will be provided to the USACE, Louisville District at the completion of this project.

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3. Property Description

This section includes a description and history of the Property and Vancouver Barracks. The primary sources of information for this section are the EBS (ENSR, 2002) and the *Integrated Cultural Resources Management Plan* (ICRMP) (Parsons, 2000). Because this section relies heavily on these two documents, reference to the EBS and ICRMP is implied throughout, unless otherwise attributed and/or cited.

3.1 Property Location and Description

The Property is situated approximately 0.25 mile north of the Columbia River immediately east of I-5 in Vancouver, Washington, at the following coordinates: Latitude 45°37'30.0" N, Longitude 122°39'56.5" W. The Property is bounded by the West Barracks to the west and the Vancouver Barracks National Historic Reserve on all other sides.

Following is a portion of the legal description of the Property, which is currently owned by the U.S. government:

Two parcels of land located in the northeast quarter of the southwest quarter of Section 26, and the southeast quarter of the northeast quarter of Section 27, township 2 north, Range 1 East of the Willamette Meridian, Clark County, Washington.

The Property is owned by the U.S. government and is managed by the USAR 70th RRC at Fort Lawton, Washington. Current uses include activities conducted by the USAR, the Washington Army National Guard, and a variety of other governmental and public nonprofit organizations. In general, these activities include administrative functions, storage of materials, motor pool activities, community group meetings, and educational programs.

The Vancouver Barracks site is an open post without a secured perimeter, with the exception of the 400 Series buildings at the South Barracks. When Vancouver Barracks was initially established, the site was 640 acres. Much of the Vancouver Barracks area has been transferred, including the West Barracks in 2005, reducing the Property to approximately 47.46 acres.

The Property contains landscaped land and military facilities including 30 wood frame and brick buildings, totaling approximately 242,367 square feet. Table 3-1 summarizes current and past building use.

Table 3.1 redacted.

3.2 Historic and Current Land Use

3.2.1 Historic Land Use

Prior to 1825, the land currently occupied by the Vancouver Barracks was inhabited by the indigenous Chinookan tribes. Their economy was based on fishing, gathering, and hunting with a particular emphasis on the salmon resources of the Columbia River. Between 1830 and 1855 the Chinook Indians living near the barracks experienced a dramatic population decline as a direct result of exposure to European diseases (i.e., smallpox, measles, and malaria). Most of the tribal sites were abandoned or the reduced populations consolidated into fewer villages. By 1850, the surviving native people were being negotiated onto reservations in exchange for fishing rights (ENSR, 2002).

Under the terms of the September 27, 1850, Act of Congress, Colonel W.W. Loring by order dated October 31, 1850, defined the limits of Vancouver Barracks, including an area of about 16 square miles, subject to any and all valid claims of Hudson's Bay Company (HBC) and others, as provided for in the treaty between the U.S. and Great Britain, dated July 17, 1846. By order of the War Department dated October 29, 1853, the area was reduced to 640 acres and boundaries were published in General Orders (December 8, 1854).

3.2.2 Facility History

3.2.2.1 Occupancy History

Vancouver Barracks

Vancouver Barracks was founded by the HBC in 1824 and was their principal depot in the Pacific Northwest from 1825 to 1846. The HBC established the 2,600-acre installation partially to maintain British control of the territory north of the Columbia River.

The installation was named Camp Vancouver prior to 1854 before being renamed Columbia Barracks. In 1853, it was renamed Fort Vancouver. Congress reduced the installation size from 2,600 acres to 640 acres and approved Fort Vancouver as a military reservation in 1854. The fort was headquarters for much of the military in the Pacific Northwest through the end of the 19th century. In April 1879, Fort Vancouver was renamed Vancouver Barracks (ENSR, 2002).

Between World War I and World War II, Vancouver Barracks was the district headquarters for the 1st, 49th, 32nd, and 5th Infantry Regiments and for the Civilian Conservation Corps, a public works program created by Congress to employ young men during the Great Depression. Between 1944 and March 1946, Vancouver Barracks was used by the 9th Service Command as a staging area for cargo and personnel. The Vancouver Barracks was declared excess by the U.S. Army in March 1946, and the installation was closed until the end of the year. At that time, 84.5 of the original 640 acres were reactivated by the U.S. Army as the headquarters for the Organized Reserve Corps of the Oregon Military District (ENSR, 2002).

To commemorate the importance of Fort Vancouver, Congress established the Fort Vancouver National Monument in 1948. In 1958, Vancouver Barracks became a subinstallation of Fort Lewis to be used in support of the USAR and the Washington Army National Guard activities on Vancouver Barracks. In 2001, the Army Reserves took real property responsibility for Vancouver Barracks. The active U.S. Army retained real property accountability for Vancouver Barracks, since the USAR was unable to hold property accountability. The U.S. Department of the Interior and the City acquired a portion of the installation for use as a historic preserve in 1994, reducing the size of Vancouver Barracks to 53.6 acres. The USAR was delegated the authority to hold property accountability in 1995. Fort Lewis, in a request to U.S. Army Forces Command (FORSCOM) dated March 23, 1995, asked that FORSCOM initiate actions to transfer all real property at Vancouver Barracks to the USAR. In 2001, Vancouver Barracks became a subinstallation of Fort Lawton under the command of the 70th RRC (ENSR, 2002).

During HBC presence at Fort Vancouver between 1824 and 1860, officers, servants, their families, and other inhabitants of varied ethnicities were buried at the HBC Cemetery established on the Fort. The boundaries of the cemetery are shown in Figure 3-1. Catholic priests from St. James Mission recorded over 200 burials at the cemetery during the 17-year period between 1839 and 1856, but prior burials predate church records (ENSR, 2002).

By the time the U.S. government arrived at Vancouver Barracks in 1849 to participate in a transition from British to American ownership of the Oregon Territory, the boundary of the cemetery was no longer clearly marked. Some graves were relocated to the present Vancouver Barracks Cemetery, located approximately 1 mile north of Vancouver Barracks. No documentation was found to indicate how many graves were relocated or when. By 1900, the location of the original cemetery was lost beneath the expanding Vancouver Barracks, and some buildings were constructed over the gravesites located on the installation (ENSR, 2002).

Adjacent Properties

The following areas were not within the Property boundaries and are provided for historic perspective only.

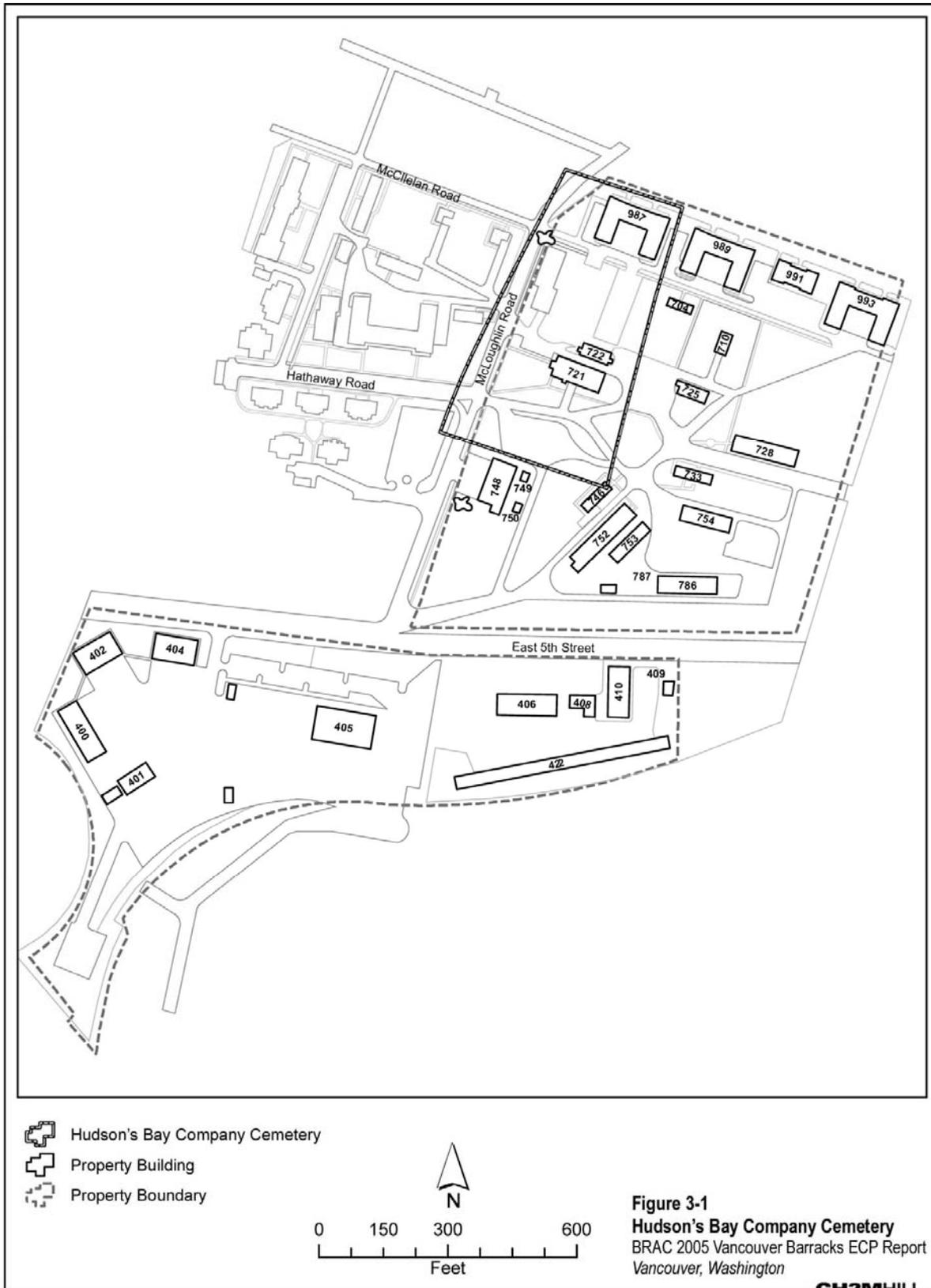


Figure 3-1
Hudson's Bay Company Cemetery
 BRAC 2005 Vancouver Barracks ECP Report
 Vancouver, Washington

CH2MHILL

File Path: \\Rosa\proj\USACE\Louisville\Dist\343346\Vancouver_Barracks\GIS\mxds\Figure3-1_Hudsons_Bay_Cemetery.mxd, Date: September 5, 2006 10:13:47 AM

Spruce Production Mill

During World War I, the Spruce Production Division (U.S. Army Signal Corps) built a saw mill and production facility at the site of Pearson Airpark located southeast of Vancouver Barracks. This facility mass-produced wooden aircraft components. At that time, the saw mill produced more than 1 million board-feet of lumber per day.

Kaiser Shipyard (Also Known as Columbia River Site)

The waterfront at the Columbia River was a government pier for the U.S. Army from 1849 to 1948 and was used to bring troops and supplies to Vancouver Barracks. In addition, during World War II, this area was a large shipyard called the Kaiser Shipyard. Today, portions of it are within the Fort Vancouver National Historic Reserve, which consists of a walkway along the stream bank and restaurants overlooking the river. Some portions are also part of the Columbia Business Center, a privately owned company.

3.2.2.2 Operational History

According to the EBS, throughout the existence of Vancouver Barracks, their mission has been mainly one of administration, housing, and training. Between 1849 and World War I, Vancouver Barracks had various ordnance and munitions uses, including a bastion, skirmish ranges, magazine storage buildings, powder storage buildings, an ordnance depot, and a pistol range. During World War I, aside from the above mission, the U.S. Army operated the Spruce Production Mill for the purpose of constructing aircraft components. Between the two world wars, the Vancouver Barracks were used for the training of the Citizen's Military Training Center and the Civilian Conservation Corp.

During World War II, the Vancouver Barracks were used as staging for the Portland embarkation, as a hospital, as an ordnance depot, and for shipbuilding. Following the end of World War II, the operations centered more on administration and training.

Other uses of the Vancouver Barracks included activities conducted by the USAR, the Washington Army National Guard, and a variety of other governmental and public nonprofit organizations. These activities included reserve training, administrative functions, storage of materials, motor pool activities, community group meetings, and educational programs.

In general, potential materials of environmental concern associated with these types of activities include, but are not limited to, petroleum, oil, lubricants, pesticides, polychlorinated biphenyls (PCBs), solvents, degreasers, lead-based paints, herbicides, munitions and explosives, and small quantities of other hazardous materials not listed.

3.2.2.3 Process Descriptions (Industrial Facilities Only)

The EBS identified industrial operations at Vancouver Barracks that were, and currently are, limited to those associated with light vehicle storage and maintenance. Maintenance consists of fluid change-outs and general repairs. Chemicals typically used include degreasers in parts-cleaning and petroleum, oil, and lubricants. Maintenance activities have occurred mainly in the 400 Series buildings located in the southern portion of the facility. Buildings 406, 408, 410, and 422 operated as maintenance facilities from the time of their construction until the early 1980s when the current maintenance facilities were constructed.

3.2.2.4 Occupancy, Lease, and Easement History

A timeline of occupant history at Vancouver Barracks is provided in Table 3-2.

TABLE 3-2

Occupancy History

Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Year	Occupancy
1825	Camp Vancouver established by the HBC encompassing 2,600 acres.
1846	Camp Vancouver became responsibility of U.S. government. First contingency of U.S. troops arrive at camp.
1853	Fort Vancouver reduced to 640 acres.
1948	U.S. Congress establishes Fort Vancouver National Monument.
1958	Vancouver Barracks becomes subinstallation of Fort Lewis.
1960	Establishment of Vancouver Barracks National Historic Preserve.
1994	Vancouver Barracks National Historic Preserve acquires northern portion (Officers Row) of Vancouver Barracks.
2001	Vancouver Barracks under real property* of U.S. Army Reserves.
2005	Eastern and southern portion of Vancouver Barracks incorporated into BRAC 2005 program.

* Real property consists of lands and improvements to land, buildings, and structures, including improvements and additions, and utilities. It includes equipment affixed and built into the facility as an integral part of the facility (such as heating systems), but not movable equipment (such as plan equipment). In many instances, this term is synonymous with real estate.

Currently, Vancouver Barracks holds three in-grants: one for connection to the City sanitary sewer system, one road access right-of-way, and one aircraft easement for use of land transferred to Department of the Interior. Twenty-two out-grants are currently in effect, primarily for utility and transportation right-of-ways and administrative use of building space.

Today, the Property is primarily occupied by the USAR and is a subinstallation under the command of Fort Lawton. The buildings at the Property are occupied by the 70th RRC, U.S. Army Air Force Exchange Service, and the Washington Army National Guard. The current list of occupants is summarized in Table 3-3.

Table 3.3 redacted.

3.2.2.5 Range Operations

There are no operational ranges located at the Property. Historically, three indoor ranges were located in the attics of Buildings 987, 989, and 993. One inactive range is located in the basement of Building 721. Potential contamination of these areas is further discussed in Sections 4.2.4.2 and 4.6.

3.3 Installation Utilities (Historic and Current)

3.3.1 Water Systems

Vancouver Barracks currently receives its potable water from the City. The source of potable water for the City is the Lower Orchard lower alluvial aquifer. The City conveys water via an 8-inch-diameter pipe to two covered reservoirs. One reservoir has a capacity of 1 million gallons; the second has a capacity of 4 million gallons (ENSR, 2002).

The historical water distribution system used at the Property, prior to the City's water distribution system, is unknown. Water is distributed throughout Vancouver Barracks via underground transmission and distribution lines. The transmission and distribution systems, which consist of piping, valves, and two master meters, provide for both domestic water service and fire protection (including fire hydrants) throughout the installation.

3.3.2 Industrial and Sanitary Sewers and Treatment Plants

Vancouver Barracks collects wastewater, most of which is domestic, via underground collection lines and mains located throughout the area. A drain survey was conducted for the Property in 2004 (ICI LLC, 2004).

A site assessment was conducted at three maintenance buildings (Buildings 400, 402, and 404) as a part of the Stormwater Pollution Prevention Plan. Currently, there are no direct connections from the work bays or other interior areas at the maintenance shops (or storage building) into local stormwater conveyances. Trench drains inside the work/storage bays of

Buildings 400, 402, and 404 discharge through respective oil/water separators (one for each building) into the local sanitary sewer system. Most other floor drains inside the shops have been sealed with concrete. The former vehicle wash rack (discussed in Section 4.2.4) has been closed by the 70th RRC, and the wash pad has been sealed with concrete. However, the oil/water separator and some drain lines still remain in place. The area is now fenced and serves as a used/waste material accumulation area for the motor pool (Weston, 2004).

Wastewater from Vancouver Barracks is conveyed by means of a gravity system to the City publicly owned treatment works through connections north of East 5th Street and at Buildings 408 and 410. These connections transmit the wastewater to the City's West Side Water Reclamation Facility, a 22.4-million-gallon-per-day plant, located on Mill Plain west of downtown Vancouver (ENSR, 2002). Wastewater is treated and then discharged from a 168-foot diffuser outfall pipe that is submerged in the Columbia River. The outfall pipe is located approximately 2.5 miles west (on the west side of the City) and south of Vancouver Barracks.

Historical information on sanitary sewers was not available.

3.3.3 Stormwater System

Stormwater from Vancouver Barracks is collected in drains and conveyed through underground pipes, ranging in size from 6-inch lateral pipes to 27-inch municipal storm drain pipes, to a connection with the City's stormwater system. The City's stormwater drainage system crosses the boundary of Vancouver Barracks at the intersection of Evergreen Boulevard and Cabell Road and continues southward through the heart of Vancouver Barracks along McLoughlin Road. South of East 5th Street, the City storm sewer leads underneath Building 405, bends to the southwest for 450 feet, then bends due south and continues south from Vancouver Barracks to the Columbia River discharge point. The City's stormwater system discharges directly to the Columbia River approximately 800 feet from the Vancouver Barracks boundary (CH2M HILL, 1998).

As mentioned above, the three maintenance buildings (Buildings 400, 402, and 404) are currently not directly connected into local stormwater conveyances (Weston, 2004). However, Mr. Bill Schell from Vancouver Barracks indicated that other maintenance buildings may have been connected to the stormwater or sanitary sewer in the past. Information on historical connections to the stormwater system was not found during the limited records review for this ECP.

South of East 5th Street, there are 20 outfalls located within the motor pool area (OF-1 through OF-20). Of these, OF-4 through OF-7 and OF-11 through OF-15 are regulated under a National Pollutant Discharge Elimination System (NPDES) permit (refer to Section 4.1.4). Dye tests performed on July 16, 2002, showed stormwater from the parking area south of Building 400 on Vancouver Barracks flowing to the Columbia River. A main outfall is located on the east side of West Washington Street along the Columbia River, approximately 0.25 mile southwest of Vancouver Barracks. However, the outfall that receives stormwater from Vancouver Barracks is located approximately 100 feet east of the main outfall. This outfall is located under a water line and is not visible. Unpaved and graveled areas percolate stormwater to the ground. Some stormwater is collected from

rooftops of large buildings and is discharged to drywells, where it then infiltrates directly into the soil.

There is no record of interior drains discharging into the stormwater system at the Property (ICI LLC, 2004). Historical records on stormwater connections were not available.

3.3.4 Electrical System

The electric utility system at Vancouver Barracks is owned by the U.S. Army. Electricity is purchased from the Clark County Public Utility District and transmitted to the installation via a single feed located at the corner of East 5th Street and Vancouver Way. The distribution system on Vancouver Barracks consists of both overhead and buried underground cables. The system includes one master meter that covers the entire Vancouver Barracks.

3.3.5 Natural Gas

Heating energy is currently provided primarily by natural gas boilers and forced air systems, although there are some small electric space heaters used on installation. Natural gas is supplied to the installation by Northwest Natural. In fiscal year 2004, the total quantity of natural gas consumed was 111,050 million British thermal units (Fort Lawton, 2005).

Based on past coal storage areas observed during the VSI, coal was historically used to heat Buildings 422, 406, 410, 746, 748, 752, 753, 786, 721, 987, 989, 991, and 993 on the Property. Heating oil also was used to heat the buildings before they were converted to natural gas. See Section 4.4.1 for further information.

3.4 Environmental Setting

3.4.1 Climate

The EBS identified that the temperate marine climate of the Vancouver, Washington, area is characterized by an annual average maximum and minimum temperature ranging from 62.1 to 42.8 degrees Fahrenheit, respectively. The annual average rainfall for the area is 39.3 inches/year (99.8 centimeters/year), with 6.8 inches/year (17.3 centimeters/year) of snowfall, based on 2005 data (Web site: National Oceanic and Atmospheric Administration, 2005).

3.4.2 Topography

Vancouver Barracks is situated along the northern floodplain of the Columbia River. The ground surface gently slopes to the south-southwest toward the river. Surface elevations range from 34 feet above mean sea level at the south end to just over 85 feet mean sea level at the north end (Google Earth, 2006).

3.4.3 Surface Water Hydrology

Vancouver Barracks is located in the Columbia River Basin. No surface bodies of water are located on the Property. Significant bodies of water in the vicinity of Vancouver Barracks

include the Columbia River and Burnt Ridge Creek. The Columbia River is approximately 0.25 mile south of the installation, and Burnt Bridge Creek is approximately 1 mile to the northeast.

Surface water drainage on the installation is from the north to the south and appears to be well drained, with runoff controlled by storm drains.

3.4.3.1 Groundwater

Groundwater wells have not been installed at Vancouver Barracks or in the vicinity. Based on a well log from a City well located just across I-5 and limited information on the geology in the immediate area, it is inferred that groundwater could be as shallow as 15 feet below ground surface (bgs) in portions of the Property. The EBS reported groundwater at 60 feet bgs in the Salmon Creek aquifer, but acknowledged a lack of site-specific information and did not report an estimated depth on the Property.

The EBS reports that the alluvial aquifer has an estimated thickness of 40 feet, and the base of the aquifer is on top of the Troutdale formation. Groundwater is inferred to flow to the south-southwest, toward the Columbia River, which constitutes the local and regional hydrologic base level.

The Salmon Creek aquifer has been described as being highly permeable with large quantities of available water. The EBS reports that the most important groundwater aquifer in the region is the Troutdale Gravel aquifer, which is estimated to be 100 feet below Vancouver Barracks, with a thickness of about 150 feet. The Upper Troutdale aquifer has a gradient of approximately 0.01 foot drop per every foot in elevation toward the southwest.

There are no known current or former groundwater wells on Vancouver Barracks. United States Geological Survey (USGS), federal Public Water Supply System, and state water well information databases were searched by EDR in 2002 during the EBS for an area within a 1-mile radius of the parcel. Thirty wells were identified from the USGS well information database. According to the database, 19 of the 30 wells are used for industrial purposes, 1 well is used for air conditioning, 1 is used for public supply, 2 are used for domestic purposes, 1 is unused (it is a test well), and the uses for the remaining 6 wells are unknown. The nearest well identified in the EBS was approximately 0.25 mile to the west-northwest of Vancouver Barracks and has a 35-foot depth to the water table, presumably under nonpumping conditions. One well was identified in the federal Public Water Supply System database. This well is the Port of Vancouver well, located approximately 0.25 mile north-northeast of Vancouver Barracks. Two EPA violations for maximum monthly coliform levels were issued for the well in 1995.

3.4.4 Geology

This section is based on a review of geologic information that was conducted by URS for a site less than 1 mile east of the Property (URS, 2004).

The Property lies within the Willamette Valley physiographic province. The Willamette Valley province is an elongated; roughly north-south trending alluvial plain that pinches out at the northern and southern ends (URS, 2004). The province was created by uplift and

tilting of the Coast Range to the west and by the western Cascade Range to the east, creating the topographically low trough of the Willamette Valley.

The Washington Division of Geology and Earth Resources (1987) maps indicate that the shallow subsurface materials near the site are quaternary alluvium, described as medium to fine sand and silt on the floodplain of the Columbia River. Regionally, the unit is less than 50 feet thick. The alluvium is underlain by late Pleistocene coarse-grained alluvial catastrophic flood deposits associated with the Missoula flood events that occurred from 13,500 to 15,000 years ago. The larger clast sizes evident in the formation are an indicator of the higher energy/velocity waters that carried these gravels and cobbles to, and deposited them in, their present location.

The Property is located in the Sauvie-Puyallup soil association, which is made up of level to gently sloping floodplains of the Columbia River. Drainage ways and shallow depressions are numerous in the area; the soils are classified as somewhat poorly to somewhat excessively drained, and are moderately fine to moderately coarse in texture.

According to the United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey of Clark County, Washington, surficial soils at the site are classified as two types: Lauren gravelly loam and fill land (USDA-SCS, 1972). The property is located in the Lauren gravelly loam (8 to 20 percent slopes) map unit. The Lauren gravelly loam soil is described as occurring on terraces. The typical profile is gravelly loam to a depth of about 6 inches, underlain by about 27 inches of very gravelly loam. From 33 to 70 inches, the soil is described as very gravelly coarse sandy loam to very gravelly loamy coarse sand. The permeability is moderately rapid to rapid, the surface runoff is slow, and the erosion potential is slight.

3.4.5 Demography and Land Use

The Vancouver Barracks is located within the limits of the City. Vancouver has a population of 157,493 (2005), which is an increase from the 144,050 reported in 2000. The City covers an area of 43 square miles with a population density of 3,662 people/square mile. In the area immediately surrounding Vancouver Barracks, an estimated population density of 1,548 people/square mile was reported in 2004 (U.S. Census Bureau, 2005).

Surrounding property use includes residential, commercial, recreational (National Historic Reserve) and light industrial. Vancouver Barracks is located in the City's Vancouver Central Park District zoning area and has a comprehensive plan designation of Public Facilities. Permitted uses include those that serve the public and comply with the Vancouver Central Park Design Guidelines, as adopted by City Ordinance M-2011. The Vancouver Central Park Guidelines also provide development standards as adopted by City Ordinance M-2073 (Vancouver Historical Study Commission, 1993).

3.5 Biological and Cultural Resources Summary

3.5.1 Biological Resources

As part of the EBS, a request was submitted to the U.S. Fish and Wildlife Service (USFWS) for a list of plant and animal species potentially occurring in the Property that are

endangered, threatened, or proposed for listing as endangered or threatened. The USFWS responded (November 2001) that wintering bald eagles (*Haliaeetus leucocephalus*), a threatened species, could be found in the vicinity of Vancouver Barracks. In addition, bull trout (*Salvelinus confluentus*; threatened) and coastal cutthroat trout (*Oncorhynchus clarki clarki*; proposed) may occur in the Columbia River located approximately 0.25 mile south of the installation boundary. The National Marine Fisheries Service Web site, which reports, by region, listed species and their current status, also was consulted during preparation of the EBS to determine fish species potentially present in the vicinity of Vancouver Barracks. The Lower Columbia River chinook salmon (*O. tshawytscha*; threatened) Evolutionary Significant Unit, Columbia River chum salmon (*O. keta*; threatened) Evolutionary Significant Unit, Lower Columbia River steelhead (*O. mykiss*; threatened) Evolutionary Significant Unit, and Lower Columbia River/Southwest Washington coho salmon (*O. kisutch*; candidate) Evolutionary Significant Unit also may occur in the Columbia River (ENSR, 2002).

3.5.1.1 Wetlands

According to the National Wetland Inventory Maps issued by the USFWS, no designated wetlands exist on or adjacent to the Property. Additionally, no wetlands were observed on the installation during the EBS site visit or during the VSI.

3.5.2 Cultural Resources

3.5.2.1 Prehistoric Resources

Within the Property, archaeological material relating to prehistoric habitation has not been found.

3.5.2.2 Historic Resources

The EBS reports that during Vancouver Barracks principal growth period between 1829 and 1846, Fort Vancouver was the social and cultural center of the region, with the first schools and churches being established on the Fort. The Fort also became the only reliable source for emergency shelter and transportation, as well as a resource for food and clothing.

Native Americans who lived in the vicinity of the present-day Vancouver Barracks resided along the banks of the Columbia River, and spoke the Multnomah dialect of Upper Chinookan. The HBC peacefully coexisted with Native Americans. Marriages between Native American women and non-Native American HBC male employees have been documented. During the 1830s, the entire population of a Multnomah Chinook village, located near Vancouver Barracks, was eradicated during a small-pox epidemic. In addition, during the same time period, an estimated 98 percent of the Chinook Native American population in the Portland basin succumbed to disease.

The Vancouver Barracks area is known to have a high concentration of significant archaeological resources. Beginning in the late 1940s, many archaeological excavations and studies were conducted, with over 1.4 million artifacts related to HBC operations collected. Artifacts pre-dating the 1860s have been found in the area. These include remnants of dwellings, buildings, fence posts, utility and sewage system features, water lines, refuse dumps, boardwalks, a corral, drainage ditches, utensils, buttons, bottles, construction devices, ceramic shards, and World War I railroad features. These artifacts represent the

largest HBC collection in the world. The majority of the investigative work has taken place at the stockade, the Kanaka Village/riverfront area, the parade grounds, the Officers' Row area, and the area southeast of McClellan Road, although work has been performed throughout Vancouver Barracks.

3.5.2.3 Former Hudson's Bay Company Cemetery

The EBS reports that construction workers digging for a water pipe in the basement of the auditorium (Building 721) on Vancouver Barracks discovered bones and some coffin remnants in 1982. It was then discovered that the auditorium had been constructed on top of the old HBC Cemetery, where the company buried servants, officers, their families, and Native Americans, among others. The cemetery was subsequently surveyed and is understood to occupy the north western portion of the Property in the vicinity of Building 721. On June 23, 1993, a spiritual cleansing ceremony was conducted on Vancouver Barracks in the basement of the installation auditorium by a Cowlitz tribal holy man. The site was purified in the ceremony and the remnants of coffins and bones were freed of Indian spirits.

The Department of the Army is working to get a commitment by partners in the Vancouver National Historic Site to leave human remains in the former HBC Cemetery undisturbed, and to limit future development in the area. Site protection procedures are currently in effect and can be obtained from the U.S. Army.

3.5.2.4 Historic Buildings/Structures

A historical buildings and structures inventory was completed in 2004. The survey identified 42 buildings/structures 50 years old or older, and 40 buildings/structures eligible for the *National Register* (Boes, 2006).

Vancouver Barracks was determined eligible for inclusion on the National Register of Historic Places in 1979. According to the 1986 Historic Properties Report (Building Technology, Inc., 1986), there are no Category I or II properties at Vancouver Barracks and, therefore, none at the Property. Category I and II properties are considered to have higher historical value than Category III properties. However, Vancouver Barracks has a composite value as a historic district because it exhibits the stylistic progression of the general development of Vancouver Barracks. The significance of the district is primarily historical, since all but 11 of Vancouver Barracks' 49 buildings are classified as Category III historic properties. The remaining 11 buildings (Buildings 400, 401, 402, 404, 405, 409, 602, 673, 676, 710, and 787) are not classified as historical because they were constructed within the last 50 years. The 400 and 700 building series are within the Property boundary.

4. Environmental Conditions

4.1 Environmental Permits/Licenses

4.1.1 Resource Conservation and Recovery Act Status

Vancouver Barracks was issued a hazardous waste handler permit (WA7210020924) as a small-quantity generator from the federal government. In 2004, Vancouver Barracks was issued temporary large-quantity generator status due to restoration work conducted on the West Barracks. Restoration work included the removal of lead-based paint and debris from a building situated in the West Barracks.

4.1.2 Solid Waste Permits

Vancouver Barracks does not have any solid waste permits. All solid wastes are handled through a contract with Waste Management, Inc.

4.1.3 Underground Storage Tank/Aboveground Storage Tank Permits

The known regulated and unregulated USTs and aboveground storage tanks (ASTs) at the Property have been removed (refer to Section 4.4). The potential still exists for unregulated tanks that were used for heating oil to be found on the Property, but no documentation was readily available that described the location of unregulated tanks, if any exist, on the Property. Heating oil tanks that are less than 250 gallons in capacity are exempt from federal and state UST regulations under RCRA Subtitle I, but can be regulated under the Clean Water Act in the event of a violation, such as a leaking tank. The documentation reviewed and interviews conducted as part of this work did not identify any unregulated tanks.

4.1.4 National Pollutant Discharge Elimination System Permits

Vancouver Barracks currently works under an EPA NPDES Permit (Number WAR 05A46F dated October 14, 2004) that encompasses the area south of East 5th Street, which is referred to as the Vancouver Barracks Motor Pool. The State of Washington does not have NPDES permitting authority for federal facilities (Weston, 2004).

Vancouver Barracks has been covered in the past under Sector P of the EPA Multi-Sector General Permit (MSGP) – Motor freight transportation facilities, passenger transportation facilities, petroleum bulk oil stations and terminals, rail transportation facilities, and U.S. Postal Service transportation facilities. According to the EPA and 70th RRC records, the U.S. Army I Corps and Fort Lewis Public Works submitted a Notice of Intent (NOI) for Sector P of the MSGP on September 23, 1998. The NOI tracking number for the submittal was WAR 05A46F and covered all of Vancouver Barracks. However, the MSGP was revised (renewed) on October 30, 2000, during which time the 70th RRC was required to reapply for coverage under the new MSGP. No record exists at the 70th RRC or EPA of a reapplication or any other NOI submittal during that time or since. In May 2004, the 70th RRC submitted an NOI for coverage of the motor pool area as opposed to the entire installation, because the motor pool area is the only location with regulated industrial activity (Weston, 2004).

4.1.5 Drinking Water Permits

No drinking water permits were identified. Potable water is provided by the City.

4.1.6 Air Permits

The air emission sources at the Property that were registered with the Southwest Clean Air Agency (SWCAA) as of 2005 (SWCAA ID 984) included 12 natural gas-fired heating units. Air emission sources at the Property include natural gas-fired boilers and heaters, painting operations, mobile sources, and other small sources.

The 2005 emissions summary for Vancouver Barracks, prepared by Fort Lawton for the SWCAA, based on EPA AP-42, reported 0.31 ton of nitrogen oxides, 0.26 ton of carbon monoxide, 0.02 ton of volatile organic compounds (VOCs), and 0.02 ton of particulate matter (SWCAA, 2005). The levels of sulfur dioxide and hazardous air pollutants were negligible according to the emission statement. The emission statement identified that no other significant emission sources are located on the Property. The boilers are not subject to new source performance standards, as described in 40 CFR 60.

4.1.7 Nuclear Regulatory Commission Licenses

Vancouver Barracks does not hold a Nuclear Regulatory Commission license for radiological materials. The use of radiological materials has been confined to low-light-level rifle sight containing promethium-147 or tritium, compasses containing tritium, and luminous dials and instruments containing low levels of tritium, radium, and iridium. These items are used by various units during training and are transported with the units when they return to their assigned installations.

No disposal of radiological materials has been reported at the Property.

4.1.8 Other Permits/Licenses

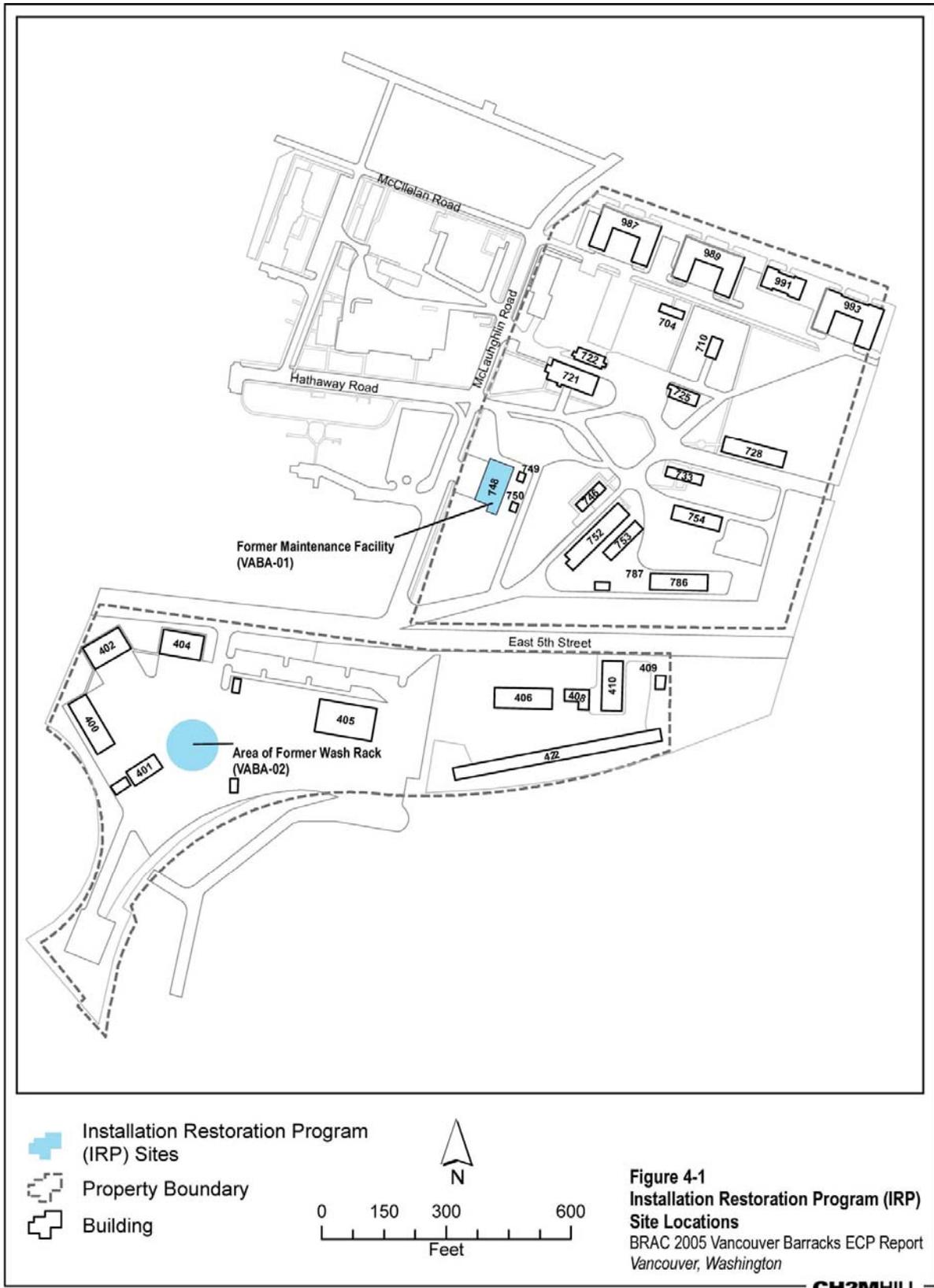
None identified.

4.2 Environmental Cleanup

4.2.1 Installation Restoration Program

There are two sites listed in the Army Environmental Database Restoration (AEDB-R) that are included in the U.S. Army DOD IRP. These include the former maintenance support Building 748 (site VABA-01) and the former wash rack (site VABA-02) at Building 400 (Figure 4-1).

A release of 0.5 quart of a mixture of diesel and oil from a vehicle parked in Building 748 to the Columbia River was reported to the EPA in 1995. As a result, a Preliminary Assessment (PA) was completed at the former maintenance support Building 748 (VABA-01) in 1996. The PA included records review, personnel interviews, and site visits. Environmental sampling is not within the scope of a PA. The PA concluded that the release of oil had not caused a release to the environment that negatively affected human health or the environment, and the report recommended no further action.



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It is inferred that this recommendation was made due to the small quantity of oil spilled and that environmental controls that were in place at the time. The site was considered Response Complete (RC) in AEDB-R as of March 1996.

The 1996 PA also addressed the former wash rack (VABA-02) at Building 400 (USACE, 1996). The PA reported that because of its design, release of process water from the wash rack would cause a discharge to the Columbia River through the stormwater system. A follow-on Site Inspection (SI) was recommended and completed in 1998. Information regarding the SI is presented in Section 4.2.4.1. Based on the SI data (primarily documentation that concentrations of contaminants met regulatory cleanup levels), no further action was considered necessary. This site was declared Remediation Complete in December 1998 (Woodward-Clyde, 1998).

4.2.2 Military Munitions Response Program

One area on the Property has the potential for munitions and explosives of concern (MEC) to be present. This area of 8.15 acres is located south of East 5th Street and currently is included in the MMRP (see Figure 4-2). Known historic uses of the MEC site (sometimes referred to as the Western Portion Site) include powder storage, ordnance depot, ammunition storage buildings, and firing ranges. This site had various ordnance and munition use on it from 1849 to 1960 (TechLaw, 2006). Section 4.12 describes this site in further detail.

4.2.3 Compliance Cleanup

Compliance-related cleanup (CC) refers to the cleanup of contamination resulting from operations that have occurred since October 1986. The Property currently does not have any CC sites.

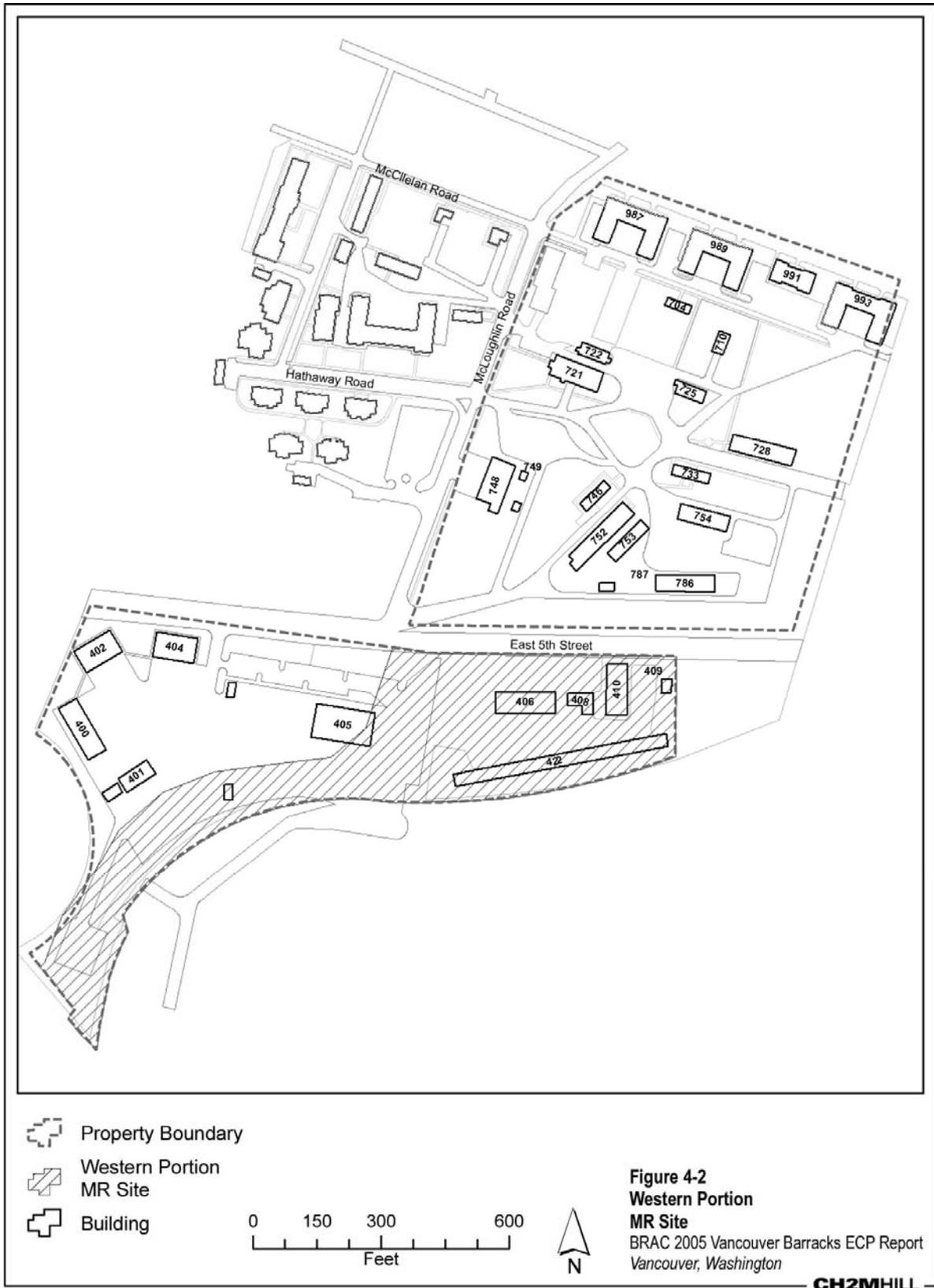
4.2.4 Previous Environmental Investigations

4.2.4.1 Preliminary Assessment

As discussed in Section 4.2.1 above, the U.S. Army conducted a PA at Vancouver Barracks in 1996 (USACE, 1996).

This PA was conducted in response to a spill of approximately 0.5 quart of motor oil at the former maintenance support Building 748 (site VABA-01). This spill reportedly reached the site storm drain system. Because of the spill, Vancouver Barracks was placed on the Federal Agency Hazard Waste Compliance Docket on April 11, 1995. The PA concluded that the reported oil spill and past practices had not caused a release to the environment through soil, air, groundwater, or surface water pathways that adversely affected human health or the environment. No further action was recommended for the former maintenance facility.

Although the PA recommended no further action at the site, an EPA evaluation required additional investigation of the abandoned vehicle wash rack and Building 402 where dry cleaning solvents were stored in bulk (EPA, 1996). Results of these investigations are summarized below.



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Former Wash Rack Area (Site VABA-02)

Six soil borings were advanced with a hand auger within the abandoned vehicle wash rack area, located east of Building 400, including two borings through the bottom of the concrete-lined drain. The drain extended approximately 4 feet bgs. Each soil boring was advanced to approximately 2 feet below the base of the concrete (Woodward-Clyde, 1998).

Two soil samples were collected from each boring. One soil sample was collected from the 0- to 1-foot interval (surface) beneath the concrete, and the second was collected from the 1- to 2-foot (subsurface) interval. The analytical results presented in the report showed that four VOCs (acetone, methyl ethyl ketone, methyl isobutyl ketone, and toluene) were present in both the surface and subsurface wash rack area samples. Acetone was detected in all but one wash rack sample with concentrations ranging from 0.011 milligrams per kilogram (mg/kg) to 0.041 mg/kg. Methyl ethyl ketone was detected in eight samples ranging in concentration from 0.003 mg/kg to 0.010 mg/kg. Three samples contained concentrations of methyl isobutyl ketone ranging from an estimated 0.006 mg/kg to 0.007 mg/kg. Toluene was detected at concentrations ranging from an estimated 0.002 mg/kg to 0.004 mg/kg in 10 samples, which is below the state screening value of 7 mg/kg. This screening level is provided in the Ecology's Model Toxics Control Action (MTCA), Method A. One semivolatile organic compound (SVOC) was detected in two samples at different depths. Di-n-butylphthalate was detected in two samples at concentrations of 0.19 and 0.22 mg/kg (Woodward-Clyde, 1998). This SVOC is a common laboratory contaminant and likely is not attributable to Property contamination.

Aluminum and chromium were detected in both sample intervals at one location at concentrations slightly exceeding twice the standard deviation added to the mean for each metal (the comparison criteria used in Woodward-Clyde [1998]). Beryllium was detected in one shallow sample at a concentration of 1.1 mg/kg. Barium was detected in one sample at a concentration of 440 mg/kg. Magnesium also was detected at a concentration of 6,820 mg/kg (Woodward-Clyde, 1998). Review of the SI Report and other pertinent documents by EPA Region 10, Ecology, and Fort Lewis has resulted in a decision that remediation was not necessary at the site and no further remediation action was planned (Woodward-Clyde, 1998). There are no plans for further sampling or cleanup at in this area (ENSR, 2002). The AEDB-R states that the IRP response at the former wash rack is complete.

Building 402, Former Dry Cleaning Solvent Use and Storage Area

EPA identified Building 402 as a historic dry cleaning practice point of concern. The dry cleaning solvent stored in Building 402 was used as a degreaser in the vehicle repair and maintenance shops. Why the solvent was used is not known because other more appropriate chemicals exist, but the inference is that an ample or leftover supply of solvent existed. The EPA and USACE agreed that additional investigation of Building 402 would consist of solids sampling from floor drains and analysis for VOCs and metals (ENSR, 2002).

Three soil borings were advanced near Building 402, an active vehicle maintenance facility. Two soil borings were advanced with a hand auger along each drain line from Building 402 to a former oil/water separator, and one soil boring was advanced along the drain line from the former oil/water separator to the location of the UST. One soil sample was collected from each boring at a depth that was estimated to be beneath the drain lines (Woodward-Clyde, 1998).

The full suite of analysis is not known. Eight VOCs were detected in the four samples collected near the drain lines at Building 402 (Woodward-Clyde, 1998). Acetone was detected in two of the samples at concentrations of 0.06 mg/kg and 0.069 mg/kg. The compound methyl ethyl ketone was detected in all four samples at concentrations of 0.004 mg/kg, 0.008 mg/kg, and two at 0.015 mg/kg. The compound methyl isobutyl ketone ranged from concentrations of 0.004 mg/kg (estimated) to 0.006 mg/kg in three of the samples. The meta and para xylene isomers were detected in two samples at estimated concentrations of 0.002 mg/kg and 0.003 mg/kg, which are well below the Ecology MTCA Method A Cleanup Level of 9 mg/kg for unrestricted land use. Toluene was detected an estimated concentration of 0.002 mg/kg in three of the samples, which is lower than the Ecology MTCA Method A Cleanup Level of 7 mg/kg. Calcium was the only metal detected in samples from the area around Building 402. The trichloroethene concentration detected in each of the samples was 0.003 mg/kg, which is below the Ecology MTCA Method A cleanup level of 0.03 mg/kg. The 1,1,1-trichloroethane concentration detected in all of the samples measured was 0.003 mg/kg, which is below the Ecology MTCA Method A cleanup level of 2 mg/kg. The tetrachloroethene concentration in each of the samples was 0.003 mg/kg, which is below the Ecology MTCA Method A cleanup level of 0.05 mg/kg (Woodward-Clyde, 1998).

Additional sampling was conducted at the site of a former UST near Building 402 resulting in the detection of five VOCs (acetone, methyl ethyl ketone, methyl isobutyl ketone, toluene, and meta and para xylene isomers). Acetone was detected at concentrations of 0.037 mg/kg and 0.025 mg/kg. The compound methyl ethyl ketone was detected at concentrations of 0.011 mg/kg and 0.008 mg/kg. The compound methyl isobutyl ketone was detected in both samples at a concentration of 0.006 mg/kg. Toluene was detected at concentrations estimated at 0.001 mg/kg and 0.002 mg/kg, which are below the Ecology MTCA Method A cleanup level of 7 mg/kg. Lastly, meta and para xylene isomers were detected at a concentration of approximately 0.001 mg/kg, which is below the Ecology Method A cleanup level of 9 mg/kg. No SVOCs or metals were detected in the samples collected from these soil borings (Woodward-Clyde, 1998). No plans exist for further sampling or cleanup in this area (ENSR, 2002). The AEDB-R lists that the IRP response is complete.

4.2.4.2 Former Firing Ranges

Four buildings (721, 987, 989, and 993) previously housed firing ranges. The attics of these buildings and the basement of Building 721 are contaminated with lead dust from former small arms firing ranges. During the 2006 VSI, the attics in building 987, 989, and 993 were locked and warning signs for lead exposure were posted.

Each building was built in the shape of a "U", with each leg extending 102 feet long by 38 feet wide (3,900 square feet [ft²]). Support beams that span the width of the ranges are set on 16-inch centers at a height of approximately 7 feet. Two of the three wings of each building had previously been used as a firing range, for a total of six indoor firing ranges. The ranges, including the two sets of stairs leading from the second floor, are constructed entirely of unsealed wood. Each range also contains two abandoned ventilation ductwork runs that support historic exterior roof ductwork caps. The types of materials used as backstops and bullet traps for these former firing ranges are unknown (Shaw Environmental, 2006).

Lead dust abatement activities were performed in 1998. This cleanup was followed by an investigation that consisted of a combination of qualitative and quantitative lead dust wipe/swab sampling, as well as monitoring air for lead dust conducted in July 2004 (Shaw Environmental 2006). These activities are described below.

Abatement activities consisting of surface cleaning were performed in the summer of 1998, to minimize exposure. Surface cleaning consisted of removing all items stored in these areas and either vacuuming the items with a high-efficiency particular air (HEPA) filter or washing them with a trisodium phosphate solution upon removal to remove lead dust. The areas were then HEPA-vacuumed, a surface coat of latex with grit was applied to the floors to reduce slipping hazards, and all nonwood surfaces were wet mopped.

The lead dust investigation was conducted by Shaw Environmental in July 2004 included Buildings 987, 989, and 993 (Shaw Environmental, 2006). Qualitative sampling of these buildings included collecting lead dust with wipe and swipe samples of the administrative offices adjacent to the ranges, as well as air samples from the attics (of the firing ranges) (see Section 4.7). Three wipe samples, out of a total of 66 samples taken, had lead concentrations higher than the U.S. Army cleanup goal of 200 micrograms per square foot ($\mu\text{g}/\text{ft}^2$).

The lead-dust wipe survey found that lead concentrations in administrative office areas ranged from less than 10 up to 350 $\mu\text{g}/\text{ft}^2$. Lead-dust wipe sampling results showed average lead concentrations that ranged from 2,253 to 5,800 $\mu\text{g}/\text{ft}^2$, which are higher than the U.S. Army cleanup standard of 200 $\mu\text{g}/\text{ft}^2$.

Two swab samples were collected in each of the three administrative office areas (typically the hallway in front of the doors leading to the attic stairs) for a total of six sampling swabs. None of the swab samples taken indicated the presence of lead dust above the 2 micrograms of lead on solid surfaces (Shaw Environmental, 2006).

The six lead dust air samples taken in the former indoor firing ranges (two samples in each of the three ranges) did not show lead dust concentrations above the laboratory's reporting limit 6.2 micrograms per cubic meter of air sampled (Shaw Environmental, 2006).

The Shaw Environmental (2006) Investigation concluded that lead concentrations on vertical surfaces, such as walls, support beams, and trusses in the attics were as high as levels found on the floors. Additionally, wooden floorboards are loosely fitted and dust and lead contamination have sifted through onto the lath and plaster below (Shaw Environmental, 2006).

4.3 Hazardous Substances

Hazardous materials are stored in several buildings including 400, 402, 404, 405, 408, 709, 410, 422, 710, 721, 728, 733, 748, 749, 750, 752, 753, 786, 987, 989, 991, and 993. A listing of available information on hazardous materials stored at the Property is provided in Appendix F.

According to the 2005 Dangerous Waste Annual Report Verification Form, the Property is a medium-quantity generator under RCRA Site Identification Number WA7210020924. Vancouver Barracks used Burlington Environmental Research, Inc. (RCRA ID No.

WAD991281767 and WAR000001743) and Safety-Kleen Corp. (RCRA ID No. ORD981766124 and TXR000050930) to dispose of hazardous waste from the installation.

The following description is based on the 2006 VSI and information from the EBS site visit.

4.3.1 Building 400

Building 400 is the Army Maintenance Support Activity (AMSA) 82 Motor Pool. General automotive repair and maintenance operations such as welding, changing of antifreeze and oil, and painting are conducted in vehicle bays in this building. Vehicles are not fueled at this facility. Potentially hazardous wastes associated with this building include used oil and oil filters, used antifreeze and waste brake/hydraulic fluid.

A trench drain is located along the front of the vehicle bays (northwest side of the building). The trench drain flows through an oil/water separator located outside of the building and then to the sanitary sewer system. The oil/water separator was formerly connected to a 500-gallon waste oil UST; however, the UST was removed in 1993 necessitating more frequent inspection and maintenance of the oil water separator.

Building 400 houses two cabinets for flammable materials. The cabinets contain cans of spray paint and some small quantities of petroleum, oils, and lubricants (POLs); solvents; and degreasers.

A solvent parts cleaner is located inside Building 400. This unit is equipped with a filter and drum, allowing the solvent to be reused. Safety Kleen, Inc. maintains this unit by periodically collecting the used solvent and replacing it with new solvent. A POL storage room is located on the west side of the building, which can be accessed only from the exterior of the building. Inside this room is a dispenser unit for several 55-gallons drums of oil, grease, and antifreeze. Small storage containers of hazardous materials including lubricants, carburetor cleaner, degreaser, and brake fluid are also stored in this room. There is a drain in the center of the room that once drained first to an oil/water separator, and then to a UST for retention of spilled hazardous materials. The oil/water separator tank has been removed and the drain has been filled with concrete.

Recycling of used oil and disposal of oily rags are coordinated through the Defense Reutilization and Marketing Office (DRMO) or through private contractors.

A battery storage room is located in Building 400, with a drain that leads to a lime pit. The lime pit, which is composed of a cell with lime in it, is intended to neutralize acid that could leak from batteries prior to discharging it to the sanitary sewer system. The pit has not been maintained and is believed to have never been used (ENSR, 2002). The pit was inspected during the 2004 Drain Survey (ICI LLC, 2004) and no media was observed inside the pit. Small quantities of POLs, cleaners, and batteries are stored in the battery storage room.

To the south of Building 400 are two small outdoor storage trailers with secondary containment. Several 55-gallon drums of lubricating oils, diesel fuel, gasoline, and brake fluid are stored in the trailers for use in Building 400.

To the southeast of Building 400 are two yellow poly-packs (each holds two 55-gallon drums) and a 55-gallon tank behind a locked gate. These drum packs are used for waste oil, waste oil filters, and waste antifreeze.

4.3.2 Building 402

Building 402 is a Motor Pool used by the 396th Combat Support Hospital (CSH) and the 104th Division Institutional Training. The 396th CSH occupies the east portion, and the 104th Division of Institutional Training operates the west portion of the building. General automotive repair and maintenance operations, such as changing of antifreeze and oil are conducted in vehicle bays in this building. Potentially hazardous wastes associated with this building include used oil and oil filters, used antifreeze and waste brake/hydraulic fluid.

A trench drain is located along the front of the vehicle bays on the south side of the building. The trench drain flows through an oil water separator located outside of the building and then to the sanitary sewer system. The oil/water separator was formerly connected to a 500-gallon waste oil UST; however, the UST was removed in 1993, necessitating more frequent inspection and maintenance of the oil water separator.

Two flammable materials cabinets in the building store cans of spray paint, 1-gallon cans of paint, and some small quantities of solvents and degreasers.

A solvent parts cleaner is located inside Building 402. This unit is equipped with a filter and drum, allowing the solvent to be reused. Safety Kleen, Inc. maintains this unit by periodically collecting the used solvent and replacing it with new solvent.

A POL storage room is located on the east side of the building. Inside this room is a dispenser unit for several 55-gallon drums of oil, grease, and antifreeze. Small storage containers of hazardous materials including lubricants, carburetor cleaner, degreaser, and brake fluid are also stored in this room. A floor drain in this room drains to a lime pit composed of a cell with lime in it. This room previously had been used for battery storage and the lime pit was intended to neutralize acid that may leak from batteries prior to discharge to the storm sewer system.

South of Building 402 are two small outdoor storage trailers with secondary containment associated with the building. One storage trailer houses several 55-gallon drums of diesel fuel and gasoline for use in the Building 402 shop. The other storage trailers houses empty hazardous material containers (including two empty 55-gallon drums used to store waste oil). Used materials remain in storage until they are removed by the 70th RRC or Fort Lewis.

4.3.3 Building 404

A POL storage room is located on the north side of the building and can be accessed only from the exterior of the building. This room was empty during the 2006 VSI. A drain in the center of the room once drained first to an oil/water separator and then to a UST for retention of spilled hazardous materials. The oil/water separator tank has been removed and the drain has been filled with concrete.

In the battery storage room of Building 404, there is a floor drain that has been filled with concrete (Schell, 2006). During the 2006 VSI, this room was observed to be a storage space for small containers of hazardous materials.

A trench drain is located on the interior of the building along the front of the vehicle bays. The trench drain flows through an oil/water separator located outside the building and then to the sanitary sewer system. The oil water separator once had an associated UST for

waste oil; however, the UST has been removed. The oil/water separator formerly was connected to a 500-gallon waste oil UST; however, the UST was removed in 1998 necessitating more frequent inspection and maintenance of the oil water separator.

A storage trailer was observed to the east of Building 404. During the 2006 VSI, no hazardous materials were stored in this trailer; however, in the past, 5-gallon containers of gasoline had been stored in this trailer (Rossi, 2006). Anecdotal evidence indicated that a lead battery was stored in a gassy area near this storage trailer (Rossi, 2006). Signs of contamination were not observed in this area during the 2006 VSI.

4.3.4 Building 405

Building 405 is used as a supply room. Most of supplies in the building are stored in locked cages.

During the EBS site visit, a janitorial supply room and biomedical storage area were observed. The janitorial supply room is used to store small quantities of various cleaners and has a drain that leads to a lime pit. The lime pit is a cell with lime in it to neutralize spilled liquid prior to discharge to the sewer. The lime pit is believed to have never been used and has not been maintained (Rossi, 2006). Most of the supplies in the building are stored in locked cages. One locked cage contains used needles (in sharps containers), immunizations, segregation locker for immunizations past expiration dates, and cleansers such as alcohol. Small cylinders of oxygen were also stored in the locked cage. Used needles and immunizations that are past expiration dates are disposed in an incinerator at Madigan Army Medical Center on Fort Lewis. A floor drain is in the center of the medical storage cage.

To the south of the building are two small outdoor storage trailers with secondary containment. Several 5-gallon containers of hydraulic oil and antifreeze were observed in these trailers during the 2006 VSI.

A fuel truck with a secondary containment area is stored in a parking lot east of the building.

4.3.5 Building 406

No hazardous materials were observed in the building during the 2006 VSI. However, due to historical use as a garage, the potential for past storage of hazardous materials exists.

4.3.6 Building 408

No hazardous materials were observed in this building during the 2006 VSI, except small quantities of general cleaning supplies and one can of paint. A floor drain is in the boiler room. This drain is suspected to discharge into the ground or to flow north off the property to join the City sanitary sewer (ICI LLC, 2004). Minor staining was observed on the concrete floor in the boiler room.

On the exterior south side of the building is a concrete area (previously a vehicle wash facility) with a steel plate covering a sump with a drain. This drain flows south through an abandoned line; the outlet pipe acts as a separator/grit trap (ICI LLC, 2004). During the 2006 VSI, liquid was observed in the sump.

4.3.7 Building 409

No hazardous materials were stored in this building during the time of the 2006 VSI, except small quantities of hydraulic fluid and antifreeze. This building has a concrete floor with a sump used as secondary containment (the sump has no discharge). This building was originally built to store hazardous materials but has never been used for this purpose (Baerncopf, 2006)

4.3.8 Building 410

No hazardous materials were observed in this building, except small quantities of general cleaning supplies. A sump filled with used oil was observed inside the garage. The sump appeared to be constructed of metal, and the integrity of the sump was not inspected during the 2006 VSI. A trench drain is located inside the building along the front of the vehicle bays on the east side of the building. The trench drain flows into the ground (ICI LLC, 2004).

A floor drain that is suspected to drain to the ground was observed in the former battery room (ICI LLC, 2004).

A floor drain that is suspected to drain into ground was observed in the former boiler room (ICI LLC, 2004). Rust and etching was observed in the concrete around the drain. This drain collects condensate from the Co Ray Vac System (ICI LLC, 2004).

4.3.9 Building 422

A flammable materials cabinet in the building housed small containers of hazardous materials. No floor drains were observed during the 2006 VSI.

4.3.10 Building 710

Hazardous materials are not typically stored in this building. At the time of the 2006 VSI, small quantities of spray paint and lubricant were observed. No floor drains were observed in this building. No ordnance was stored at this location.

4.3.11 Building 721

No hazardous materials were stored in this building at the time of the 2006 VSI. The drain in the boiler room is suspected to drain into the ground (ICI LLC, 2004). This drain collects boiler blow down. During the 2006 VSI, water was observed in the sump located in the southeast corner of the boiler room.

A can wash drain flows into a grease trap, which is located on the exterior northeast corner of the building, this drains to the sanitary sewer (ICI LLC, 2004).

The floor drains in the shower rooms in the basement are filled with concrete. Several floor drains in the kitchen drain to the sanitary sewer (ICI LLC, 2004).

In December 1996, a spill involving approximately 5 gallons of antifreeze and approximately 25 gallons of hydraulic oil was reported southeast of the McClellan Road/McLoughlin Road intersection near the old Chapel (Building 701, which has been demolished) and Building 721. No fuel oil or motor oil was spilled, and the antifreeze and hydraulic oil were immediately soaked up using Ecology cleaning pads, which were put

into barrels along with the contaminated soil, as directed by the hazardous material official. The contractor disposed of the spill cleanup debris, and none of the spill material reached the storm drains (ENSR, 2002).

4.3.12 Building 728

A flammable materials cabinet is located in the restroom on the east side of the building. This cabinet contains small quantities of plastic polish, enamel, rifle cleaner, and dry cleaning solvent. A floor drain is located in the boiler room, and a condensate return tank is in the boiler room.

4.3.13 Building 733

No hazardous materials were stored in the building, except small quantities of enamel paint, leather dressing, and lubricating oil in the basement. This building was not included in the 2004 Drain Survey (ICI LLC, 2004), and it is unknown where the drain in the boiler room discharges. During the 2006 VSI, a stain was observed in the concrete floor of the boiler room.

4.3.14 Building 748

Hazardous materials stored in Building 748 at the time of the 2006 VSI included 12 bags of fertilizer, 50 pounds each; 3 bags of salt, 50 pounds each; 1 bag of 60 pounds of ferrous sulfate; approximately 20 bags of dolomite, 50 pounds each; and several 50-pound bags of Rice Hull Ash.

A flammable materials cabinet contained several gallons of floor varnish, paint lacquer, semi-gloss paint, and latex paint.

During the 2006 VSI, a locked corrosive materials storage cabinet was observed adjacent to the restroom.

The basement boiler room has a floor drain that drains to an unknown location.

4.3.15 Building 749

This building could not be accessed during the 2006 VSI. According to onsite personnel, no hazardous materials are currently in the building, and the building has a cement floor with no floor drains (Schell, 2006). During the EBS site visit, hazardous materials stored in this building included 1 bag of Snapshot, 3 bags of Casaron 4G, 2 bags of Ronstar, and approximately 10 bags of dolomite (ENSR, 2002).

4.3.16 Building 750

No hazardous materials were found in the building during the 2006 VSI. This building has a wooden floor and no floor drain. During the EBS site visit, hazardous materials stored in this building included small quantities (less than 5 gallons each) of motor oil and tank cleaners (ENSR, 2002).

4.3.17 Building 752

Various hazardous materials and supplies are sold at the exchange, and inventory at the time of the final environmental baseline survey included (ENSR, 2002): canisters of propane; 1-gallon cans of Coleman fuel; approximately 100 cans of spray paint; 9, 8 ounces each, of drip strip; 9 cans, 8 ounces each, of Brasso; 10-pound bags of lawn and garden insect killer; 18-pound bags of weed and feed; 20-pound bags of rose and flower food; 32-ounce bottles of charcoal lighter fluid; 78-pound bags of starter fertilizer; 7 bags, 20 pounds each, of 16-16-16 fertilizer; 2 bags, 40 pounds each, of 16-16-16 fertilizer; 9 bags, 20 pounds each, of Turf Supreme fertilizer; 12 bags, 17 pounds each, of lawn fertilizer; 5 bags, 5 pounds each, of Preen fertilizer; 4 bags, 5 pounds each, of Preen and Green weed control and lawn fertilizer; and small quantities of containers (fewer than 10 of each) of various pesticides, herbicides, insecticides, rodenticides, and fungicides, including gopher mix, Isotox, Diazinon Ultra, Orthene, Malathion, Garden & Pest Dust, Slug & Snail Killer, Moss B-Ware, Brush B-Gon, Dursban, Deadline, Diazinon, ant killer, home pest killer, weed and grass killer, weed and broadleaf killer, Bug B-Gone, Stump Remover, Fung-Away, fertilizer spikes, houseplant insect spray, cockroach killer, and household cleaners. No change was observed during the 2006 VSI.

No floor drains were observed in the building.

4.3.18 Building 753

The building is being used as a warehouse for storage of furniture and supplies, including cylinders of helium gas used to charge a weather balloon. The helium canisters are stored in a locked cage in the building. No floor drains were observed in this building at the time of the 2006 VSI.

4.3.19 Building 754

Small quantities (less than 10 of each) of various hazardous materials are sold at the Shoppette, including propane, Coleman white gasoline fuel, spray paint, lawn and garden maintenance materials, automotive maintenance products, household pesticides and insecticides, and household cleaners. No floor drains were observed in the building.

4.3.20 Building 786

The building currently is used as a woodwork and repair shop, office space, barbershop, and storage area. Hazardous materials in the building are stored in cabinets for flammable materials.

No floor drains were observed in this building at the time of the 2006 VSI.

4.3.21 Building 987

Small quantities of household cleaners are stored in the bathroom of the men's locker room and in the kitchen area. There are floor drains in the shower rooms.

Two boiler rooms are in the basement (one in each wing). The boiler rooms have drains that are suspected to discharge into the ground, and they collect hot water heater and boiler blow down (ICI LLC, 2004). No hazardous materials are stored in the boiler rooms.

A potential coal storage room is adjacent to the boiler room in the west wing. No drain was observed in this room during the 2006 VSI.

4.3.22 Building 989

No hazardous materials were stored in the building, and no floor drains were observed in this building at the time of the 2006 VSI.

Two boiler rooms are in the basement (one in each wing). The boiler rooms have drains that are suspected to discharge into the ground, and they collect condensate (ICI LLC, 2004). A locked storage cabinet for flammable materials is in the west wing boiler room. No hazardous materials are stored in the east wing boiler room.

4.3.23 Building 991

No hazardous materials were stored in the building during the 2006 VSI. A sump is located inside the boiler room. At the time of the 2006 VSI, a sump pump was observed in the sump. The contents of the sump are reported to be pumped to the sanitary sewer.

4.3.24 Building 993

A boiler room on the east side of the building contained various types of unused or partially used containers of hazardous materials, including nine 1-gallon cans of epoxy. A floor drain in the boiler room is suspected to discharge into the ground (ICI LLC, 2004).

Two vaulted "arms rooms" are located in the basement, one in each wing. These rooms were not accessed during the 2006 VSI. According to the National Guard representative, small-caliber ammunition and small quantities of armory cleaner were stored in this room (Spencer Marks, 2006).

Two storage areas were located in the south side of the basement at the time of the EBS site visit. The storage area on the southwest side of the building in the basement contains small quantities of paints and some new fluorescent light ballasts. The storage area in the southeast portion of the basement is used by the Special Forces Detachment and contains various hazardous materials, including small quantities of wasp killer, powdered insecticide, and degreaser; six 50-pound bags of fertilizer; several 1-gallon cans of paints and adhesives; one 55-gallon drum of asphalt patch; three 5-gallon buckets of blacktop; a 5-gallon bucket of ice-melting compound; and small quantities of paints, seals, and stains (ENSR, 2002). These storage areas were not inspected during the 2006 VSI.

A cabinet for flammable materials is in the hallway of the west wing basement and contains small quantities of spray paints and degreasers (ENSR, 2002).

4.4 Petroleum Products (Underground and Aboveground Storage Tanks)

Regulated and unregulated USTs have been removed from the Property. A total of 15 USTs were removed between 1992 and 1998 (Table 4-1). Twelve of the USTs were removed from the 400 Series buildings located south of East 5th Street (CEcon, 1993; ENSR, 2002). The remaining three USTs along the east and north sides of Building 748 were removed (ENSR, 2002). Figure 4-3 shows the former locations of the USTs. Appendix G contains UST closure documentation.

The potential exists for unregulated tanks that were used for heating oil to be found on the Property, but no documentation is available on the location of any such tanks. Heating oil tanks that are less than 250 gallons are exempt from federal and state UST regulations under RCRA Subtitle I, but they can be regulated under the Clean Water Act in the event of a violation, such as a leaking tank.

4.4.1 Veteran's Administration (VA) Pump Station

This former pump station was located to the east of Building 748. Records indicated that, at one time, two fuel pumps associated with a gasoline UST and Diesel UST were operated by the VA. During the 2006 VSI, no evidence of potential environmental contamination was observed.

4.4.2 VA Laundry Facility

A laundry facility operated by the VA (former Building 778 located directly south of Building 748) was believed to be in operation between 1927 and 1985. This building was demolished in 1993, and the lot it previously occupied is being used to store equipment for the 396th CSH. No records of any spills at this facility exist (USACE, 1996), and the 2006 VSI did not reveal signs of potential contamination.

This facility used a steam generator for power, with the boiler located in the basement. Chemicals used at the facility include bleach, detergents (1 percent mixture), an alkaline product, a neutralizer of alkalinity, and a softener. The exact constituents of these chemicals are unknown. Chemicals were stored in powder form in 25-pound sacks. Typically, a month's supply, roughly 8 to 12 sacks of 25 pounds each would be stored. Wastewater was discharged into the sanitary sewer (USACE, 1996).

A removed 10,000-gallon storage tank was associated with this laundry facility. This tank was 16 feet bgs in a concrete vault. No records of any spills at this facility exist, and the 2006 VSI did not reveal signs of potential contamination.

Currently, no known ASTs are located on the Property. One active, double-walled, portable, 360-gallon oil tank used by the AMSA 82 Motor Pool was located in the motor pool yard east of Building 400 and was returned to Phillips Corporation in the first quarter of 2002 (ENSR, 2002). In the past, ASTs that contained heating oil were located throughout the housing area, but the last of these tanks was removed in 1985.

Figure 4.3 redacted.

TABLE 4-1
 UST Summary
Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Tank ID	Year Installed (est.)	Tank Capacity (gal)	Construction Material	Product Stored	Release Detection Method	Location	Equipment Served by Tank	Any Release From Tank? (Y/N)	Follow-up Action	Removal Date	Closure Rec'd? (Y/N/NA)
VB-1	1982	550	Fiberglass	Waste oil	Visual field inspection, soil samples	Northeast side Building 400	Floor drain in POL storage room formerly drained to an oil/water separator	N	Tank removed	12/14/93	Y
VB-2	1964	30	Steel	Waste oil	Visual field inspection, soil samples	Southwest side Building 400	Trench drain in front of vehicle bay drains to an oil/water separator	N	Tank removed	12/13/93	NA
VB-3	1982	550	Fiberglass	Waste oil	Visual field inspection, soil samples, Infrared spectrometer	Southeast side Building 402	Floor drain in Building 402 drains to an oil/water separator	N	Tank removed	12/13/93	Y
VB-4	1964	30	Steel	Waste oil	Visual field inspection, soil samples	North side Building 402	Floor drain in POL storage room formerly drained to an oil/water separator	N	Tank removed	12/14/93	NA
VB-5	Unknown	550	Fiberglass	Waste oil	Visual field inspection, soil samples	Northeast side Building 405	Floor drain in Building 405 formerly drained to an oil/water separator	N	Tank removed	12/9/93	Y
VB-6	1964	550	Fiberglass	Waste oil	Visual field inspection, soil samples	North side Building 405	Floor drain in Building 405 formerly drained to an oil/water separator	N	Tank removed	12/8/93	Y
VB-7	1964	30	Steel	Waste oil	Visual field inspection, soil samples	West side Building 405	Floor drain in Building 405 formerly drained to an oil/water separator	N	Tank removed	12/8/93	NA

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Tank ID	Year Installed (est.)	Tank Capacity (gal)	Construction Material	Product Stored	Release Detection Method	Location	Equipment Served by Tank	Any Release From Tank? (Y/N)	Follow-up Action	Removal Date	Closure Rec'd? (Y/N/NA)
VC-1	1964	24,000	Steel	Diesel contaminated water	Visual field inspection, soil samples	Southeast side Building 409	Unknown	N	Tank removed	12/17/93	Y
VC-2	Unknown	200	Steel	Diesel fuel	Visual field inspection, soil samples	Southeast side Building 409	Unknown	N	Tank removed	12/16/93	Y
VC-3	1964	550	Fiberglass	Waste oil	Visual field inspection, soil samples	East side Building 410	Building 410 used oil sump	N	Tank removed	12/8/93	Y
404-1	1982	500	Fiberglass	Waste oil	Visual field inspection, soil samples	South side Building 404	Trench drain in front of vehicle bay	N	Tank removed	1/26/98	Y
404-2	1964	50	Steel	Received spills from hazardous materials storage area	Visual field inspection, soil samples, Photo ionization detector	North side Building 404	Floor drain in Building 404	N	Tank removed	1/26/98	Y
V-1-A	unknown	1,000	Steel	Gasoline	Visual field inspection, soil samples.	East side Building 748	Former fueling station	N	Tank removed	3/12/92	Y

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Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Tank ID	Year Installed (est.)	Tank Capacity (gal)	Construction Material	Product Stored	Release Detection Method	Location	Equipment Served by Tank	Any Release From Tank? (Y/N)	Follow-up Action	Removal Date	Closure Rec'd? (Y/N/NA)
V-1-C	1964	1,000	Steel	Fuel oil	Visual field inspection, soil samples. Visibly stained soil observed indicating impacted soil south and west of tank.	North side Building 748	Former fueling station	Y	Tank removed along with 100 cubic yards of petroleum impacted soil	3/12/92	Y
V-1-B	1964	6,000	Steel	Diesel	Visual field inspection, soil samples. Stockpile of soil near tank showed total petroleum hydrocarbon (TPH) contamination presumably a result of overfills.	East side Building 748	Former fueling station	N	Tank removed, stockpiled soils removed	3/12/92	Y

Sources: CEcon Corporation, 1994; ENSR, 2002

4.4.3 Underground Storage Tanks Removed

4.4.3.1 Former USTs near 400 Series Buildings

A regulated 550-gallon fiberglass waste oil UST (VB-1) was removed from the northeast side of Building 400 on December 14, 1993. To facilitate tank removal, a concrete pad encapsulating the tank had to be broken. Approximately 4 inches of oily water were pumped from the tank, the tank was rinsed, and the rinse water was pumped from the tank. Visual inspection determined that there was no visible staining that could be related to hydrocarbon contamination. The tank was then excavated, removed, inspected, cleaned, crushed, and transported to a disposal facility. Six soil samples were taken in the excavation area and analytical results of the samples showed no total petroleum hydrocarbon (TPH) contamination above detectable limits. No further action was required at this site (CEcon, 1993). In 1994, Washington Department of Ecology's Southwest Regional Office, Vancouver Field Office received documentation for closure of this UST. This documentation included a Site Assessment Checklist and a Permanent Closure Site Assessment Notice.

A non-regulated 30-gallon steel waste oil UST (VB-2) was removed from the southwest side of Building 400 on December 13, 1993. Approximately 8 inches of oily water were pumped from the tank, and the tank was rinsed, cleaned and transported to a scrap metal recycling facility. Six soil samples were taken from the excavation area. Analytical results of the samples showed no evidence of TPH contamination, and no further action was required at this site (CEcon, 1993).

A 550-gallon fiberglass waste oil UST (VB-3), located on the southeast side of Building 402, was removed on December 13, 1993. This tank was used to hold fluids generated in Building 402, which were pumped into the holding tank through a floor drain system in the building. There was no visual or infrared spectrometer evidence of TPH contamination associated with this site. Results of the soil samples taken from the base and sidewalls of the excavation area were reported to be below detection limits, and no further action was required. In 1994, Ecology's Southwest Regional Office, Vancouver Field Office received documentation, including a Permanent Closure Site Assessment Notice and a Site Assessment Checklist, for closure of this UST.

A non-regulated 30-gallon steel waste oil UST (VB-4) was removed from the north side of Building 402 on December 14, 1993. Approximately 4 inches of oily water were pumped from the tank, and the tank was rinsed, excavated, removed, inspected, cleaned and transported to a scrap metal recycling facility. Six soil samples were collected from the excavation area. All six were found to be below detection limits for TPH contamination, and no further action was required at this site (CEcon, 1993).

A non-regulated 30-gallon steel waste oil tank (VB-7) was removed from the west side of Building 405 on December 8, 1993. Overburden material was removed and approximately one inch of oily water was pumped from the tank. The tank was then rinsed, excavated, removed and disposed of at an offsite metal recycling facility. Six soil samples were collected from the excavation site and were analyzed for TPH contamination. All six were found to be below detection limits, and no further action was required at this site (ENSR, 2002).

A regulated 550-gallon fiberglass waste oil UST (VB-5) was removed on December 9, 1993 from the northeast side of Building 405. Overburden material was removed and 8 inches of oily water were pumped from the tank. The tank was then rinsed and the rinse water was pumped out. The tank was excavated, removed, inspected, and disposed of at an offsite facility. Six soil samples were collected from the excavation site. The samples were analyzed and found to be below detection limits for TPH contamination. No further action was required at this site (CEcon, 1993). In 1994, Ecology's Southwest Regional Office, Vancouver Field Office received documentation for closure of this UST including a Site Assessment Checklist and a Permanent Closure Site Assessment Notice.

A regulated 550-gallon fiberglass waste oil UST (VB-6) was removed from the north side of Building 405 on December 8, 1993. Overburden material was removed from the site and approximately 3 inches of oily water were pumped from the tank. The tank was cleaned and rinsed, excavated, removed, inspected and disposed of at an offsite location. Six soil samples were taken from the excavation area and examined for TPH. All of the samples were found to be below detectable limits, and no further action was required at this site (CEcon, 1993). In 1994, Ecology's Southwest Regional Office, Vancouver Field Office received a Site Assessment Checklist and a Permanent Closure Site Assessment Notice documenting closure.

On December 16, 1993, an empty 200-gallon tank (VC-2), previously used to store diesel fuel and located on the southeast side of Building 409, was removed and inspected for structural integrity. The tank had no obvious holes, dents, or loose fittings and field screening presented no evidence of TPH contamination. The tank was moved, cleaned onsite, and transported to a scrap metal recycling facility. Six soil samples were collected from four locations in the excavation area. The samples were all analyzed for TPH, and all samples showed results below detection limits. No additional actions were required at this site (CEcon, 1993).

A nonregulated 2,000-gallon steel diesel UST (VC-1) was due to be removed from the southeast side of Building 409 on December 17, 1993. However, during excavation activities, VC-1 was discovered to be a 24,000-gallon steel tank filled with diesel-contaminated water. The contaminated water was pumped out of the tank and disposed of by contractors. The tank was then cleaned, removed, and transported to a scrap metal recycling facility. The excavated materials were field screened, and approximately 4 cubic yards of diesel-contaminated soil were removed from the tank excavation during the cleaning process. The contaminated soil was transported to Woodworth & Company for thermal desorption, treatment and disposal. Seven soil samples collected from the excavation site were analyzed for TPH, and all were found to be below detection limits. No further action was required at this site (CEcon, 1993).

On December 8, 1993, a regulated 550-gallon fiberglass waste oil UST (VC-3) was removed from the east side of Building 410. Removal procedures consisted of pumping 2 inches of oily water from the tank, rinsing the tank and pumping out the rinse water. The tank was then excavated, removed, inspected, and transported to a disposal facility. Six soil samples were collected from four locations in the excavation area. All samples were found to be below detection limits for TPH, and no additional action was required (CEcon, 1993).

Two USTs were removed from Building 404 on January 26, 1998, Tanks 404-1 and 404-2. Tank 404-1 was a 17-year-old fiberglass tank with a 500-gallon storage capacity that had been used to store waste oil. This UST was located on the south side of Building 404. Approximately 200 gallons of waste oil were pumped from the tank prior to excavation. During the removal process, excavated soil fell into the tank and was subsequently removed and placed into 55-gallon drums (ENSR, 2002).

The second tank (404-2) was a 17-year-old, 50-gallon-capacity steel tank designated to receive spills from the hazardous materials storage area. This tank was located on the north side of Building 404, and it appeared that the tank had never been used. No complications were associated with tank removal, and photoionization detector sampling and visual observations indicated that no soil had been contaminated.

A total of 14 soil samples were collected and analyzed from both sites (404-1 and 404-2), and all samples were tested for TPH and metals. Soil associated with the 500-gallon tank was further tested for eight RCRA metals using the toxicity characteristic leaching procedure (TCLP) method. Soil associated with the 50-gallon tank was also tested for PCBs, VOCs, and SVOCs. No contamination was detected at either site.

4.4.3.2 Former USTs near Building 748

The Washington National Guard historically had a single fuel pump on the east side of Building 748 until the late 1970s, when the fuel pump was demolished. In the vicinity of Building 748 was an additional service station, located next to the former location of Building 723, which has also been demolished. Three USTs near Building 748 (V-1-A, V-1-B, and V-1-C) were removed in 1992. Upon removal, the tanks were cut apart, cleaned, and disposed of as scrap metal.

The two USTs located along the east side of Building 748, V-1-A and V-1-B, were described as a 1,000-gallon gasoline tank and a 6,000-gallon diesel tank, respectively. Neither of these tanks had visual evidence of leaks during removal. Samples were collected from both tanks and from a stockpile of soil near tank V-1-B. The samples were analyzed using the Washington State Total Petroleum Hydrocarbon Identification Analytical Method. Diesel concentrations in the stockpile of soil by V-1-B exceeded state limits. Analytical results of testing conducted on the stockpile showed diesel levels as high as 360 mg/kg in one sample. This contamination was limited to the stockpile, as all other samples were found to be below 50 mg/kg (ENSR, 2002).

The UST located on the north side of Building 748 (V-1-C) was a 1,000-gallon fuel oil tank with visibly stained surface soils. The tank reportedly had been overfilled in the past. Additionally, a small hole was discovered in the bottom of V-1-C, and sampling showed soil with petroleum hydrocarbons located to the south and west of the tank. Samples collected in the vicinity of V-1-C showed diesel concentrations of 930 mg/kg in one sample and heavy petroleum oil concentrations at 1,400 mg/kg in two samples. The remedial action consisted of the removal of approximately 100 cubic yards of petroleum-containing soil in the vicinity of the tank excavation site, including the stockpiled soil near V-1-B. The affected soil was transported to Camp Murray for treatment and land farming. The excavations were filled with imported fill and topsoil (ENSR, 2002).

4.4.4 Additional Investigations

The UST removal report associated with the CEcon Corporation December 1993 removal activities indicated 4.5 tons of petroleum-contaminated soil was transported offsite, although it was not clear from which UST excavation the soil originated.

As part of an environmental site inspection at Vancouver Barracks conducted by Woodward-Clyde in 1997, an additional soil investigation was made along the drain lines leading from Building 402 to former UST VB-3. The results of this investigation included detection of the following five VOCs: acetone, methyl ethyl ketone, methyl isobutyl ketone, toluene, and para xylenes. Concentrations of these compounds did not exceed Ecology Model Toxics Control Act Method A cleanup levels for soil. No further remediation was required for the site (Woodward-Clyde 1998).

4.4.5 Petroleum Product Spills

During the summer of 1999, a 60-gallon fuel release occurred at Building 402 on the pavement. The spill reportedly did not reach the soil or the storm drain. Cleanup consisted of cleaning the spill site with Ecology cleaning pads and placing the cleanup materials inside Building 402 to await offsite disposal (ENSR, 2002).

On April 2, 1999, fuel from a Mobile Army Surgery Hospital generator located south of Building 748 spilled onto the ground. Less than 5 gallons of fuel were reported to have spilled and the spilled fuel was fully recovered. The fuel soaked soil was placed into a drum. The spill was reported to the National Spill Response center and assigned Spill report No. 9092-1 (ENSR, 2002).

On February 15, 1995, a fuel spill occurred in the motor pool adjacent to Building 402. The fuel spill resulted when the plugs were removed from a Washington Army National Guard howitzer. A sheen was visible in the storm drain, and the spill was reported to the National Spill Response Center. The Spill Report states that the spill was secured and the spill site was contained and recovered. The spill was assigned Spill Report No. 280001 (ENSR, 2002).

A spill of approximately 0.5 quart of motor oil reportedly reached the installation stormwater system in 1994. Consequently, Vancouver Barracks was added to the federal Hazardous Waste Compliance docket on April 11, 1995. Under CERCLA requirements, Vancouver Barracks conducted a PA in 1996, which concluded that no further action was necessary (Woodward-Clyde, 1996). EPA concurred with the no further action recommendation in the PA (ENSR, 2002).

4.5 Polychlorinated Biphenyls

All of the transformers and light fixtures on the installation are owned by Vancouver Barracks. On December 1 and 2, 2004, 24 buildings of the Property were inspected for PCB-containing equipment. During this inspection, a total of 224 ballasts were discovered to either contain or be likely to contain PCB. These ballasts are located in the following buildings: 408, 422, 721, 725, 746, 748, 752, 786, and 987 (Engineering and Environmental Management, Inc. [e²M], 2005).

The East Barracks have 22 pole-mounted transformers (e²M, 2005). The last oil-filled transformers that contained PCBs were replaced in 1985, and according to Property representatives none of the transformers remaining on the installation contain PCBs. The transformers that were removed were disposed of by DRMO at Fort Lewis (ENSR, 2002)

In summary, no PCB-containing transformers exist at Vancouver Barracks, and 224 ballasts contain or are likely to contain PCBs (e²M, 2005).

4.6 Asbestos-Containing Materials

An Asbestos Site Inspection was conducted as a part of the EBS. The EBS reported that the majority of the 400, 700, and 900 Series buildings were observed to have potential asbestos-containing materials (ACMs). Without additional analysis, these materials cannot be confirmed to contain asbestos. Four buildings were identified during the site investigation with conditions that potentially pose a threat to human health due to ACM. The buildings include:

- Building 704 – Damaged floor tile throughout the building and damaged heat shield in the restroom (ENSR, 2002)
- Building 721 – Floor tile on stairway from basement to first floor was in disrepair (ENSR, 2002).
- Building 987 – Fireproofing in boiler room has been abated; however, some still remains. Pipe insulation has been disturbed in some places (ENSR, 2002).
- Building 989 – Damaged plaster on the basement ceiling (ENSR, 2002).

Additional follow-up is required to determine whether these areas are being inspected in accordance with the 1999 Asbestos Maintenance and Repair Manual (ENSR, 2002).

4.7 Lead and Lead-Based Paint

The presence of lead-based paint (LBP) in a building is also potential concern for disposal of demolition debris due to landfill restrictions. The use of LBP was generally discontinued in 1978. The routine application of LBP in the past, and the associated peeling or degradation of paint over time have created the potential for localized lead contamination in soil in areas around the buildings that were constructed prior to or during 1978.

As part of the EBS, an inspection at Vancouver Barracks observed buildings with peeling paint, both on the interior and exterior. This was confirmed during the 2006 VSI. In general, LBP on the buildings and on the ground likely poses an ingestion hazard to humans and ecological receptors. Paint chips were observed during the VSI to have accumulated on the ground surface, creating a potential source of lead in soil.

As described in Section 4.2.4.2, four buildings (721, 987, 989, and 993) previously housed firing ranges. The attics of Buildings 987, 989, and 993 and the basement of Building 721 are contaminated with lead dust. These four buildings were surface cleaned in the summer of 1998. It was determined at that time that a final clearance sample would not be required for Building 721 because the remediation was considered thorough. An investigation conducted

in 2006 concluded further abatement is necessary in the attic and administrative areas of Buildings 993, 989, and 987. The 2006 investigation did not include the basement of Building 721 (Shaw Environmental, 2006)

Table 4-2 provides a summary of the buildings with potential lead contamination.

TABLE 4-2
Potential Lead Contamination
Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Building No.	Year Built	Interior	Exterior
400	1983	potential for LBP	potential for LBP
401	1990	potential for LBP	potential for LBP
402	1983	potential for LBP	potential for LBP
404	1983	potential for LBP	potential for LBP
405	1983	potential for LBP	potential for LBP
406	1935	potential for LBP	potential for LBP
408	1936	potential for LBP	potential for LBP
409	1990	potential for LBP	potential for LBP
410	1935	potential for LBP	potential for LBP; exterior paint is observed to be in poor (peeling) condition
422	1935	potential for LBP	potential for LBP; exterior paint is observed to be in poor (peeling) condition
704	1935	potential for LBP	potential for LBP; exterior paint is observed to be in poor (peeling) condition
710	1978	potential for LBP	potential for LBP
721	1905	potential for LBP; possibly in basement	potential for LBP
722	1914	potential for LBP	potential for LBP
725	1914	potential for LBP	potential for LBP
728	1941	potential for LBP	potential for LBP; exterior paint is observed to be in poor (peeling) condition
733	1919	potential for LBP	potential for LBP
746	1940	potential for LBP	potential for LBP
748	1918	potential for LBP; paint observed peeling from garage ceiling	potential for LBP
749	1919	potential for LBP	potential for LBP
750	1919	potential for LBP	potential for LBP
752	1905	potential for LBP	potential for LBP

TABLE 4-2
 Potential Lead Contamination
Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Building No.	Year Built	Interior	Exterior
753	1917	potential for LBP	potential for LBP
754	1909	potential for LBP	potential for LBP
786	1905	potential for LBP	potential for LBP
787	1985	potential for LBP	potential for LBP
987	1906	potential for LBP; paint observed peeling in eastern hallway near offices. Lead dust found in the attic (mean concentration of 2,253 $\mu\text{g}/\text{ft}^2$) ^a and administrative areas (levels ranged from less than 10 $\mu\text{g}/\text{ft}^2$ to 11 $\mu\text{g}/\text{ft}^2$) ^b	potential for LBP
989	1904	potential for LBP; paint observed peeling in eastern shower stall. Lead dust was found in attic (mean concentration of 3,207 $\mu\text{g}/\text{ft}^2$) ^a and administrative areas (levels ranged from less than 10 $\mu\text{g}/\text{ft}^2$ to 280 $\mu\text{g}/\text{ft}^2$) ^b	potential for LBP
991	1906	potential for LBP	potential for LBP
993	1906	lead dust was found in the attic (mean concentration of 5,795 $\mu\text{g}/\text{ft}^2$) ^a and administrative areas (levels ranged from less than 10 $\mu\text{g}/\text{ft}^2$ to 350 $\mu\text{g}/\text{ft}^2$) ^b	potential for LBP

^a Lead wipe samples collected in August 2002

^b Lead wipe sampling analysis results of the July 2004 Investigation

Sources: 2006 VSI; ENSR, 2002; and Shaw Environmental, 2006

The routine application of LBP in the past, and the associated peeling or degradation of paint over time have created the potential for localized lead contamination in soil in areas around the buildings that were constructed prior to or during 1978. Buildings 406, 408, 410, 422, 704, 710, 721, 722, 725, 728, 733, 746, 748, 749, 750, 752, 753, 754, 786, 987, 989, 991, and 993 were built prior to 1978, and soils surrounding these building have the potential to be affected by lead-based paint.

4.8 Radioactive Materials

According to the Radiation Safety Manager for the 70th RRC, only low-level commodities were stored at the Property (Chris Boes, 2006b). Instruments known as Improved Chemical Agent Monitors, used to measure chemical agents, were stored in Building 400 in a locked cage 2 to 3 weeks per year. These instruments are known to contain a very small amount of Nickel-63, and a radioactive warning sign was posted on the cage. These instruments were not used at the Property but were stored in transit to another destination. Storage of this equipment ceased in 2004, and the storage duration is unknown (Rick Adams, 2006).

4.9 Historical Landfills/Dumps

There are no current or known historical landfills located on the Property. From the time the federal government located facilities at this location, solid waste could have been disposed onsite at any location, although no records of such disposal are known to be available. Additional information on the possibility and location of historical landfills or dumps might be available once the aerial photographic analysis is completed.

4.10 Radon

Radon gas levels are site specific and are influenced by atmospheric, soil, and building conditions, including pressure differentials between the soil and the building. Clark County is located in Radon Zone 1, which has a predicted average indoor radon screening level greater than 4 picocuries per liter (pCi/L) (EPA, 1999). EPA has established a guidance threshold of 4 pCi/L of air, above which could exist adverse health risks to humans if exposure is continued over a prolonged time, generally 70 years (EPA, 2001). The U.S. Army has adopted the same radon guidelines as those established by the EPA (Environmental and Natural Resources Division, 1991). Radon is a non-CERCLA safety concern and is discussed in the conclusion of this report as a non-CERCLA disclosure item.

The only records available on radon at the Property were on surveys performed in 1991 and 1996. The 1991 survey revealed that Building 721 had radon levels of 9.3 pCi/L. It was determined that vertical radon exhaust vents going up through the middle of the main room would not be a feasible means of radon mitigation for this building. Instead, the entry end of the structure was determined to be better suited for the radon exhausts. The EBS reported that radon testing conducted by Cavalier Corporation in 1996 showed that the radon level was less than 0.3 pCi/L as a result of radon mitigation measures.

In 1991, three additional buildings at Vancouver Barracks were found to have radon readings above 4 pCi/L. These buildings are summarized in Table 4-3. Radon mitigation has not yet occurred at these buildings.

TABLE 4-3
Summary of Radon Results
Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Building Number	Status	Square Feet	Number of Floors	Highest Radon Reading
754	Waiting for mitigation	3,968	1	5.8
991	Waiting for mitigation	13,215	2 + basement	8.1
993	Waiting for mitigation	32,526	2 + basement	6.1

Source: Fort Lewis, 2001

No other records were available.

4.11 Pesticides

Pesticide control on Vancouver Barracks is contracted out to Eden Pest Control Company. Available information on the historical storage of pesticides is contained in Appendix F.

Portland Habilitation Company, the grounds maintenance company, is contracted to maintain the grounds at the Property. Application records from the Oregon State University Extension Service indicated that herbicides have been used throughout the installation to control pre-emergent weeds (ENSR, 2002).

4.12 Munitions and Explosives of Concern

There is one potential MEC site within the Property. This potential MEC site is located south of East 5th Street and involves 8.15 acres. The location of the potential MEC site (sometimes referred to as the Western Portion MR site) is shown in Figure 4-2.

A historic records review (HRR) was completed for this site in 2006 (TechLaw, 2006). According to the HRR, potential munitions concerns have not been identified at the Western Portion MR site due to the lack of information regarding MEC. Based on the proximity of this area to other MR sites, it is possible that the same unexploded ordinance (UXO) could be identified. It is assumed that MEC in the Western Portion would include 60-mm mortar rounds and hand grenades (TechLaw, 2006).

Two UXO removals have occurred in this area. One UXO item was removed from near Building 410 and another item was removed during grading activities in front of Building 422. These UXO removals occurred in the late 1980s and early 1990s. No additional information was located during the HRR regarding these UXO items (TechLaw, 2006).

4.13 Other Identified Concerns

Building 406 is structurally unsound (Baerncopf, 2006).

4.14 Identification of Uncontaminated Property

This section describes portions of the Property that are considered “uncontaminated.” The identification of uncontaminated property was based on the records review, VSI, and interviews. Based on this available information, no release or disposal of hazardous substances or petroleum products or their derivatives has occurred, including no migration of these substances from adjacent areas.

- **Building 401** – Based on available information, no hazardous materials have been stored, released, or disposed of in this building. This building has a concrete floor with sump used as secondary containment (the sump has no discharge).
- **Building 704** – Based on available information, no hazardous materials have been stored, released, or disposed of in this building.

- **Building 722** – No drains or hazardous materials were found in the building during the 2006 VSI.
- **Building 725** – No drains or hazardous materials were found in the building during the 2006 VSI.
- **Building 746** – No hazardous materials were stored in the building, except small quantities of household cleaners. The restroom has a floor drain.
- **Building 787** – No drains or hazardous materials were found in the building during the 2006 VSI.
- **East of Building 754** is an undeveloped area. This area includes an overgrown building foundation and a sewer outlet. During the 2006 VSI no signs of potential contamination were observed
- **Open areas of Vancouver Barracks** include parking lots, roadways, and landscaped areas not associated with buildings. During the 2006 VSI, no signs of potential contamination were observed in these areas.

4.15 Description of Remaining Property

This section of the ECP Report identifies geographically contiguous and geospatially located areas where the results of environmental investigation show that a release or disposal of petroleum products or hazardous substance has occurred. There are no remaining properties at the Property.

4.16 Applicable Regulatory Compliance Issues

The U.S. Army currently tracks issues concerning compliance with environmental laws and regulations through the Environmental Quality Report (EQR). The EQR includes an Enforcement Action Summary which is derived from data stored in the AEDB-R. The EQR indicates no enforcement actions were found at the Property.

4.17 Adjacent Properties

The Property is surrounded by areas of mixed land use, including military, private industrial, commercial, retail, residential, and undeveloped. The land uses of the area immediately bordering the Property are summarized below:

North and East: The Property is bordered to the north and east by the Fort Vancouver National Historic Site. An athletic field is also located to the north of the Property.

South: The Property is bordered by State Highway 14, Pearson Airpark, and the Fort Vancouver National Historic Site.

West: The area to the west of the Property, formerly West Barracks, is composed mostly of commercial and residential areas of the City.

Sites located adjacent to the Property that were identified in the EDR report are listed below. Environmental conditions at these facilities pose a low potential of a threat to the Property; however, because groundwater was affected, the site is regulated in a cleanup program. Given the nature and extent of environmental contamination at these facilities, further details are provided.

4.17.1 Brazier Forest Industries

The former Brazier Forest Industries site, now owned by the Port of Vancouver, is located at the southeast corner of Port of Vancouver Way and Industrial Way, approximately 1 mile west-northwest and cross-gradient of the Property. Soil and water at this site were contaminated with petroleum hydrocarbons prior to 1992, and remedial activities were conducted between 1992 and 1995. The remedial activities removed most of the contamination (ENSR, 2002).

4.17.2 Frontier Hard Chrome, Inc.

The Frontier Hard Chrome property is located at 113 Y Street, approximately 1 mile east and cross-gradient of the Property. Onsite operations included chrome plating for about 25 years between 1958 and 1982. Between 1970 and 1982, Frontier Hard Chrome discharged chromium-contaminated waste water from electroplating operations into a dry well. In 1982, chromium concentrations greater than twice the state groundwater cleanup standard of 48 micrograms per liter ($\mu\text{g}/\text{L}$) were detected in groundwater samples from an industrial well located approximately 0.5 mile southwest of the Frontier Hard Chrome site. In September 1983, this site was added to the NPL. Site remediation included injection of a reducing agent underground around the most concentrated contamination, forming an underground fence to keep contamination from spreading. As a result, hexavalent chromium passing through this treatment zone is reduced to the less toxic trivalent chromium valence. Site remediation began in 2002 and was completed in 2003 (EPA, 2006).

4.17.3 PRI Northwest, Inc.

PRI Northwest, Inc. Vancouver is located at 1300 West 8th Street, less than 1 mile west-northwest down-gradient of the Property. An independent remedial investigation is in progress for petroleum contamination of groundwater and soil at the facility (EDR, 2006).

4.17.4 Emerald Petroleum Services

Emerald Petroleum Services is located at 1300 W 12th Street, less than 1 mile west-northwest of the Property. The facility is undergoing independent cleanup for petroleum in soil and halogenated organic compounds in groundwater. Of the three USTs reported, two have been closed and inactivated and one is unregulated due to its small capacity (EDR, 2006).

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5. Conclusions

Based on the findings of this ECP, the environmental condition of the Property has been established. A summary of CERCLA, IRP, and/or cleanup areas of concern are presented in Table 5-1. A summary of environmental conditions at each study section is provided in Table 5-2. Section 5.3 discloses the non-CERCLA environmental hazard and safety issues identified during the records review and/or VSI.

5.1 Environmental Conditions Findings

The environmental features and areas located at Vancouver Barracks are classified into Categories 1, 2, 3, and 7. Figure 5-1 provides a map of the ECP categories at Vancouver Barracks.

5.1.1 Category 1

The following areas are considered Category 1 properties. These are areas where no release or disposal of hazardous substances or petroleum products has occurred, and areas to which no migration of such substances from adjacent areas has occurred:

- **Buildings 401, 704, 722, and 787** – Based on available information, no hazardous materials have been stored, released or disposed of at these buildings.
- **Buildings 400, 402, 404, 405, 406, 408, 409, 410, 422, 710, 721, 725, 728, 733, 746, 749, 750, 752, 753, 754, 786, 987, 989, 991, and 993** – These areas contained small quantities of hazardous materials. Based on available information, there have been no releases at these buildings.
- **Storage trailers associated with Buildings 400, 402, and 404** – Based on available information, no hazardous materials have been stored, released, or disposed of at these buildings.
- **Former VA Laundry Area** – Based on available information, no hazardous materials have been stored, released, or disposed of at this facility.
- **East Barracks Open Areas** – This area includes parking lots, roadways, and landscaped areas not associated with buildings. Based on available information, no hazardous materials have been stored, released, or disposed of in these areas.
- **Antifreeze and Hydraulic Oil Spill** – A de minimis¹ release of approximately 5 gallons of antifreeze and approximately 25 gallons of hydraulic oil occurred at the intersection of McClellan and McLoughlin Roads in December of 1996.

¹ Washington State Department of Ecology defines a "de minimis" amount of petroleum as an amount that either (1) immediately evaporates, or (2) has been recovered or contained sufficiently so that it will not pose a threat to human health or the environment (Ecology, 2004).

- **Building 748, Former Maintenance Facility (AEDB-R site VABA-01)** – This is a former IRP site (former maintenance facility adjacent to Building 748). A de minimis release of approximately 2 quarts of a mixture of diesel and oil from a vehicle parked in Building 748 went into the storm drain system that discharges into the Columbia River.
- **Generator Fuel Spill** – A de minimis release of fuel (less than 5 gallons) from a generator was reported south of Building 748 in April 1999.

TABLE 5-1

Summary of CERCLA, IRP or Cleanup Sites

Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Site or Area where Release or Disposal of CERCLA Hazardous Substances or Petroleum Products Occurred	Comments	Was Release or Disposal in Excess of the CERCLA RQ? (40 CFR 302.4)	Reference
Building 400, former wash rack	Soil Investigation completed in 1997, no further action planned, declared RC in December 1998	Unknown	Woodward-Clyde ,1998
Building 402, along drain to UST VB-3 (former dry cleaning solvent use and storage area)	Soil Investigation completed in 1997, no further action planned	Unknown	Woodward-Clyde ,1998
Building 748, former maintenance facility (AEDB-R site VABA-01)	PA completed in 1996, RC as of March 1996	No	USACE, 1996

TABLE 5-2

Summary of ECP Findings

Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Study Section	Building Number	Building Name/Area Name	ECP Category	Hazardous Substances	Petroleum	PCBs	Asbestos	Lead	Radiological	Radon	MEC	Other
1	748	Former Maintenance Facility (VABA-01)	1	V	R	S	S	S		B		
2		Former Wash Rack (VABA-02)	2		V							
1000	400	Building 400 Motor Pool	1		S	A	S	S				
1001	400	Storage Trailer	1		V							
1002	401	Building 401	1	A			N	S				
1003	402	Building 402 Motor Pool	1	V	V	A	S	S		B		
1004	402	Storage Trailer	1		V							
1005	402	Storm Drain	2		S							
1006	404	Building 404 Motor Pool	1		V		S	S		B		

TABLE 5-2
 Summary of ECP Findings
Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Study Section	Building Number	Building Name/Area Name	ECP Category	Hazardous Substances	Petroleum	PCBs	Asbestos	Lead	Radiological	Radon	MEC	Other
1007	404	Storage Trailer	1									
1008	405	Building 405	1			A	S	S		B	S	
1009	406	Building 406	1				S	S			S	
1010	408	Building 408	1			S	S	S			S	
1011	408	Former Wash Rack	2		S							
1012	409	Building 409	1				N	S			S	
1013	410	Building 410	1			A	S	S			S	
1014	410	Used Oil Sump	2									
1015	410	Battery Room Floor Drain	7		S							
1016	422	Building 422	1			S	S	S				
1017	704	Building 704	1	A		A	S	S				
1018	710	Building 710	1				S	S				
1019	721	Building 721	1			S	S	V		B		
1020	722	Building 722	1			A	S	S				
1021	725	Building 725	1			S	S	S				
1022	728	Building 728	1			A	S	S		B		
1023	733	Building 733	1			A	S	S				
1024	746	Building 746	1			S	S	S				
1025	749	Building 749	1			A	S	S				
1026	750	Building 750	1			A	S	S				
1027	752	Building 752	1			S	S	S		B		
1028	753	Building 753	1				S	S				
1029	754	Shopette	1			A	S	S		X		
1030	786	Building 786	1			S	S	S		B		
1031	787	Building 787	1			A	N	S				
1032	987	Barracks	1			S	S	V		B		
1033	989	Barracks	1			A	S	V		B		
1034	991	Building 991	1			N	S	S		X		
1035	993	Barracks	1				S	V		X		
1036		UST VB-1 (NE of 400)	2		R							

TABLE 5-2
 Summary of ECP Findings
Environmental Condition of Property Report, Vancouver Barracks, Vancouver, Washington

Study Section	Building Number	Building Name/Area Name	ECP Category	Hazardous Substances	Petroleum	PCBs	Asbestos	Lead	Radiological	Radon	MEC	Other
1037		UST VB-2 (SW of 400)	2		R							
1038		UST VB-3 Drainage Lines (SE of 402)	2	V	V							
1039		UST VB-4 (N of 402)	2		R							
1040		UST 404-1 (S of 404)	2		R							
1041		UST 404-2 (N of 404)	2		R							
1042		UST VB-5 (NE of 405)	2		R							
1043		UST VB-6 (N of 405)	2		R							
1044		UST VB-7 (W of 405)	2		R							
1045		UST VC-1 (SE of 409)	2		R							
1046		UST VC-2 (SE of 409)	2		R							
1047		UST VC-3 (E of 410)	2		R							
1048		UST V-1-A (E of 748)	2		R							
1049		UST V-1-B (E of 748)	2		R							
1050		UST V-1-C (N of 748)	2		R							
1051		Generator fuel spill	1		R							
1052		Former VA Laundry (S of 748)	1		N							
1053		Antifreeze and hydraulic oil spill	1	R	R	R						
1054		East Barracks Open Areas	1									
1055		South Barracks Open Areas	2		S						S	

PCBs – polychlorinated biphenyls

MEC – munitions and explosives of concern

V – Verified

S – Suspected

N – Not suspected

A – Absent

R – Removed/Remediated

X – Radon measured greater than 4.0 picocuries per liter (pCi/L)

B – Radon measured less than 4.0 pCi/L



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5.1.2 Category 2

The following areas are considered Category 2 properties. These are areas where release or disposal of petroleum products only has occurred:

- **Location of former USTs** - VB-1, VB-2, VB-4, 404-1, 404-2, VB-3, VB-5, VB-6, VB-7, VC-1, VC-2, VC-3, and V-1-A.
- **Building 402 Storm Drain** - Two spills affected the storm drains between Buildings 402 and 400.
- **Former UST B-1-A and surrounding area**
- **Former UST V-1-B and surrounding area** - Stockpile of soil near the tank showed total petroleum hydrocarbon (TPH) contamination. The tank was removed; impacted soils were removed.
- **Former UST V-1-C and surrounding area**- Visibly stained soil was observed, signifying a release. The tank and 100 cubic yards of petroleum-impacted soils south and west of the tank were removed.
- **South Barracks Open Areas** - This area includes parking lots, roadways, and landscaped areas not associated with buildings.
- **VABA-02** - This is a former IRP site (former wash rack located northeast of Building 400).
- **Building 408 Former Vehicle Wash Rack** - A concrete area (old vehicle wash facility) with a steel plate covering a rectangular slotted manhole cover inside a sump with a drain that drains south through an abandoned line; the outlet pipe acts as a separator/grit trap (ICI LLC, 2004). During the 2006 VSI, liquid was observed in the sump.
- **Building 410 Used Oil Sump** - A sump filled with used oil was observed inside the garage. The sump appeared to be constructed of metal; the integrity of the sump was not inspected during the 2006 VSI.

5.1.3 Category 3

Category 3 properties are areas where release, disposal, or migration of hazardous substances has occurred, but in concentrations that do not require a removal or other remedial response. No Category 3 properties were identified at Vancouver Barracks

5.1.4 Category 4

Category 4 properties are areas in which release, disposal, or migration of hazardous substances has occurred, but all removal or other remedial actions necessary to protect human health and the environment have been taken. No Category 4 properties were identified at Vancouver Barracks.

5.1.5 Category 5

Category 5 properties are areas in which release, disposal, or migration of hazardous substances has occurred, and removal or other remedial actions are under way, but all required actions have not yet been taken. No Category 5 Properties were identified at Vancouver Barracks.

5.1.6 Category 6

Category 6 Properties are areas in which release, disposal, or migration of hazardous substances has occurred, but required remedial actions have not yet been implemented. No Category 6 properties were identified at Vancouver Barracks.

5.1.7 Category 7

The following areas are considered Category 7 Properties. These are areas that have not been evaluated or require additional evaluation:

- **Building 410, Battery Room Drains:** A floor drain located in the battery room of Building 410 is suspected to drain directly into the ground. A potential exists for historical releases to have occurred in this battery storage room and drain through the floor drain. However, sampling is not recommended because lead is not mobile in soil. The potential area of contamination is underneath the building and, unless the building is demolished, is not accessible to human or ecological receptors.

5.2 Adjacent Properties

The record search indicated that low potential exists for contamination from adjacent properties to affect the Property through groundwater migration.

5.3 Disclosure of Non-CERCLA Issues

This section discloses the non-CERCLA environmental hazard and safety issues identified during the records review and/or VSI.

The following non-CERCLA environmental safety concerns exist on the Property. These concerns include asbestos, LBP, radon, PCBs, and ordnances:

- Buildings 704, 721, 987, and 989 were identified during the site investigation as having conditions that potentially pose a threat to human health due to ACM.
- Buildings 754, 991, and 993 have radon readings above 4 pCi/L and are awaiting radon mitigation.
- A total of 224 ballasts that either contain or are likely to contain PCBs are located in the following buildings: 408, 422, 721, 725, 746, 748, 752, 786, and 987 (e²M, 2005).
- The Western Portion MMRP site has the potential for MEC to be present. This 8.15-acre area is located south of East 5th Street and currently is included in the MMRP. Hand grenades, small-caliber munitions, and large-caliber munitions have been identified in

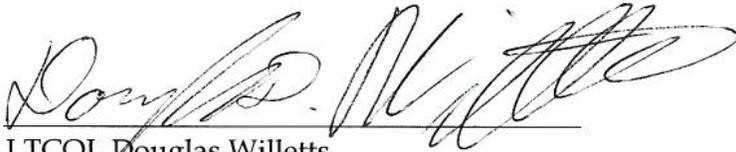
the western portion MEC; and it is anticipated that additional MEC could be identified at this site.

- The attics of Buildings 987, 989, and 993 are contaminated with lead dust from former small arms firing ranges.
- The routine application of LBP in the past and the associated peeling or degradation of paint over time have created the potential for localized lead contamination in soil in areas around the buildings that were constructed prior to or during 1978. Buildings 406, 408, 410, 422, 704, 710, 721, 722, 725, 728, 733, 746, 748, 749, 750, 752, 753, 754, 786, 987, 989, 991, and 993 were built prior to 1978; and soils surrounding these building have the potential to be affected by lead-based paint.

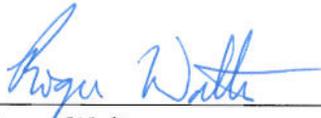
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6. Certification

All information/ documentation provided accurately reflects the conditions of the Property. This report meets the DOD requirements for completion of an Environmental Conditions of Property Report.



LTCOL Douglas Willetts
BRAC Environmental Coordinator
70th RRC Vancouver Barracks



Roger Walton
Environmental Engineer
U.S. Army Environmental Center

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7. References

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