First Periodic Review for US Army Camp Bonneville

23201 NE Pluss Road, Vancouver WA, Clark County

Facility Site ID: 69965472

Cleanup Site ID: 11670

Toxics Cleanup Program, Headquarters Cleanup Section

Washington State Department of Ecology
Lacey, Washington

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Document Information

This document is available on the Department of Ecology's US Army Camp Bonneville cleanup site page.[1]

Related Information

- Facility Site ID: 69965472
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[1] https://apps.ecology.wa.gov/cleanupsearch/site/11670
[2] https://ecology.wa.gov/About-us/Who-we-are/Our-Programs/Toxics-Cleanup
[3] https://ecology.wa.gov/About-us/Accountability-transparency/Our-website/Accessibility

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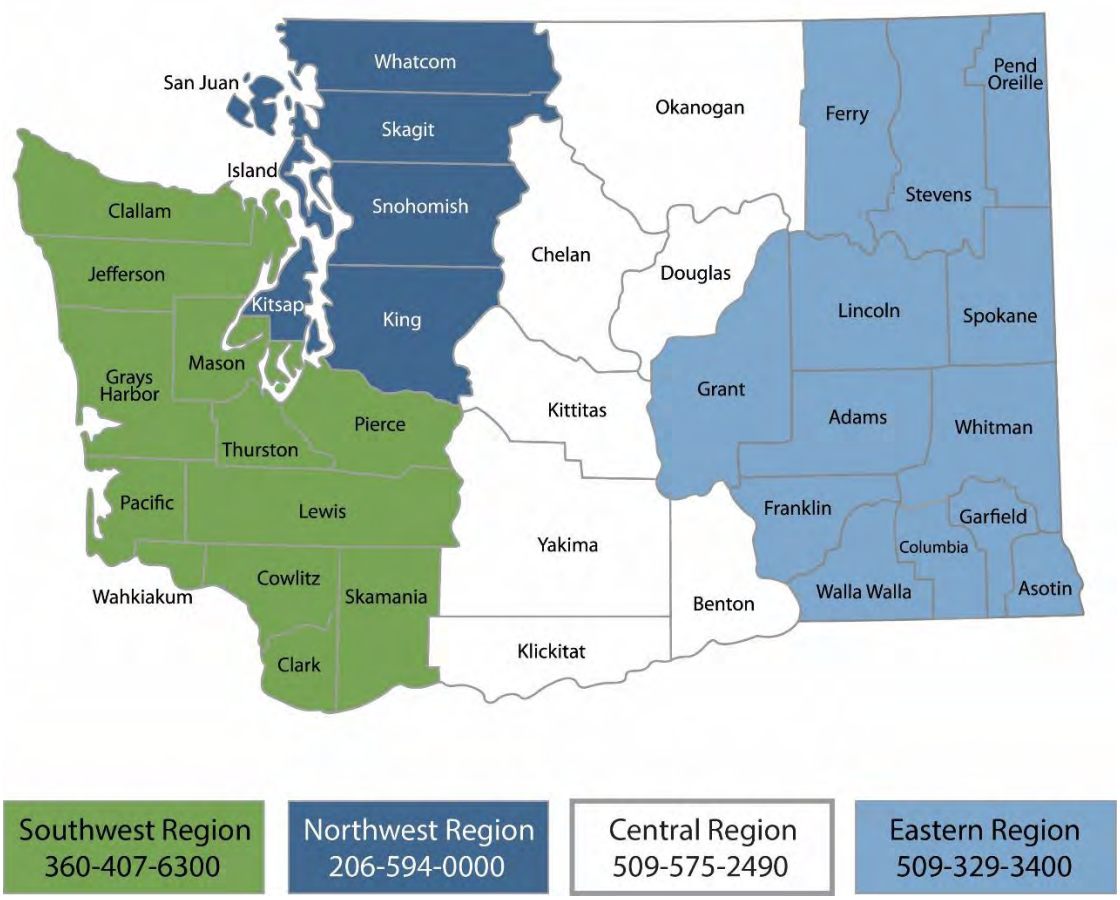
Map of Counties Served



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Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
Headquarters	Across Washington	PO Box 47600 Olympia, WA 98504	360-407-6000

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Acronym List

- AGC – advanced geophysical classification
- APPCD – Amended Prospective Purchasers Consent Decree
- ASR – Archives Search Report
- ASTs – Aboveground Storage Tanks
- ATF – Bureau of Alcohol, Tobacco, Firearms and Explosives
- BCRRT – Clark County and Bonneville Conservation, Restoration, and Renewal Team, LLC
- bgs – below ground surface
- BRAC – Base Realignment and Closure
- CAP – Cleanup Action Plan
- CCSO – Clark County Sheriff's Office
- CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
- CITA – Central Impact Target Area
- CS gas – tear gas/2-chlorobenzalmalononitrile gas
- CSID – Cleanup Site Identification number
- CVF – Central Valley Floor
- cy – cubic yards
- DA – Demolition Areas
- DGM – digital geophysical mapping
- DNR – Department of Natural Resources
- DoD – Department of Defense
- DVMS – Dense Vegetation/Moderate Slope
- EBS – Environmental Baseline Survey

- EPA – U.S. Environmental Protection Agency
- ESA – Environmental Study Area
- ESCA – Environmental Services Cooperative Agreement
- FBI – Federal Bureau of Investigation
- FSID – Facility Site Identification number
- HEAL – Healthy Environment for All Act
- HFPO-DA – hexafluoropropylene oxide dimer acid
- HMX – High Melting Explosive
- HTW – Hazardous toxic waste
- Ma – million years ago
- MCL – Maximum Contaminant Level
- MD – munitions debris
- MDAS – Material Documented as Safe
- MEC – munitions and explosives of concern
- MEDU – Metro Explosive Disposal Unit
- Mg/cm^2 – milligrams per square centimeter
- mg/kg – milligram per kilogram
- MPPEH – material potentially presenting an explosive hazard
- MTCA – Model Toxics Control Act
- NFA – No Further Action
- ng/L – nanograms per liter
- O&M – Operations and Maintenance
- OE – Ordnance and Explosives
- PBS/APEX – PBS Engineering and Environmental now Apex Companies, LLC

- PFAS – Per- and polyfluoroalkyl substances
- PFBS – perfluorobutane sulfonate
- PFHxS – perfluorohexane sulfonate
- PFNA – perfluorononanoic acid
- PFOA – perfluorooctanoic acid
- PFOS – perfluorooctane sulfonate
- PPCD – Prospective Purchaser Consent Decree
- ppm – parts per million
- RAU – Remedial Action Unit
- RCW – Revised Code of Washington
- RDX – Research Department Explosive, 1,3,5-Trinitro-1,3,5-triazine
- RI/FS – Remedial Investigation / Feasibility Study
- RRD – range-related debris
- RWAs – Remedial Work Areas
- SAA – small arms ammunition
- SVOCS – semi-volatile organic compounds
- SWAT – Special Weapons and Tactics
- TCLP – Toxicity Characteristic Leaching Procedure
- TNT – 2,4,6-Trinitrotoluene
- TPH – total petroleum hydrocarbons
- TPH-DRO – petroleum hydrocarbons diesel range organic
- USACE – U.S. Army Corps of Engineers
- UST – Underground Storage Tank
- UXO – Unexploded Ordnance

- UXOQP – Unexploded Ordnance Qualified Personnel
- VOC – volatile organic compounds
- WAC – Washington Administrative Code
- WSA – Western Slopes Area

1. Introduction

The Washington State Department of Ecology (Ecology) reviewed post-cleanup site conditions and monitoring data to ensure human health, and the environment are being protected at the US Army Camp Bonneville cleanup site (Site). Site cleanup was implemented under the Model Toxics Control Act (MTCA) regulations, Chapter 173-340 Washington Administrative Code (WAC). This is the first periodic review conducted for this Site.

The cleanup has been subdivided into Remedial Action Units (RAUs) each with their own Facility Site Identification number (FSID) and Cleanup Site Identification number (CSID). This periodic review has been prepared for the Site as a whole and includes each of the RAUs:

- RAU 1 – FSID 5093080 & CSID 1513
- RAU 2A – FSID 47197 & CSID 3867
- RAU 2B – FSID 3184561 & CSID 252
- RAU 2C – FSID 475000 & CSID 861
- RAU 3 – FSID 5125990 & CSID 2216

Cleanup activities at this Site are being completed under an Amended Prospective Purchasers Consent Decree (APPCD) (Ecology 2012). Concentrations of explosive residues, volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCS), along with residual concentrations of metals and petroleum hydrocarbons that exceeded MTCA cleanup levels remain on the property along with military munitions. The MTCA cleanup levels for soil and groundwater are established under WAC 173-340-740[4] and WAC 173-340-720,[5] respectively.

Cleanup of military munitions was site specific for munitions and explosives of concern (MEC). MEC as defined in the APPCD are specific categories of military munitions that may pose unique explosive safety risks and means: (1) unexploded ordnance (UXO); (2) discarded military munitions; or (3) munitions constituents (e.g. TNT, RDX) present in high enough concentrations to pose an explosive hazard. Eliminating all risk from MEC at the Site is not feasible and the cleanup level for MEC was chosen to be the point where the likelihood for MEC and receptor (human or ecological) interaction is negligible.

The APPCD required institutional controls including restrictive covenants, at the Site to limit or prohibit activities that may interfere with the integrity of the cleanup action or that may result in exposure to hazardous substances. WAC 173-340-420(2)[6] requires Ecology to conduct a periodic review of certain sites every five years. For this Site, a periodic review is required because long-term ground water monitoring and institutional controls are required as part of the cleanup actions.

[4] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-740
[5] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-720
[6] https://app.leg.wa.gov/wac/default.aspx?cite=173-340-420

When evaluating whether human health and the environment are being protected, Ecology must consider the following factors (WAC 173-340-420(4)[7]):

a) The effectiveness of ongoing or completed cleanup actions, including the effectiveness of engineered controls and institutional controls in limiting exposure to hazardous substances remaining at the site.

b) New scientific information for individual hazardous substances or mixtures present at the site.

c) New applicable state and federal laws for hazardous substances present at the site.

d) Current and projected site and resource uses.

e) The availability and practicability of more permanent remedies.

f) The availability of improved analytical techniques to evaluate compliance with cleanup levels.

Ecology publishes a notice of all periodic reviews in Ecology's *Contaminated Site Register* and provides an opportunity for public comment.

[7] https://app.leg.wa.gov/wac/default.aspx?cite=173-340-420

2. Summary of Site Conditions

This section summarizes the Site's remedial units, background information, and administrative history. It further breaks down the development and findings of cleanup activities by RAU into Site Investigations, Interim and Emergency Actions, Cleanup Actions, and cleanup standards. It is important to note that remedial activities, especially initial investigations and interim actions overlapped multiple administrative subunits, either because those units had not been established yet, or cleanup activities overlapped. This section also provides an overview of groundwater monitoring, and restrictive covenants.

2.1. Site description and history

The Site is an approximately 3,840-acre former military training facility located near Proebstel in Clark County, Washington, about 12 miles northeast of Vancouver (**Figure 1**). The U.S. Army established the installation as a field and rifle range in 1909 (URS Greiner Woodward Clyde 1999). Over time, the army installation grew to include rifle, machine gun, grenade, and artillery ranges, as well as barracks and support buildings at Camp Bonneville and Camp Killpack cantonments (**Figure 2, Figure 3, Figure 4**). It was used by multiple military branches; including the Reserve Officer Training Corps (ROTC), National Guard, and Marine Corps until 1995, when it was closed under the Department of Defense's (DoD) Base Realignment and Closure (BRAC) program (URS Greiner Woodward Clyde 1999).

The Army subsequently transferred the property in 2006 to Clark County for eventual reuse as a regional park. Clark County Public Works currently oversees and maintains the Site.

Historic military and associated maintenance operations have resulted in contamination of the property. These activities include but are not limited to:

- Live fire exercises with various munitions (e.g., artillery, rockets, mortars, grenades).
- Use of 2-chlorobenzalmalononitrile gas (commonly known as tear gas but referred to in this document as CS gas) for riot control training.
- Munitions demolition and burial areas.
- Operation of landfills.
- Use of petroleum products, solvents, and pesticides.
- Vehicle maintenance and grease pits.
- Firefighting facilities and use of suppression agents.

Following the closure of the Camp Bonneville installation, extensive investigations and cleanup efforts have been ongoing to prepare the Site for eventual reuse. Cleanup has focused on identifying and removing MEC, addressing contaminated soil and groundwater, and ensuring the Site is safe for current site users, future public access, and ecological restoration.

2.1.1. Remedial action units

Remedial investigations and activities at the site were initially conducted by the DoD under federal statutes. In 2003 as part of an Enforcement Order issued by Ecology the Site was subdivided administratively into RAUs (Ecology 2003). These RAUs were established based on the nature of the contaminants of concern rather than physical location (See **Table 2-1**). Each RAU was given an FSID and CSID to track progress:

- Remedial Action Unit 1 (RAU 1) FSID 5093080 & CSID 1513 consists of 20 areas of the property with identified releases of hazardous toxic waste.
- Remedial Action Unit 2A (RAU 2A) FSID 47197 & CSID 3867 consists of small arms ranges with lead and munition contamination in soils.
- Remedial Action Unit 2B (RAU 2B) FSID 3184561 & CSID 2522 consists of two former open burning/demolition areas where ammunitions were either burned or detonated.
- Remedial Action Unit 2C (RAU 2C) FSID 475000 & CSID 861 consists of the former Landfill 4 / Demolition Area 1 (L4/D1) area where Site debris and demolition of munitions took place.
- Remedial Action Unit 3 (RAU 3) FSID 5125990 & CSID 2216 is the cleanup of MEC, including UXO, across the property.

2.1.2. Administrative History

The following is an outline of the administrative history of the property from establishment of the Site to the present day:

- 1909 – Camp Bonneville was established with 309 leased acres as a drill field and Rifle Range for Vancouver Barracks (URS Greiner Woodward Clyde 1999).
- 1919 – According to Title documents 3,020 acres of the property were acquired by the US Army (Woodward-Clyde Federal Services 1997).
- Late 1920s to Early 1930s – Camp Bonneville and Camp Killpack cantonments were established at the Camp Bonneville Installation (URS Greiner Woodward Clyde 1999).
- 1955 – The US Army Leased 840 Acres in two separate parcels from the State of Washington (URS Greiner Woodward Clyde 1999).
- 1957 – The US Army lease on 20 acres of the 1955 lease was terminated, the remaining 820 acres continued to be leased through base closure. (Woodward-Clyde Federal Services 1997).
- 1995 – Camp Bonneville was selected for closure under the 1995 BRAC Process (Woodward-Clyde Federal Services 1997) and the Federal Bureau of Investigation (FBI), a tenant of the US Army constructed a small arms training Facility (FBI Range) (Woodward-Clyde Federal Services 1997).

- 2003 February – Ecology issued Enforcement Order No. 03TCPHQ-5286 to the US Army directing it undertake remedial actions at the Site under MTCA (Ecology 2003).
    - Enforcement Order No. 03TCPHQ-5286 subdivided cleanup into remedial action units (RAUs).
- 2004 June – Ecology amended Enforcement Order No. 03TCPHQ-5286 extending the schedule of work (Ecology 2004).
- 2005 – U.S. Environmental Protection Agency (EPA) lists the site as other cleanup activity: State-Lead Cleanup site.
- 2006 September – Property transferred from DoD to Clark County. (CCAO 2006).
    - This transfer occurred under a process known as "early transfer" under the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 42 U.S.C. §9620(h)(3)(C). The early transfer conveyance for the Site is a Conservation Conveyance under 10 U.S.C. §2694(a). This transfer occurred following a Finding of Suitability for Early Transfer (USASA 2006).
    - DoD and Clark County subsequently entered into an Environmental Services Cooperative Agreement (ESCA) with the Army providing funding for cleanup and long-term obligations for the property. Throughout this project the ESCA has been modified to allocate additional funds needed for remedial activities.
- 2006 October – Ecology entered into a Prospective Purchaser Consent Decree (PPCD) with Clark County and Bonneville Conservation, Restoration, and Renewal Team, LLC (BCRRT) (Ecology 2006). Clark County transferred ownership of the Site to BCRRT to manage remediation of the property.
- 2006 November – A Restrictive Covenant was recorded for the property for RAU 1.
- 2008 January – Ecology issues a "No Further Action" (NFA) letter for RAU 1 (Ecology 2008).
- 2008 August – ownership of Parcel 208619000, approximately 640 acres in the northeast portion of the Site leased from the State of Washington (Department of Natural Resources) was transferred to Clark County via quitclaim deed.
- 2009 February – EPA received a public petition for Preliminary Assessment of the Site for placement on the National Priority List.
- 2009 March – Ecology issues a NFA for RAU 2B (Ecology 2009).
- 2009 June – ownership of Parcel 986028066, approximately 40 acres in the northeastern portion of the Site leased from the State of Washington (Department of Natural Resources) was transferred to Clark County under the Trust Land Transfer Program. Following transfer approximately 135 acres of land remained leased from the State of Washington (Department of Natural Resources) in the Southwestern portion of the Site.

- 2009 December – Remediation work stopped at the site following funding disputes between BCRRT and the Army (Robinson 2009).
- 2010 July to 2011 November – Clark County Public Works operated the Site under lease with BCRRT (Ecology and Environmental Inc. 2012).
- 2011 December – Ownership of the Property was transferred through a quit claim deed from BCRRT to Clark County.
- 2012 May
    - Ecology and Clark County entered into an Amended Prospective Purchaser Consent Decree, dismissing BCRRT from the Decree and Clark County taking over responsibility for overseeing the remaining remedial activities at the Site (Ecology 2012a).
    - EPA publishes an Expanded Site Inspection following the Public Petition (Ecology and Environment 2012).
- 2012 September –Public Participation Plan for the Site updated and approved (Ecology 2012b).
- 2019 September – Ecology issues a NFA for RAU 2A (Ecology 2019b).
- 2020 June – Ecology issues a NFA for RAU 3 Phase 2 (Ecology 2020).
- 2021 March – Ecology issues a NFA for RAU 3 Phase 4 (Ecology 2021a).
- 2021 May
    - Ecology issues a NFA for RAU 3 Phase 3 (Ecology 2021b).
    - Ecology issues a NFA for RAU 3 Phase 1 (Ecology 2021a).

2.2. Physical Setting, Hydrology, and Hydrogeology

Camp Bonneville, situated north of the Portland Basin in the foothills of the Cascade Range, is comprised of approximately 3,840 acres of steep rolling hills surrounding a relatively flat central valley floor. Outside of the central valley floor, most of the Site is steep terrain and heavily forested making access difficult. Terrain ranges in elevation from approximately 250 feet above mean sea level at the southwestern corner of the central valley floor to approximately 1,463 above mean sea level at the summit of Little Baldy.

The general area consists of Eocene and Miocene volcanic and sedimentary rocks, with Holocene sedimentary rocks in valleys and areas where gravels of the Troutdale Formation can be found (Phillips 1987). The U.S. Geological Survey made detailed updates to the Lacamas Creek 7.5 minute quadrangle recognizing five geologic formations present at Camp Bonneville (**Figure 10)** (Evarts 2006). These formations from oldest to youngest are:

1) Basaltic (volcanic) Andesite of Elkhorn Mountain (Tbem)

2) Sandy River Mudstone (Tsr)

3) Lower (Conglomerate) Member of the Troutdale Formation (Ttfc)

4) Landslide Deposits (Qls)

5) Alluvial Sediments (Qa)

Vulcanism and uplift of the Cascade Range approximately 24-26 million years ago (Ma) resulted in the deposition of low energy sediments that form the Sandy River mudstone. Increased topography, 5-24Ma, resulted in the coarser high energy sediments that compose the Troutdale Formation. An abrupt lifting of the Cascade Range, 2-5Ma caused the erosion of much of the Troutdale formation from the Portland Basin (Evarts 2006). While the Lacamas Creek quadrangle is outside the area covered by Pleistocene glaciation in the Southern Cascades, areas below 400 feet elevation were subject to repeated episodes of glacial washout resulting from catastrophic ice dam breakage and flooding from Glacial Lake Missoula. Approximately 40 episodes occurred carving the trough that is now occupied by Lacamas Lake. (Bertz 1925; Trimble 1963; Waitt 1994).

Lacamas Creek and its tributaries flow through the Site. The North Fork of Lacamas Creek bounds RAU 2C to the north and west, cutting a steep ravine along a north-south orientation with exposures of quaternary alluvium deposits, Troutdale Formation, and Elkhorn basaltic andesite. The East Fork of Lacamas Creek flows westward and bounds RAU 2C to the south cutting through quaternary landslide deposits. The confluence of these streams occurs at approximately 360 feet elevation forming a wetland complex and floodplains across quaternary alluvium deposits, colloquially known as the Central Valley Floor. Lacamas Creek meanders west from this point, taking a southward bend around Munsell Hill. At the western and southwestern portions of the site, Lacamas Creek flows through quaternary deposits and is bound by exposures of the Troutdale Formation and Sandy River Mudstone.

Named tributaries of Lacamas Creek include David Creek which flows over quaternary landslide deposits and Elkhorn Mountain basaltic andesite in the Central Impact Target Area, and Buck Creek flowing over Elkhorn Mountain basaltic andesite. Both streams drain the southeastern portion of the site flowing to the northwest. David Creek enters the Central Valley Floor near the pop-up pond, while Buck Creek enters the Central Valley Floor near the FBI range.

Camp Bonneville has a mild climate marked by wet winters and warm, moderately dry summers. November, December, and January represent the wettest months with 6.31, 6.79, and 6.05 average inches of precipitation, respectively, and a total average annual precipitation of 42 inches. Annually the area experiences an average of 26 days below freezing, with January being the coldest month having an average temperature of 38 degrees Fahrenheit. July and August represent the driest and hottest months with 0.48 and 0.62 average inches of rain and average temperatures of 65.4 and 65.5-degrees Fahrenheit, respectively and typically only seven days with temperatures reaching above 90 degrees Fahrenheit.

In general, groundwater roughly follows topology and gradient along Lacamas Creek at the Site. The Central Valley Floor is part of the headwaters of the Troutdale aquifer. The EPA designated the Troutdale Aquifer as a sole source aquifer in 2006. RAU 2C, which has groundwater contamination, is located on an isolated unit of the Troutdale former and is hydrogeologically separated from the Troutdale Aquifer by competent crystalline bedrock (i.e. Basaltic (volcanic) Andesite of Elkhorn Mountain).

2.3. Cleanup Standards

Cleanup standards include cleanup levels, the location where these cleanup levels must be met (point of compliance), and any other regulatory requirements that apply to the Site. WAC 173-340-704[8] states MTCA Method A may be used to establish cleanup levels at sites that have few hazardous substances, are undergoing a routine cleanup action, and where numerical standards are available for all indicator hazardous substances in the media for which the Method A cleanup level is being used. WAC 173-340-705[9] states Method B may be used at any site and is the most common method for setting cleanup levels when sites are contaminated with substances not listed under Method A. WAC 173-340-706[10] states Method C cleanup levels may be used to set soil and air cleanup levels at industrial sites.

The point of compliance is the area where the cleanup levels must be attained. For soil cleanup levels based on the protection of human health and the environment as they are for this Site, the point of compliance is established as soils throughout the Site (standard point of compliance).

Cleanup standards will be discussed for each RAU that has undergone cleanup.

[8] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-704
[9] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-705
[10] https://app.leg.wa.gov/WAC/default.aspx?cite=173-340-706

2.4. Remedial Action Unit 1 – 20 areas

RAU 1 was investigated and remediated through independent actions by the DoD prior to the entry of the 2006 consent decree for the Site (**Figure 5**). The following descriptions of each area in RAU 1 are based on the Cleanup Action Plan Remedial Action Unit 1 (URS 2004).

2.4.1. RAU 1 Areas

Landfill 1

Landfill 1 was reportedly located east of the Camp Bonneville cantonment area and just north of the existing sewage lagoon. It was identified as having potential historic significance based on a 1980 cultural resources survey which stated that bottle fragments dating from the early 1900s were found in the area. There is no record of when this area was used or what other types of materials it may contain. In the 1980 archaeological survey, the area was described as a small (approximately 12 by 15 feet) shallow depression.

Multiple field surveys in 1997 found no evidence of a landfill and based on this work the term landfill may not be appropriate for this location. Instead, it may have been a former homestead where household debris was disposed (Shannon and Wilson 1999a).

Following site investigations, Ecology concurred with the determination that cleanup actions were not required for the Landfill 1 area.

Landfill 2

Landfill 2 was discovered in about 1978, during excavation for construction of the former sewage lagoon. According to an interview performed during the Environmental Baseline Survey (EBS), landfill material was unearthed at the eastern and northern borders of the sewage lagoon (Woodward-Clyde 1997). No description of the materials encountered during construction of the sewage lagoon was found. No additional records of the type or quantity of material that was placed in this landfill were located, and the exact dates of Landfill 2's use are unknown. Although the EBS suggested that the landfill may have been operated from 1940 to 1950, its use apparently preceded the mid-1970s, since base personnel working at Camp Bonneville at that time and interviewed were unaware of the landfill's existence.

Following site investigations, Ecology concurred with the determination that cleanup actions were not required for Landfill 2.

Landfill 3

Landfill 3 is located southeast of the former sewage lagoon, near Lacamas Creek, and approximately 300 feet southeast of Landfill 2. According to the EBS, the area was described as having been dug out as a trench and then used as a trash burial area from the mid to late-1970s to the early to mid-1980s. The landfill trench reportedly was approximately 40 feet long by 12 feet wide by 8 feet deep and ran north to south. Reportedly objects such as a refrigerator, locker, wallboard, and paint cans were buried in Landfill 3. Soil was scraped from nearby and pushed onto the landfill, creating a broad mound that currently marks the location of the landfill.

Following site investigations, Ecology concurred with the determination that cleanup actions were not required for Landfill 3.

Former Burn Area

The Former Burn Area is located immediately north of Landfill 3, to the southeast of the former sewage lagoon. A pile of wooden debris approximately 20 feet long by 15 feet wide marking the area was removed in June 1997. The area reportedly was used infrequently to burn wood and debris, although there is no record of the length of use or list of materials burned. This area has apparently not been used for burning material since the mid-1980s. According to the EBS, debris had been piled on the site for 3 to 4 years before its removal in June 1997.

Following site investigations, Ecology concurred with the determination that cleanup actions were not required for the former burn area.

Buildings 1962 and 1983

Buildings 1962 and 1983 were located near the southeastern corner of the Camp Bonneville cantonment area. The buildings were burned in place, and the burned debris was removed to an unknown location, leaving no visible trace of the footprints of the buildings. Building 1962 was a 9-foot-wide by 12-foot-long storage shed used to store fire hoses, and Building 1983 was a 10-foot-wide by 40-foot-long structure used as a stage and outdoor theater. Both buildings were constructed in the 1930s with wooden frame walls, wooden floors, wooden post/concrete pillar foundations, and rolled composition roofs. Based on their age and type of construction, it is reasonable to suspect that lead-based paint may have been used in the buildings. Peeling and flaking of paint or the burning of buildings may have contaminated the soils with lead. Asbestos and semi-volatile organic compounds may have been present in the composition roofing materials and other building materials.

Following site investigations, Ecology concurred with the determination that cleanup actions were not required for Buildings 1962 and 1983.

Grease Pits

Three grease pits were identified at Camp Bonneville: two located in the Camp Bonneville cantonment north of Building 1828, and one located in the Camp Killpack cantonment east of Building 4389. Each of the grease pits consists of a gravel-filled excavation with a corrugated metal pipe extending vertically down into the gravel. The grease pits were used for disposal of waste cooking greases and oils from nearby mess halls. Use of the pits reportedly began around 1935. During an interview performed as part of the EBS, the potential for the disposal of unauthorized materials in the pits was suggested.

The two grease pits in the Camp Bonneville cantonment are located north of the mess hall and associated structures. They occupy a flat, elevated area north of the gravel road. The ground surface is covered with grass and slopes steeply down to a ditch and the gravel road, approximately 10 feet south of the grease pits. Several rows of concrete tent pads remain immediately north of the pits. Each of these grease pits consists of a single corrugated metal pipe approximately 18 inches in diameter. The pipes are approximately 1.5 feet apart. There were no lids on these grease pits, and trash was observed in both pits.

The grease pit at the Camp Killpack cantonment is located approximately 10 feet east of the gravel road that runs north to south, on the east side of the former mess hall building (Building 4389). Small ditches run along both sides of the gravel road. The grease pit is located just inside a heavily wooded area; access is somewhat limited by the trees. The visible portion of the grease pit consists of two corrugated metal pipes, one inside the other. The outer pipe is approximately 16 inches in diameter, and the inner pipe is approximately 10 inches in diameter. The pipes are covered with a metal lid.

Following site investigations, Ecology concurred with the determination that cleanup actions were not required for the grease pits.

Former Sewage Pond

The Former Sewage Pond site is located south of the Camp Bonneville cantonment area. The exact location and dimensions of the pond were not documented in the records reviewed for the EBS. According to the former Facility Caretaker, the pond was an unlined lagoon that was pumped out and filled with clean soil derived from a local source when it was abandoned. The pond reportedly was used for sewage disposal until 1978, when the existing sewage lagoon was constructed. The years of pond usage are not known; however, according to the Facility Caretaker, it may have been used for only a short period of time. While no record of hazardous materials or UXO disposal was documented for this location it was included in investigations due to the potential to receive such materials.

Following site investigations, Ecology concurred with the determination that cleanup actions were not required for the former sewage pond.

Hazardous Materials Accumulation Point

The Hazardous Materials Accumulation Point (Building 4476) is in the northeast corner of the Camp Bonneville shop area, in the Camp Killpack cantonment. The building is a three-walled structure, built in 1990, with concrete masonry block walls and a concrete slab floor. The open front of the structure is secured with locked metal gates. The structure, also referred to as the Covered Vehicle Maintenance Storage, has been used for the storage of drums of liquids such as antifreeze and used oil. It may have been used for temporary accumulation of drums of other hazardous materials. The concrete floor of the building is sloped toward a sump in the middle of the floor. The sump measures approximately two feet square and is approximately two feet deep. No drains are present in the sump. No evidence or reports of spills at this site were found.

Following site investigations, Ecology concurred with the determination that cleanup actions were not required for the Hazardous Materials Accumulation Point.

Drum Disposal Area

An anonymous former Camp Bonneville Military Reservation employee reported the existence of an area of buried drums located south of the Killpack cantonment and east of a gravel road south of the current storage area. The caller reported that pesticides, paints, and solvents were disposed of at this location. As a result of the call, a program was established to characterize and remediate the area.

Following site investigations, independent remedial action was undertaken at the drum disposal area.

Paint and Solvent Disposal Area

The same anonymous employee reported the existence of the Paint and Solvent Disposal Area, reported to be south of the Camp Killpack cantonment, in an open area where a tractor shed exists. The caller stated that paints, solvents, and pesticides were disposed of in this location. As a result of the call, a program was established to characterize and remediate the area.

Following site investigations, independent remedial action was undertaken at the Paint and Solvent Disposal Area.

Washrack 1

Located immediately west of the shop office (Building 4475) in the Camp Killpack cantonment, Washrack 1 was used to clean vehicles from approximately 1978 to 1994. A wooden two-track vehicle ramp was demolished in June 2000. Wastewater from the washing operations was reportedly discharged directly to ground via overland flow to a nearby ditch.

Following site investigations, independent remedial action was undertaken at Washrack 1.

Maintenance Pit (Building 4475)

The Maintenance Pit is located underneath a concrete slab within the west end of Building 4475 in the Camp Killpack cantonment. It was formerly an area where mechanics repaired and maintained vehicles. The pit was reported to be an unlined excavation, and no documentation exists concerning its depth or how long the pit was used.

Following site investigations, independent remedial action was undertaken at the Maintenance pit area. This remedial action successfully removed contaminated soil; however, site investigations were unable to sample soil beneath the maintenance pit without damaging building 4475 which was constructed over the maintenance pit. As such contamination is suspected to exist at this location. Institutional controls in the form of a restrictive covenant, between BCRRT and Clark County, are in place for the area. If Building 4475 is demolished, the covenant requires additional sampling, and remediation if the soil sampling reveals a need for remediation.

Washrack 2

The Washrack 2 site (former maintenance rack site) is in the Camp Killpack cantonment at the northeast corner of the shop office area, near Building 4476, on the hillside in a small, relatively level clearing. The Washrack 2 site was used for vehicle cleaning, and a rack for performing vehicle maintenance, including the draining of engine fluids. The rack, reportedly demolished in the 1980s, was originally constructed of two parallel timber ramps with gravel in between them. If vehicles were washed at this area, wash water would have discharged, by uncontrolled overland flow, onto the surrounding surface area. According to the EBS, the Washrack was demolished in the early 1980s, and an adjacent underground storage tank (UST) was removed in 1978.

Following site investigations, Ecology concurred with the determination that cleanup actions were not required for Washrack 2.

Pesticide Storage/Mixing Building (Building 1864)

Built in 1955, the Pesticide Storage/Mixing Building (Building 1864), a wood-frame building with a concrete slab-on-grade floor, was originally used as a fire station. Much later (1977 through 1980), it was used as an area where pesticides were stored and mixed. Fifty-five-gallon drums of hazardous herbicides and pesticides were reportedly stored there. A sink was used for pesticide mixing and pesticide container and applicator cleaning. This sink was discovered to discharge via a pipe to a dry well containing large drain rock to a depth of three feet. Subsequently, the building had been used as a shop where equipment, vehicles, small gasoline containers, and car batteries were stored.

Following site investigations, independent remedial action was undertaken at the Pesticide Storage/mixing Building (Building 1864).

Aboveground Storage Tanks (ASTs)

26 ASTs are located at multiple locations with 23 located in the Camp Bonneville cantonment and the remaining three in the Camp Killpack cantonment. Each of these ASTs has a 275-gallon capacity tank and had been in use since the 1920s and 1930s to store diesel fuel for heating. In July 1999 three ASTs were reportedly still in use at Camp Killpack. The three ASTs at Camp Killpack at the time of this periodic review are no longer in use by Clark County Public Works.

Following site investigations, Ecology concurred with the determination that 18 ASTs did not require cleanup actions. Eight ASTs required further investigation with seven of those eight locations requiring independent remedial action. Following independent remedial action at one location, AST #6 which is associated with building T-1932, had contamination left in place exceeding cleanup levels. Institutional controls in the form of a restrictive covenant, between BCRRT and Clark County, are in place for the area. If building T-1932 is demolished, the covenant requires additional sampling, and remediation if soil sampling reveals a need for remediation.

Former CS Gas Training Building Site

The former CS Gas Training Building was located south of the Camp Bonneville cantonment, between Lacamas Creek on the north and the RAU 2A-16 (referenced in URS 2004 as the 50-caliber firing range or Range 7) on the south. The exact location and dimensions of the building are unknown as is its period of use. This former structure was used to train troops in the use of protective equipment for chemical warfare. The primary substance reported to have been released during training exercises was CS gas (tear gas). The dates of use for the building are not documented, but the building is observed in aerial photographs from the years 1950, 1960, and 1970. The building was destroyed by fire in the late 1970s.

Following site investigations, independent remedial action was undertaken at the Former CS Gas Training Building Site.

Pesticide Storage Building (Building 4126)

Building 4126, the Pesticide Storage Building, was located on the edge of a small, flat, grassy field approximately 75 feet south of the gravel road in front of the Camp Killpack cantonment. The building was constructed in approximately 1958 and was composed of a wood frame and wood floor. This building was used to store 55-gallon drums of hazardous herbicides and pesticides until 1977 when these materials were moved to Building 1864.

According to the ESB, previous uses of the Pesticide Storage Building included towing it to various locations throughout the cantonment. Wooden skids attached to the underside of the floor further suggest this type of use. Vines and bushes growing up against the building walls observed during the ESB suggest that the building has not been moved and has been in its present location for a considerable amount of time.

Following site investigations, independent remedial action was undertaken at the Pesticide Storage Building 4126 with the building being demolished.

Ammunition Storage Magazines (#2953, #2951, #2950)

Ammunition Storage Magazines #2953, #2951, and #2950 are located approximately 2,000 feet northeast of the Pesticide Storage Area on the south side of the road leading into the facility from the Camp Killpack cantonment. Note that some historic reports use the term Ammunition Storage Bunkers to describe these magazines. They were constructed in 1976, and used to store munitions of various types that were brought to Camp Bonneville for training purposes. They are positioned on a flat, graded terrace approximately 10 feet below the elevation of the road. An approximately 10-foot-wide by 50-foot-long access road descends from the main gravel road on the west side of the largest magazine #2953 and ends in front of the bunker entrance on the south side.

The westernmost Ammunition Storage Magazine #2953 has an interior floor space measuring roughly 10 feet by 10 feet. The entrance to this structure faces southward. The center magazine #2951 is the smallest, with an interior floor space measuring only about 2 feet by 2 feet, and a door also facing southward. The interior floor space of the easternmost magazine #2950 measures roughly 4 feet by 4 feet.

Following site investigations, independent remedial actions were undertaken at the Ammunition Storage Magazines.

CS Gas Chamber Building (Building 1834)

The CS Gas Chamber Building (Building 1834) is located in the Camp Bonneville cantonment and was used historically to train troops in chemical warfare agents. The wood frame structure is a one-story, post-on-pier converted troops barracks. The chemical warfare training conducted in this building was restricted to CS gas (tear gas).

Following site investigations, Ecology concurred with the determination that cleanup actions were not required for the CS Gas Chamber Building and the building was demolished.

Underground Storage Tank (associated with Building 4475)

An underground storage tank (UST) was formerly located approximately 10 feet east of Building 4475. This UST was part of a refueling system connecting one 275-gallon diesel AST with the 300-gallon diesel UST. The UST was thought to have leaked because the fuel consumption and tank filling records did not coincide. As a result, the 300-gallon diesel UST was removed in 1995.

Independent remedial actions were undertaken at the UST associated with Building 4475.

2.4.2. RAU 1 Site Investigations

The following are general summaries of the reports documenting site investigations for RAU 1. The RAU 1 Cleanup Action Plan also provides detailed summaries of these investigations and cleanup activities as they relate to each cleanup area (URS 2004).

2.4.2.1. Petroleum Contaminated Soil Investigation, Former Tank No. 7-CMPN, Building No. 4475 (Hart Crowser 1996)

This report details the results of soil sampling in June 1996 following the removal of a refueling system UST (UST No. 7-CMPBN) associated with building 4475 in October 1995. This investigation was performed to assess the vertical and horizontal extent of soil contamination. Soil samples were collected from 4 borings and a drainage ditch. Soil samples at the UST and drainage ditch detected petroleum hydrocarbons diesel range organic (TPH-DRO) at concentrations which exceeded MTCA method A cleanup levels at the time which were 200 milligram per kilogram (mg/kg). Please note the cleanup level for TPH-DRO was subsequently revised upward and is currently 2,000 mg/kg.

2.4.2.2. Environmental Baseline Survey (EBS) (Woodward Clyde 1997)

Following the Site's selection for closure an EBS was prepared in 1997. This classified areas of the property into one of seven standard environmental conditions of property area types as defined by the Community Environmental Response Facilitation Act guidance and the DoD BRAC Cleanup Plan Guidebook of time. This report conducted a review of existing installation documents, federal, state, and local government records, aerial photographs, site visits, and employee interviews. Based on this report areas were identified for investigation and if necessary, remediation under the BRAC 95 program.

2.4.2.3. Letter Report, Pre-Demolition Survey, CS Gas Chamber building, Camp Bonneville Washington (Hart Crowser 1997)

In preparation for demolition of Building 1834, a pre-demolition survey was conducted that included sampling surface soils for CS gas and its breakdown products, field-screening (plus one laboratory sample) the near surface soil for lead, and sampling building materials for lead and asbestos.

No soil samples collected during this survey had detectable concentrations of CS gas or its breakdown products. An x-ray fluorescence (XRF) spectrometer was used to field screen for lead in the near surface soil samples with one confirmation sample submitted for laboratory analysis. All samples were reported to have lead concentrations of less than 93 mg/kg, the limit of the instrument at the time, and the confirmation sample had a total lead concentration of 17 mg/kg.

The x-ray fluorescence instrument was also used to sample building material surfaces for the presence of lead. The surfaces sampled that were found to contain lead-based paint included corner boards, exterior siding, and stairway risers. None of the building materials tested contained more than 2.9 milligrams per square centimeter (mg/cm^2) of lead. Regulatory guidelines at the time indicate that painted materials with elevated concentrations of lead (4 mg/cm^2 or greater) may be a potentially dangerous waste if separately removed during demolition activities.

No asbestos containing materials were discovered.

2.4.2.4. Multi-Sites Investigation Report (Shannon and Wilson 1999a)

This report documented several site investigations conducted between October 1997 and November 1998. The areas addressed in this investigation included Landfill 1, Landfill 2, Landfill 3, the Former Burn Area, Former buildings 1962 and 1983, the drum disposal area, the paint and solvent disposal area, maintenance pit (building 4475), Washrack no. 1, grease pits, the pesticide storage/mixing building, above ground storage tanks, the former sewage pond, ammunition storage magazines, hazardous material accumulation point, the former CS gas training building, and Washrack no. 2.

Investigation activities included UXO avoidance in areas outside of the cantonments; geophysical surveys where the suspected contaminant sources were underground; soil sampling at all of the sites that could be located; soil gas sampling of Landfills 2 and 3; well installation and groundwater sampling at the landfills, former sewage pond, and pesticide mixing/storage building; and wipe sampling in the ammunition storage magazines. The report recommended no further action either because no evidence or minimal contamination was detected at the following locations: Landfills 2 and 3, the further burn area, the paint and solvent disposal area, the grease pits, 18 ASTs, the former sewage pond, the hazardous materials accumulation point, and Washrack no. 2. No existence of Landfill 1 was found.

The report found contamination in soils at the drum disposal area (metals), Washrack no 1 (total petroleum hydrocarbons (TPH) and metals), the pesticide storage/mixing building (TPH, one semi-volatile organic compound, pesticides, and metals), 8 above ground storage tank locations (TPH-DRO), the former CS gas training building (lead, SVOCs), the Maintenance Pit (TPH, metals, pesticides, and VOCs), and the Ammunition Storage Magazines (metals).

The report recommended removal and disposal of contaminated soils and additional site characterization of the ammunition storage magazine and maintenance pits.

2.4.2.5. Supplemental Site Investigation, Ammunition Storage Magazines and Pesticide Storage Area (URS 2000)

This report summarizes the results of soil sampling and flooring material sampled of the Pesticide Storage building (building 4126) and soil sampling at the largest Ammunition Storage Magazine (Building 2953).

At the Pesticide Storage building (Building 2953), pesticides were detected in samples at concentrations below regulatory cleanup levels, TPH (DRO & motor oil range) were detected at concentrations below regulatory cleanup levels, arsenic and chromium were detected above regulatory cleanup levels but below regional background levels. Lead was detected in surface samples above regulatory cleanup levels and regional background levels. The report recommended demolition of the building and removal of contaminated soils.

At the Ammunition Storage Magazine, the report found metals above regulatory screening levels. One SVOC, bis(2-ethylhexyl)phthalate, was detected in one sample at a concentration below cleanup levels. Explosive compounds Pentaerythritol tetranitrate and picric acid were detected in one surface soil sample and 2,4-dinitrotoluene was detected in all three surface soil samples at concentrations less than MTCA cleanup levels. The report recommended removal of contaminated soils in the interior of the storage magazines, cleaning of the interiors of the storage magazines with collection and disposal of cleaning materials, excavation and disposal of contaminated soils outside of the magazines.

2.4.3. RAU 1 Interim and Emergency Actions

Cleanup and investigation of the RAU 1 areas occurred as independent actions prior to the consent decree. These cleanup actions were not interim or emergency actions.

2.4.4. RAU 1 Cleanup Actions

The following are general summaries of the reports documenting the cleanup activities for RAU 1. The RAU 1 Cleanup Action Plan provides detailed summaries of investigations and cleanup activities as they relate to each cleanup area (URS 2004).

2.4.4.1. Field Report for Drain Line and PCS Removal (Cecon Corporation 1997)

This report outlines the removal of petroleum contaminated soil, and the drain lines following removal of UST No. 7 associated with Building 4475. Between November 1996 to October 1997 approximately 375 cy of petroleum contaminated soil were removed from that UST location and the associated drainage ditch. Confirmation samples were below the current MTCA Method A cleanup level of 2,000 milligrams per kilogram for diesel range organics.

2.4.4.2. BRAC HTRW Site Closure Reports for Landfills 1, 2, and 3; Former Burn Area, Buildings 1962 and 1963; Grease Pits at the Camp Bonneville and Camp Killpack Cantonments; Former Sewage Pond; and Hazardous Materials Accumulation Point, Camp Bonneville, Washington (URS Greiner Woodward Clyde 2000)

This report provides an evaluation of past data collection and provides documentation that the eight (8) locations, which the Shannon and Wilson 1999 Report recommended for no further action, met regulatory requirements at the time. No further action recommendations were evaluated and finalized in the Cleanup Action Plan for RAU 1 (URS 2004).

2.4.4.3. Final Closure Report, Environmental Restoration, Multi-Sites, Camp Bonneville Washington (Gary Struthers Associates 2001a)

This report documents the independent remedial actions at the drum disposal area, paint and solvent disposal area, Washrack no. 1, maintenance pit (building 4475), the Former CS Gas Training Building Site, Pesticide Storage/Mixing Building (Building 1864), and the 8 ASTs identified in Shannon and Wilson 1999a. Remedial field activities took place between June 19, and August 25, 2000, and was conducted with UXO support. In general, contaminated soils were excavated with soils screened for waste characterization along with lead-based paint chips where applicable. Confirmation sampling was conducted at each location with subsequent excavation and confirmation sampling until it was established that the site-specific clean closure concentrations for contaminants of potential concern had been met or conditions were encountered that rendered further excavation impractical.

At the conclusion of these efforts, remediation was successfully completed except for three areas. Petroleum hydrocarbon (TPH-DRO) was left in place beneath building T-1932 at the Camp Bonneville cantonment as further excavation risked undermining the structure from the release associated with AST #6. The maintenance pit which building 4475 was constructed over could not be sampled, and contamination is suspected to be present associated with its use. The drum burial area was identified as being significantly larger than initially anticipated and the report recommended additional investigation and remediation.

2.4.4.4. Final Closure Report, Environmental Restoration, Pesticide building #4126 and Ammunition Bunkers #2953, #2951, and #2950, Camp Bonneville Washington (Gary Struthers Associates 2001b)

This report documents the remediation of the Pesticide Storage building #4126 and Ammunition Storage Magazines #2953, #2951, and #2950. Remedial field activities, with UXO support, took place between May 7 and September 17, 2001. In general, contaminated soils were excavated and disposed of at these locations with confirmation sampling confirming remedial goals were achieved. The Pesticide Storage Building #4126 was demolished prior to remediation of contaminated soils. Following confirmation sampling, the excavations were restored with clean fill.

2.4.4.5. Final Closure Report, Environmental Restoration, Drum Burial Area, Camp Bonneville Washington (Gary Struthers Associates 2002)

This report documents the remediation of the Drum Disposal Area. Following the initial halted excavation an additional geophysical survey was conducted in October 2000 to identify additional areas which may contain buried drums. Thirteen anomalies were identified, and the area was remediated between October 29, 2001, and January 23, 2002. Contaminated soils, metallic and non-metallic debris were excavated, screened and properly disposed. Confirmation sampling was conducted and confirmed the remedial goals were achieved. Following remediation, the excavations were backfilled with clean material.

2.4.4.6. Final Cleanup Action Plan for Remedial Action Unit 1, Camp Bonneville, Washington (URS 2004)

The Cleanup Action Plan (CAP) described the final cleanup requirements for RAU 1. This document also provided a summary of site investigations and remediation for RAU 1 and was finalized in July 2004 following a public comment period. Based on the data gathered during the investigation and remediation activities at the RAU 1 sites, No Further Action (NFA) was the selected remedy for the areas comprising RAU 1. The data demonstrated that contaminants were not detected, detected in concentrations below cleanup levels (or background), or remediation activities reduced the concentrations to below cleanup levels.

The NFA decision was made with consideration to five locations where exceedances above cleanup levels were noted. Arsenic was detected in one soil sample at the Camp Killpack Grease Pit at a concentration of 7.9 mg/kg and in one soil sample at the Former Sewage Pond at a concentration of 7.2 mg/kg, both of which are above the regional background value of 7.0 mg/kg. While exceeding cleanup levels, these were localized detections and did not indicate a risk to human health or the environment. A pesticide, Lindane, was detected in one soil sample at the Camp Bonneville Grease Pits above cleanup levels.

Lindane was not detected in any other samples at the Camp Bonneville Grease Pits, and it is unlikely that the grease pits were a source for Lindane. This exceedance was considered a localized detection which did not indicate a risk to human health or the environment. Petroleum hydrocarbon contamination remained in place following the cleanup of AST #6 at Building T-1932 in Camp Bonneville cantonment and contamination was likely to be present at the Maintenance Pit (building 4475) at Camp Killpack cantonment.

Institutional Controls in the form of restrictive covenants were required at Building T-1932 and at the maintenance pit (Building 4475). Restrictive covenants are required as Building T-1932 has confirmed TPH-DRO contamination left in place while the maintenance pit (Building 4475) was remediated, soils beneath the Building 4475 could not be sampled and likely have residual contamination. The restrictive covenants required signage on these two buildings notifying that if buildings are demolished, soil must be sampled and if necessary remediated by removal.

Additionally, the owner of the property is required to make annual reports on these restrictive covenants and the covenants must be incorporated into any hazard awareness program for the property.

The restrictive covenants were recorded against the property with the Clark County Auditor's Office in 2006 (**Appendix C**).

2.4.5. RAU 1 Cleanup Standards

RAU 1 had independent remedial actions completed prior to Ecology's Enforcement Order and were undertaken by the DoD following CERCLA regulations. Upon Ecology's issuance of the Enforcement Order, the cleanup was screened against MTCA Method A cleanup levels for unrestricted land use and MTCA Method B cleanup levels for chemicals not listed in Method A or for use in soils where groundwater was encountered.

Cleanup standards for remedial work conducted as part of RAU 1 are presented in **Table 2-3**.

2.5. Remedial Action Unit 2A – Small Arms Ranges

RAU 2A was the investigation and cleanup of small arms ranges identified at the Site (**Figure 6A, Figure 6B**). Lead in soils is the primary contaminant of concern for this remedial action unit.

Original estimates of the number of small arms ranges on site varied from 21 to 25 ranges and the Ecology's Enforcement Order and the subsequent consent decrees defined the unit as 21 ranges (Enforcement Order No. 03TCPHQ-5286). Following site investigations and administrative review, 17 small ranges were confirmed on Site due to the misidentification of ranges (e.g. the range name changed), overlap of ranges (e.g. the ranges shared the same physical location), or other factors (e.g. no physical evidence for the range was found) (BCRRT. 2008d).

Pursuant to the Cleanup Action Plan, cleanup actions were required for RAU 2A. Following cleanup actions contamination remains in place at two locations range 2A-16 (1,000-inch Rifle Range and Machine Gun Range) and range 2A-21 (Rifle Ranges/Field Fire Ranges No. 1 and No. 2), which is contained by a geosynthetic liner with a protective clean soil cover.

2.5.1. RAU 2A Site Investigations

The following are general summaries of the reports documenting site investigations for RAU 2A.

2.5.1.1. Final Archives Search Report (USACE 1997a, 1997b, 1997c)

A comprehensive Archives Search Report (ASR) was conducted by the U.S. Army Corps of Engineers (USACE). This investigation compiled and reviewed historical records, maps, interviews, and environmental documentation to assess the presence and distribution of ordnance and explosives (OE), suspected chemical warfare material and other military-related hazards. For RAU 2A this report established the first estimate of the number of ranges that had been historically present at the Site.

2.5.1.2. Camp Bonneville, Washington, GIS-Based Historical Time Sequence Analysis (USACE 2000)

In 2000, USACE Topographic Engineering Center conducted an aerial photograph analysis of the Camp Bonneville area using black and white imagery from 1940 to 1980, historical range maps from 1926 to 1991, and digital photomaps from 1990 and 1998. As it relates to RAU 2A, this analysis identified possible firing point and berms for investigation.

2.5.1.3. Draft Final Site Investigation Report Small Arms Ranges and Demolition Areas 2 and 3 Camp Bonneville Vancouver, Washington (AEM 2003)

This report documents Site field investigation conducted in February and March 2003 of the small arms ranges and Demolition Areas 2 and 3 (RAU 2B). Seventeen ranges were confirmed during sampling and were subdivided into half acre grids for sampling. Each grid had five soil samples collected corresponding to the grid center and boundaries. This investigation, as it related to RAU 2A, sampled soils for lead at the small arms ranges and background locations on Site. It also sampled soils for explosive residues in the muzzle blast areas of firing ranges where the location was known. Detections of explosive residues at the muzzle blast areas were below screening levels and lead was detected above screening levels in 12 of the 17 ranges sampled.

2.5.1.4. Final Remedial Investigation/Feasibility Study Report Small Arms Ranges (RAU 2A) (BCRRT 2007d)

The RI/FS report was finalized following a public comment period. The purpose of the remedial investigation portion is to present and evaluate information to adequately characterize a contaminated site, while the feasibility study develops and evaluate cleanup action alternatives to enable the selection of a cleanup action that meets the requirements of MTCA. The results of previous sampling (approximately 1,760 soil samples (including quality assurance samples)) and analysis from the identified range areas were evaluated and the Site was characterized and evaluated to select an appropriate cleanup action.

The RI/FS for RAU 2A recommended the cleanup action alternative 5 – the excavation and off-site disposal or recycling of contaminated soils.

2.5.2. RAU 2A Interim and Emergency Actions

No Interim or emergency actions took place for the RAU 2A as it pertained to remediation of the ranges for lead contaminated soil.

2.5.3. RAU 2A Cleanup Actions

The following are general summaries of the reports documenting cleanup activities for RAU 2A.

2.5.3.1. Final Cleanup Action Plan Small Arms Ranges (RAU 2A) (BCRRT 2008)

The CAP documents the required cleanup activities at the site. This document was finalized following a public comment period in fall 2007.

The CAP identified 9 small arms ranges for remediation, 7 of which included berms **Table 2-2**. Cleanup criteria was based on the sampling grids, 173 grids total, with individual grids falling into designated 5 categories:

- Category 1—All individual lead sample concentrations less than 50 mg/kg; (111 grids)
    - No cleanup action was required for Category 1 grids
- Category 2 – All individual sample results are less than 118 mg/kg and the average concentration of all samples from that grid is less than 50 mg/kg (27 grids)
    - No cleanup action was required for Category 2 grids
- Category 3 – All individual sample results are less than 250 mg/kg, and the average concentration is between 50 mg/kg and 118 mg/kg (15 grids)
    - Excavation of a 29 foot by 29 foot area to a depth of 6 inches. Confirmation sampling following excavation to confirm removal of contaminated soil.
- Category 4 – Remediation required: The average concentration is between 118 mg/kg and 250 mg/kg (9 grids)
    - Excavation of a 58 foot by 58 foot area to a depth of 6 inches. Confirmation sampling following excavation to confirm removal of contaminated soil.
- Category 5 – Remediation Required: The average concentration is greater than 250 mg/kg (11 grids)
    - Excavation of all surface soils in the grid to 6 inches below ground surface. Confirmation sampling following excavation to confirm removal of contaminated soil.

This document is the first document of record which assigned cleanup specific designations to the small arms ranges (e.g. 1,000-inch Rifle Range/Machine Gun Range was designated 2A-16).

As will be discussed further in Section 3.8.4, Ecology's review of the RAU 2A CAP excluded the cleanup of five ranges with soil contamination above 50 mg/kg identified in the RI/FS. These ranges were the Close Combat Range, Machine Gun Range North, Machine Gun Range South, M31 Sub-Caliber Ranges 1 & 2, and the infiltration Course South.

2.5.3.2. Operations Plan for HTW Remediation, Remedial Action Unit 2A - Small Arms Firing Ranges, Camp Bonneville Military Reservation (BCRRT 2008e)

This work plan developed the methodology for executing the goals of the RAU 2A CAP. The berms would be remediated first followed by the range floor.

Excavation, clearing and grubbing, and sifting and screening of soils would be conducted with UXO Support. Excavated soils were staged for disposal based on waste characterization and sifted to remove brush debris and bullet fragments prior to treatment and disposal. Resource Conservation and Recovery Act soils or soils with Toxicity Characteristic Leaching Procedure (TCLP) value equal to or greater than 5 parts per million (ppm) were shifted and treated with ECOBOND a propriety reagent to stabilize soluble lead prior to disposal. Soils classified as "MTCA soils" with total lead less than 250 mg/kg and TCLP less than 5ppm were to be placed in the northern sewage lagoon which would be lined, covered with a 1-foot layer of clean soil and compacted.

Some areas of the ranges were identified as having special conditions which required alternative cleanup actions as the proposed remedy would not be viable. This included areas of running or standing water, such as a creek or stream, and/or locations outside of firing line and/or the historical boundary of the range. The alternative action for situations with special conditions was sampling and analysis of soils to determine the actual concentrations of lead within the special condition area.

For areas within a cultural resource area or with standing or running water, five discrete soil samples were to be collected in a 29-foot by 29-foot area and evaluated. If those areas exceeding the cleanup level (50 mg/kg), further remedial actions would be evaluated with Ecology and other project stakeholders.

For areas outside of the range or firing line, soils samples would be collected and if samples exceeded the cleanup level (50 mg/kg), then further excavation would occur until lead removal was confirmed.

2.5.3.3. Addendum to the Cleanup Action Plan, Small Arms Ranges, RAU 2A-16 and RAU 2A-21, Former Camp Bonneville Military Reservation, Vancouver, Washington (Weston 2017)

The RAU 2A CAP was amended in 2017 to address lead contamination at two range areas, the 1,000-inch Rifle Range and Machine Gun Range (Range 2A-16) and Field Fire ranges No. 1 and No. 2 (2A-21).

During remedial action activities confirmation sampling determined that lead concentrations were increasing with depth at range 2A-16 and exploratory trenching in June 2009 indicated that 2A-16 was situated on lead impacted fill from elsewhere in the Site (Michael Baker 2010, MKM 2008a). Similarly, during remedial actions at range 2A-21 it was discovered that lead contamination in soil in the overshoot area past the range berm was present in a much larger area (6.21 acres) than initially anticipated (MKM 2010).

The recommended cleanup action was to install a protective cover over the lead-impacted areas of ranges 2A-16 and 2A-21 with a geotextile fabric and one-foot clean soil cover.

2.5.3.4. Final Cleanup Action Report Remedial Action Unit 2A Small Arms Ranges (Weston 2018c)

The Final Cleanup Action report documents the completion of remedial activities for RAU 2A.

The cleanup history of RAU 2A was complicated by departure of contractors from the Site in 2010 with final cleanup records either not being retained or transmitted to Clark County Public Works and Ecology. Documents from the time of field work, including daily field logs, indicate field work for RAU 2A was proceeding following the methodology laid out in the work plan at that time (MKM 2008a, MKM 2008b, MKM 2009). The 2012 APPCD documented the cleanup with associated confirmation data for all ranges except 2A-16 and 2A-21 had been completed to Ecology's satisfaction; however, the data from the confirmation samples collected during cleanup activities have not been identified in the project files. This data is needed for this and future periodic reviews to evaluate the effectiveness of the cleanup actions should the MTCA screening levels for lead change. This will be discussed further in Section 4 Issues and Recommendations.

2.5.4. RAU 2A Cleanup Standards

RAU 2A cleanup standard was MTCA Method A Unrestricted Land Use for lead of 250 mg/kg. The point of compliance for remediation actions ensured that lead concentrations would be protective of Ecological receptors with average soil concentrations below 50 mg/kg and no individual soil samples exceeding 118 mg/kg in a remedial grid. The MTCA Method A values for lead have not changed since cleanup occurred.

2.6. Remedial Action Unit 2B – Demolition Areas 2 and 3

RAU 2B was the investigation of two open burning/demolition areas where ammunition was either burned or detonated (**Figure 7A and Figure 7B**).

Demolition Area 2 was estimated to be approximately 60-feet in diameter located on the southwest facing valley slope north of David Creek and east-southeast of the base pop-up target pond. The exact location of Demolition Area 2 was not discovered in investigations due to the steep slope and heavy vegetation and investigations focused sampling near and downgradient to the location. The existence of Demolition Area 2 was established from historic photographs, inferred by demolition debris in the area, and from site interviews. Remedial investigations of Demolition Area 2 focused on sampling for impacts near and downgradient from the inferred location.

Demolition Area 3 was a surface crater approximately 20-feet in diameter and 10 feet deep located 2,000 feet upstream of the base boundary with Lacamas Creek. Demolition Area 3 may have been used for detonation of unwanted ordnance.

Following site investigations, Ecology determined that cleanup actions were not required for Demolition Area 2 or Demolition Area 3.

2.6.1. RAU 2B Site Investigations

2.6.1.1. Draft Final Site Investigation Report Small Arms Ranges and Demolition Areas 2 and 3 Camp Bonneville Vancouver, Washington (AEM 2003)

This report documents Site field Investigation conducted in February and March 2003 of the small arms ranges and Demolition Areas 2 and 3 (RAU 2B). This report, as it related to RAU 2B, included results from sampled soils in the approximate location of Demolition Area 2, from locations approximately 100 feet away in the cardinal directions, and samples from the earthen berm adjacent to the road on the south side of Demolition Area 2. The report stated that no explosives or perchlorates were detected while metals (arsenic and barium) were detected above screening levels.

At Demolition Area 3 soil samples were collected in the from the depression/crater sides and a surface water sample from the center of the depression/crater. Samples were analyzed for explosive residues and metals. Explosives were detected below benchmark values and metals (barium) exceeded benchmark values.

2.6.1.2. Final Remedial Investigation Report Demolition Areas 2 & 3 (RAU 2B) (BCRRT 2007e)

This Final Remedial Investigation Report was initially completed as "Final Site Investigation Report, Demolitions Areas 2 and 3" by Calibre Systems, Inc in 2005, and modified and finalized by BCRRT in 2007 (Calibre 2005). This report documents the findings of all sampling events from RAU 2B including additional soil sampling in Fall 2003 and groundwater monitoring from the fourth quarter of 2003 through second quarter of 2006. Groundwater monitoring included sampling of additional monitoring wells: three wells installed downgradient of Demolition Area 2, five wells installed at Demolition Area 3, and eight wells installed at the base boundary.

At Demolition Area 2, the report stated that Barium and Arsenic were detected above screening levels in soils and regional background levels. Barium was below the current MTCA method B screening level, but above ecological screening levels for wildlife. Soils were compared to the background at the Site and exceedances of both metals were within 90th percentile for regional background and within the range of naturally occurring concentrations. Groundwater monitoring detected no explosives at Demolition Area 2 and apart from two sampling events groundwater samples were below screening levels.

During the March 2005 sampling event Well LC-MW-09S had exceedances of arsenic, chromium, and lead for total metals. During the September 2005 sampling event, Well LC-MW-10S had an exceedance of lead in total metals. In both cases, the dissolved (filtered) metal samples were below screening levels, and the elevated detections were attributed to sample turbidity and therefore not indicators of groundwater contamination. Based on these findings no cleanup action was recommended for Demolition Area 2.

At Demolition Area 3, soils were below screening levels except for barium. Barium was below the current MTCA method B screening level, but above ecological screening levels for wildlife. Soils were compared to background at the Site and the exceedance was within 90th percentile for regional background and within the range of naturally occurring concentrations. Groundwater monitoring at Demolition Area 3 had no detections of explosives above screening levels. Metals were below screening levels, with one exception. A single sampling event in January 2003 detected dissolved arsenic in well LC-MW-08S above MTCA screening levels; this exceedance appears to be an outlier and was below screening levels in all other sampling events. Based on these findings no cleanup action was recommended for Demolition Area 3.

2.6.1.3. Focused Groundwater Assessment for Perchlorate and Explosives Lacamas Creek and Demolition Area 3 (PBS 2014a, 2014b, 2014c)

This report details the investigation of groundwater at Demolition Area 3 following a detection of an explosive compound, high melting explosive (HMX) at a base boundary well (LC-MW01D) during the September 2013 quarterly monitoring event for RAU 2C and Sitewide groundwater. This groundwater sample was above laboratory detection limits but well below screening levels.

Following this detection, the monitoring wells at Demolition Area 3 were redeveloped, or swabbed and pumped to remove any accumulated sediment in the well or sand pack, in December 2013 and sampled in January, March, and June of 2014. Samples were analyzed for explosive compounds and perchlorate. Explosive compounds and perchlorate were not detected in the DA3 monitoring wells above laboratory detection limits.

2.6.2. RAU 2B Interim and Emergency Actions

No interim or emergency actions were conducted at RAU 2B.

2.6.3. RAU 2B Cleanup Actions

No interim or emergency actions were conducted at RAU 2B.

2.6.4. RAU 2B Cleanup Standards

No cleanup standards were established for RAU 2B as Ecology determined that no cleanup actions were required following remedial investigations.

2.7. Remedial Action Unit 2C –Landfill 4 / Demo Area 1

RAU 2C includes Landfill 4/Demolition Area 1, which the investigation and remediation of is ongoing (**Figure 8**). RAU 2C is included in sitewide groundwater monitoring.
Landfill 4/Demolition Area 1 is approximately 2.5 acres in size and located approximately 1 mile northeast of the Camp Bonneville cantonment bounded to the west and north by the North Fork Lacamas Creek. Landfill 4/Demolition Area 1 was used for the open burning and open demolition of munitions by the DoD and received civilian fireworks for destruction (Tetra Tech 2006, Shannon and Wilson 1999b).

An interim action took place at RAU 2C in 2004 to remove the primary source of contamination. Residual contamination remained following the interim action and a remedial investigation/feasibility study (RI/FS) is pending for RAU 2C pursuant to the APPCD. Following the RI/FS a Cleanup Action Plan will be developed. The RI/FS and the Cleanup Action Plan will undergo a public comment period. Currently RAU 2C and sitewide groundwater is monitored quarterly.

2.7.1. RAU 2C Site Investigations

RAU 2C is an active cleanup and investigations of RAU 2C are ongoing. A RI/FS for RAU 2C is being prepared and will go through a public comment and notification period.

2.7.2. RAU 2C Interim and Emergency Actions

An interim action at RAU 2C was conducted in 2004 to remove and dispose of ordnance, landfill materials, and associated contaminated soil at Landfill 4/Demolition Area 1. Soil was removed until confirmation samples indicated that perchlorate was at concentrations below MTCA Method B soil cleanup levels for protection of groundwater. In the western area of the landfill, excavation was stopped prior to reaching the interim action goals at approximately 27 feet below ground surface as saturated soils were encountered and work could no longer continue safely. An estimated 13,300 cubic yards (cy) of impacted material were removed from the landfill (Tetra Tech. 2006).

2.7.3. RAU 2C Cleanup Actions

RAU 2C is undergoing active investigation. A cleanup action plan will be developed following finalization of the remedial investigation and feasibility study report.

2.7.4. RAU 2C Cleanup Standards

RAU 2C is undergoing active investigation. Cleanup standards will be developed as part of the Cleanup Action Plan process.

2.8. Remedial Action Unit 3 –Site Wide Munitions and Explosives of Concern

RAU 3 consists of the MEC cleanup at the Site (**Figures 9A, 9B, 9C, 9D**). It was established to address the presence of military munitions and related materials remaining from the Site's long history as a training facility. RAU 3 focuses on the identification, removal, and long-term management of MEC and material potentially presenting an explosive hazard (MPPEH).

The RAU-specific Final RI/FS subdivided the MEC concerns across RAU 3 into a series of Remedial Work Areas (RWAs) based on historical land use, terrain, and the likelihood of encountering munitions (BCRRT 2008f). These RWAs provided a framework for planning, implementing, and evaluating cleanup actions across the site.

Cleanup under RAU 3 was then carried out in four major phases, each focused on specific RWAs:

- Phase 1 targeted the Central Valley Floor (CVF) and associated wetlands.
- Phase 2 addressed demolition areas (DA) as well as known firing positions and target areas across the site, including grenade ranges, rocket ranges, and artillery and mortar firing points.
- Phase 3 focused on the Central Impact Target Area (CITA) and the adjacent Northern CITA Expansion.
- Phase 4 covered the Western Slopes Area (WSA), including a pilot study and subsequent surface clearance in accessible portions.

2.8.1. RAU 3 Site Investigations

2.8.1.1. Archives Search Report, Site Inspection, and Supplemental Archives Search Report

A comprehensive Archives Search Report (ASR) was completed by the USACE in 1997. This investigation compiled and reviewed historical records, maps, interviews, and environmental documentation to assess the presence and distribution of ordnance and explosives (OE), suspected chemical warfare materials, and other military-related hazards. As determined by the ASR, training activities included the use of small arms, grenades, mortars, rockets, and artillery.

A site inspection was conducted to validate historical records and identify specific areas of interest for further investigation. Approximately 3,225 acres, including 725 acres leased from the State of Washington, were identified as areas recommended for further action by USACE. These include historical ranges, impact zones, artillery and mortar positions, demolition areas, and the sewage treatment facility (where a rocket had been discovered shortly prior to the ASR). The ASR noted that potential munitions could remain on site ranging from small arms ammunition to 155mm artillery rounds and various training devices. Statistical sampling for UXO was recommended to delineate potentially contaminated areas and guide future remediation efforts. (USACE 1997a, USACE 1997b)

A supplemental ASR was performed in 1999. It focused on evaluating the potential presence and impacts of UXO off-site, particularly in a 20-acre parcel once leased by the Army and later used by Clark County as a rock quarry. Historical research by USACE determined that the fueling station and associated structures on the property were not Army-built and it excluded the parcel from the Defense Environmental Restoration Program (DERP). Interviews with 29 individuals revealed limited first-hand accounts of UXO findings, mainly hand-held munitions like practice grenade rounds, and no confirmed artillery impacts. While some second-hand reports and unauthorized UXO removals were noted, agencies agreed that no off-site actions were necessary unless future clearance along the Site's boundary indicated otherwise. (URS, 1999)

2.8.1.2. MEC Site Characterization

In 1998, UXB International conducted an OE survey at the Site to evaluate the presence and distribution of UXO and OE scrap. The study area was divided into sectors based on historically documented training use, and within each sector, randomly located 100 foot by 100 foot sample grids were established. Non-advanced geophysical classification (AGC) digital geophysical mapping (DGM) surveys using the Geonics EM61 were performed in each grid. The UXO teams completed surface clearance and subsurface investigations (up to 4 feet below ground surface (bgs)) within 207 grids, covering approximately 50 acres, to assess cleanup needs in relation to future land use.

In addition to the survey work, a Time Critical Removal Action was carried out on a 10-acre portion of the explosive ordnance disposal (EOD) demolition range, which is referred to in later site documents as Demolition Area 1 (DA 1), following the postponement of a separate removal planned for the 40mm M203/light anti-tank weapon range. The contractor established 44 survey grids within this area and conducted full surface clearance. Across both tasks, OE sampling and the surface clearance, a total of 24 live UXO items were discovered and safely detonated, with 16 found during the sampling effort (including five outside the sample grids) and eight located within the demolition range. UXB also recovered 212.7 pounds of OE-related scrap during the operation (UXB, 1998).

2.8.1.3. M203 Ranges / Target Area 8 and Target Area 9

In 1998, UXB International conducted an OE Removal Action over an 18.9-acre area that included two former M203, 40mm grenade launcher ranges at the Site. The project was divided into two phases. Phase I involved geophysical mapping and a surface-level assessment without a prior surface clearance, while Phase II included full subsurface removal of ordnance to a planned depth of two feet. However, based on test grid performance, effective detection of 40mm grenades was limited to 1.5 feet. Removal work was performed using metal detectors in a mag-and-dig approach.

Across both phases, UXB located and disposed of Nine UXO items. Six during Phase I and three during Phase II and removed over 31,000 items of OE-related scrap. An additional 1.5-acre surface sweep of a demolition range area was conducted at the request of the USACE, but no UXO was found there. (UXB, 2000)

2.8.1.4. Camp Bonneville, Washington, GIS-Based Historical Time Sequence Analysis

In 2000, USACE Topographic Engineering Center conducted an aerial photograph analysis of the Camp Bonneville area using black and white imagery from 1940 to 1980, historical range maps from 1926 to 1991, and digital photomaps from 1990 and 1998. This analysis identified approximately 677 features, including structures, berms, ground scars, depressions, and cleared areas potentially related to past military activity. Based on their characteristics and historical records, these features were classified as either areas of concern (AOCs), if linked to known training or munitions use, or areas of potential concern (AOPCs), if their function could not be confirmed. (USACE, 2000)

2.8.1.5. Instrument-Aided Field Reconnaissance

Two rounds of field reconnaissance activities were conducted at the Site in 2001 and 2002 to assess potential OE hazards. Over the course of these two efforts, approximately 2,200 acres of the 3,840-acre site were surveyed, and a total of 16,004 data points were collected. The 2001 investigation identified a single piece of UXO - a fired 105mm high-explosive artillery round, in the CITA. Additional findings included 19 pieces of OE scrap and numerous training-related items such as expended flares, smoke grenades, and small arms debris. These discoveries were consistent with known historical training and target activity at the site. One area was elevated from an AOPC to an AOC based on the identification of rocket-related debris, including an intact 2.36-inch practice rocket.

The 2002 effort focused on the proposed regional park land and road/trail corridors across the site. While no UXO was discovered during this phase, 38 items of inert ordnance scrap were recorded, along with over 300 military training and target-related features. All items located within the footprint of the proposed park were inert and reflective of standard training use (Parsons, 2003).

2.8.1.6. Draft Final Remediation Investigation / Feasibility Study for RAU 3

The RAU 3 Draft Final Remedial Investigation and Feasibility Study (RI/FS) was prepared under CERCLA and MTCA to evaluate MEC hazards across the site. The original draft was released for public comment in 2005 (Parsons 2004). This revised draft final version fulfills the requirements of the ESCA and PPCD with BCRRT assuming responsibility for its completion as a condition of early property transfer and deferral of the CERCLA covenant, which warrants that all hazardous substance remedial actions necessary to protect human health and the environment have been completed prior to transfer.

The RI/FS presents a site-specific, qualitative risk assessment developed to estimate the likelihood of explosive hazards from MEC exposure. This approach consisted of two parts. The first evaluated the characteristics of potential MEC sources, including munition types, spatial distribution, and historical training activity. The second assessed the likelihood of human interaction with those sources based on factors such as land use, accessibility, frequency of activity, and the expected depth of future disturbance. Areas such as target areas, and open burn/open demolition areas were determined to pose the greatest potential risk. In contrast, areas such as the Wildlife Management Area and the Western Slopes Area (WSA), where access is limited by steep terrain and/or dense vegetation and where evidence of historical munitions use is minimal, were found to pose negligible explosive safety hazard.

Characterization efforts prioritized known or suspected MEC areas and proposed reuse areas, resulting in the identification of ten Remedial Work Areas (RWAs):

- Target Areas
- Central Impact Target Area (CITA) – Non-Target Areas
- CITA – Target and Road Areas
- Open Burn/Open Demolition Areas
- Firing Points
- Roads and Trails
- High Intensity Reuse Areas
- Accessible Medium Intensity Reuse Areas
- Limited Access Medium Intensity Reuse Areas
- Wildlife Management Area

The RI/FS concluded with cleanup recommendations tailored to each RWA, based on site-specific risk, accessibility, and anticipated land use. These recommendations informed the selection of final remedies in the Cleanup Action Plan (CAP) (BCRRT, 2008f).

2.8.2. RAU 3 Interim and Emergency Actions

Emergency actions and interim actions for RAU 3 were planned and implemented in accordance with sub-section C of Section X (Work to be Performed) of the 2006 Prospective Purchaser Consent Decree (PPCD). Subsection C identified actions associated with RAU 3 for the purpose of investigating and aiding in the cleanup of the Site, and to reduce the threat to human health and safety associated with military munitions and other contamination located within the Site. These actions were developed and carried out under a series of interim and emergency actions and associated addendums between 2006 and 2009, each addressing a distinct portion of the Site. Due to the dynamic nature of field conditions and scheduling during this period, the work associated with these addendums was not executed sequentially. As a result, final reports - specifically for the Central Valley Floor (CVF), Dense Vegetation/Moderate Slope (DVMS), and CITA – were not produced prior to departure of contractors in 2009. These interim actions took place, as substantiated through references in other completed interim action final reports as well as daily production records. Ecology has included these emergency and interim actions in this discussion, as they are part of the Site's remedial history, but due to lack of documentation Ecology cannot state this work was completed to Ecology's satisfaction.

Following the dismissal of BCRRT from the 2006 Consent Decree, the APPCD was filed with the courts which added Clark County as the Defendant to the Decree. At that time, a separate contractor, Bay West, was engaged to complete the final interim action, which focused on the processing and demilitarization of MPPEH collected during the emergency and interim action efforts.

2.8.2.1. Emergency Actions

In 2006 and 2007, emergency actions as defined in the 2006 PPCD, were conducted along both the Site's perimeter and the perimeter of the CITA to enhance safety, improve access for future munitions response activities, and mitigate immediate risks to human health and the environment. Along the Site boundary, a 10-foot-wide corridor was brush cleared on the interior side of the perimeter fence, covering approximately 11.4 miles (BCRRT 2007a). A similar 10-foot-wide corridor was cleared along the exterior side of the CITA boundary, which spans approximately 3.6 miles. This exterior approach to the CITA perimeter differed from the area originally specified in the PPCD but was approved by Ecology to improve public safety and facilitate access for fence repair work. The change from interior to exterior work of the CITA perimeter is reflected in the 2012 APPCD.

Munitions debris (MD) was identified in four adjacent grids located on the northern side of the CITA during this effort. A total of 9.5 pounds of MD were recovered and relocated to the on-site secure storage area. These materials were later addressed during the MPPEH Processing and Demilitarization Interim Action. Surface clearance for MEC was completed throughout all brush-cleared zones along both perimeters. Several designated exclusion grids could not be cleared during the initial effort due to nearby residential development or seasonal flooding; these areas were completed later under follow-up activities.

Additional emergency actions included repair and replacement of damaged perimeter fencing and the installation of new "No Trespassing" signs at 50-foot intervals along the Site and CITA boundaries. In areas within 200 feet of surface water bodies, a Clark County programmatic habitat permit required the use of manual brush clearing methods. These environmentally sensitive practices were implemented to minimize habitat disturbance while ensuring continued progress on site safety objectives. (BCRRT, 2007a; 2007b; 2007c)

2.8.2.2. 2.36" Rocket Range

In 2007 and 2008, interim actions took place at the 2.36-inch Rocket Range, which involved conducting anomaly avoidance prior to vegetation removal to identify potential MEC hazards and to define the lateral extent of contamination associated with the range. Following anomaly avoidance procedures, brush was cleared to the ground surface using a combination of mechanical and manual methods to establish access. Once access was established, surface and subsurface clearance for MEC was performed to a depth of 14 inches below ground surface.

During these actions, 69 MEC items were discovered and removed from the investigation area. In addition, 35 MD items were identified and removed from throughout the range. (BCRRT, 2008a)

2.8.2.3. Roads and Trails

From 2007 to 2009, interim actions for the Roads and Trails area took place, including anomaly avoidance, vegetation removal, and surface MEC clearance within a 20-foot buffer on each side of existing roads and trails, covering approximately 203 acres. The roads and trails themselves were not cleared because, at the time the interim actions were planned, their historical use and continued maintenance, particularly grading and cut-and-fill operations, were considered adequate to address potential surface hazards. Some portions of roads and trails located within 200 feet of adjacent properties along the site's fence line were previously addressed during the 2006 and 2007 emergency actions.

A total of 88 MEC items were identified and documented during this interim action. In addition, 456 MD items were recorded and relocated to the on-site secure storage area for consolidation with other MD findings from interim actions (BCRRT, 2009a).

2.8.2.4. Environmental Study Area (ESA)

The ESA is a 62-acre area located in the southwest corner of the Site and is generally considered part of the Central Valley Floor. Interim actions in the ESA, which occurred in 2007, included anomaly avoidance to identify potential MEC hazards prior to vegetation removal, followed by brush clearance to the ground surface using both mechanical and manual methods. Surface clearance for MEC was then conducted across the area.

During these activities, four MEC items (fired, unfuzed 3-inch Stokes mortars) were identified and demilitarized. A total of 32 MD items were also recorded during the investigation (BCRRT, 2009b).

2.8.2.5. Central Valley Floor

The Central Valley Floor (CVF) is a low-lying area located in the western-central portion of the Site. Interim actions planned for the CVF included 100% vegetation removal and MEC surface clearance, supported by non-advanced geophysical classification (AGC) digital geophysical mapping (DGM) surveys across the area. The primary geophysical tools identified for use were the EM61 system, with Schonstedt magnetometers employed in areas inaccessible to the EM61. Following brush removal and completion of non-AGC DGM, anomaly reacquisition and investigation of selected targets were to occur after quality control checks of the geophysical data. In the northwestern portion of the CVF, brush removal was planned for 25% of the area using transects (BCRRT, 2008b).

No final report was produced for this interim action, and as a result, Ecology is unable to verify whether the work was completed or able to identify a detailed record of the activity. Records from the time indicate field work did take place, as references to this work are found in documentation for other interim actions where final reports were completed (i.e., daily field activity reports).

2.8.2.6. Dense Vegetation / Moderate Slope

This interim action focused on characterizing potential MEC concerns in areas designated as Target Areas 4, 5, and 12. Planned work included the establishment of four north-south and four east-west transects within each area, with 10-foot-wide paths spaced at 500-foot intervals. Brush clearance and anomaly avoidance were to be conducted along these transects, followed by MEC surface clearance using Schonstedt magnetometers. The use of these instruments was necessary due to the steep slopes and rocky outcroppings present in both areas, which made the collection of geophysical data impractical (BCRRT, 2008c).

No final report was produced for this interim action, and as a result, Ecology is unable to verify whether the work was completed or able to identify a detailed record of the activity. Records from the time indicate field work did take place, as references to this work are found in documentation for other interim actions where final reports were completed (i.e., daily field activity reports).

2.8.2.7. Central Impact Target Area

Interim actions planned within the CITA focused on the removal of surface and subsurface hazards associated with former target remnants and range use. Planned work included anomaly avoidance, brush removal, and surface and subsurface clearance along approximately 10-foot-wide work roads used to reach and remove former "hard" targets such as old vehicles and appliances. These access routes covered an estimated 3-acre area within the CITA.

Each identified hard target was also surrounded by a 200-foot by 200-foot grid where brush removal and surface and subsurface MEC clearance were performed. Subsurface clearance was completed to a depth of 12 inches bgs along the access routes and to frost depth (14 inches bgs) within the hard target grids.

Metallic scrap and any MD encountered during these activities were relocated to the on-site MD storage area for later processing as part of the MPPEH Processing and Demilitarization Interim Action (BCRRT, 2009c).

No final report was produced for this interim action, and as a result, Ecology is unable to verify whether the work was completed or able to identify a detailed record of the activity. Records from the time indicate field work did take place, as references to this work are found in documentation for other interim actions where final reports were completed (i.e., daily field activity reports).

2.8.2.8. Material Potentially Presenting an Explosive Hazard (MPPEH) Processing

In 2010, MD, small arms ammunition (SAA), and range-related debris (RRD) were recovered and staged during the various interim and emergency actions across the Site, including activities within the CVF, CITA, and DVMS areas. This material was secured in 55-gallon drums and containers at the former motor pool area in Camp Killpack. The final MPPEH Processing and Demilitarization Interim Action was conducted in 2010 by Bay West under a previously approved Explosives Safety Submission.

Bay West's efforts included visual inspection and classification of all previously recovered MD, inspection and mechanical processing of RRD items staged at the CVF, and segregation and off-site shipment of SAA. A total of 11,436 pounds of MD were documented as Material Documented as Safe (MDAS) and shipped to a certified recycler. An additional 12,320 pounds of RRD were also inspected, verified as free of explosive hazards, and processed for recycling. Approximately 520 pounds of SAA were classified as Material Documented as an Explosive Hazard and sent to a specialized facility for treatment and destruction. Where necessary, explosive venting and mechanical demilitarization methods were used under approved procedures to safely confirm the status of any suspect items.

MPPEH processing confirmed that no explosive hazards remained in the previously staged materials. While the initial segregation and staging efforts by prior contractors were generally effective in recovering material from across the Site, the commingling of live and expended SAA, incomplete documentation, and mixed condition of MD were not in line with industry best practices or regulatory standards and presented potential safety concerns. As a result, Bay West conducted additional verification and processing to ensure all material was managed safely and disposed of in compliance with applicable requirements. This effort completed the final disposition of all MPPEH recovered during prior emergency and interim actions (Bay West, 2011).

2.8.3. RAU 3 Cleanup Actions

In accordance with Section X of the APPCD, cleanup activities for RAU 3 are organized into phases to address the Site systematically. While specific phases are identified in the APPCD, the sequence of their execution is not fixed. As noted in the APPCD, "the parties recognize that order of future phases may change," (Ecology 2012a) this allows for flexibility in response to site conditions, access limitations, or technical considerations. The following sections summarize the phased approach to remediation conducted to date within RAU 3.

2.8.3.1. RAU 3 Cleanup Action Plan and Cleanup Action Plan Amendments

A Draft Final RAU 3 RI/FS was completed in 2008 to evaluate MEC contamination across Camp Bonneville. Subsequent Emergency and Interim Actions revealed additional areas of concern that were not fully characterized in the RI/FS. A Supplemental RI/FS, completed in 2009, incorporated these findings, updated the conceptual site model, and applied the same remedy evaluation framework to newly identified or expanded areas. The Supplemental RI/FS was integrated into the CAP.

The 2010 CAP identified cleanup goals and selected remedial actions across multiple RWAs. Selected actions included:

- Subsurface clearance of the CVF and associated wetlands to a depth of 14 inches
- Surface clearance of target areas, firing positions, roads and trails
- Subsurface clearance within 200 by 200 feet around 15 hard target points
- Surface clearance of the western slopes area with a slope of 25 degrees or less

In August 2017, the CAP was amended to modify the cleanup approach for the Targets within the Central Impact Target Area (CITA). Rather than performing a 200 by 200-foot subsurface clearance around each of the 15 hard targets, the amendment expanded cleanup to include vegetation removal and a surface MEC clearance over a 100-120 acre polygon encompassing the hard targets and surrounding areas. Additional institutional controls were added, including annual surface MEC inspections and inspections after heavy storms. (Ecology, 2017a)

In November 2018, the CAP was amended for cleanup of the of the Western Slopes Area. This amendment changed the cleanup from vegetation removal and surface MEC clearance of all areas with a slope of 25 degrees or less (approximately 425 acres of the 609 acres) to vegetation removal and surface MEC clearance of all areas with a slope of 14 degrees or less (approximately 195 acres) (Ecology, 2018).

These amendments were approved following associated public comment periods and formal responses issued by Ecology. (Ecology, 2017b; 2019a)

2.8.3.2. Phase 1: Central Valley Floor and Associated Wetlands

From 2012 to 2018, Weston Solutions, Inc. (Weston) conducted Phase 1 of the RAU 3 cleanup at the Site. This phase targeted 449 acres across the CVF and associated wetlands, with efforts focused on removing MEC, MPPEH, MD, small arms, and other metallic debris to a depth of 14 inches. Two 100-foot grids and a partial grid were not cleared due to steep, inaccessible terrain with slopes over 25 percent. In addition, eleven 100-foot grids were not cleared because the area is the FBI training range, inside and outside the CVFAW. Initial efforts involved surface sweeps and vegetation clearing, followed by anomaly excavation using non-AGC DGM. However, due to dense metallic clutter and background interference, analog detection methods were more widely applied. In areas where the density of subsurface metal and soil conditions precluded the effective use of handheld techniques, mechanized soil excavation and sifting methods were employed.

Mechanized efforts began with analog detection and removal of larger munitions items (e.g., 57-mm projectiles and 2.75-inch rockets) to reduce the risk of blast overpressure during soil handling. Excavators were then used to remove soil, which was processed through a vibratory screen assembly fitted with 2-inch and ½-inch screens to capture all items ½ inch or larger. Magnets placed along feed and discharge conveyors aided in segregating ferrous materials, improving the efficiency of soil inspection.

The CVF and associated wetlands was divided into 2,241 grids, with the majority cleared using analog “mag and dig” methods. A total of 118 100-foot grids were cleared using the mechanized technique. Across the site, 515 MEC and MPPEH items were recovered, including various projectiles, rockets, grenades, and bulk explosives. All recovered items were destroyed on site, and remaining materials were classified as MDAS or non-munitions scrap and disposed of accordingly (Weston, 2018b).

2.8.3.3. Phase 2: Demolition Areas (DA) 1 and 2, Range Target Areas, Firing Positions, and Roads/Trails Step-out Areas

Weston completed Phase 2 cleanup across multiple areas outside the CFVAW, in accordance with the RAU 3 CAP. These cleanup efforts took place from 2015 through 2019, and targeted DA 1 and 2, three range target areas (hand grenade, rifle grenade, and 3.5" rocket ranges), artillery and mortar firing positions, two firing points, and the associated step-out areas identified during the roads and trails interim action. Surface clearance (0–3 inches below ground surface)

was performed at DA 1 and 2, all range target areas, and the roads/trails step-out zones. Subsurface clearance (0–14 inches) was conducted at the firing positions and points.

Munitions removal was performed using analog methods following surface sweeps and vegetation removal. The areas were divided into 100-foot grids for anomaly investigation. Artillery Positions 1, 2, 3, 4, and 7 and Mortar Positions 1, 2, 5, and 6 were cleared along with the Rifle Grenade and 3.5" Rocket Range Firing Points. A total of 86 MEC and MPPEH items were recovered, primarily from DA 1, the 3.5" Rocket Range Target Area and Firing Point, and Mortar Position 5. Step-out surface clearance was required and completed at portions of DA 1, the 3.5" Rocket Range Target Area, and along various roads and trails due to the presence of MEC, MPPEH, or significant MDAS. All recovered hazardous items were destroyed on site, and MDAS and non-munitions scrap were inspected and prepared for off-site demilitarization or recycling (Weston, 2020a).

2.8.3.4. Phase 3: CITA and Northern CITA Expansion

During 2018 and 2019, Weston conducted Phase 3 of the munitions clearance within the CITA and Northern CITA Expansion at the Site. The CITA covers approximately 465 acres and includes 15 identified target areas and previous MEC discovery locations. Surface clearance (0 inches bgs) was performed across a 100-acre polygon encompassing these target areas, while subsurface clearance (to 14 inches bgs) was conducted along 6,800 linear feet of the internal road alignment. A total of 467 grids were cleared in the CITA polygon using analog methods. Clearance resulted in the recovery of 87 MEC/MPPEH items including artillery projectiles, mortars, grenades, and pyrotechnics.

Some step-out clearance was required in the CITA based on recovery of MEC/MPPEH or significant MD/MDAS in boundary subgrids. A total of 94 additional grids (17 acres) were cleared to surface depth using step-out criteria, resulting in the recovery of 9 additional MEC/MPPEH items. All hazardous items were either destroyed in place or consolidated and destroyed on site.

At the Northern CITA Expansion, a 9,050-foot perimeter road was emplaced along the northern boundary, including two bridges and a 5-strand barbed-wire fence with warning signage installed along the boundary. The associated easement was surface and subsurface cleared to a depth of 14 inches bgs to support construction. One MPPEH item - an unfuzed artillery projectile - was recovered during initial vegetation removal and was destroyed on site and reclassified as MEC. No additional MEC or MPPEH items were recovered during or after road construction (Weston, 2021).

2.8.3.5. Phase 4: Western Slopes Area (WSA) and Pilot Study

2.8.3.5.1 Western Slopes Area Pilot Study

In 2016 and 2017, as a preliminary step under Phase 4 of the RAU 3 munitions response, Weston conducted a Pilot Study within the WSA at the Site. This effort focused on 17 acres of accessible terrain adjacent to the western edge of the CVF. The Pilot Study area was divided into 74 uniquely identified grids, where surface clearance was performed to a depth of 3 inches below ground surface using analog techniques. Prior to clearance, low vegetation and deadfall were removed to reduce signal interference. All detected anomalies were investigated and cleared in real time as the UXO teams advanced across the area.

A total of one MEC item was recovered and properly destroyed. Other recovered materials were inspected and classified as MDAS or non-munitions scrap, with all items properly managed and disposed. The Pilot Study was used to inform future clearance decisions for the broader WSA by evaluating terrain accessibility, clearance feasibility, and anomaly density in representative terrain conditions (Weston, 2018a).

2.8.3.5.2. Western Slopes Area

Following the Pilot Study, in 2019 and 2020, Weston conducted a full surface clearance of MEC and MPPEH within approximately 194 accessible acres of the 600-acre WSA. The WSA, characterized by steep terrain and dense vegetation, had limited historical use, primarily for non-live fire military training involving blanks and pyrotechnics. However, previous transects had yielded two Stokes mortars, prompting broader clearance. The 194-acre accessible area was divided into 500-foot by 500-foot major grids and further into 1,167 subgrids of approximately 100 by 100 feet.

Vegetation removal preceded surface clearance operations. During the full WSA clearance, 24 MEC and MPPEH items were recovered, including high explosive anti-tank rockets, mortars, rifle grenades, artillery projectiles, grenade fuzes, and various signaling devices. Of these, 7 items were confirmed as MEC and 17 were reclassified as MDAS after inspection or post-detonation analysis. All explosive items were either detonated in place or consolidated and disposed of at the CITA. The final clearance affirmed that while the WSA had limited prior live-fire use, isolated MEC items were present, and surface clearance was necessary to reduce explosive risk within accessible terrain (Weston, 2020b).

2.8.4. RAU 3 Cleanup Standards

As stated in the RI/FS and CAP, there is no universal cleanup standard for MEC. At this Site, a cleanup level for MEC was developed, under MTCA, based on site-specific conditions and the anticipated future reuse of the Site. The cleanup standards were established to ensure a very low level of risk to human receptors (i.e., park users, County and park personnel, construction personnel, and cleanup action personnel) as well as ecological receptors during and after the cleanup action implementation.

The cleanup standard for RAU 3 was defined as the condition where the likelihood of interaction between MEC and human or ecological receptor is negligible. This standard was applied in conjunction with a defined point of compliance for each remedial work area, identifying the specific areas and depths that required remediation to meet cleanup objectives.

2.9. Groundwater Monitoring

Groundwater has been sampled at multiple wells on the site since 1998. Long-term Groundwater monitoring is required by the APPCD and conducted as part of the ongoing RAU 2C Cleanup activities. Groundwater monitoring is currently conducted quarterly for the RAU 2C monitoring well network, three water supply wells, and the base boundary well network (**Figure 8**). On an annual basis surface waters at Lacamas Creek and its tributary North Fork Lacamas Creek are sampled. Surface water samples have been collected annually since 2013.

Starting in 2024, the monitoring program has been expanded to address data gaps identified in the monitoring network identified during the RI/FS. A data gap in this context does not indicate a new concern or danger, but a place where additional data can provide relevant information to support the decision-making process. Quarterly monitoring now includes observation and sampling of groundwater seeps along the North Fork Lacamas Creek. Thus far, no seeps have been observed. Annual monitoring now includes two additional surface water samples taken on North Fork Lacamas Creek to collect data cross gradient and upgradient from the RAU 2C plume.

Groundwater monitoring reports are available on Ecology's webpage for the RAU 2C Cleanup[11]. In general, groundwater contamination from perchlorates and explosive compounds are present above screening levels in the vicinity of Landfill 4/Demolition area 1. This contamination has been generally stable and trend analysis for chemicals of concern is conducted quarterly. Wells at Landfill 4/Demolition Area 1 show increasing, decreasing, or no trends in contamination concentrations depending on location. The wells with increasing trends are in or near areas where residual contamination in the soil is known or suspected to exist following the 2004 removal action.

[11] https://apps.ecology.wa.gov/cleanupsearch/site/11670#site-documents

Perchlorate has been consistently detected at low concentrations (i.e. below screening levels) in the downgradient well (L4-MW07B) closest to Landfill 4/Demolition area 1. The other downgradient wells for RAU 2C (L4-MW17 and L4-MW18) have not had detections above laboratory reporting limits of perchlorate or other explosives since 2010.

Surface waters have been sampled since 2013 following detections of perchlorate below screening levels during the EPAs Expanded Site Inspection in 2011 (Ecology and Environment 2012). No chemicals of potential concern have been detected in surface waters since sampling began.

The base boundary wells generally have not had detections of chemicals of potential concern above laboratory reporting limits. Reviewing the data collected from Base Boundary wells from 2003 to third quarter 2024, there have been sporadic detections of chemicals of potential concern above laboratory reporting but well below screening levels. The results of four quarterly sampling events over that time period had detections in one or two wells. The last instance where chemicals of potential concerns were detected was in February 2019, the explosive compounds HMX and RDX were detected in well LC-MW02D while RDX in well LC-MW04D.

Site hydrology and hydrogeology related to the groundwater contamination at RAU 2C will be extensively discussed as part of the upcoming RI/FS.

2.10. Environmental and Restrictive Covenants

Ecology determined that institutional controls would be required as part of the cleanup action to document the remaining contamination, protect the cleanup actions, and ensure protection of human health and the environment. The Quitclaim deed for the property, recorded on October 4, 2006 between DoD and Clark County included environmental protection provisions which apply throughout the Site. BCRRT LLC and Clark County signed a restrictive covenant for RAU 1 on November 21, 2006 **(Appendix C)**. The restrictions under these two documents include:

- A prohibition on residential use of the property.
- A prohibition on public access of the property until all remedial actions are complete.
- Construction and maintenance of a fence along the perimeter of the property.
- Requirements to maintain fencing and signage, as appropriate, to restrict access and inform of potential hazards.
- A prohibition on the development of groundwater resources underlying Demolition Area 1 and Landfill 4 (RAU 2C).
- Groundwater resources outside of RAU 2C may not be developed without prior written approval from Ecology and the US Army.
- Existing groundwater resources (e.g. base wells) may be used for non-potable purposes. Use of existing groundwater resources for potable usage (i.e., drinking water) requires both determination that water is suitable for potable use and written approval from Ecology and the US Army.
- Restrictions on ground disturbing activities. No excavation or land disturbance can occur without UXO qualified personnel and prior approval.
- Requirements to protect archaeological and cultural resources, including mandatory consultation with the State Historic Preservation Officer and the Cowlitz Indian Tribe before ground disturbance in sensitive areas.
- Obligations to manage and notify others about the potential presence of MEC and to stop work and notify authorities if MEC is encountered.
- Responsibilities for asbestos and lead-based paint management, including requirements for safe use and abatement of affected buildings and materials.
- Provisions requiring that all environmental restrictions be carried forward in any future deeds, leases, easements, or other property transfers.
- A requirement that signage be installed at Building T-1932 and at Building 4475 identifying the environmental contamination associated with the building, in the event the buildings are demolished that additional soil sampling shall be performed, and that in the event such soil sampling reveals a need for further remediation that such remediation will be undertaken.

3. Periodic Review

3.1. Current and Projected Site and Resource Uses

To conduct the periodic review the effectiveness of the cleanup needs to be evaluated against the current site use and the projected use of the site. Projected use is how the site activities and site resources will be managed in the future; in this document the term future use will be used interchangeably.

3.1.1. Current Site Use

The Site is currently being operated and maintained by Clark County Public Works. County staff and their contractors, the Department of Natural Resources (DNR) Helicopter tactical team (Helitack), and various law enforcement agencies use portions of the property. Clark County Public work staff and contractors maintain the roads, trails, and future park area along with institutional controls (e.g. fence maintenance).

3.1.1.1. Law Enforcement Activities

The FBI, after receiving a permit from the Army in 1991, constructed a training facility and small arms range in 1995 referred to as the FBI range. The Clark County Sheriff's Office (CCSO) and the FBI both maintain a presence at this facility. Various law enforcement agencies have used this facility for training, including the Metro Explosive Disposal Unit (MEDU).

The majority of Law Enforcement activity occurs at the FBI Range though training has also occurred at the Bonneville cantonment, and along roads and trails for the property. As of May 2025, all use agreements for law enforcement training were being negotiated between Clark County Public Works and respective law enforcement agencies for continue use of the Site.

The Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) stated that the ATF shares the former Ammunition Storage Magazines with the CCSO for storage of blasting caps, explosives and evidence as needed. The ATF states each magazine contains "a small amount of net explosive weight" and the ATF only uses the site magazines for storage and does not use any explosives on the Site.

The FBI stated in a questionnaire, that the FBI conducts Quarterly Firearms Training for it's Law Enforcement Officials and monthly training for it's Special Weapons And Tactics (SWAT) Operators. Quarterly Firearms Training is four sessions per quarter and involve pistol and rifle qualifications and marksmanship skill building. It also involves Medical Training and search/arrest procedures. SWAT trains four times per month and conducts firearms drills and close quarter clearing/arrest techniques. The FBI stated they conduct activities outside of the FBI range and Bonneville cantonment for group runs and practicing vehicle stop procedures approximately twice a year.

The MEDU stated in a questionnaire, that they used the FBI range for practice with robots and other Bomb Squad trainings about 4 – 5 days a year. MEDU states that energetic training (e.g. firearms or detonations of explosive) were restricted to the FBI Range. MEDU stated that in the past other areas of the site were used for non-energetic training such as driving robots, but this activity has not occurred for quite some time. Ecology has confirmed that MEDU has as part of training activities detonated simulator devices at the FBI Range in August 2022 and January 2025, without notice to Clark County Public Works. Ecology understands that this training activity is currently prohibited.

The CCSO stated in questionnaires and in emails that they use the FBI Range, roads and trails, and Bonneville cantonment area including nearby wooded areas for training. Roads and trails have been used for All-Terrain Vehicle training. The FBI range is used at least twice a month for open range days, reserved for up to 14 days a year, and occasionally used for citizens academy and new hire firearms orientations. Outside of the FBI range, the Bonneville cantonment is used for close quarters training, and both SWAT and K-9-unit training have occurred in the wooded areas nearby. The CCSO has confirmed use of CS gas and smoke grenades in training at the Site. CCSO statements indicate that recent CS gas deployment has been limited to use at the FBI range, while smoke grenades have been used at the Bonneville cantonment.

There is an incomplete record of law enforcement activities at the Site. No documentation has been presented to Ecology that small arms have been used outside the FBI Range. The following trainings are known to have occurred:

- An explosives course led by the MEDU was conducted in 2012.
    - Gregory Johnson, a Project Manager for Clark County with UXO expertise who attended and assisted with the training described it as placement of approximately five abandoned vehicles throughout the valley floor for the training. After the training the vehicles were removed from the site and the areas that were utilized were cleaned up. Training used Disruptors which are water filled containers with a small amount of charge to disrupt a simulated Improvised Explosive Device's circuitry. No more than a quarter pound of explosive was allowed to be used at a time and the spots were chosen specifically as the areas were going to be remediated as part of the RAU 3 cleanup of the central valley floor.
- Gregory Johnson stated that CCSO SWAT team used Landfill 4 Demo Area 1 (RAU 2C) for training involving firing CS gas 39mm cartridges for training in the years 2010-2015. These trainings occurred once or twice and involved firing four to five rounds. The area was inspected by Gregory Johnson, and he confirmed all spent cartridges were cleaned up.
- In 2019 a CCSO email discussed the use of Landfill 4/Demo Area 1 (RAU 2C) for CS gas deployment in May or June of 2019. Ecology was unable to verify if this training took place but assumed it occurred.

3.1.1.2. DNR Helitack Operations

Clark County Public Works has an interlocal, short-term lease agreement with DNR, which establishes a forward operating base for helicopter operations. DNR's helicopter operations at Camp Bonneville assist in its efforts to mitigate and improve response times for wildfires in the area. DNR has been using Camp Bonneville to conduct these operations since 2019 (CCPW, 2022). The agreement includes adequate space for a helicopter, fuel truck, and Building T-1980 to house crew members, and limits WDNR's access to Camp Bonneville to only the barracks, parking area, and airfield near the main camp entrance.

3.1.1.3. Forestry

Logging activities at the Site are currently on hold pending the implementation of required institutional controls related to those activities. Logging to promote forest health has periodically been completed at the Site (**Table 3-1**).

Clark County Public Works has stated logging is completed by outside contractors and consists of thinning from below and removing smaller trees. Logging is only completed in areas outside of the CITA or critical areas (wetlands, etc.), ground disturbance protocols were communicated in the contract documents, and logging contractors receive MEC awareness training. Logging is completed under permit from DNR and DNR notifies Ecology of logging activities. All activities were related to thinning, hazard removal and replanting to promote forest health. Ecology has not been provided or identified records which verify this information.

3.1.2. Future Site Use

The planned future use of the Site is a regional park with the eastern third of the property used for recreation and remaining two thirds of the property set aside for conservation with public access to roads and trails. For the evaluation in the Periodic Review, Ecology is using the 2005 Camp Bonneville Reuse Plan (2005 Reuse Plan), as it is currently the document of record for future use activities (OTAK, 2005).

The 2005 Reuse Plan identifies the following activities and uses (**Figure 11**):

- Recreation trails for hiking, mountain biking, and equestrian use
- Group Picnic areas and shelters
- An amphitheater and stage
- A meadow area for group picnics and recreational sports activities
- Restroom facilities
- Tent camping facilities
- Recreation vehicle camping facilities
- Public Firing Ranges
- Archery Practices Rangers
- Park Watch persons residences
- Vehicle Access Roads
- Ponds for recreational use and environmental education
- Native American Cultural Center at the Bonneville cantonment Area
- Environmental Study Area
- Orienteering
- Law Enforcement Training Center
- Rustic Retreat Center/Outdoor School
- Clark College Environmental Field Station
- Timber Resource Management Area
- Wetland/Riparian Area Restoration/Enhancement & Habitat Restoration

Several of these activities require new infrastructure or have the potential to disturb the ground below depths of clearance or occur in areas that were not cleared as part of the RAU 3 Cleanup Actions. For example, a proposed logging camp partially overlaps with the CITA exclusion zone and an expansion zone for the retreat center/outdoor school is in a section of the Western Slope Area which has not had clearance. Restrictive Covenants are in place to prevent or manage ground disturbing activities, but it may be necessary to add additional

restrictions. Based on the 2005 Reuse Plan, the cleanup actions undertaken are not protective of the Projected Use.

It is important to acknowledge, at the time of this Periodic Review the 2005 Reuse Plan is almost two decades old and was developed prior to substantial portions of the cleanup being completed. As cleanup has progressed at the Site, the cleanup team has agreed that changes from the 2005 Reuse Plan are needed. The RAU 3 CAP included changes such as moving the proposed Logging Camp off Site and restricting activities to hiking along roads and trails in the Western Slope Area (Ecology 2010b, Ecology 2018, Ecology 2019a). These proposed changes to the park plan still need to be incorporated into the proper document of record. Changes could be formalized by revising the existing Reuse Plan or incorporated with changes in the future Master Park Plan for the site to be developed by Clark County Public Works.

3.2. Institutional Controls

Institutional controls are defined in MTCA as a measure undertaken to limit or prohibit activities that may interfere with the integrity of an interim action or a cleanup action or result in exposure to hazardous substances at the site (WAC 173-340-200, -440). Institutional Controls are a type of remedial action. Under MTCA institutional controls can include physical measures such as fences, use restrictions such as limitations on the use of a property, or specific requirements for future actions such as ongoing maintenance or sampling if existing structures or pavement are disturbed or removed (WAC 173-340-440).

The APPCD and RAU specific CAPs identified institutional controls are required for the Site and additional institutional controls may need to be developed following cleanup actions (**Table 3-2**) (URS 2004, Ecology 2010b, Ecology 2012, Ecology 2017). Institutional Controls in the form of a Restrictive Covenant and Environmental Protection Provisions of the quitclaim deed were implemented at the Site in October 2006. These remain active and discoverable through the Clark County Auditor's Office. Ecology found no evidence that a new instrument has been recorded, which is in contravention of the APPCD's requirements and that limits the effectiveness or applicability of the Covenant or environmental protection provisions.

Implementation of the institutional controls for the Site is to be documented in a Long-Term Operations and Maintenance Plan (Long-Term O&M Plan). The Long-Term O&M Plan is a requirement of the APPCD and Cleanup Action Plans that should include all actions that are necessary to ensure the long-term effectiveness of the cleanup completed at each RAU (URS 2004, Ecology 2010b, Ecology 2012, Ecology 2017). The RAU 3 CAP additionally identifies that a formal Institutional Control Manual will be developed. This manual is also referenced as a "Institutional Controls Plan" (Ecology 2010b). The stated purpose of the Institutional Control Manual is to document the institutional control requirements and obligations at the Site.

Multiple institutional controls are in place or partially in place and being maintained for the protectiveness of the current site uses, however, the Clark County Public Works is out of compliance for implementing multiple institutional controls required for the projected Site use (**Table 3-2**). At the time of this Periodic Review, the Long-Term O&M Plan and the Formal Institutional Control Manual have not been prepared for the Site. Clark County Public Works is in the process of developing these documents. Additionally, Ecology through the course of its Periodic Review has identified the need for additional Restrictive Covenants following the RAU 2A and RAU 3 Cleanups Actions (see Section 4).

3.3. New scientific information for the individual hazardous substances or mixtures present at the Site

3.3.1. Per- and polyfluoroalkyl substances – Preliminary Assessment and Site Investigation (Leidos 2023)

In 2023, the Army conducted a Preliminary Assessment and follow up Site Investigation to determine if PFAs are present at the Site (Leidos 2023a, Leidos 2023b). This work was conducted without input and guidance from Ecology as it was part of a larger nationwide contract managed by USACE. With Ecology's input, the Army is planning a Supplemental Site Investigation to further characterize PFAS at the Site. This work is scheduled to take place later in 2025 and will include at Ecology's request sampling of select monitoring wells at RAU 2C and the base boundary.

A preliminary assessment is an initial collection and review of existing information that evaluates if there are potential threats to human health and the environment and whether further investigation is needed. Based on this review the Army concluded that further investigation for PFAS release was needed at Building 1864, Building 4483, and Wash Racks 1 and 2. To summarize:

- Building 1864 was used as a fire house then later as the Pesticide Storage Building based on the time of operation use of PFAs containing Aqueous Film-Forming Foam (AFFF) firefighting foams could have taken place.
- Building 4483 was a fire station in the Killpack cantonment which operated from the late 1980s to 2007. AFFF was documented as being historically stored on the fire truck inside the station. No AFFF use or firefighting training activities were documented as taking place at the Site.
- Wash Racks 1 and 2 are in the vicinity of Building 4483 at the Killpack cantonment and may have been used to wash the fire truck. Fire truck washing could have resulted in the release of PFAs compounds.

A site investigation is a focused investigation to determine whether a release of contaminates to the environment has occurred. In June 2023 field work was carried out at Building 1864, Building 4483, and Washracks 1 and 2 that involved the collection of soil, groundwater, surface water, and sediment samples. PFAs were detected above laboratory detection limits at all three locations. At the time of the investigation these detections were below Washington's 2021 State Action Levels and federal screening levels, and no further action was recommended.

Based on the EPA's final Maximum Contaminant Levels (MCL) for PFAS, one groundwater sample at Building 1864 exceeded the MCL for PFOA, 4.0 nanograms per liter (ng/L), with a detected value of 4.4 ng/L. Additionally, the analytical methods use had several detection limits that were over new screening levels. Due to the detections of PFAS, along with improvements in analytical methods, a Supplemental Site Investigation has been recommended to collect additional groundwater, surface, sediment, and soil samples from the study areas. The Supplemental Site investigation will also collect groundwater samples from the existing monitoring well network at RAU 2C and the Base Boundary wells. This work is scheduled to take place in late summer 2025.

3.3.2. Vapor Intrusion

Since the investigations of RAU 1, vapor intrusion has been identified as an exposure pathway for volatile compounds such as fuels and solvents. Vapor Intrusion describes the process where volatile compounds in soils and groundwater can result in the formation of chemical vapors which can migrate through soil to indoor air. When it occurs, there is the potential for humans to be exposed if occupied buildings are in the vicinity of the contamination, or if buildings are constructed in the area in the future. Soils below Buildings 4475 and T-1932 at RAU 1 have contamination in place, or suspected contamination, that could pose a vapor intrusion risk. These buildings are currently unoccupied and require a vapor intrusion evaluation prior to occupancy. If the buildings are demolished in the future prior to occupancy, then a vapor intrusion assessment would not be necessary. See Section 4.14 for recommendations specific to this risk.

3.4. New applicable state and federal laws for hazardous substances present at the Site

3.4.1. Per- and polyfluoroalkyl substances

At the time of initial site investigations and cleanup actions PFAS had not yet been identified as a potential contamination of concern. PFAS have since been determined to be hazardous substances requiring regulation. Guidance documents and cleanup levels are being updated as regulation of these chemicals has changed significantly over the past several years.

PFAS are a wide class of chemicals which have been produced on a commercial scale since the 1950s, and production continues today. The unique physical and chemical properties of PFAS impart oil, water, stain, and soil repellency, chemical and temperature resistance, friction reduction, and surfactant properties to a wide range of products. (Glüge et al 2020). PFAs at the Site have been detected and those investigations are discussed in Section 3.3.1.

In October 2021, Ecology concluded PFAS compounds are a Dangerous Waste and meet the definition of a hazardous substance under MTCA. Designation of PFAS as hazardous substances make them subject to cleanup under Ecology's MTCA rules. In April 2024, EPA finalized a rule to designate two widely used PFAS, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), as hazardous substances under CERCLA. The EPA also issued the national drinking water standards to protect communities from exposure to PFAS. EPA established Maximum Contaminant Level (MCLs), for six PFAS in drinking water: PFOA, PFOS, perfluorohexane sulfonate (PFHxS), perfluorononanoic acid (PFNA), and hexafluoropropylene oxide dimer acid (HFPO-DA) as contaminants with individual MCLs. EPA also established MCLs for PFAS mixtures containing at least two or more PFHxS, PFNA, HFPO-DA, and perfluorobutane sulfonate (PFBS) using a Hazard Index MCL to account for the combined and co-occurring levels of these PFAS in drinking water. EPA also finalized health-based Maximum Contaminant Level goals for these PFAS.

On June 17, 2025, the Washington State Department of Health adopted final rule revisions for PFAS to chapter 246-290 WAC (Group A Public Water Supplies) and chapter 246-390 WAC (Drinking Water Laboratory Certification and Data Reporting). The adopted rule changes align sections within these chapters with the EPAs changes to the National Primary Drinking Water Regulations. The amendments to chapters 246-290 and 246-390 WAC incorporate by reference the requirements for monitoring, reporting, public notification, treatment, and violations, as well as incorporate the federal PFAS Maximum Contaminant Levels (MCLs) into the appropriate contaminant tables in rule.

3.4.2. Healthy Environment for All Act

The Healthy Environment for All Act (also known as the HEAL Act) was enacted in 2021 to create a coordinated and collaborative approach to Environmental Justice, making it a priority and part of the mission of key state agencies. The HEAL ACT, codified at RCW 70A.02[12] requires state actions, such as cleanup actions, to consider possible impacts to vulnerable populations and overburdened communities, as required under WAC 173-340-350(6)(h)(iii).

Ecology had issued Implementation Memo No. 25, Identifying Likely Vulnerable Populations and Overburdened Communities under the Cleanup Regulations compliance with the HEAL Act (Ecology 2024). Implementation Memo No. 25 established that a potentially exposed population is considered a likely vulnerable population or overburdened community if it met any of the following three criteria:

1. The potentially exposed population is located in a census tract that ranks a 9 or 10 on the index from the Washington State Department of Health's Environmental Health Disparities Map;

2. The potentially exposed population is located in a census tract that is at or above the 80th Washington state percentile of the Demographic Index from the U.S. Environmental Protection Agency's EJScreen; or

3. The potentially exposed population is located in a census tract that is at or above the 80th Washington state percentile of the Supplemental Demographic Index from the U.S. Environmental Protection Agency's EJScreen.

The US EPA's environmental justice mapping and screening tool, "EJ Screen" and other environmental justice resources were taken offline in February 2025 and are no longer available for use. Ecology is developing new guidance and staff have been directed to use only Criteria 1 for new demographic assessments. Based on Criteria 1, the potentially exposed population is not considered a likely vulnerable population or overburdened community (Appendix D). This information will be used in the site hazard assessment and ranking.

Updated guidance is being developed, and Ecology will reevaluate the Site for the HEAL Act accordingly.

[12] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.02&full=true#70A.02.100

3.4.3. Site Hazard Assessment and Ranking Process

Ecology is required to assess contamination sites, WAC 173-340-320. On January 1, 2024, Ecology developed a new assessment method called the Site Hazard Assessment and Ranking Process (SHARP). Ecology has completed a SHARP assessment for the site (Appendix E). The SHARP assessment rated the site as Low. Please note that Ecology SHARP's assessment is for chemicals of potential concern and currently does not address MEC in the assessment process. The Site likely will be reassessed as cleanup progresses.

3.5. Availability and practicability of more permanent remedies

3.5.1. RAU 1

The remedy implemented included containing hazardous substances, and it continues to be protective of human health and the environment. While more permanent remedies may be available, they are still not practicable at this Site.

3.5.2. RAU 2A

The remedy implemented included containing hazardous substances, and it continues to be protective of human health and the environment. While more permanent remedies may be available, they are still not practicable at this Site.

3.5.3. RAU 3

The remedy implemented included the physical removal of MEC in accessible areas and relies on institutional controls to manage risk in areas where a full clearance was not practicable due to terrain, vegetation, or other limitations. While more permanent remedies may be available, they are still not practicable at this Site.

3.6. Availability of improved analytical techniques to evaluate compliance with cleanup levels

3.6.1. RAU 1, RAU 2A, and RAU 2B

Analytical techniques, or the concentration at which specific chemicals can be detected, at the time of cleanup decisions for RAU 1, RAU 2A, and RAU 2B were capable of detecting contaminants of potential concern below the MTCA cleanup levels or screening levels. Improvements in Laboratory methods to detect contaminants of potential concern at lower concentrations would not have affected the evaluations, decisions, or recommendations made for these RAUs.

3.6.2. RAU 3 Advanced Geophysical Classification (AGC)

For the purposes of this section, “improved analytical techniques” refers to advancements in the methods used to detect, evaluate, and differentiate subsurface anomalies – specifically for UXO - since the time of the original site activities.

In the early phases of cleanup, particularly during Phase 1, digital geophysical mapping (DGM) was employed to survey portions of the Site with a Geonics EM61. Due to site-specific limitations, such as dense subsurface clutter and high anomaly saturation, DGM was eventually abandoned in favor of analog (handheld) detection methods. In this case, dense subsurface clutter referred to a high concentration of small metallic debris, including nails, expended small arms ammunition, and other materials, that interfered with the DGM system’s ability to differentiate hazardous items from background noise. Despite multiple adjustments to the target selection process, quality assurance and quality control inspections showed that small items potentially presenting an explosive hazard were not consistently being identified. As a result, the efficiency and accuracy benefits typically associated with DGM were lost, prompting the transition to analog detection.

For clarity and consistency with current terminology, the DGM approach used at that time will be referred to here as non-AGC DGM.

Since those initial efforts, AGC has emerged as an alternative geophysical tool. AGC combines advanced electromagnetic sensors, physics-based modeling, and classification algorithms to estimate intrinsic properties of buried metallic objects - such as size, symmetry, aspect ratio, and material composition. The primary intent of AGC is to reduce false positives by distinguishing between munitions-related items (targets of interest) and non-hazardous subsurface debris (non-targets of interest). AGC is conducted in-situ and allows for real-time or near-real-time decision-making in the field. (IDQTF 2016)

AGC is not a required or universally applicable method and has not been implemented at this Site. While early iterations of AGC technology existed, it was not operationally available, financially viable, nor supported by a formal accreditation process at the time when the decision was made to transition from non-AGC DGM to analog detection methods. Additionally, certain areas of the Site may present ongoing challenges - such as continued high anomaly density below established clearance depths, complex terrain, or limited accessibility - that could preclude the effective use of AGC. If future work is planned where AGC makes sense for a specific area and scope, Ecology and the County can consider it at that time.

3.7. Effectiveness of completed cleanup actions

The following is a review of the effectiveness of the completed and ongoing cleanup actions at the site.

3.7.1. RAU 1 Effectiveness

Cleanup of RAU 1 was intended to be protective of human health and the environment by removing contaminated soils and materials. Following remedial investigations, Ecology determined that 11 of the 20 areas did not have contamination exceeding cleanup screening levels at the time of decision. One location, Landfill 1, was determined to have been misattributed as a base landfill and may have been debris from a historic homestead (Shannon and Wilson 1999a). For the remaining sites with exceedances of screening levels removal of soil and debris occurred to permanently reduce human and ecological exposure to the contamination. Following removal actions contamination above cleanup levels was left in place beneath Building T-1932 or suspected to be present above cleanup levels at Building 4475 associated with a maintenance pit. Institutional controls are in place for these two locations, which include restrictive covenants that require signage notifying that sampling and cleanup of these locations upon demolition of the buildings.

Cleanup decisions at time were made with consideration of individual samples which exceeded screening or cleanup levels at the time:

- Maximum arsenic concentrations at the grease pit (7.2 mg/kg) and former sewage pond (7.9 mg/kg) exceeded background concentrations (7.0 mg/kg) and the current Method B screening level. These cleanup decisions were made with Method A concentration limits (which are 20 mg/kg). No new scientific information, state or federal laws, or changes in current or projected site use require this decision to be revisited.
- Lindane, a pesticide, was detected in one sample above screening levels (Method A and Method B) at the Camp Bonneville Grease Pit at a concentration of 2.0 mg/kg. This exceedance was considered a localized detection which did not indicate a risk to human health or the environment. The Method B screening has since been lowered, however, the decision point for this chemical has not changed and no new scientific information, state or federal laws, or changes in current or projected site would require this decision to be revisited.
- Petroleum Hydrocarbons (diesel-range) was confirmed above cleanup levels at Building T-1932 and is suspected to be above cleanup levels at the maintenance pit associated with Building 4475. Instructional controls are in effect for this location. New scientific information regarding the hazards from vapor intrusion has been established since the time decisions were made regarding these locations (Section 3.3 New Scientific Information). Additional remedial investigation/assessment for vapor intrusion risks prior to occupation is recommended.

- Groundwater samples collected at Landfills 2 and 3 had concentrations that exceeded Method B screening levels at the time of the decision. The Method B Cleanup level has since been revised upward, and the samples do not exceed current screening levels.

Current and projected Site uses within RAU 1 cleanups have not changed since cleanup decisions were made. Building T-1932 and Building 4475 require assessment for vapor intrusion prior to occupancy to address changes in the exposure pathways from volatile compounds. All other remedial actions for RAU 1 are considered protective and either a vapor intrusion assessment or an amendment to the RAU 1 CAP requiring remedial investigation of possible threats from vapors prior to occupancy at Buildings T-1932 and Building 4475 is recommended.

3.7.2. RAU 2A Effectiveness

Cleanup of RAU 2A was intended to be protective of human health and the environment by removing contaminated soils or installing protective soil covers. A total of 17 historical ranges were confirmed at the Site. Nine (9) Small Arms ranges were selected for remediation in the RAU 2A CAP.

Confirmation sampling results for the removal actions are not accessible for Ecology to assess the long-term protectiveness of these remedial actions. The 2012 APPCD and field records document that cleanup occurred and met the goals of the CAP and workplan; however, this data must be located, or additional sampling will be required to confirm the removal actions met the cleanup goals.

The following locations were considered complete prior to meeting the cleanup goal of no samples above 118 mg/kg lead and an average lead concentration below 50 mg/kg:

- The Field Fire Rifle Ranges 1 & 2, designated as range 2A-22, received approval to stop work with a 119 mg/kg in place at the range berm.
- The Field Fire Rifle Ranges 1 & 2, designated as range 2A-22, received approval to stop work where step-outs encountered special conditions (i.e., standing water).
- The Rifle Ranges 1 & 2, designated as range 2A-21, had two grids not fully excavated due to special conditions (i.e., standing water).
- The Rifle Ranges 1 & 2, designated as range 2A-21, had one grid not fully excavated due to special conditions (i.e. gravel road)**.**
- The 25 M Record Fire Field/Field Firing range, designated as range 2A-19, received approval to stop work with a single soil sample of 156 mg/kg.
- The Field Firing Ranges 1 & 2 and Pistol Range, designated as range 2A-20, was identified in the final cleanup action report as having field work for cleanup grids with special conditions (standing water) remaining at the end of the 2008 field season. It is documented that this work was scheduled for completion in the 2009 field season and as being completed in the APPCD, but detailed records of that work were not identified (Weston 2018c).

- The 25 Meter and Machine Gun Range, designated as range 2A-18, is identified in the final cleanup action report as having two berm panels exceeding cleanup levels at the end of the 2008 field season. It is documented that this work was scheduled for completion in the 2009 field season, and as being completed in the APPCD, but detailed records of that work were not identified (Weston 2018c)

The 1,000-inch Rifle Range / Machine Gun Range, designated as range 2A-16, and Rifle Ranges 1 & 2, designated as range 2A-21 have lead contamination remaining in place above cleanup levels. Clean soil covers were placed on the locations to protect human health and the environment at these locations which require institutional controls. While restrictions on ground disturbing are in place for the Site, this periodic review has identified the need for additional institutional controls to ensure the long-term protectiveness of the soil covers. These are as follows:

- Routine inspection of the caps for non-grassy plants (such as shrubs or saplings) followed by their removal and repair of the soil cover. RAU 2A – 21 has trees that either need removal or inspection for damage to the soil cap.
- Demarcation of the boundary of the soil covers (such as through simple fencing or other permanent control) and installation of signage to provide notice of the restricted land use.
- Physical maintenance of the soil covers, such as repair of the rutted tire tracks observed at Range 2A-16 and installation of a barrier and signage across the road frontage of the capped area.

Current and projected site uses within the RAU 2A cleanup area have not changed since cleanup decisions were made. Currently the cleanup of RAU 2A is considered protective of human health and the environment in the short term; however, a CAP amendment is necessary to add institutional controls to ensure the soil covers remain protective into the future. Confirmation sampling data of the cleanup is needed for future assessments, if this data cannot be located additional sampling will be required.

3.7.3. RAU 2B Effectiveness

Cleanup actions were not required for RAU 2B following site investigations. Metal concentrations for arsenic in soils at Demolition Area 2 exceeded screening levels at the time and were compared to regional background concentrations. Current and projected site uses within the RAU 2B areas have not changed since cleanup decisions were made. No new scientific information or state or federal laws would require the cleanup decisions to be revisited.

3.7.4. RAU 3 Effectiveness

Cleanup of RAU 3 was intended to be protective of human health and the environment by removing MEC so that any interaction in the future is negligible in areas open to staff and the general public. The remedial activities across all phases of the RAU 3 cleanup followed approved work plans and explosive safety protocols. Work included surface and subsurface clearance of MEC and MPPEH, followed by quality control and quality assurance inspections. These cleanup efforts resulted in the recovery and safe destruction of over 700 MEC and MMPEH items across all four phases of the RAU 3 cleanup. These included munitions such as artillery rounds, mortars, grenades, and fuzes. Institutional controls were incorporated into the remedy to restrict intrusive activities and ensure long-term protectiveness in areas where MEC may remain at depth or where clearance was not possible due to site conditions. Protective measures during the cleanup activities included archaeological monitoring and wetland protection protocols.

Cleanup remains effective; however, continued protectiveness depends on the proper implementation and maintenance of institutional controls. An amendment to the RAU 3 CAP is recommended to modify existing institutional controls.

3.8. Additional Considerations outside of WAC 173-340-420(4)

To support this Periodic Review Ecology has gathered additional information not required for the review criteria in WAC 173-340-420.

3.8.1. Site Inspection

A Site Inspection was conducted by Ecology staff on December 5–6, 2024. The inspection team included Ecology personnel, Clark County representatives, and the County's contractor (PBS/APEX). The full report is included in **Appendix A**.

The inspection assessed the status of institutional controls across the Site, including fencing, signage, access controls, range/target areas, demolition areas, and known cleanup areas.

Institutional controls were found to be partially maintained in most areas.

- Perimeter and CITA fencing were generally intact; however, localized repairs were needed, and some signage was obscured or weathered. A section of perimeter fence in the northwest portion of the property was observed to be missing. County personnel indicated that maintenance staff were actively repairing damaged sections as time and resources allowed. This discussion also disclosed additional missing or damaged fence segments in the southern portion of the Site, though these areas were not directly observed during the inspection.
- At the CITA, a barbed wire gate across the through-road was found unsecured and off to the side, allowing unrestricted access.
- At the FBI training range, an unsecured and corroded container of weapons cleaning solvent was found outside.

- The Clark County Sheriff's Office (CCSO) storage area co-located with the FBI range had open storage of fuels and chemicals. A flammable storage cabinet was present but was blocked and not readily accessible.
- Other observations included frost heaves, weathered signs, and exterior deterioration of historical buildings.

Following Ecology's December 2024 inspection, PBS/APEX reported observing ponding in the former sewage lagoon system flowing to the nearby surface road and evidence of burrowing wildlife on the lagoon sides. This observation occurred outside of Ecology's presence and was made under the assumption that soils from the RAU 2A cleanup had been placed in the eastern lagoon prompting further evaluation.

A supplemental Site Inspection was conducted by Ecology in May 2025 to follow up on the sewage lagoon concern and previously identified issues. The full report is available in **Appendix A.**

The following is a summary of the observations made during the supplemental inspection:

- No soil was observed within the sewage lagoons; an asphalt or concrete bottom and siding was noted in both the eastern and western lagoons. Following this observation Ecology confirmed from daily field reports that the RAU 2A lead impacted soils (above 50 mg/kg and below 250 mg/kg lead with a TCLP less than 5 ppm) placed in the eastern lagoon was profiled for disposal and disposed of at the Wasco County Landfill starting on August 31, 2009.
- BCRRT breached both lagoon sidewalls to prevent the lagoons from ponding as part of the decommissioning. PBS observed water flowing out of these breaches and thought this was a pathway for contaminated soil to escape. Since no soil was permanently placed in the lagoons there was no issue and the breach was functioning as intended.
- The CITA through-road gate was in place and restricting access.
- No unsecured solvents or hazardous materials were observed at the FBI range.
- Storage sheds (FBI and CCSO) were locked and secure. The conditions at the CCSO storage area remained unchanged, including open storage of chemicals and obstructed access to the flammable storage cabinet.
- Fencing in the northwestern portion of the Site had been repaired though subsequent damage from tree fall and animals was observed and scheduled for repair.

3.8.2. Former Staff and Site Users Questionnaires

To support the periodic review, Clark County sent Ecology prepared questionnaires to former site managers and current site users (i.e., FBI, CCSO, MEDU, ATF) regarding land use history (**Appendix B**). While these questionnaires contributed limited information to the existing cleanup record, they did provide additional insight regarding use of the property by law enforcement agencies.

Ecology received information from both the County Forester and the FBI regarding potential munitions finds outside of designated remedial areas. Upon follow-up, the County Forester clarified their statements were based on secondhand information and the items referenced were encountered during formal remedial investigations and cleanup efforts. The FBI reported a potential munitions find near the barracks in 2019. Ecology requested additional details from the FBI but did not receive a response. Ecology also followed up with their former UXO specialist and Clark County's former UXO specialist, and neither recalled the event described by the FBI. Based on the available information, the item was likely non-hazardous and was managed as general debris by the cleanup production contractor.

3.8.3. Clark County's Periodic Review Support Report

A requirement of the APPCD is that Clark County shall submit to Ecology a report ninety (90) calendar days before every 5-year anniversary of the date of dismissal that addresses the review criteria in WAC 173-340-420. On January 21, 2025, Ecology received a draft report, titled "Periodic Review" prepared by PBS (an Apex Company), referred to as a "Periodic Review Support Report" (Support Report) which fulfilled Clark County's obligation, pursuant to the APPCD. Ecology reviewed the Support Report and identified numerous and substantial issues with the accuracy of information, analysis, and findings within. Ecology does not consider the Support Report to satisfy the requirements of a Periodic Review under MTCA. The draft Support Report including Ecology's comments is included in this review as **Appendix F**.

Following Ecology's comments on May 2, 2025, two major comments have been resolved based on additional information gathered or provided to Ecology. Ecology had informed the County that RAU 1 Restrictive Covenants were not recorded with the County Auditor's Office as those documents did not appear to be part of the Auditor's documents for the property. Subsequently, Clark County Public Works was able to confirm that the Restrictive Covenant for RAU 1 was recorded with Auditor's Office against the property in October 2006 and that record was filed under the miscellaneous documents tab. Ecology through a supplemental site investigation and subsequent records review confirmed that no soil from the RAU 2A cleanup were permanently placed in the former sewage lagoons. Clark County assisted with confirming the records identified with the waste manifests for the project. Therefore, Ecology no longer agrees with this Statement in the Support Reports findings on the former sewage lagoons.

Due to the time and effort that went into reviewing the Support Report and the substantial number of issues identified, Ecology has elected not to require a revised report and has focused on preparing this Periodic Review. Clark County Public Works chose to revise the Support Report to address Ecology's comment and provide a document which accurately reflects the cleanup activities and conditions at the Site.

On August 6, 2025 Ecology received a revised report, dated July 31, 2025 and titled "*Summary and Data Assessment Summary and Technical Assessment for Periodic Review Report*" (Revised Support Report). The Revised Support Report was received after Ecology had substantially prepared the Periodic Review and past the date of consideration of new material. At the

request of Clark County, Ecology has not conducted a formal review of the Revised Support report but has included it in this review as **Appendix G** for inclusion in the project record.

3.8.4. Administrative Review

As part of this Periodic Review, Ecology has conducted an administrative review of the work conducted and documents produced and has identified several issues and deficiencies in the administrative record. These issues and deficiencies are summarized below and issues along with recommendations are further discussed in Section 4 (Issues and Recommendations).

3.8.4.1. Cleanup Action Plan Amendments

Amendments to the RAU 2A and RAU 3 Cleanup Action Plans went through the public comment period with published responses finalizing the amendment decisions, however these amendments were not filed with the Clark County Superior Court as part of an amendment to the APPCD. These amendments need to be filed by Ecology and Clark County as a joint motion with the Clark County Superior Court.

3.8.4.2. Periodic Reviews

The Washington State Auditor's Office published an Accountability Audit Report (Report No. 1035573) on September 19, 2024, which found that Ecology did not comply with requirements to conduct the Periodic Review required for the Site. The APPCD between Ecology and Clark County required the County to perform and submit a report for the Periodic Review, however the County had not prepared such as a report. The Auditors' finding is that state law (RCW 70A.305.030(7)) requires Ecology to conduct the Periodic Review regardless of whether Clark County submitted a report or not.

Based on language in the Amended PPCD, the first periodic review should have been produced in January 2013, five years after the No Further Action letter was issued for RAU 1.

3.8.4.3. RAU 3 Western Slopes Area Reporting Discrepancy

Ecology has identified a discrepancy in the Phase 4 site-specific final report for the WSA (Weston 2020b). The report indicates that portions of the WSA were either previously cleared by BCRRT as part of the Dense Vegetation/Moderate Slope (DVMS) – Interim Action, which was addressed using a transect-based surface survey, or identified as a "restricted accessibility area".

The 2018 RAU 3 CAP amendment identified that areas with a slope of 25% (14°) would be surfaced cleared and did not provide an exemption for restricted accessibility areas. After reviewing the DVMS interim action work plan (BCRRT 2008c) and the 2010 RAU 3 CAP (Ecology 2010b), Ecology found that a small section of the WSA, with a slope of less than 25% (14°), was incorrectly attributed to having transect-based work or considered a "restricted accessibility area" and did not receive the cleanup required under the CAP (**Figure 12A)**.

3.8.4.4. RAU 2A Selection of Ranges for Remedial Action.

A review of the RAU 2A RI/FS and RAU 2 CAP identified that 5 ranges recommended for cleanup in the RI/FS that were not selected for remediation as part of the CAP. These ranges are the Close Combat Range, the M31 Sub-Caliber Range 1 & 2, the Infiltration Course South, Machine Gun Range North and Machine Gun Range South. The CAP and the RI/FS discussion around selection of ranges for cleanup was not made in a clear or concise manner.

A technical review of the RAU 2A data demonstrates that the exclusion of these ranges was appropriate under MTCA and met the requirements for no action based on both the cleanup level selected of MTCA method A unrestricted land use (250 mg/kg) and for more stringent screening level based on an ecological protective value (50 mg/kg). Soils at each excluded ranges have lead concentrations below 50 mg/kg based on a 95% upper confidence limit analysis.

3.8.4.5. RAU 1 Restrictive Covenant Reporting Requirements

The Restrictive Covenant for RAU 1 requires annual reporting and specifies that the signage should identify the potential environmental contamination associated with the particular building. Ecology has confirmed the signage for the restrictive covenant is and has been in place. This signage did functionally fulfill the RAU 1 CAP requirement that the location be sampled should the buildings be modified or demolished; However, the signage does not fulfill the terms of restrictive covenant as it does not identify the potential environmental contamination associated with each building. Additionally, the County's annual reporting required by the quitclaim deed has not documented that signage was placed and the condition of the signage. Given the physical signage has remained in place and neither building has been demolished or modified, the covenant has largely been in compliance with the RAU 1 CAP but only partially compliant with the language of the restrictive covenant. Signage should be installed that fulfill the language of the restrictive covenant and future reporting should document the signage to ensure complete compliance with the restrictive covenant for RAU 1.

3.8.4.6. RAU 3 Transect-Based Investigations Are Not Appropriate Substitutes for CAP-Required Cleanup Actions

Ecology has determined that transect-based investigations are not an acceptable substitute for CAP-required MEC surface clearance. As described in Ecology's prior technical comments on the Western Slopes Area transect approach (Ecology 2010a), transect-based investigation is an investigative method that provides limited coverage and does not establish the contamination status of the uninvestigated remainder of an area.

The amended CAP for the Western Slopes Area includes vegetation removal and surface MEC clearance of all areas with slopes less than 25%. Previous transect-based investigative work does not satisfy that requirement. Therefore, areas below the 25% (14°) slope threshold that were attributed to prior transect-based work (**Figure 12B**) should have been included in the MEC surface clearance footprint required by the 2018 CAP amendment.

4. Issues and Recommendations

This section presents the issues and recommendations identified during this Periodic Review.

4.1. The County has not developed Long-Term Operations & Maintenance (O&M) Plans for the Site

4.1.1. Issue

The County has not developed the Long-Term O&M Plans for the Site. These plans are a requirement of the APPCD and the CAPs developed for many of the remedial action units 2A and 3. The Long Term O & M plan is designed to document how Sitewide and RAU specific institutional controls will be implemented.

4.1.2. Recommendation

The long-term O&M Plan for the site must be developed in a timely manner. Ecology recommends that the Plan be prepared in an iterative process with priority given to the O&M needs necessary for the continued maintenance of the Site and cleanup actions. Establishing a review requirement, such as semi-annual or annual, would be recommended to ensure the long-term O&M plan continues to serve the Site needs and requirements.

Ecology recommends that the RAU 3 requirement for a Formal institutional Control Manual be incorporated as part of the Long-Term O&M Plan. Both documents are closely related with the Manual outlining the institutional control requirements and obligations, and the O&M Plan detailing how those requirements will be met. This will allow for both requirements to be evaluated and updated in a single document if future revisions are necessary.

This long-term O&M Plan will likely require public input if additions of institutional controls, modifications to institutional controls, or removal of institutional controls will require an Ecology lead public participation and notification period (WAC 173-340-600; WAC 173-340-440).

4.2. Institutional Controls for the Site have either not been implemented or only partially implemented

4.2.1. Issue

Multiple Institutional Controls for the Site have not been implemented or have only been partially implemented at the Site (Table 3-2). Without these requirements the Site is not protective of the Projected Future Use. The institutional controls which have been implemented or partially implemented are protective of the current Site users, but the County is out of compliance with the requirements of the APPCD for future use based on the 2005 Reuse Plan.

4.2.2. Recommendation

Clark County Public Works should evaluate, identify, and prioritize implementation of institutional controls based on immediate future needs. For example, forestry services are needed in the near future to maintain tree health at the Site while signage raising public awareness at target areas and firing points will be needed prior to public access to the Site.

The formal Institutional Control Manual is required by the RAU 3 Cleanup Action Plan and should be developed promptly to assist in identification and prioritization of Institutional Controls (Ecology 2010b). Ecology recommends development of this manual as part of the long-term O&M Plan.

4.3. The evaluations in this Periodic Review rely on Site Uses set forth in the 2005 Reuse Plan

4.3.1. Issue

The Projected Site use for evaluation in this Periodic Review is based on the 2005 Reuse Plan which was written prior to completion of cleanup actions at the site. This plan has activities with the potential to disturb ground surfaces below the depth of cleanup or that occur in uncleared areas. Based on this plan additional UXO remediation may be necessary to protect human health and the environment.

Later cleanup documents did propose changes to reuse activities, such as the removal of the logging camp and restriction of activities in the Western Slopes Areas to hiking along roads and trails (Ecology 2010b, Ecology 2018, Ecology 2019a). These changes, however, have not been incorporated into the reuse plan or future park plans.

4.3.2. Recommendation

The changes to the proposed reuse activities need to be formally documented. This may be achieved with the preparation of a Master Park Plan or by revising the 2005 Reuse Plan. Clark County is planning to develop a Master Park Plan. Ecology recommends planned park activities take into consideration the cleanup actions which have occurred at the Site. Ecology is available as a technical resource and a partner to provide input and evaluation on proposed activities. Any update to the Master Park Plan will be incorporated into future Periodic Reviews.

4.4. Additional Restrictive Covenants need to be recorded

4.4.1. Issue

During the course of this Periodic Review, the need for new or revised restrictive covenants has been identified to ensure the long-term protection of human health and the environment.

4.4.2. Recommendation

Clark County Public Works and Ecology will identify and develop restrictive covenants for the protection of the cleanup actions at the Site and record those covenants against the property.

The RAU 2A cleanup has a protective cover at ranges 2A-16 and 2A-21 that was assessed to be protective as there is an existing site-wide restriction on ground disturbance. However, this restriction is not completely protective of the cleanup action as the soil could be exposed through erosion or potential tree falls. Ecology recommends that the RAU 2A CAP be amended and restrictions be recorded to require delineation, regular inspection and maintenance of the soil covers, thus preventing exposure of contaminated soils. The restriction should also recommend that if the soils are disturbed, that appropriate health and safety measures be taken.

The RAU 3 Cleanup requires recording of restrictive covenant prohibiting activities at the site following cleanup. For example, the Western Slopes Area requires a covenant to prohibit public activities in restricted areas. At a minimum public activity in the Western Slopes Area should be restricted to areas where cleanup has occurred and require the appropriate level of UXO support for forestry and other maintenance activities.

4.5. Confirmation sampling Data for RAU 2A is not available for review

4.5.1. Issue

When BCRRT and its contractors departed from the project they did not transmit or retain the confirmation soil samples that documented RAU 2A's remediation activities achieved cleanup goals. Documents from the time indicate that work proceeded according to Cleanup Action Plan and that confirmation data was collected and evaluated. This data, however, is missing from the project record and is considered a major data gap that is needed for evaluation in future Periodic Reviews.

4.5.2. Recommendation

Ecology has requested and is working with Clark County to review the project files and contact past contractors to locate these records.

If records cannot be located, then Ecology will require soil sampling if MTCA method A cleanup levels change to confirm that human health and the environment are being protected by the remedial actions undertaken at RAU 2A.

4.6. Cleanup Action Plan Amendments were not filed with the Courts as documents to the APPCD review

4.6.1. Issue

The RAU 2A and RAU 3 CAP Amendments (Weston 2017, Ecology 2017a, Ecology 2017b, Ecology 2018, Ecology 2019a) were not filed with the Clark County Superior Court as part of the APPCD. The Responses to Public Comments (Ecology 2017B and Ecology 2019) identify that the Cleanup Amendments were considered final. However, these documents should have been filed as part of the Court Record for the APPCD.

4.6.2. Recommendation

Ecology recommends that the CAP amendments should be filed as written with the Clark County Superior Court to accurately reflect the project record. Further amendments to Cleanup Action Plans should be filed separately.

4.7. RAU 3 Cleanup Action Plan – Level 1 MEC Technician Requirement

4.7.1. Issue

The 2010 RAU 3 CAP establishes a requirement for two Clark County Park employees to be certified as Level I MEC technicians to facilitate implementation of the procedures for land disturbing activities (Ecology 2010b). This requirement has several issues that limit the ability to address site conditions required to maintain the Site:

- A “Level I MEC Technician” is not a formally recognized certification within the Department of Defense Explosive Safety Board or industry-standard UXO qualification structure. The correct terminology for this certification is a UXO Technician I (UXO-TI).
- A UXO-TI can be authorized to perform limited activities but is not UXO-Qualified Personnel (UXOQP) for the purposes of ground disturbing activities. UXO Technicians II (UXO-T2) and UXO Technicians III (UXO-T3) are UXOQPs. A UXOQP is required by the Environmental Protection Provisions for ground disturbing activities and is necessary for the long-term maintenance of cleanup actions protective of human health and the environment.
- The requirement that UXO technicians be County employees means any vacancy that may occur would result in Clark County being immediately in non-compliance with the site cleanup requirements until that vacancy can be filled. This could create significant gaps in compliance.

4.7.2. Recommendation

The CAP should be amended to use the correct certification requirements and require UXOQP services for ground disturbing activities. An amendment would need to be formally developed and should:

- Replace the terminology from a "Level I MEC Technician" with the recognized Department of Defense Explosive Safety Board recognized certification "UXO Technician I."
- Change the requirement that Clark County employ two "Level I MEC Technicians" so that the County may obtain the required UXO support through either direct employment or contracted services. The revised requirement should specify that services of at least a minimum of one UXOQP is required, rather than two personnel.
- Clearly require that at least one UXOQP be available for any ground-disturbing or intrusive activity conducted on the Site. A certified UXO-TI may be used for limited non-intrusive UXO safety escort or anomaly avoidance functions when authorized by the responsible authority and when supported by the applicable MEC Probability and MEC Risk Assessments.
- Require a documented MEC Probability Assessment for each project area to establish the likelihood that MEC may be present, based on historical use, prior site activities, and previous investigations or cleanup work. The resulting probability determination shall be used as an input to a MEC Risk Assessment, which shall be prepared for every task or activity regardless of the probability outcome. The MEC Risk Assessment shall evaluate the specific work activity, its location within the assessed area, and the depth and nature of anticipated ground disturbance in order to determine the required level of UXO support. Both assessments shall be incorporated into project planning documentation and site-specific health and safety procedures.

4.8. RAU 3 Cleanup Action Plan – Surface Inspections following storm events and annual inspections

4.8.1. Issue

The RAU 3 Cleanup Action Plan Amendment for the CITA (Ecology 2017) requires "Institutional controls to include annual surface MEC inspection and surface MEC inspection after heavy rainstorms to minimize potential risks from frost heave". This requirement lacks critical details such as what constitutes a "heavy rainstorm" and what surface inspections would entail. Further inspections following rainstorms do not adequately address other types of mass movement events which could in theory bring MEC to the surface. These requirements are also specific to the CITA Popup Targets Cleanup Action. Expanding surface inspections to other areas of the Site would be more protective of human health and the environment.

4.8.2. Recommendation

Ecology recommends amending the RAU 3 CAP to provide clear details on what events would require additional surface inspections and to expand an annual inspection requirement to other areas of the RAU 3 cleanup to ensure the long-term protection of human health and the environment. The details of this amendment need development and may likely constitute a substantial change to the Cleanup Action Plan, requiring public notice and participation.

4.9. Ecology did not conduct a Periodic Review in a timely manner

4.9.1. Issue

Periodic reviews were not conducted in a timely manner as required by state law. Part of the root cause of this lapse was the incorrect interpretation of the law on when the start date for a periodic review began and who was responsible for producing the document.

4.9.2. Recommendation

Ecology recommends amending Section XV. "Periodic Review" of the APPCD so that section accurately reflects the legal requirements for periodic review as set forth in WAC 173-340-420. Under this amendment, Ecology will conduct a periodic review at least every five years after the initiation of a cleanup action, and Clark County is required to produce the records needed to help facilitate Ecology's periodic review.

4.10. Information Repositories required by APPCD need to be updated and maintained

4.10.1. Issue

The APPCD states information repositories shall be located at the Department of Ecology in Lacey Washington and Washington State University Vancouver Library. These locations are no longer up to date with the Washington State Library repository moving to the downtown Fort Vancouver Regional Library. Additionally, these information repositories have not been consistently maintained by either party to the APPCD and do not account for digital record keeping technology.

4.10.2. Recommendation

Ecology recommends amending the APPCD Section XX. Public Participation. Ecology and Clark County continue to receive and maintain hard copies of final reports for project records. Revisions should include:

- Establishment of a digital information repository such as Ecology's Document Storage and Retrieval System (DSARs)
- Clearly identify which party is responsibility for maintenance of the public record repositories and clarifying which documents (e.g. Final Reports, Public Drafts) will be retained.

Ecology recommends one public physical repository be maintained in Clark County for all public notices, fact sheets, monitoring reports, and documents relating to public comment periods. A copy of all Model Toxics Control Act (MTCA) documents related to this Site shall be maintained at Ecology's Toxics Cleanup Program's Headquarter Cleanup Section in Lacey, Washington and certain records are available online through Ecology's "Cleanup and Tank Search" database.

4.11. The APPCD does not accurately describe the number of small arms ranges at RAU 2A

4.11.1. Issue

The supporting attachments and definition of RAU 2A in the APPCD does not accurately reflect the number of small arms ranges determined to exist at this RAU. RAU 2A describes 21 ranges while over the course of investigations Ecology confirmed 17 ranges at the Site.

4.11.2. Recommendation

Ecology recommends any future revision of the APPCD revise the APPCD to accurately reflect the cleanup history.

4.12. RAU 2A Findings in the Final Cleanup Action Report Need Revision For Accuracy

4.12.1. Issue

The Final Cleanup Action Report for RAU 2A relied on an incomplete project record following the departure of contractors in 2009 and resumption of cleanup activities. The Final Cleanup Action report used work plans, memorandums, and landfill manifests to document Cleanup Activities for RAU 2A that occurred prior to Weston Solution taking over the project (Weston 2018). Ecology as part of the periodic review process has identified detailed field records which appear to have been unavailable to Weston. These records document the field activities from 2008 through 2009 and provided additional confirmation that RAU 2A work plans were being followed and identify that soils with elevated lead “MTCA Soils” were initially placed in the eastern Sewage Lagoon then profiled and disposed of in a landfill.

4.12.2. Recommendation

Ecology recommends that the Weston report either be revised or a memorandum with attached field documents be added to the final report detailing this work to ensure an accurate project record.

4.13. RAU 3 - Western Slopes Area

4.13.1. Issue

A small section of the Western Slope Area, with a slope of less than 25% (14°), appears to have not undergone cleanup (**Figure 12A)**. Following the public comment period and further administrative review, Ecology determined that this area is part of a larger set of accessible areas below the 25% (14°) slope threshold that were attributed to prior transect based investigations and were not included in the MEC surface clearance footprint required by the 2018 CAP amendment (**Figure 12B**). Ecology has determined that transect based investigations are not an acceptable substitute for CAP required MEC surface clearance, and the 2018 CAP amendment did not include a caveat or exception that would allow accessible areas below the 25% (14°) slope threshold to be excluded from the required clearance. These recently identified portions are a larger part of the area that was identified during the periodic review process as being misattributed to work previously stated to have been conducted as part of the Dense Vegetation/Moderate Slope interim action and identified as a "restricted accessibility area" in the final report for the Western Slopes Area (BCRRT 2008c, Ecology 2010b, Weston 2020b). The roads and trails buffer zones were cleared in the corresponding area (BCRRT 2009a).

4.13.2. Recommendation

Ecology recommends that either this area undergo surface clearance as required by the CAP or the CAP is amended to establish additional institutional controls specific to this area. This may include a restrictive covenant prohibiting public activities other than hiking along the roads and trails and construction support for other activities.

4.14. RAU 1 – Vapor Intrusion Assessment

4.14.1. Issue

The cleanup for RAU 1 never evaluated vapor intrusion as an exposure pathway for volatile chemicals. Two locations, building T-1932 and Building 4475, are known or suspected to have contamination remaining in place that could pose a risk from vapor intrusion.

4.14.2. Recommendation

The RAU 1 CAP could be amended to require additional remedial investigation to evaluate vapor intrusion risks prior to occupancy of Building 4475 and Building T-1932. Alternatively, a vapor intrusion assessment can be conducted to assess those risks without requiring an amendment to the CAP. If after that assessment or evaluation, data establishes that contamination is present at RAU 1, which may generate harmful vapors and/or combustible gas, then the Environmental Covenant for RAU 1 could require that a vapor or gas control system be operated and maintained to prevent migration of vapor or gas into the buildings.

5. Conclusions

The cleanup actions undertaken at the Site are only protective of human health and the environment based on current Site uses and with continued maintenance of institutional controls. While the Site is currently protective of current users, Clark County is currently out of compliance with the APPCD and the cleanup action plans for individual remedial action units. Clark County Public Works has demonstrated its commitment to addressing these issues.

For future use as a regional park, based solely on activities in the 2005 reuse plan, the cleanup actions are not protective of human health and the environment.

After reviewing the cleanup actions and the administrative record, Ecology recommends amending the RAU 1, RAU 2A and RAU 3 Cleanup Action Plans and the APPCD. This includes recording additional or modifying existing restrictive covenants for the RAU 1, RAU 2A and RAU 3 Cleanups. Ecology recommends rewriting the current inspection requirements in the RAU 3 Cleanup Action Plan and its amendments to provide clearer expectations, remove unnecessary activities, and ensure that long-term management aligns with actual site risks and access conditions. Based on the findings of this Periodic Review, periodic reviews will continue to be required for this Site.

5.1. Next Review

The next Periodic Review is scheduled for no more than five years from the date this periodic review is finalized following the Public Participation Process.

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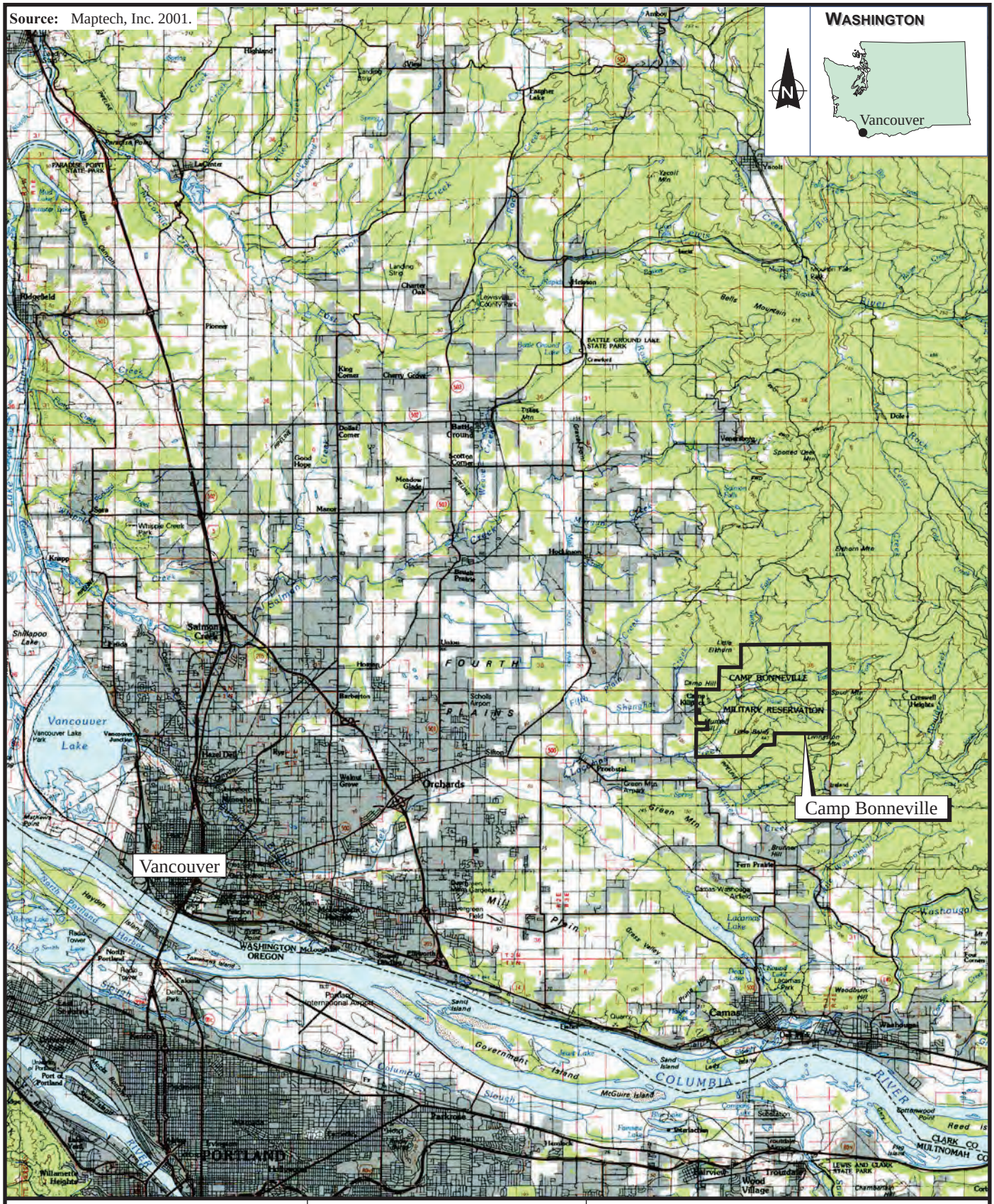
FIGURES



US Army Camp Bonneville Periodic Review March 2026	CAMP BONNEVILLE Vancouver, Washington	Figure 1 VICINITY MAP		
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Modified from Figure 2-1 (Ecology and Environment 2012)

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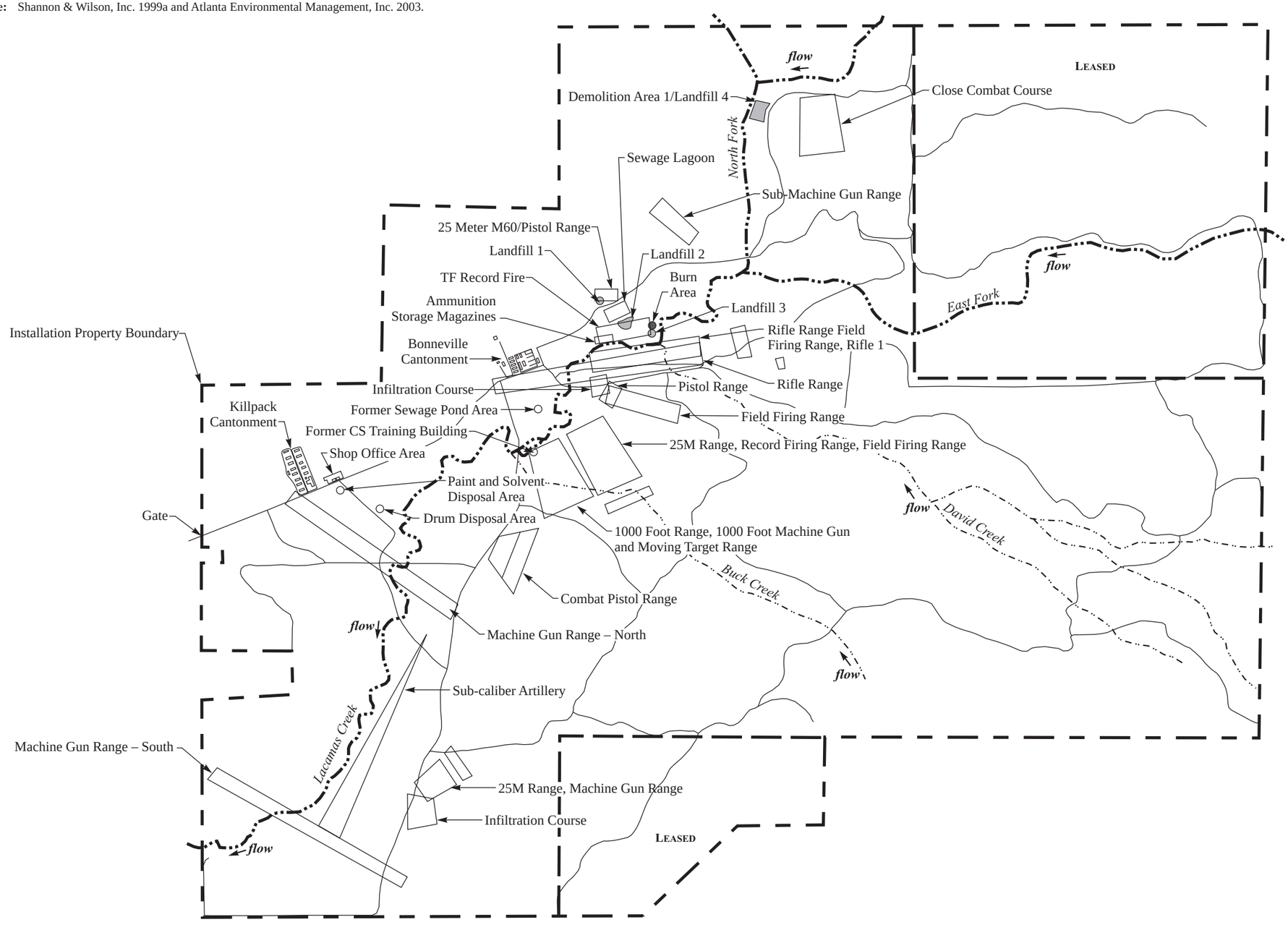

US Army Camp Bonneville - Periodic Review
March 2026

N

0 1600 3200
Approximate Scale in Feet

CAMP BONNEVILLE
Vancouver, Washington

Figure 2 SITE MAP

Date:	Drawn by:	
3/26/12	AES	10:START-3\10030010\fig 2-2

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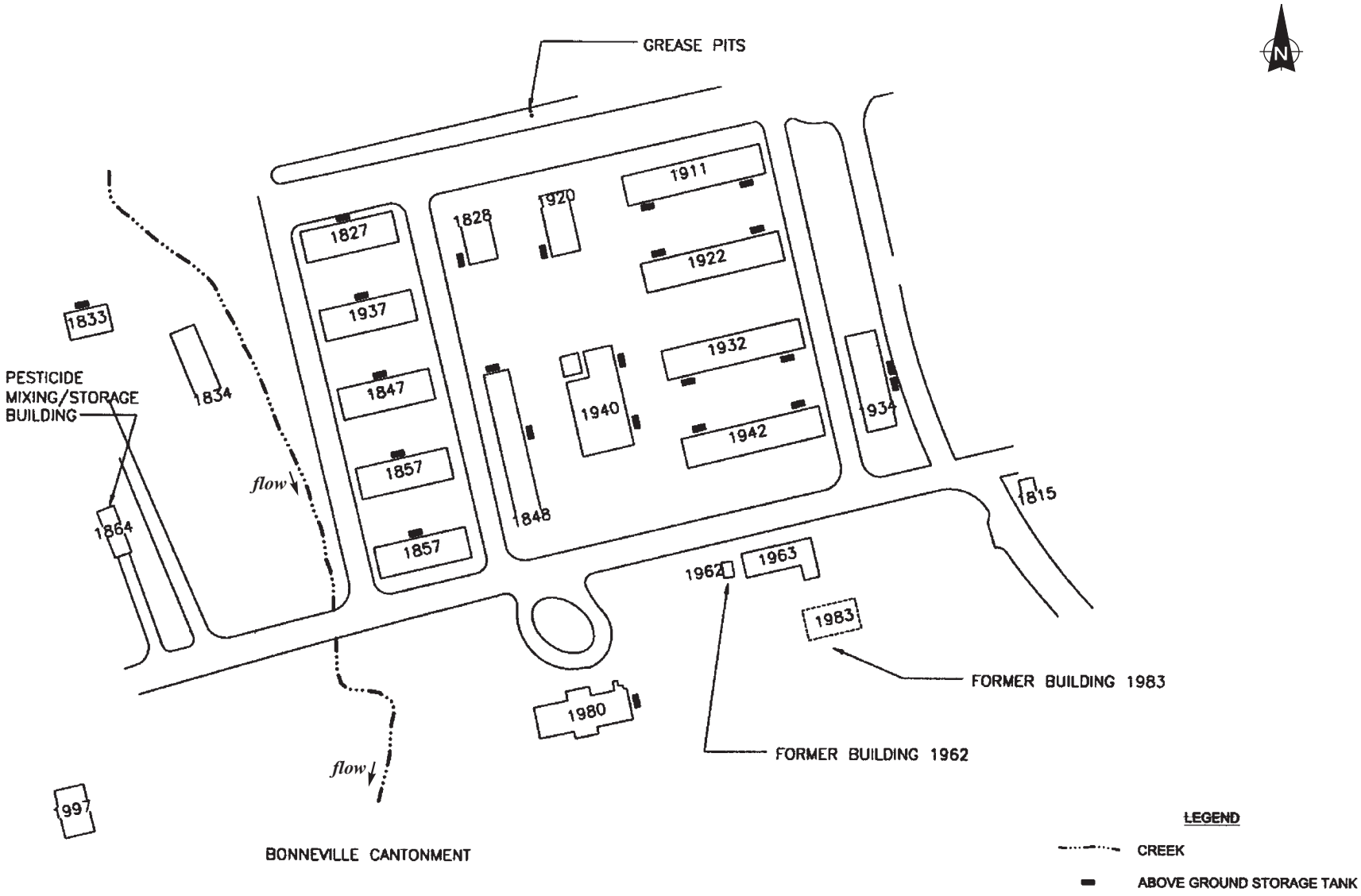
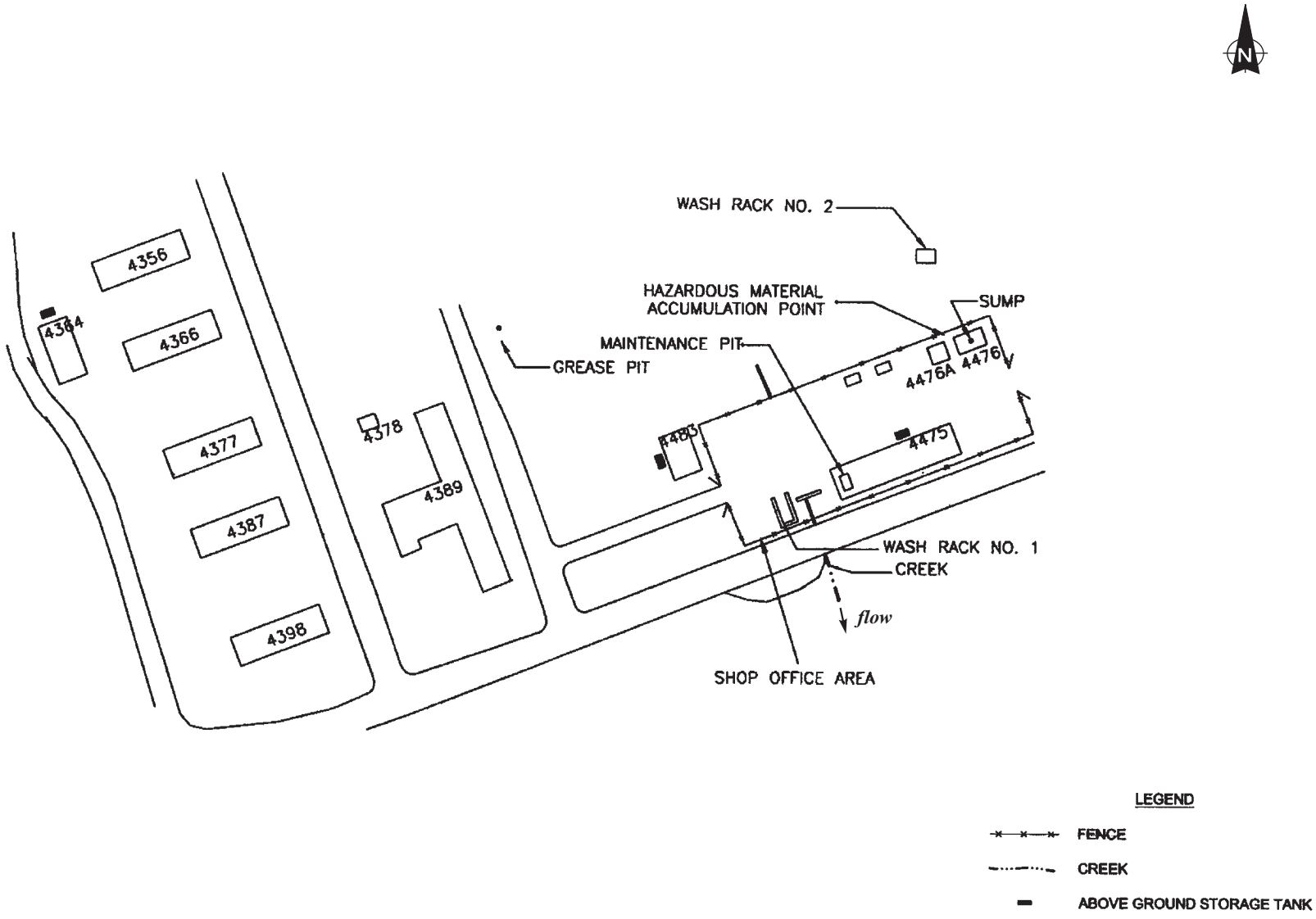


US Army Camp Bonneville - Periodic Review March 2026	CAMP BONNEVILLE Vancouver, Washington	Figure 3 BONNEVILLE CANTONMENT SITE MAP		
	0 100 200 Approximate Scale in Feet	Date: 3/27/12	Drawn by: AES	10:START-3\10030010\fig 2-3

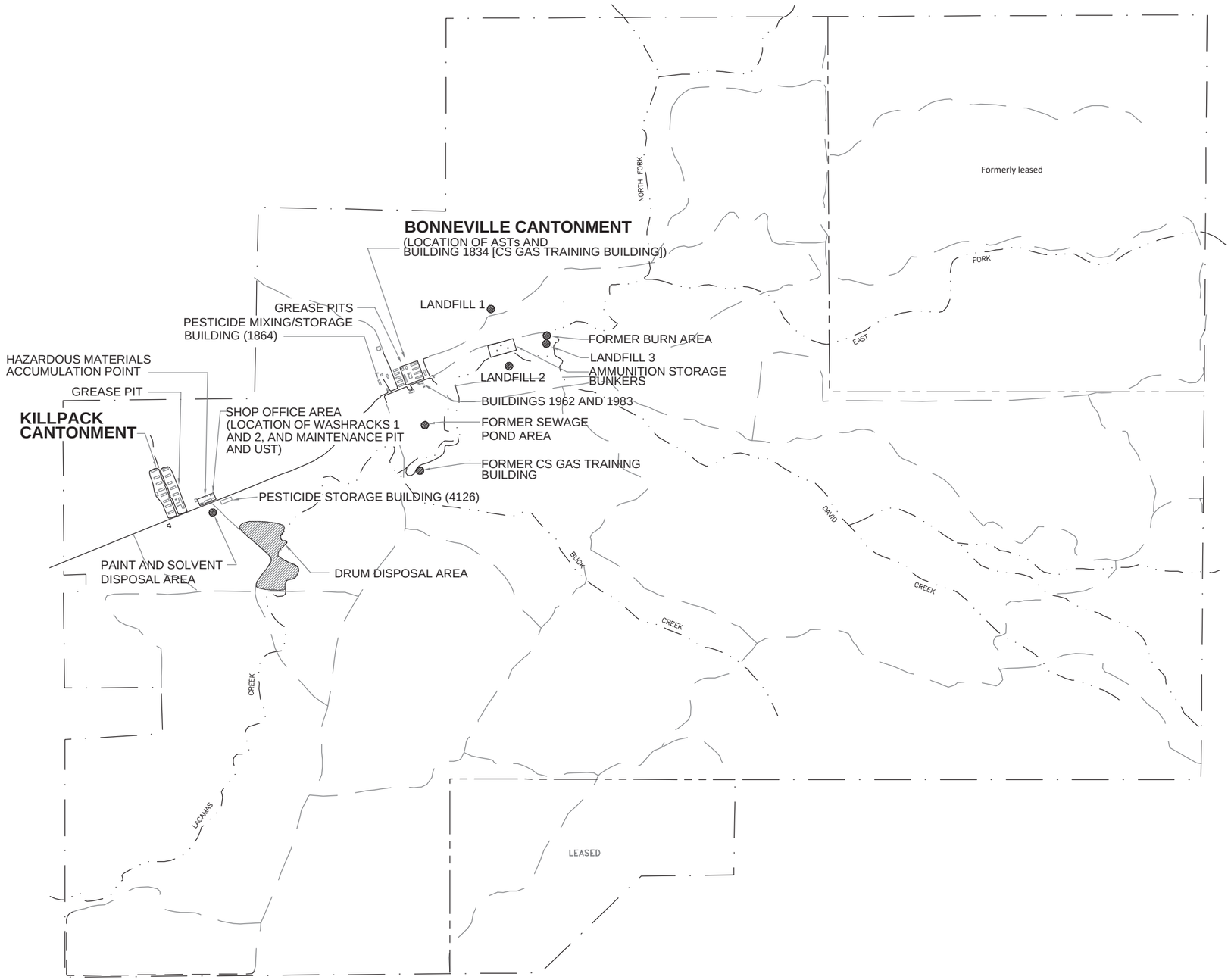
Modified from Figure 2-3 (Ecology and Environment 2012)

Base Map Reference: Shannon & Wilson, Inc. 1999a.



US Army Camp Bonneville - Periodic Review March 2026	CAMP BONNEVILLE Vancouver, Washington	Figure 4 KILLPACK CANTONMENT SITE MAP		
	0 100 200 Approximate Scale in Feet	Date: 3/27/12	Drawn by: AES	10:START-3\10030010\fig 2-4

Modified from Figure 2-4 (Ecology and Environment 2012)



LEGEND

- INSTALLATION PROPERTY BOUNDARY
- LEASED AREAS BOUNDARY
- LOOSE SURFACE, GRAVEL OR EARTHEN ROAD
- CREEKS

NOTE

REFERENCE: SHANNON & WILSON 1999

N

0 400 800 1600 3200

SCALE IN FEET

FILENAME: Q:\geo\COE\Camp Bonneville\CB-158.dwg
EDIT DATE: 08/02/04 AT: 16:37

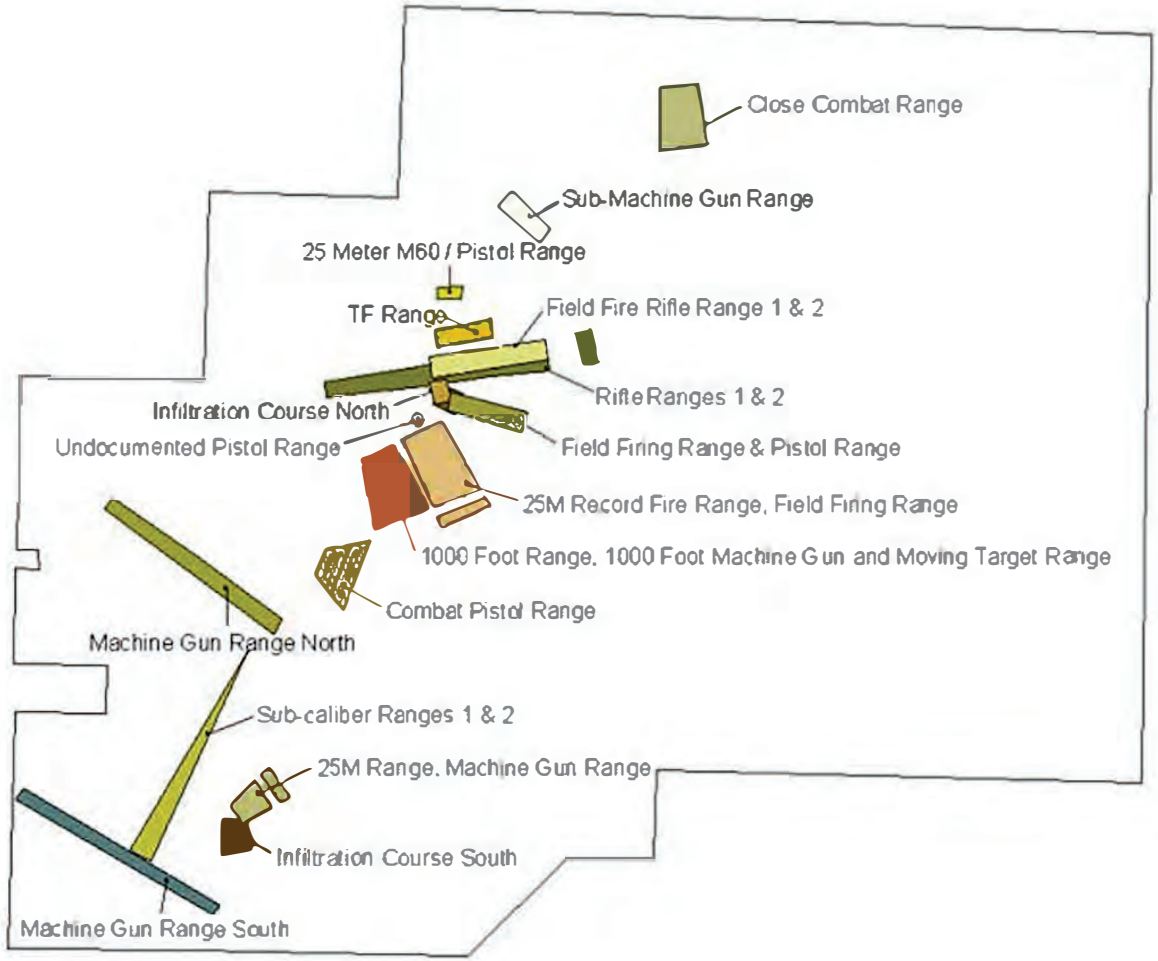
US Army Camp Bonneville - Periodic Review
March 2026

Figure 5
RAU 1 LOCATIONS

CAMP BONNEVILLE 53-03100477.04 WASHINGTON

Modified from Figure 1-2 (URS 2004)

Figure 6A
RAU 2A Small Arms Ranges Locations



Range Footprints
- 1000 Foot Range, 1000 Foot Machine Gun and Moving Target Range
- 25 Meter M60 / Pistol Range
- 25M Range, Machine Gun Range
- 25M Record Fire Range, Field Firing Range
- Close Combat Range
- Combat Pistol Range
- Field Fire Rifle Range 1 & 2
- Field Firing Range & Pistol Range
- Infiltration Course North
- Infiltration Course South
- Machine Gun Range North
- Machine Gun Range South
- Pistol Range
- Rifle Ranges 1 & 2
- Sub-Machine Gun Range
- Sub-caliber Ranges 1 & 2
- TF Range
- Undocumented Pistol Range
- Camp Bonneville Boundary

US Army Camp Bonneville - Periodic Review
March 2026

Modified from Figure 3-1 (BCRRT 2007d)

1 0 1 2 Miles

N
W E
S

RAU 2A-17

RAU 2A-15

RAU 2A-21 and RAU 2A-22

RAU 2A-20

RAU 2A-19

RAU 2A-16

RAU 2A-4

RAU 2A-18

Main Gate

Wildlife Management Area

LEGEND

- Small Arms Range
- Berm
- Property Boundary
- Central Valley Floor and Wetlands
- Wetland
- Road
- Stream / River

N

0 500 1,000 2,000 Feet

US Army Camp Bonneville - Periodic Review
March 2026

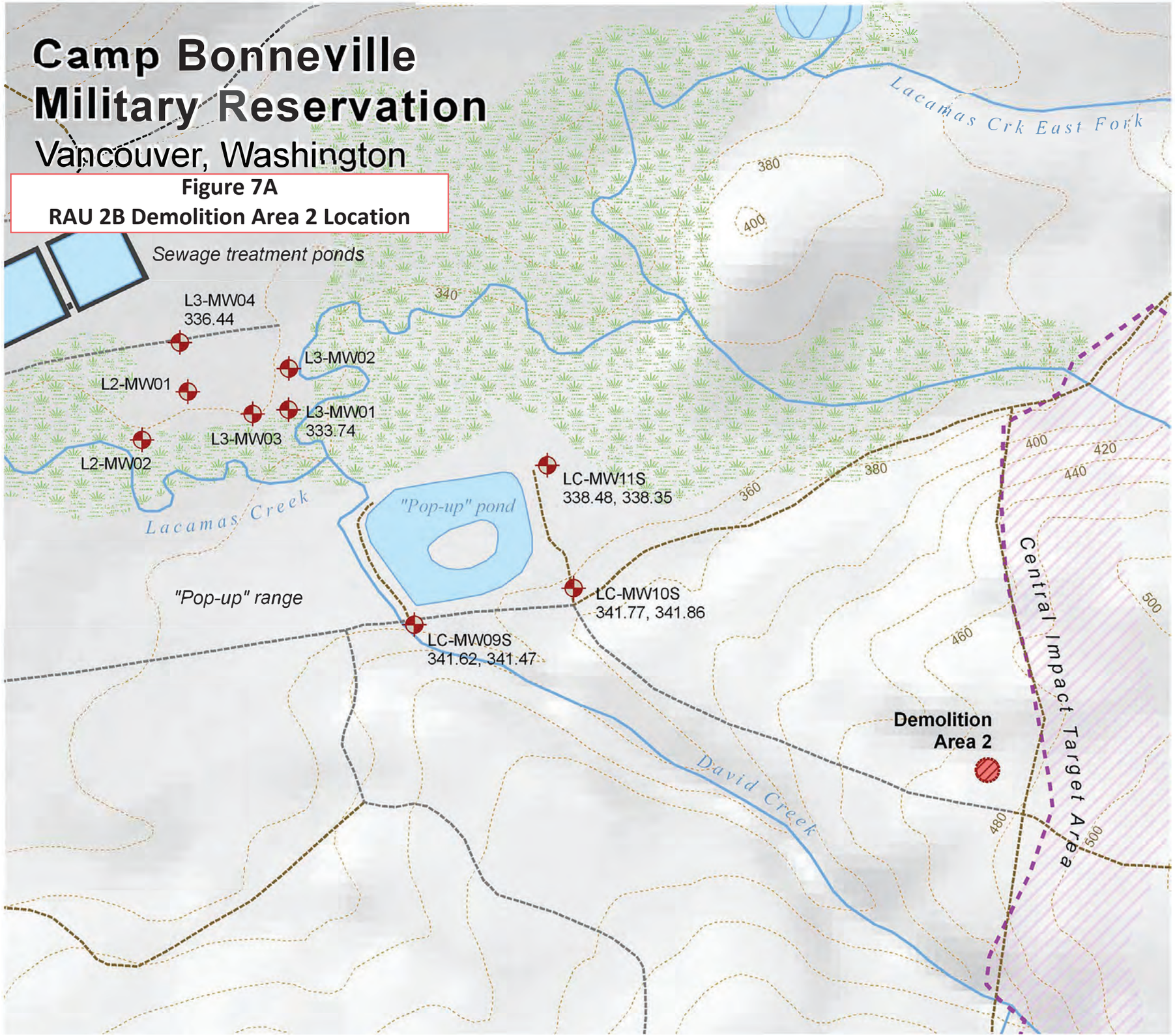
FIGURE 6B
RAU 2A Remediated Small Arms Range locations
Former Camp Bonneville Military Reservation
Vancouver, Washington

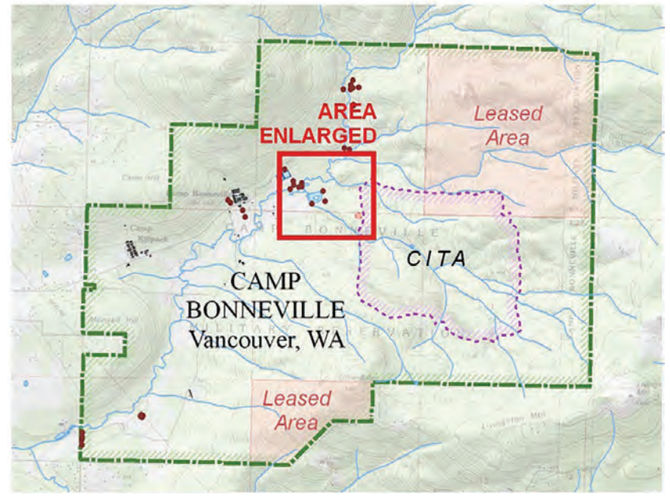
Modified from Figure 2 (Weston 2018C)

Camp Bonneville Military Reservation

Vancouver, Washington

Figure 7A
RAU 2B Demolition Area 2 Location





US Army Camp Bonneville - Periodic Review
March 2026

Modified from Figure 2 (BCCRT 2007e)

LEGEND

- Monitoring well (ID number and groundwater elevation shown*)
- Demolition area 2
- Wetlands
- CITA fence line
- Streams and creeks
- Elevation contours (20-foot intervals)

Road & Trail Conditions

- Paved roads
- Gravel roads
- Dirt trails (ATV only)

* Groundwater sample date is Jan 2003 for the first number shown; For the three wells around the "Pop-up" pond, the second number shown is from June 2006.

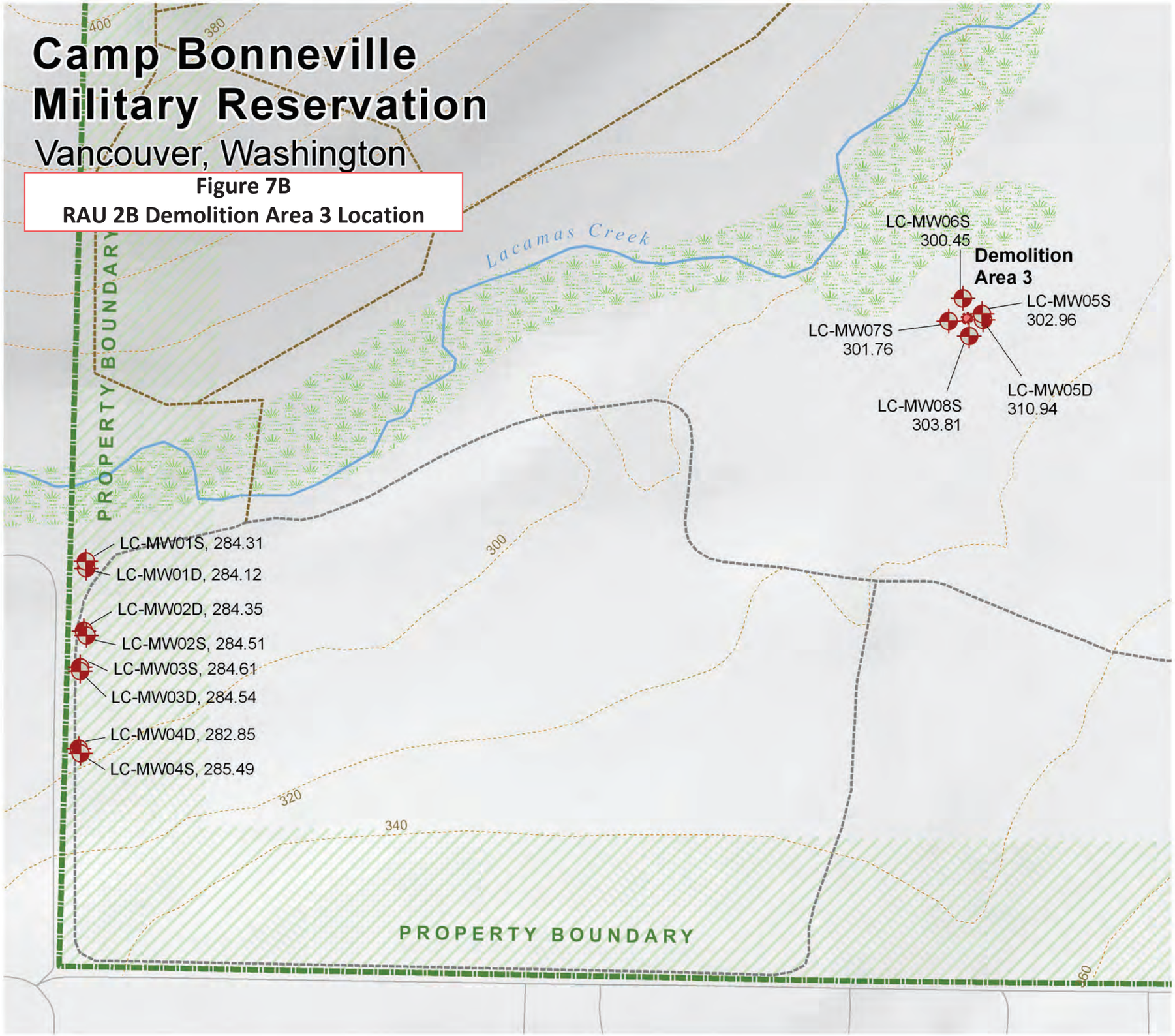
0 200 400 600 800 1,000 ft
0 50 100 150 200 m

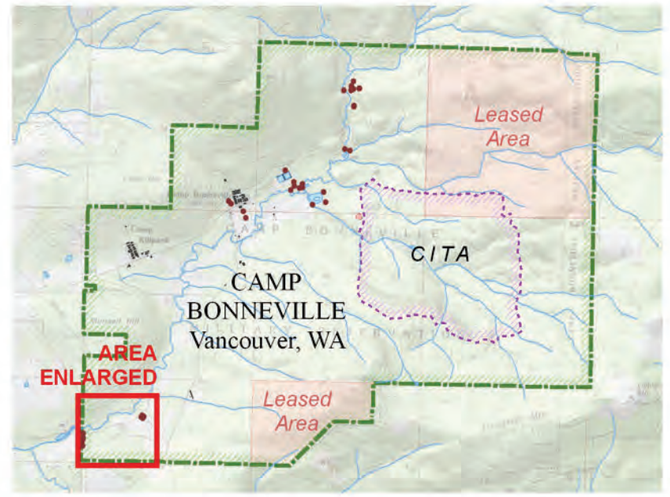
Scale - 1:3,000
Projection - Lambert Conformal Conic
Coordinate System - State Plane Washington South FIPS 4602
Data - Parsons, U.S. Army Corps of Engineers and Michael Baker Jr.
© BCRRT April 2007

Camp Bonneville Military Reservation

Vancouver, Washington

Figure 7B
RAU 2B Demolition Area 3 Location





US Army Camp Bonneville - Periodic Review
March 2026

Modified from Figure 3 (BCCRT 2007e)

- Monitoring well (ID number and groundwater elevation shown*)
- Demolition area 3
- Wetlands
- Property fence line
- Streams and creeks
- Elevation contours (20-foot intervals)

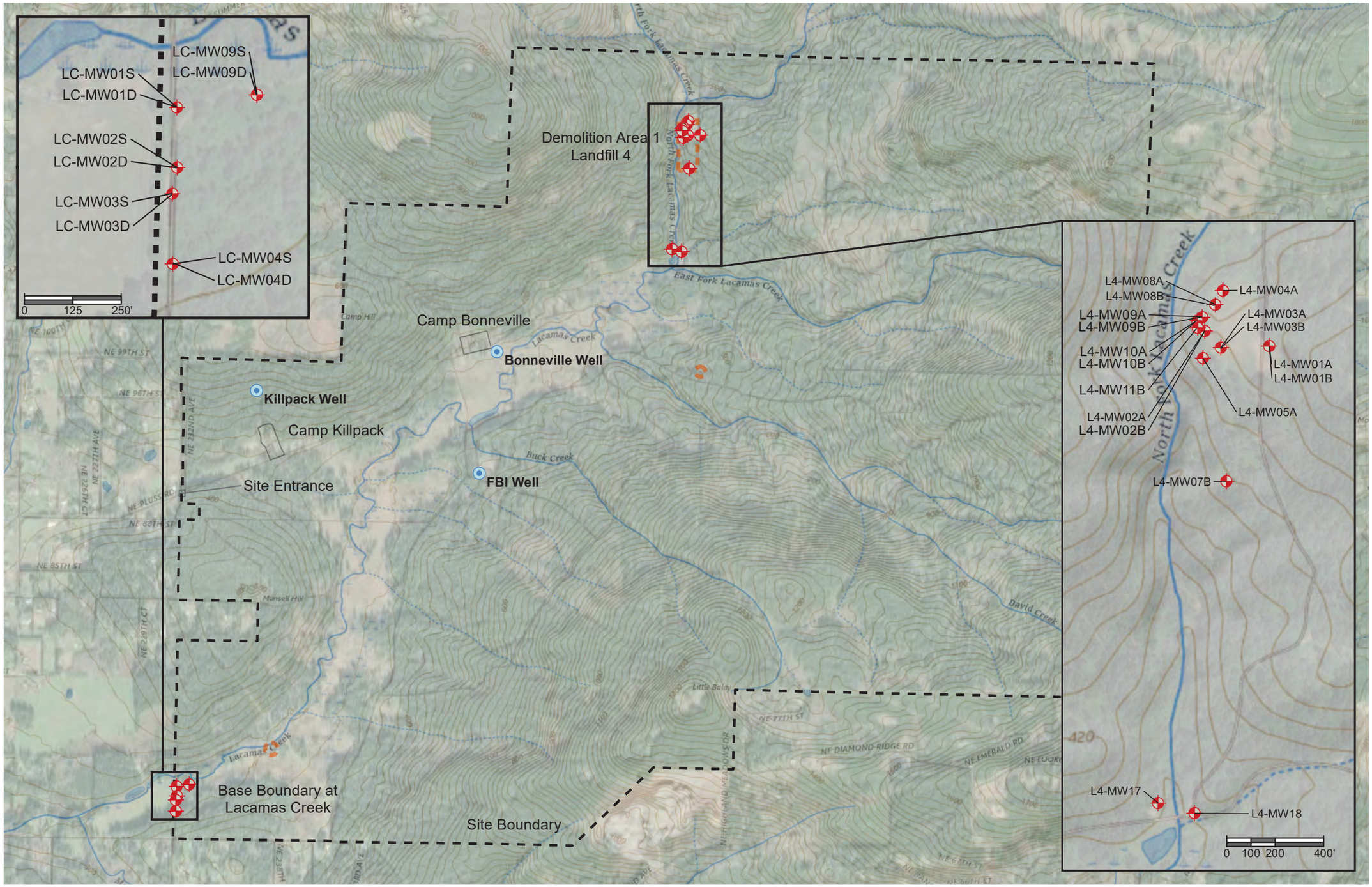
Road & Trail Conditions

- Paved roads
- Gravel roads
- Dirt trails (ATV only)

* Groundwater sample date June 2006.

0 100 200 300 400 500 ft
0 50 100 150 200 m

Scale - 1:2,500
Projection - Lambert Conformal Conic
Coordinate System - State Plane Washington South FIPS 4602
Data - Parsons, U.S. Army Corps of Engineers and Michael Baker Jr.
© BCRRT April 2007



SOURCES: USGS, ESRI WORLD IMAGERY

LEGEND

- Approximate Location of Water Supply Well
- Monitoring Well Location
- Site Boundary
- Camp Boundary
- Demolition Area

Figure 8 RAU 2C and Base Boundary Wells

US Army Camp Bonneville - Periodic Review
March 2026
Modified from PBS 2020

1 inch = 1,600 feet
0 400 800 1,600'

PREPARED FOR: CLARK COUNTY

PBS Engineering and Environmental Inc.
4412 SW Corbett Ave.,
Portland, OR 927239
503.248.1939
pbsusa.com

INVESTIGATION AREAS WITHIN CAMP BONNEVILLE BOUNDARY
CAMP BONNEVILLE
CLARK COUNTY, WASHINGTON

PROJECT
76151.009
DATE
DEC 2020
FIGURE
8

\\pbsenv\anlL\Projects\76000\76100-76199\76151_Camp Bonneville, Vancouver\DWG\GIS\2020\mxds\Fig2_SiteMap_2020Jun.mxd

Figure 9A
RAU 3 Work Areas

US Army Camp Bonneville - Periodic Review
March 2026
Modified from Figure 1.3 (Ecology 2010b)

Camp Bonneville Military Reservation
Vancouver, Washington

Mortar Position 1
Mortar Position 2
Mortar Position 3
Mortar Position 4
Mortar Position 5
Mortar Position 6
Artillery Position 1
Artillery Position 2
Artillery Position 3
Artillery Position 4
Artillery Position 5
Artillery Position 6
Artillery Position 7
Former Artillery Position 1
Former Artillery Position 2
2.36-inch Range Target
M203 Grenade Range Target (HE)
M203 Grenade Range Target (Practice)
Hand Grenade (HE) Range Target Area
Rifle Grenade Range Target Area
Rifle Grenade Firing Point
3.5-inch Rocket Range Target Area
3.5-inch Rocket Range Firing Point
Demo Area 1/ Landfill 4
Demo Area 2
Demo Area 3
Central Impact Target Area
Wildlife Management Area
Wildlife Management Area
PARK BOUNDARY
PARK BOUNDARY
Main Gate
South Gate
Elk Horn Road
NW Corner Fence Line Road
North Road - West
North Road - East
North Loop Road
Lower DNR Road
Upper DNR Road
Bobcat Road
CITA Fence North Road
CITA Fence South Road
CITA Road
SE Corner Fence Line Road
Eastern Boundary Road
Main Road
Sleepy Hill Road
Baldy Mountain Road
DNR Fence Road
Billy's Road
South Gate Circle Road
Range Road
East Fork Lacamas Creek
Buck Creek
David Creek
Lacamas Crk
Lands Road

Recommended Clearance Depths

- B3 — Site grid (with grid # shown)
- CITA (Central Impact Target Area / Central Impact Area)
- CITA targets
- Northern CITA expansion (fence)
- Western Slopes - Surface clearance (areas less than 25% slope)
- Western Slopes - Site-wide IC's (areas greater than 25% slope)
- Surface clearance
- Firing points - Sub-surface (to 14-in)

Central Valley Floor

- Frost-depth clearance (to 14-in)
- Frost-depth clearance (to 14-in) with wetland protocols

Target areas and Open Burn / Open Demolition areas are identified by labels only.

BONNEVILLE CONSERVATION, RESTORATION & RENEWAL TEAM, LLC

BCRRT

0 1,000 2,000 3,000 4,000 5,000 ft
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 mi

Scale - 1:16,000 I Projection - Lambert Conformal Conic
Coordinate System - State Plane Washington South FIPS 4602
Data - Parsons, U.S. Army Corps of Engineers, MKM Engineers and Michael Baker Jr., Inc.
© BCRRT May 2009

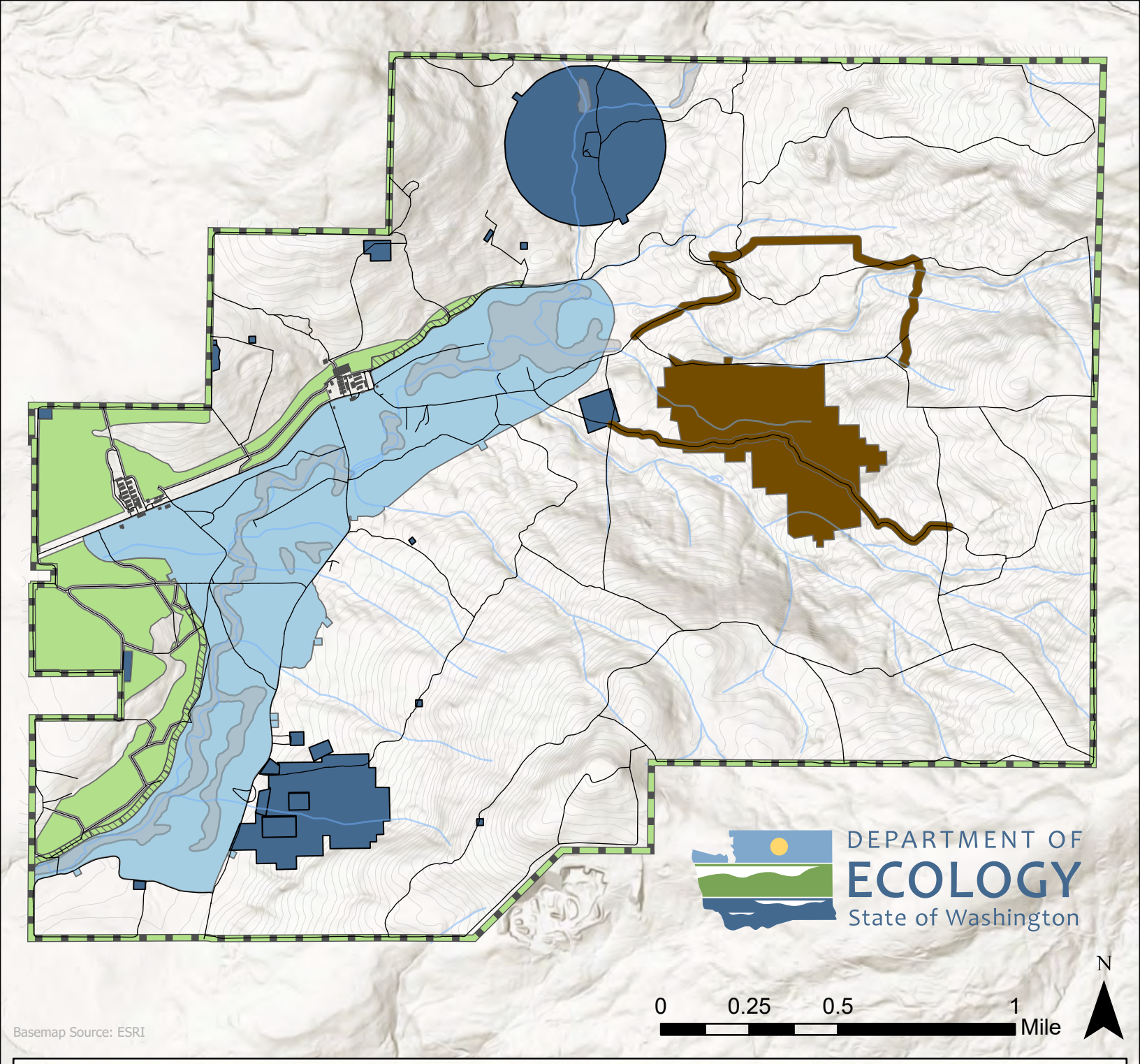


Figure 9B
RAU 3 – Cleanup Phases

- Phase 1: Central Valley Floor and Associated Wetlands
- Phase 2: Demo Areas 1 and 2, Range Target Areas, Firing Positions, and Roads and Trails Step-out Areas
- Phase 3: Central Impact Target Area (CITA) and Northern CITA Expansion
- Phase 4: Western Slopes Area (WSA)
- Phase 4: WSA Pilot Study
- Site Boundary
- Buildings
- Wetlands
- Streams
- Roads and Trails

GIS data is derived from multiple sources and reflects varying levels of accuracy. Map features may not be to scale. 2025 Camp Bonneville First Periodic Review. Prepared 08/2025.

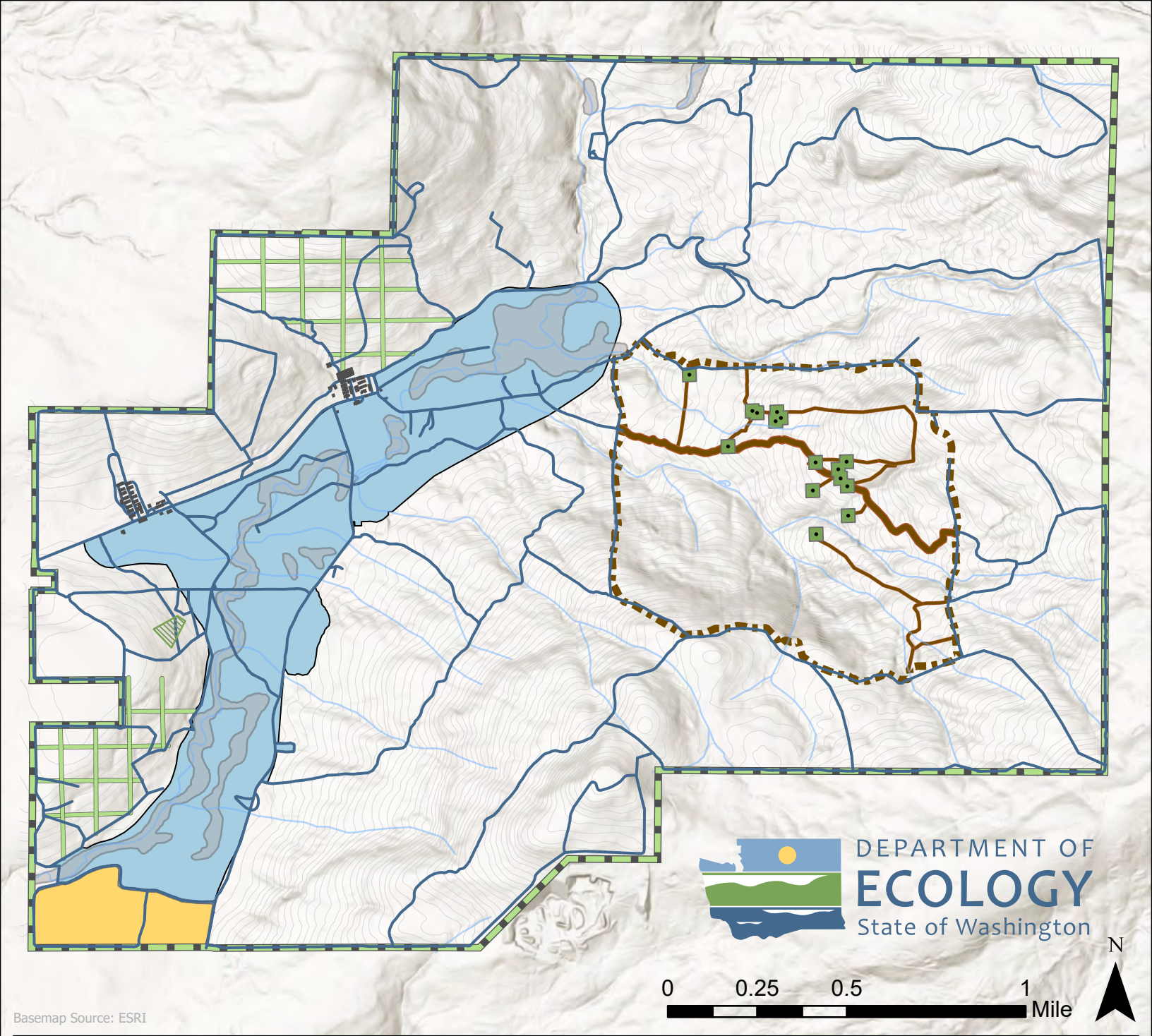


Figure 9C
RAU 3 – Emergency and Interim Actions [1]

- 2.36" Rocket Range
- Roads and Trails Buffer Zones[2]
- Environmental Study Area (ESA)
- Central Valley Floor (CVF)[3]
- Dense Vegetation/Moderate Slope (DVMS) [4]
- Central Impact Target Area (CITA) Main Road [5]
- CITA Target Access Roads [5]
- CITA Hard Target Areas [5]
- CITA Hard Targets [5]
- CITA Perimeter Fence
- Site Perimeter Fence
- Streams
- Wetlands
- Buildings

[1] This map excludes the interim action for the final inspection and disposal of material collected during all emergency and interim actions.
[2] The road and trails were not directly cleared. Instead, adjacent buffer zones, typically 20 feet wide on either side were surfaced cleared. Roads and trails located along the site boundary had a buffer zone on the interior side of the permitter fence that was 30 feet wide.
[3] The CVF interim action boundary shown on this map is approximate based on draft work plans.
[4] The transect lines in the DVMS area are approximate and based on draft work plans.
[5] The CITA Target Access Roads, CITA Hard Targets, and CITA Hard Target Area locations are approximate and based on draft work plans.

GIS data is derived from multiple sources and reflects varying levels of accuracy. Map features may not be to scale. 2025 Camp Bonneville First Periodic Review. Prepared 08/2025.

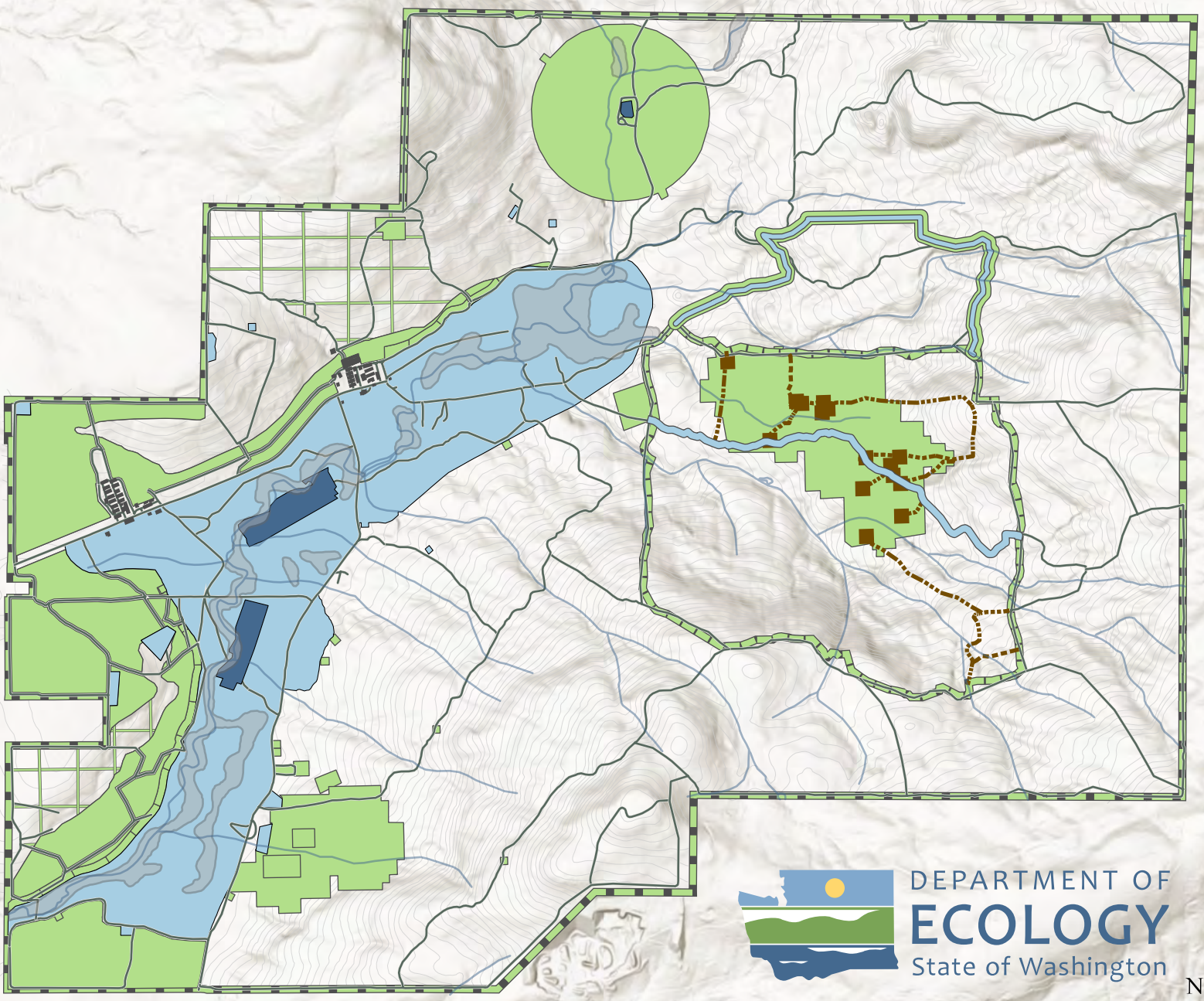


Figure 9D
RAU 3 Clearance Depth

Surface Clearance

- Roads and Trails Buffer Zones[1]
- Property Boundary Fence [2]
- CITA Perimeter Fence [3]
- 0" or 0 - 3" bgs

Subsurface Clearance

- Main CITA Road [4]
- Northern CITA Expansion Perimeter Fence/Road Easement [5]
- CITA Target Access Roads [6]
- 0 - 12" bgs [6]
- 0 - 14" bgs
- 0 - >14" bgs

[1] The road and trails were not directly cleared. Instead, adjacent buffer zones, typically 20 feet wide on either side were surfaced cleared. Roads and trails located along the site boundary had a buffer zone on the interior side of the permitter fence that was 30 feet wide.
[2] Surface cleared along a 10-foot-wide buffer on the interior side of the fence.
[3] Surface cleared along a 10-foot-wide buffer on the exterior side of the fence.
[4] Subsurface cleared to 14 inches.
[5] Surface cleared along a 10-foot-wide buffer on the interior side of the fence; subsurface cleared to 14 inches along the 10-foot-wide roadway itself; and surface cleared along a 20-foot-wide buffer on the exterior side of the roadway.
[6] CITA Target Access Roads and a 200'x200' work area around CITA Hard Targets were subsurface cleared to 12 inches as indicated by work plans. No final report exists and cannot be confirmed by Ecology.

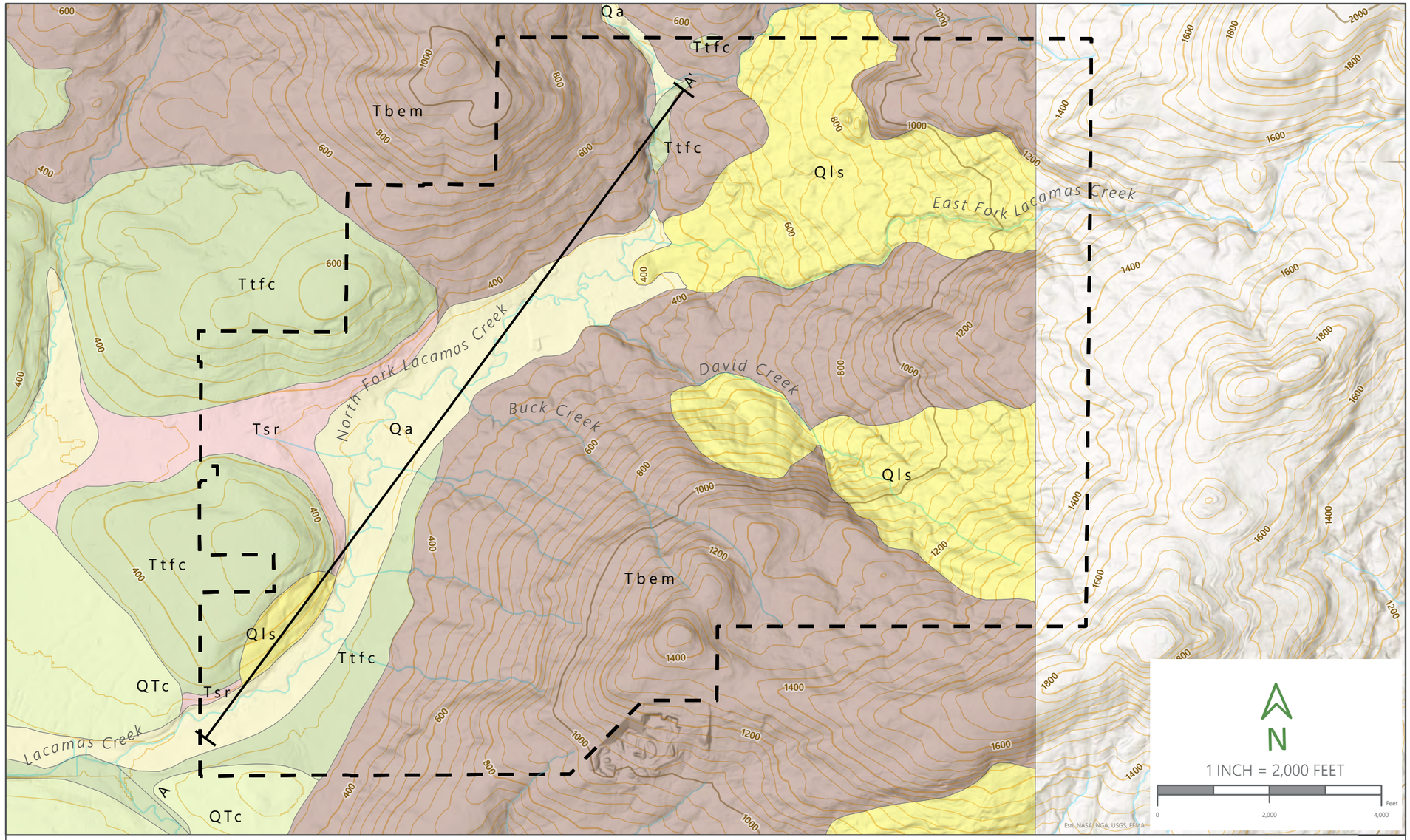
GIS data is derived from multiple sources and reflects varying levels of accuracy. Map features may not be to scale. 2025 Camp Bonneville First Periodic Review. Prepared 08/2025.

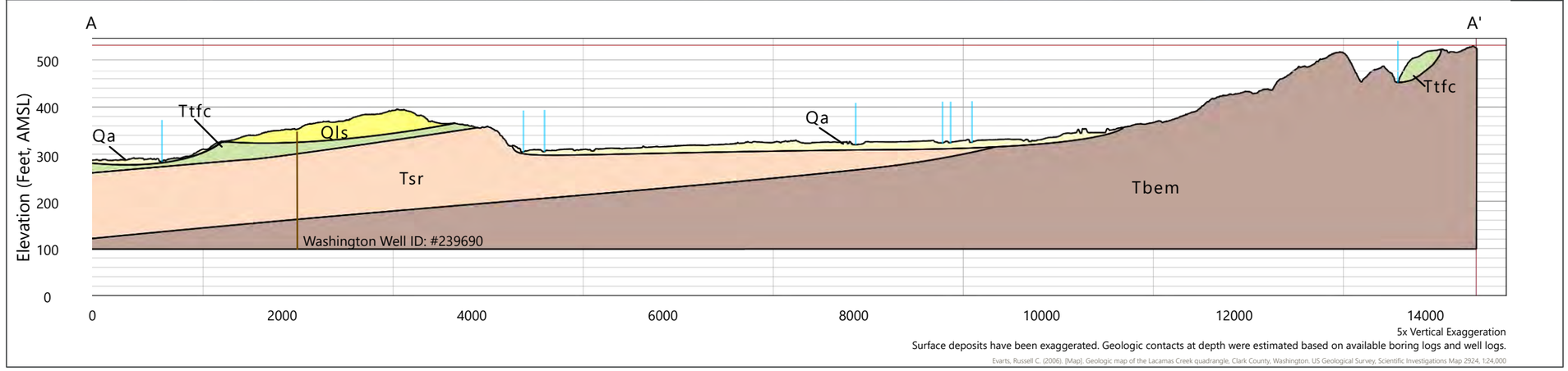
Figure 10 Sitewide Geologic Map

23201 NE Pluss Road
Vancouver, Washington

Date: January 2025
Project: CLA061-0314013-24011091

US Army Camp Bonneville - Periodic Review
September 2025 Modified from PBS Draft
Periodic Review Submission (January 2025)





Surface deposits have been exaggerated. Geologic contacts at depth were estimated based on available boring logs and well logs.

Evarts, Russell C. (2006). [Map]. Geologic map of the Lacamas Creek quadrangle, Clark County, Washington. US Geological Survey, Scientific Investigations Map 2924, 1:24,000

- Waterway
- Topographic Contour (40 Foot Interval)
- Site Boundary

Geologic Unit

- Alluvial Sediments (Qa)
- Landslide Deposits (Qls)
- Lower Troutdale Member (Ttfc)
- Sandy River Mudstone (Tsr)
- Basaltic Andesite of Elkhorn Mountains (Tbem)

PBS

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

NAD 1983 StatePlane Washington South FIPS 4602 Feet | L:\Projects\76000\76100-76199\76151_Camp Bonneville, Vancouver\DWG\GIS\23Q2\76151_CampB_23Q2\76151_CampB_23Q2.aprx | 12/23/2024 12:45 PM

O:\Data\TWC\CLIENTS\Clark County\Vanc-Clark Parks\Camp Bonneville\GIS\Final Reuse Plan 6-3-03 JR

Law Enforcement / Clark College / Rustic Retreat / Outdoor School Classrooms and Offices (C / O)

* Reuse / Renovate Existing Camp Killpack Buildings for Outdoor School, Retreat Center &/or Law Enforcement Training Center
* 3 to 6 Classrooms - New Building
* Administrative Offices
* Future Expansion As Needed
* Law Enforcement Training Areas

Rustic Retreat / Outdoor School (RR / OS)

* Reuse / Renovate Existing Camp Bonneville Buildings
* Classrooms
* Lodging
* Native American Cultural Center
* New Multi-Purpose Building and Other Building Expansion As Needed
* Park Administration Center
* Park Maintenance Headquarters

Rustic Retreat Future Expansion (RRFE)

* Future Building

Regional Park (RP)

* Hiking Trails
* Equestrian Trails
* Mountain Bike Trails
* Picnic Areas & Shelters
* Amphitheater & Stage
* Restrooms
* Tent/Yurt Camping
* RV Camping
* Park Watchperson's Residence
* Archery Range
* Park Entry / Control Station (Fee Collection Booth, Information Board, Kiosk & Turn Around)
* Park Transit Station & Route
* General Store
* Equestrian Center
* Trailhead & Parking

Firing Ranges

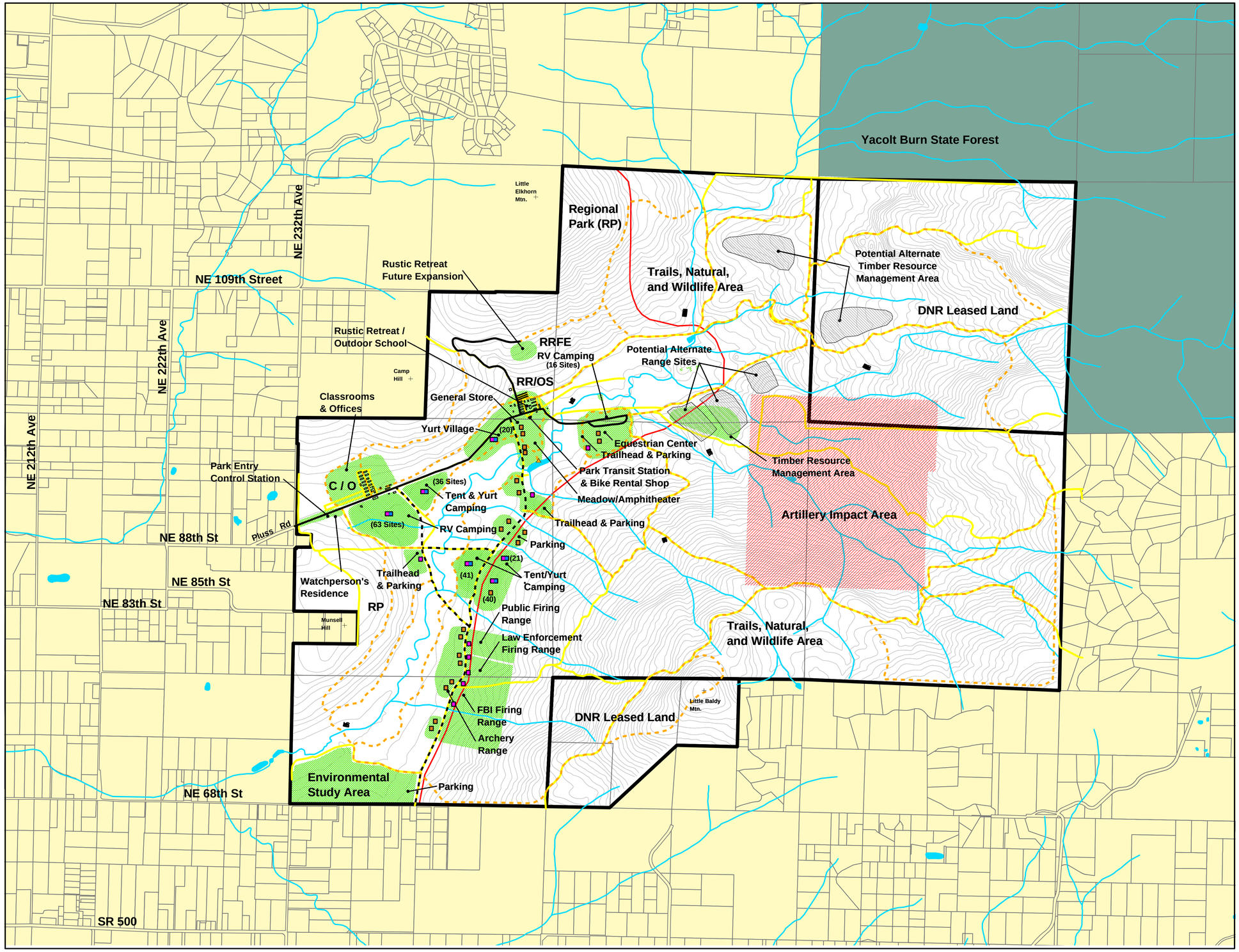
* Local Law Enforcement Range
* FBI Range
* Public Range
* Restrooms for Shooters
* Mine Gravel for Range Site

Environmental Study Area

* Outdoor Studies
* CPU Well Field
* Water Resource Center (Wastewater Treatment Facility)

Trail, Natural, and Wildlife Areas

* Hiking Trails
* Equestrian Trails
* Mountain Bike Trails
* Wildlife Habitat Area



CLARK COUNTY, WASHINGTON

Figure 11

2005 Camp Bonneville Reuse Plan

Preliminary Site Plan

LEGEND

- Restrooms & Showers
- Restrooms
- Group Picnic Shelters
- Water Access
- Site Facilities
- 20 Foot Contour Intervals
- Trails
- Existing Unpaved Roads
- Gravel Road
- Paved Road
- Artillery Impact Area
- Regional Park Boundary
- Site Boundary Line
- Existing Buildings
- Taxlots
- Private Property
- Yalcolt Burn State Forest
- Park Transit Route 'A'
- Park Transit Route 'B'

N W E S

0 300 600 1,200 1,800 2,400 Feet

LAND AREA SUMMARY:

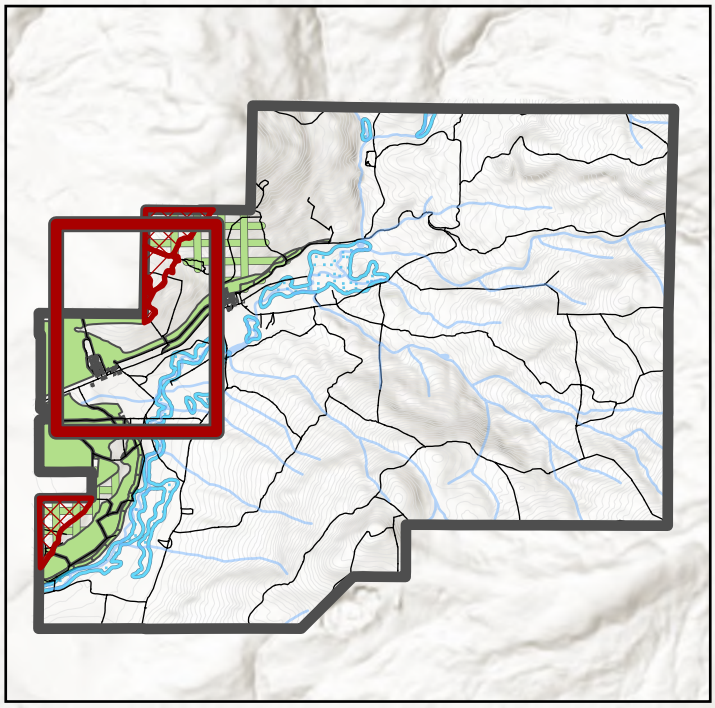
Camp Bonneville:	3,040 acres
DNR Land Area 'A':	620 acres
DNR Land Area 'B':	180 acres
TOTAL AREA:	3,840 acres

the jd white company, inc

Creative Problem Solving

Plot Date: 6-3-03

Information Source: Clark County GIS Data Oct. 2002



0 250 500 1,000 Feet

N

Basemap Source: ESRI

Figure 12A
Western Slopes Area Reporting Discrepancy

- Area Previously Identified as Reporting Discrepancy w/ Less Than 25% Slope
- Phase 4: Western Slopes Area (WSA)
- Dense Vegetation/Moderate Slope (DVMS)
- Roads and Trails
- Site Boundary
- Buildings
- Streams
- Wetlands

DEPARTMENT OF ECOLOGY
State of Washington

GIS data is derived from multiple sources and reflects varying levels of accuracy. Map features may not be to scale. 2026 Camp Bonneville First Periodic Review. Prepared 03/2026.

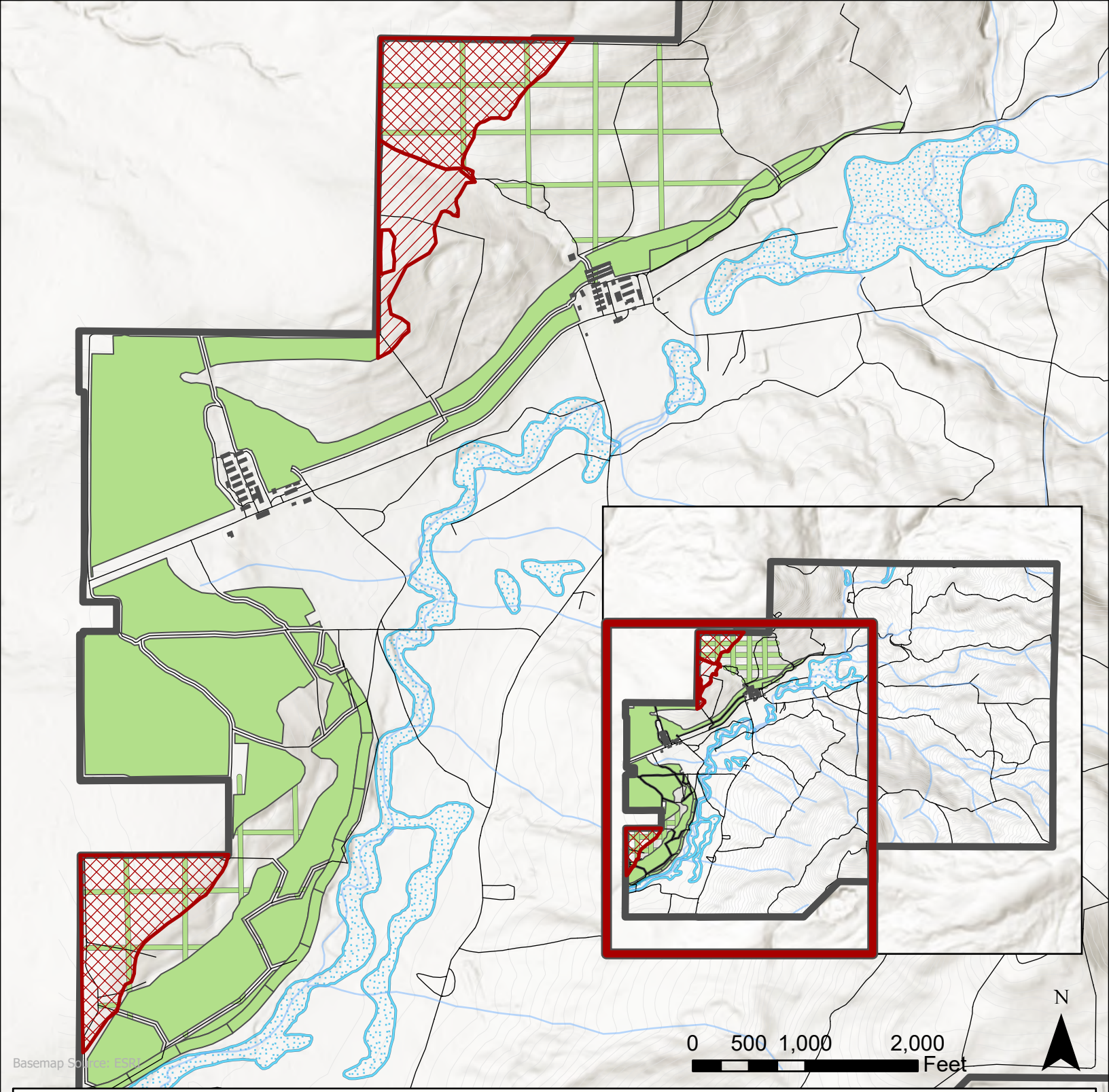


Figure 12B
Transect Areas Excluded From Surface MEC Clearance

- Area Previously Identified as Reporting Discrepancy w/ Less Than 25% Slope
- Area Previously Investigated by Transect w/ Less Than 25% Slope
- Phase 4: Western Slopes Area (WSA)
- Dense Vegetation/Moderate Slope (DVMS)
- Roads and Trails
- Site Boundary
- Buildings
- Streams
- Wetlands

DEPARTMENT OF ECOLOGY
State of Washington

GIS data is derived from multiple sources and reflects varying levels of accuracy. Map features may not be to scale. 2026 Camp Bonneville First Periodic Review. Prepared 03/2026.

TABLES

Table 2-1 Remedial Action Units

Remedial Action Unit (RAU)	Description	Chemicals of potential Concern*
RAU 1	20 areas where hazardous substances (other than military ammunition) have been found	petroleum hydrocarbons, pesticides, VOCs, SVOCs, solvents, and lead- and chromium-containing paint
RAU 2A	small arms ranges with lead and munition contamination in soils	metals - lead
RAU 2B	Demolition Area 2 and Demolition Area 3	petroleum hydrocarbons, VOCs, SVOCs, metals, and explosive compounds
RAU 2C	Landfill 4 / Demolition Area 1	Explosive Compounds, VOCs, SVOCs
RAU 3	Sitewide cleanup of munitions and explosives of concern	MEC; UXO

Notes

VOCs = Volatile organic compounds
SVOCs = Semi-volatile organic compounds
MEC = Munitions and explosives of concern
UXO = Unexploded ordnance
* = MEC and UXO are not chemicals but are dangerous waste

Table 2-2 RAU 2A Ranges

Range	Cleanup Designation
Close Combat Range	
25 Meter M60 Range/Pistol Range	2A-17
Sub Machine Gun Range	
TF Range	
Rifle Ranges 1 & 2	2A-21
Field Fire Rifle Ranges 1 & 2	2A-22
Infiltration Course North	
Field Firing Ranges 1 & 2 and Pistol Range	2A-20
Undocumented Pistol Range	2A-15
1,000-inch Rifle Range / Machine Gun Range*	2A-16
Combat Pistol Range	2A-4
Machine Gun Range North	
Machine Gun Range South	
M31 Sub-Caliber Ranges 1 & 2	
25 Meter and Machine Gun Range	2A-18
Infiltration Course South	
25 M Record Fire Field/Field Firing range	2A-19
*Range Identified in RI/FS and several earlier documents as 1,000 Foot Range, Machine Gun and Moving Target Range	

Table 2-3 RAU 1 Cleanup Standards

Chemical of Potential Concern*			MTCA 2001 Values**				MTCA 2025 Values CLARC February 2025 Update				Note	Comparison	RAU 1 locations with cleanup actions										
			Method A		Method B		Method A		Method B				Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1	Maintenance Pit (Building 4475)	Washrack 2	Pesticide Storage/Mixing Bldg.	ASTs	Former CS Gas Training Building	Pesticide Storage Building 4126	Ammunition Storage Magazines	UST associated with building 4475
			Soil Unrestricted land use	Ground water	Soil Direct Contact	Ground water	Soil Unrestricted land use	Ground water	Soil	Ground water													
Chemical Name	CAS	Class	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L													
Acetone	67-64-1	VOC					NE	NE	72000	7200	1		X										
2-Butanone (methyl ethyl ketone)	78-93-3	VOC	NE	NE	48000	4800	NE	NE	48000	4800		No change	X										
tert-Butylbenzene	98-06-6	VOC	NE	NE	NE	NE	NE	NE	8000	800		Current values are more stringent	X										
Carbon Disulfide	75-15-0	VOC	NE	NE	8000	800	NE	NE	8000	800		No Change				X		X					
Cis-1,2-Dichloroethene	156-59-2	VOC	NE	NE	800	80	NE	NE	160	16		Current values are more stringent				X							
Ethylbenzene	100-41-4	VOC	6 .00	700	8000	800	6.00	700	8000	800		No change	X										
2-Hexanone (butyl methyl ketone)	591-78-6	VOC	NE	NE	NE	NE	NE	NE	400	40		Current values are more stringent	X			X							
Isopropylbenzene (cumene)	98-82-8	VOC	NE	NE	8000	1600	NE	NE	8000	800		Current values (groundwater) are more stringent	X										
Naphthalene	91-20-3	VOC	0.10	160	1600	160	5.00	160	1600	160		Current Method A soil Less stringent. Method A water and Method B values no change	X										
n-Propylbenzene	103-65-1	VOC	NE	NE	NE	NE	NE	NE	8000	800		Current values are more stringent	X			X							

Chemical of Potential Concern*			MTCA 2001 Values**				MTCA 2025 Values CLARC February 2025 Update				Note	Comparison	RAU 1 locations with cleanup actions										
			Method A		Method B		Method A		Method B				Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1	Maintenance Pit (Building 4475)	Washrack 2	Pesticide Storage/Mixing Bldg.	ASTs	Former CS Gas Training Building	Pesticide Storage Building 4126	Ammunition Storage Magazines	UST associated with building 4475
			Soil Unrestricted land use	Ground water	Soil Direct Contact	Ground water	Soil Unrestricted land use	Ground water	Soil	Ground water													
Chemical Name	CAS	Class	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L													
1,3,5-Trimethylbenzene	108-67-8	VOC	NE	NE	NE	NE	NE	NE	800	80		Current values are more stringent	X			X							
1,2,4-Trimethylbenzene	95-63-6	VOC	NE	NE	NE	NE	NE	NE	800	80		Current values are more stringent				X							
Vinyl Chloride	75-01-4	VOC	NE	0.20	0.67	0.0292	NE	0.20	0.67	0.029	CA	No change				X							
m-Xylene	108-38-3	VOC	9.00	1000	160000	16000	NE	NE	16000	1600		Current Method B Values No change; Method A values removed (see total Xylenes)	X			X							
p-Xylene	106-42-3	VOC	9.00	1000	160000	16000	NE	NE	16000	1600		Current Method B Values No change; Method A values removed (see total Xylenes)	X			X							
o-Xylene	95-47-6	VOC	9.00	1000	160000	16000	NE	NE	16000	1600		Current Method B Values No change; Method A values removed (see total Xylenes)	X			X							

Chemical of Potential Concern*			MTCA 2001 Values** Method A Soil Unrestricted land use	MTCA 2001 Values** Method A Ground water	MTCA 2001 Values** Method B Soil Direct Contact	MTCA 2001 Values** Method B Ground water	MTCA 2025 Values CLARC February 2025 Update Method A Soil Unrestricted land use	MTCA 2025 Values CLARC February 2025 Update Method A Ground water	MTCA 2025 Values CLARC February 2025 Update Method B Soil	MTCA 2025 Values CLARC February 2025 Update Method B Ground water	Note	Comparison	RAU 1 locations with cleanup actions: Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1	Maintenance Pit (Building 4475)	Washrack 2	Pesticide Storage/Mixing Bldg.	ASTs	Former CS Gas Training Building	Pesticide Storage Building 4126	Ammunition Storage Magazines	UST associated with building 4475
Chemical Name	CAS	Class	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L													
Xylenes	1330-20-7	VOC	--	--	--	--	900	1000	16000	1600		Current Method A soi values less stringent. Method A water and Method B values no change	X			X							
Benzo[b]fluoranthene	205-99-2	SVOCs	NE	--	--	--	NE	NE	NE	NE		No change								X			
bis(2-Ethylhexyl)phthalate (DEHP)	117-81-7	SVOCs	NE	NE	71.40	6.25	NE	NE	71.0	6.30		No change			X			X		X			
di-n-Butylphthalate	84-74-2	SVOCs	NE	NE	8000	1600	NE	NE	8000	1600		No change			X			X		X			
Diethyl phthalate	84-66-2	SVOCs	NE	NE	64000	12800	NE	NE	64000	13000		Current water value is less stringent. No change for soil value				X							
2,4-Dinitrotoluene	121-14-2	SVOCs	NE	NE	160	32.0	NE	NE	160	32.0		No Change								X			
2,6-Dinitrotoluene	606-20-2	SVOC; Explosives	NE	NE	80.0	16	NE	NE	24.0	4.80		Current values more stringent								X			
Hexachlorobenzene	118-74-1	SVOCs	NE	NE	0.63	0.0547	NE	NE	0.63	0.027	CA	Current Method B water value more stringent)						X					
Naphthalene	91-20-3	SVOCs	5.00	160	1600	160	5.00	160	1600	160		No change	X										
N-Nitrosodiphenylamine	86-30-6	SVOCs	NE	NE	204	17.9	NE	NE	200	18	CA	No change								X			
Pyrene	129-00-0	SVOCs	NE	NE	2400	480	NE	NE	2400	240		Current water more stringent.								X			
Beta-BHC (Beta-Hexachlorocyclohexane)	319-85-7	Organochlorine Pesticides	NE	NE	NE	NE	NE	NE	0.560	0.049	CA	Current values more stringent									X		

Chemical of Potential Concern*			MTCA 2001 Values**				MTCA 2025 Values CLARC February 2025 Update				Note	Comparison	RAU 1 locations with cleanup actions										
			Method A		Method B		Method A		Method B				Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1	Maintenance Pit (Building 4475)	Washrack 2	Pesticide Storage/Mixing Bldg.	ASTs	Former CS Gas Training Building	Pesticide Storage Building 4126	Ammunition Storage Magazines	UST associated with building 4475
Chemical Name	CAS	Class	Soil Unrestricted land use mg/kg	Ground water µg/L	Soil Direct Contact mg/kg	Ground water µg/L	Soil Unrestricted land use mg/kg	Ground water µg/L	Soil mg/kg	Ground water µg/L													
gamma-BHC (Lindane)	58-89-9	Organochlorine Pesticides	0.010	0.200	0.77	0.0673	0.010	0.200	0.910	0.080	CA	Current Method B values less stringent									X		
gamma-Chlordane	5103-74-2	Organochlorine Pesticides	NE	NE	NE	NE	NE	NE	40.0	4.00		Current values more stringent			X	X							
alpha-Chlordane	5103-71-9	Organochlorine Pesticides	NE	NE	NE	NE	NE	NE	40.0	4.00		Current values more stringent			X	X							
Chlordane (tech) - technical mixture	12789-03-6	Organochlorine Pesticides	1.00	0.1	2.86	0.25	NE	NE	2.90	0.13	CA	Current method B water values more stringent. No change in Method B soil. Method A values removed			X	X							
4,4'-DDD	72-54-8	Organochlorine Pesticides	NE	NE	4.17	0.365	NE	NE	4.20	0.36		No change				X			X		X		
4,4'-DDE	72-55-9	Organochlorine Pesticides	NE	NE	2.94	0.257	NE	NE	2.90	0.13	CA	Current water value more stringent				X			X		X		
4,4'-DDT	50-29-3	Organochlorine Pesticides	3.00	0.3	2.94	0.257	3.00	0.30	2.90	0.26	CA	No Change			X	X			X		X		
Endosulfan Sulfate	1031-07-8	Organochlorine Pesticides	NE	NE	NE	NE	NE	NE	480	96		Method B values added				X							
Endrin	72-20-8	Organochlorine Pesticides	NE	NE	24.00	4.80	NE	NE	24	4.80		No Change				X							
2,4-D (2,4-Dichlorophenoxy acetic acid)	94-75-7	Chlorophenoxy Herbicides	NE	NE	800.00	160	NE	NE	800	160		No change						X			X		

Chemical of Potential Concern*			MTCA 2001 Values**				MTCA 2025 Values CLARC February 2025 Update				Note	Comparison	RAU 1 locations with cleanup actions										
			Method A		Method B		Method A		Method B				Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1	Maintenance Pit (Building 4475)	Washrack 2	Pesticide Storage/Mixing Bldg.	ASTs	Former CS Gas Training Building	Pesticide Storage Building 4126	Ammunition Storage Magazines	UST associated with building 4475
			Soil Unrestricted land use	Ground water	Soil Direct Contact	Ground water	Soil Unrestricted land use	Ground water	Soil	Ground water													
Chemical Name	CAS	Class	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L													
2,4-DB	94-82-6	Chlorophenoxy Herbicides	NE	NE	640.00	128	NE	NE	NE	NE		Current values less stringent									X		
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	73432-75-4	Chlorophenoxy Herbicides	NE	NE	800	160	NE	NE	800	160		No change						X			X		
MCPP (Mecoprop) (methylchlorophenoxypropionic acid)	93-65-2	Chlorophenoxy Herbicides	NE	NE	NE	NE	NE	NE	80.0	16.0		Current values more stringent									X		
Gasoline Range no detectable Benzene	N/A	Total Petroleum Hydrocarbons	100	1000	NE	NE	100	1000	NE	NE		No Change									X		
Gasoline range, benzene present	N/A	Total Petroleum Hydrocarbons	100	800	NE	NE	30.0	800	NE	NE		Current values more stringent											
Diesel Range	N/A	Total Petroleum Hydrocarbons	2000	500	NE	NE	2000	500	NE	NE		No Change	X	X	X	X		X	X				X
Oil Range	N/A	Total Petroleum Hydrocarbons	2000	500	NE	NE	2000	500	NE	NE		No Change									X		
Antimony	7440-36-0	Metals	NE	NE	32.0	6.40	NE	NE	32.0	6.40		No Change	X	X	X	X		X			X	X	
Arsenic	7440-38-2	Metals	20.0	5.00	0.67	0.058	20.0	5.00	0.31	0.0027		Revised down (method b)	X	X	X	X		X			X	X	
Barium	7440-39-3	Metals	NE	NE	5600	1120	NE	NE	16000	3200		revised up (less stringent)	X	X	X	X		X			X	X	
Beryllium	7440-41-7	Metals	NE	NE	160	32	NE	NE	160	32		No change	X	X	X	X		X			X	X	
Cadmium	7440-43-9	Metals	2.00	5.00	8.00	8.00	2.00	5.00	80.0	8		No change	X	X	X	X		X			X	X	
Chromium Total	7440-47-3	Metals	NE	--	--	--	NE	50	NE	NE		Current value for method A water more stringent	X	X	X	X		X			X	X	
Copper	7440-50-8	Metals	NE	NE	2960	592	NE	NE	3200	640		Current values less stringent	X	X	X	X		X		X	X	X	

Chemical of Potential Concern*			MTCA 2001 Values**				MTCA 2025 Values CLARC February 2025 Update				Note	Comparison	RAU 1 locations with cleanup actions										
			Method A		Method B		Method A		Method B				Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1	Maintenance Pit (Building 4475)	Washrack 2	Pesticide Storage/Mixing Bldg.	ASTs	Former CS Gas Training Building	Pesticide Storage Building 4126	Ammunition Storage Magazines	UST associated with building 4475
			Soil Unrestricted land use	Ground water	Soil Direct Contact	Ground water	Soil Unrestricted land use	Ground water	Soil	Ground water													
Chemical Name	CAS	Class	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L													
Lead	7439-92-1	Metals	250	15	NE	NE	250	15	NE	NE		No change	X	X	X	X		X		X	X	X	
Mercury	7439-97-6	Metals	2.00	2.00	24.0	4.80	2.00	2.00	NE	NE		No change			X	X		X				X	
Nickel	7440-02-0	Metals	NE	NE	1600	320	NE	NE	1600	320		No change	X	X	X	X		X			X	X	
Selenium	7782-49-2	Metals	NE	NE	400	80.0	NE	NE	400	80.0		No change			X	X							
Silver	7440-22-4	Metals	NE	NE	400	80.0	NE	NE	400	80			X	X		X		X			X	X	
Thallium	7440-28-0	Metals	NE	NE	56.00	1.12	NE	NE	0.8	0.16		Current values more stringent				X						X	
Zinc	7440-66-6	Metals	NE	NE	24000	4800	NE	NE	24000	4800		No change	X	X	X	X		X			X	X	
2,4-Dinitrotoluene	121-14-2	Explosives	NE	NE	160	32.0	NE	NE	160	32		No Change								X		X	
2,4,6-Trinitrotoluene (TNT)	118-96-7	Explosives	NE	NE	33.3	2.92	NE	NE	33.0	2.9	CA	No Change										X	
2-Amino-4,6-dinitrotoluene	35572-78-2	Explosives	NE	NE	NE	NE	NE	NE	8.00	1.60		Current values more stringent										X	
2-Amino-2,6-dinitrotoluene	19406-51-0	Explosives	NE	NE	NE	NE	NE	NE	8.00	1.60		Current values more stringent										X	
HMX (Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine)	2691-41-0	Explosives	NE	NE	4000	800	NE	NE	4000	800		No change										X	
RDX (Hexahydro-1,3,5-trinitro-1,3,5-triazine)	121-82-4	Explosives	NE	NE	9.09	0.795	NE	NE	13	1.10	CA	Current values less stringent										X	
PETN (pentaerythritol tetranitrate)	78-11-5	Explosives	NE	NE	NE	NE	NE	NE	720	140		Current values more stringent										X	

Notes:

* Values are Chemical of Potential Concern for RAU 1 cleanups which had remedial activities. As Indicator hazardous substances were established this list includes every chemical detected above laboratory reporting limits for those locations.

** Values from RAU 1 Cleanup Action Plan Table 4-1 Screening Levels (Tetra tech 2004). Cited source was Model Toxics Control Act Cleanup Regulation, WAC 173-340 Method A values are from Ecology Publication 94-06 amended February 12, 2001. Method B values are from MTCA Cleanup Levels and Risk Calculations (CLARC) version 3.1, Ecology publication 94-145 updated November 2001. Soil values are for direct contact (ingestion only). Soil values were in µg/kg and subsequent revisions to Clark adjusted soil values to mg/kg and rounded multiple values. Ecology considers these cases as no change in comparative cleanup values

1 Acetone values were blank in Table 4-1

CA Indicates values are for Method B Direct Contact Cancer (Eq. 740-2) and Groundwater Method B Cancer (Eq. 720-2)

Chemical of Potential Concern*			MTCA 2001 Values**				MTCA 2025 Values CLARC February 2025 Update				Note	Comparison	RAU 1 locations with cleanup actions										
			Method A		Method B		Method A		Method B				Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1	Maintenance Pit (Building 4475)	Washrack 2	Pesticide Storage/Mixing Bldg.	ASTs	Former CS Gas Training Building	Pesticide Storage Building 4126	Ammunition Storage Magazines	UST associated with building 4475
			Soil Unrestricted land use	Ground water	Soil Direct Contact	Ground water	Soil Unrestricted land use	Ground water	Soil	Ground water													
Chemical Name	CAS	Class	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L	mg/kg	µg/L													
NE	Not Established																						
--	Changes have occurred in how the induvial substance is evaluated																						

Table 3-1 Historic Forestry Activities

Year	Acres Harvested	Primary Prescription	Priority Focus
2012	50	Release thin	Dense stands near access roads
2013	200	Release thin	High-density Douglas-Fir units
2014	101	Release thin	High-density Douglas-Fir units
2015	--	--	--
2016	--	--	--
2017	79	Mixed thinning and replanting	Expanded thinning in Priority I areas
2018	150	Release thin - hazard removal	Expanded thinning in Priority I areas
2019	130	Release thin - hazard removal	Expanded thinning in Priority I areas
2020	194	Complete release thin - hazard removal	Expanded thinning in Priority I areas
2021	--	--	--
2022	46	Release thin - hazard removal	Expanded thinning in Priority I areas
2023	144	Complete release thin - hazard removal	Expanded thinning in Priority I areas
2024	--	--	--
2025	--	--	--

Table 3-2 Institutional Controls

Area	Institutional Control	Reference	Section	Implementation
Sitewide	Residential Use Restriction - Property may not be used for residential purposes.	Environmental Protection Provisions - Exhibit C 10/2006 Quitclaim deed	1.A.(1)	In Place
Sitewide; RAU 2C;	Development of groundwater resources underlying Demolition Area 1/Landfill 4 (RAU 2C) is prohibited. Development of groundwater resources outside of RAU 2C area is permitted subject to approval of Washington Department of Ecology and US Army. Existing developed groundwater resources may be used for non-potable uses. Potable use may be allowed provided the regulating agencies have made a written determination.	Environmental Protection Provisions - Exhibit C 10/2006 Quitclaim deed	1.A.(2)	In place
Sitewide;	Excavation Land use Restrictions - No excavation or other intrusive activity without qualified UXO personnel (UXOQP) on staff and a DoD approved Explosives Safety Submission and/or explosives site plan.	Environmental Protection Provisions - Exhibit C 10/2006 Quitclaim deed	1.A.(3)	Substantially in place. Services of UXOQP retrained by County as of June 2025. The requirement for submission of Explosive Safety Submission being reviewed by DoD and County as there is no mechanism for approval of an Explosive Safety Submission when using anomaly avoidance procedures.
Sitewide;	Public Access Restrictions - No public access until all remedial actions are completed.	Environmental Protection Provisions - Exhibit C 10/2006 Quitclaim deed	1.A.(4)	In place
Site perimeter	Construct and maintain a fence along the perimeter of the Property to control or restrict public access.	Environmental Protection Provisions - Exhibit C 10/2006 Quitclaim deed	1.A.(4)	In place - Site Inspections observed damaged sections of fencing; however, the County is actively performing ongoing maintenance.
Sitewide	Provide and maintain appropriate signage to inform about the potential hazards on the Property.	Environmental Protection Provisions - Exhibit C 10/2006 Quitclaim deed	1.A.(4)	Partially in place - Signage was permanently installed and remains in place but does not identify the hazard associated with each building. Annual reporting on the restrictive covenants id not clearly identify that RAU 1 signage was being maintained.
Sitewide	Archaeological Site and Preservation Covenant.	Environmental Protection Provisions - Exhibit C 10/2006 Quitclaim deed Amended Prospective Purchasers Consent Decree (Ecology 2012a)	Exhibit: C 1.A.(5) APPCD: X.D.(F)	In place
Sitewide; RAU Specific	Long-Term Operation and Maintenance Plan - Shall include all actions at the RAU that are necessary to ensure the long-term effectiveness of the cleanup completed at the RAU.	Amended Prospective Purchasers Consent Decree (Ecology 2012a) Final Cleanup Action Plan Small Arms Ranges (RAU 2A) Camp Bonneville (BCCRT 2008d)	APPCD: X.C. APPCD: X.D. RAU 2A 2008 CAP: 8.3	Not in place - Long term O&M Plan not developed

Area	Institutional Control	Reference	Section	Implementation
RAU 1	Restrictive Covenant in place for Buildings 4475 and Building T-1932.In the event that either Buildings 4475 and Building T-1932 are demolished additional soil sampling shall be performed and that in the event such soil sampling reveals a need for further remediation such remediation will be undertaken. A sign shall be posted permanently on or in each building identifying the potential environmental contamination associated with the particular building and provide notification that upon demolition soil sampling is required and additional may be required. Annual reports documenting this institutional control is in place is required by the restrictive covenant.	RAU 1 Cleanup Action Plan (Tetra tech 2004) Restrictive Covenant (11/21/2006)	7.2.3	Substantially in place - Signage was permanently installed and remains in place. Annual reporting on the restrictive covenants, however, did not clearly identify that RAU 1 signage was in place and maintained.
RAU 1; Sitewide	Soil Excavation Restrictions - A soil excavation permit shall be required for each proposed excavation within the boundary of Camp Bonneville. The permit shall be required for each excavation or subsurface activity, regardless of the planned depth of the activity.	RAU 1 Cleanup Action Plan (Tetra Tech 2004)	7.2.3	Not in place - No Permit System is in place though project management team is notified soil excavations. Permit systems are a standard land use control for DOD properties. The Cleanup Action Plan for RAU 1 was developed while the DOD owned the property and this requirement may need to be modified use by Clark County Public Works.
RAU 1; Sitewide	Education Program.	RAU 1 Cleanup Action Plan (Tetra Tech 2004)	7.2.4	Partially in place - display board present at Range HQ; County Public Works has developed formalized UXO awareness training for the Site.
RAU 3; Site Specific; CITA	Annual surface MEC inspection of the CITA and inspections after heavy rainstorms to minimize the potential risk from frost heave.	Proposed Changes to the 2010 Cleanup Action Plan for Remedial Action Unit 3, Site Wide Munitions Contamination (Ecology 2017a)	Page 2, Proposed Changes to Above Cleanup Actions 3.	Not in place
RAU 3; Sitewide	Formal Institutional Control Manual.	RAU 3 Cleanup Action Plan (Ecology 2010b)	2.5.1 4.2.5	Not in place
RAU 3; Sitewide	Fencing and signage along the perimeter of the facility as well as fencing and signage used to isolate CITA. Warning signs identifying potential of UXO at 50 ft intervals.	RAU 3 Cleanup Action Plan (Ecology 2010b)	3.0	In place - County is performing ongoing maintenance.
RAU 3; Sitewide	Public Information Program - Permit Notification program on-site permits for construction or installations of building foundations, aboveground/underground utility lines, roads, and other paved or graded gravel areas, land surveying, timber management, and other tasks which will or may involve land disturbance activities.	RAU 3 Cleanup Action Plan (Ecology 2010b)	3.0	Not in place
RAU 3; Sitewide	Permit Program to be supported and reinforced by Standard operating Procedures for construction and maintenance related activities and other potential land disturbing tasks.	RAU 3 Cleanup Action Plan (Ecology 2010b)	3.0	Not in place

Area	Institutional Control	Reference	Section	Implementation
RAU 3; Sitewide	Printed media program and On-site Information Kiosk.	RAU 3 Cleanup Action Plan (Ecology 2010b)	3.0	Partially in place - display board present at Range HQ; Printed media program has not been developed.
RAU 3; Sitewide	Two Clark County Park Employees certified as Level I MEC technicians.	RAU 3 Cleanup Action Plan (Ecology 2010b)	3.0	Not in place
RAU 3; Site Specific	Signage at select target areas and each firing point to increase public awareness of past military activities conducted at the site.	RAU 3 Cleanup Action Plan (Ecology 2010b);	4.5.5	Not in place
RAU 3; Site Specific; CITA	The restrictive covenants will prohibit any future development and/or forestry activities within the CITA.	RAU 3 Cleanup Action Plan (Ecology 2010b)	4.2.5	Not in place - no restrictive covenant prohibiting development or forestry has been recorded.
RAU 3; Site Specific	Signs along roads and trails at appropriate intervals to inform the public about the past military use of the site.	RAU 3 Cleanup Action Plan (Ecology 2010b)	4.6.5	Not in place
RAU 3; Site Specific	Construction support activities for forest management and fire suppression logging work.	RAU 3 Cleanup Action Plan (Ecology 2010b); RAU 3 RI/FS 2008 RI/FS (BCRRT 2008f)	4.7.5 8.2.10.2	Not in place - Construction support has been provided for these activities but no formal program has been established.
Sitewide	Groundwater monitoring.	APPCD	X.B.2	In Place
RAU 2A	Soil covers at RAU 2A-16 and RAU 2A-21 need inspections and maintenance to be protective. The need maintenance and institutional controls are identified in the RAU 2A CAP addendum; however, no details are provided. Ecology has recommended institutional controls in this periodic review.	Addendum to the Cleanup Action Plan Small Arms Ranges RAU 2A-16 and RAU 2A-21 (Weston 2017)	5.1.	Currently not an institutional Control

Appendix A. Ecology Site Inspections

Camp Bonneville Military Reservation

Periodic Review Site Inspection Field Report

Site Name: Camp Bonneville

Date of Inspection: December 5-6, 2024

Agency Leading Periodic Review:
Washington State Department of Ecology

Location: Vancouver, WA

Facility Site ID: 69965472
Cleanup Site ID: 11670

Weather: Clear skies with calm winds. Temperature range: 36°F – 50°F.

Ecology Site Inspectors: Forrest Malone, John Fot

Other Personnel Present:
Dec. 5, 2024 – John Foxtrot (PBS/Apex), Mike Stevens (PBS/Apex), Sheridan Kindrick (PBS/Apex), Kevin Tyler (Clark County), Erik Harrison (Clark County)

Dec. 6, 2024 – Mike Stevens (PBS/Apex), Kevin Tyler (Clark County)

Public Information Program

Institutional control (IC) in place and maintained: Partially

An unexploded ordnance (UXO) awareness briefing was presented to the inspection team by the Clark County Parks maintenance supervisor. Clark County has recently begun utilization of a draft county standard operating procedure directing the usage of an authorized UXO awareness briefing along with associated documentation of trainers and trainees. At present, no documentation exists for prior UXO awareness training and/or acknowledgement thereof.

A display board was present in the range headquarters (HQ) building depicting a wide array of items found on Camp Bonneville. Each item was previously inerted and conspicuously labeled.

During site inspection, Ecology observed multiple personnel (county, contractor, law enforcement, or otherwise) accessed the property. Inspection team did not witness any persons signing into Range HQ for accountability on the property and it is unknown if these persons have had prior UXO awareness training.

Property Perimeter Fence Line

IC in place and maintained: Partially

Perimeter fence line was inspected at various locations due to perimeter road accessibility. Clark County informed the inspection team that entirety of perimeter fence line is accessible by maintenance staff with appropriate vehicles and access to all areas may be limited by

seasonal weather. Fence line appears to be mostly intact with interspersed areas of disrepair (due to weather events, animal crossing, or other natural occurrences). Clark County Parks Maintenance is actively repairing fence areas as time and resources permit. There is no documentation of their ongoing or past repair activities. Signs are mostly present at 50' intervals. Some signage is obscured by biological growth or illegible due to age/weather.

Central Impact Target Area (CITA) Perimeter Fence Line

IC in place and maintained: Partially

CITA fence line was inspected at various locations due to perimeter road accessibility (see attached map). Fence line appears to be intact with no discernable areas of disrepair where inspected. CITA access through-road is unsecured. Stranded barbed wire is utilized as a "gate" to discourage traffic through the CITA, however the stranded barbed wire is continuously placed off to the side of the access road allowing full access to CITA and was found in this unsecured condition at the time of site inspection. No means to secure the access road were identified.

CITA perimeter fence line and road along the northern CITA expansion were in good condition and noticeably maintained. No documentation was provided for any ongoing maintenance and repairs. Signage is legible and conspicuously visible at appropriate intervals where inspected.

Ecology inspected approximately 200' feet of the CITA through-road surface with a Schonstedt GA-52cx magnetic locator, using anomaly avoidance techniques. During this inspection, no less than five subsurface anomalies were detected (no investigation of detected anomalies occurred. The nature of these anomalies is unknown). Water erosion was observed down the length of the through-road.

Roads and Trails

IC in place and maintained: Partially

Roads observed to be maintained dependent on maintenance staff availability and seasonal access. Clark County informed the inspection team that all roads and trails are accessible by maintenance staff with appropriate vehicles, and access to all areas may be limited by seasonal weather. Some rutting of roads is present, and inspection team noted that inspection vehicles easily caused rutting during site inspection. Signage not readily present throughout property along roads and trails, however some (< 5) older signs were observed, though some of those were also partially obscured to biological growth or illegible due to age/weather.

Firing Points

IC in place and maintained: No

Firing points not readily identifiable for inspection, however the inspection team was informed that there are no signs present at the known firing points.

Western Slopes Area (WSA)

IC in place and maintained: No

No physical delineation of WSA observed; however, the WSA is identifiable on property maps. No modern signage observed in mapped area of WSA aside from perimeter fence line.

Reuse Construction Areas

IC in place and maintained: No

Reuse construction areas are part of proposed reuse areas identified in 2008 RI/FS. These areas have not yet been established.

M203 HE Grenade Range Target Area

IC in place and maintained: No

ICs, for this area, are dependent on the quality assurance (QA) of the munitions and explosives of concern (MEC) remediation effort. Further review will be required before determining if ICs are necessary. Presently, no signage is observable.

M203 Practice Grenade Range Target Area

IC in place and maintained: No

ICs, for this area, are dependent on the quality assurance (QA) of the munitions and explosives of concern (MEC) remediation effort. Further review will be required before determining if ICs are necessary. Presently, no signage is observable.

Tent and Yurt Camping Area in South Central Valley Floor (CVF)

IC in place and maintained: N/A

Tent and yurt camping area is part of proposed reuse areas identified in 2008 RI/FS. These areas have not yet been established.

RV and Tent Camping Area in North CVF

IC in place and maintained: N/A

RV and tent camping area is part of proposed reuse areas identified in 2008 RI/FS. These areas have not yet been established.

Rifle Grenade Target Area

IC in place and maintained: No

No physical delineation of rifle grenade target area, however the rifle grenade target area is identifiable on property maps. No signage was observed.

3.5-inch Rocket Range Target Area

IC in place and maintained: No

No physical delineation of 3.5-inch rocket range target area, however the 3.5-inch rocket range target area is identifiable on property maps. No signage was observed.

Wildlife Management Area (WMA)

IC in place and maintained: No

No physical delineation of WMA observed; however, the WMA is identifiable on property maps. No modern signage observed in mapped area of proposed wildlife management area aside from CITA and property perimeter fence lines.

Bldg. 4475 - Maintenance Pit

IC in place and maintained: Yes

Signage present on four sides of building. Building is inside of unsecured fenced compound.

Bldg. T-1932 - Above Ground Storage Tank

IC in place and maintained: Yes

Signage present on three sides of building. Building is publicly accessible inside of Camp Bonneville cantonment area.

Bldg. 2950 - Storage Magazine

Bldg.(s) Present: 3
In Use: Unknown

Bldg. 2950 contains three buildings. Two of these structures are earth covered magazines outside of a fenced compound and are empty. One building is inside of a fenced area and its construction makeup is undiscernible due to limited access and visibility within the fenced area. Inside of the fenced area are two BATFE type 2 portable explosives storage magazines. Their usage is unknown due to lack of placarding and no contact information signage on fence/gate. Fenced area is secured.

Demo Area 1 / Landfill 4

IC in place and maintained: Yes

No signage present. Area is regularly maintained (mowed). Groundwater monitoring wells present in this area. These wells appear to be actively maintained and presumed to be in use for monitoring. Lacamas Creek was observed for evidence of groundwater seeps entering the stream. To the west of RAU 2C there was moisture on the stream bank and standing water outside the stream channel above the flowing water line, however it was not possible to determine if this was from seeps or left by recent high water that receded. Inspection of Lacamas Creek at the bridge to the north of RAU 2C revealed evidence that the stream level was approximately 12-16 inches higher where vegetation was disturbed and debris deposited by stream flow was observed leaving a high-water mark.

Soil Cap at RAU-2A-16

IC in place and maintained: Unknown

Area clear of trees and only sparse grassy vegetation. Partially standing silt fence still visible on western/northwestern boundary to lower lying wetland area. No evidence of erosion into adjacent wetland was visible. Evidence of rutting was visible, presumably from vehicle traffic, near roadway access side of perimeter of soil cap area. Unknown concrete structure located at far eastern/southeastern side, immediately outside of soil cap area. This unknown structure is presumably remnant of the former 1000-inch rifle range and machine gun range.

Soil Cap at RAU-2A-21

IC in place and maintained: Unknown

Area dense with dead standing trees with some deadfall in area of soil cap. Some trees have been felled/bucked above the ground surface presumably from area maintenance.

Additional Notes:

- One gallon container of hazardous material (weapons cleaning solvent) discovered at the FBI shooting/training range in an uncovered, unsecured area, and without appropriate containment. Container is corroded with a legible label. Container taken to proper storage area by Clark County employee. A flammable storage cabinet was identified in a separate secured area of the FBI shooting/training range.
- Open storage of fuel containers (1-5 gal) and other chemicals identified at the Clark County Sheriff's Office storage facility adjacent to the FBI shooting/training range within a secured and covered area. A flammable storage cabinet was observed nearby in the same CCSO secured area, however access to it was obstructed with debris.
- Historical buildings (Camp Kilpatrick and Camp Bonneville cantonment areas), with painted exteriors, had visible flaking paint exposed to weather and subsequent runoff to ground.
- One historical building at Camp Bonneville cantonment area was utilized as a close quarters combat training facility. Simulated ammunition debris was present in and around building entrances despite usage of waste bins to collect simulated ammunition shipping containers. Unsure of current disposal practices, on this site, for simulated ammunition and associated shipping containers.
- Two additional BATFE type 2 portable explosives storage magazines were present near the former 1000yd firing range. Both magazines were open and empty. No placarding was observed, and no contact information signage was present on fencing surrounding storage area. Unsure of ownership or current usage.
- Three 55-gallon drums were found on the 1000yd firing range. All three were empty with no label or illegible labels. One drum was open, two were sealed.
- Identified former Combat Pistol Range near the presumed former Hand Grenade Range Target Area. No signage present and various small arms cartridge cases were identified on the range.
- Frost heaves were observed at many locations site wide where soil was exposed.

Camp Bonneville Military Reservation

Periodic Review Site Inspection Photo Log

Photos Taken By: Forrest Malone & John Fot, Dec. 5-6, 2024

1. Entry sign to Camp Bonneville.

2. Inerted military munitions on display inside of Range HQ building.

3. Section of perimeter fence line on the northwester portion of site. Signage is visible and spaced at approx. 50’ intervals.

4. One of the warning signs on perimeter fence line.

5. Missing/damaged segment of perimeter fence line in northwestern portion of site.

6. Bldg. T-1932 and appropriate institutional control signage.

7. Two Type 2 explosives storage magazines within a secured fenced compound near Bldg. 2950.

   Type 1 explosives storage magazine in the background. Presumed to be original part of Bldg. 2950.

8. Additional view of previous image:

   Type 1 magazine in foreground.

   Type 2 magazines in background.

9. 1 of 2 additional Type 1 explosives storage magazines as part of Bldg. 2950.

   Earth-covered magazine. Access door is approx. 3' tall.

10. 2 of 2 additional Type 1 explosives storage magazines as part of Bldg. 2950.

    Earth-covered magazine. Access door is approx. 1.5' tall.

11. Historical signage above earth-covered magazines at Bldg. 2950.

12. Drum found near 1000-yard range.

13. Another drum found near 1000-yard range.

14. Another drum found near 1000-yard range.

15. Evidence of frost heave on site.

16. Empty Type 2 explosives storage magazines located near 1000-yard range in an unsecured fenced compound.

17. Snags (dead, standing trees) in area of RAU-2A-21 soil cap.

18. Felled trees in area of RAU-2A-21 soil cap.

19. FBI firing range.

20. Open storage of full chemical container at FBI shooting range.

21. Clark Country Sheriff Office secured storage compound collocated at FBI shooting range.

    Fuel containers visible in background and obstructed access to flammable storage locker in foreground.

22. Downrange view from firing point of M203 high explosive (HE) range.

23. RAU-2A-16 soil cap area. Remnants of silt fencing visible in left 1/3 of image.

24. Presumed area of M203 practice range.

25. Presumed area of Demolition Area #3.

26. Perimeter fence at southern boundary of site. Signage is readily visible and at appropriately spaced intervals.

27. Uprooted tree near southern portion of property near Range Rd.

28. Former pistol range near former hand grenade target range.

29. Portion of northern perimeter fence line.

30. Bldg. 4475. Appropriate signage present on 4 sies of the building.

    Flaking exterior paint and staining visible throughout.

31. Presumed oil staining at exterior of Bldg. 4475

32. Detail of flaking paint on exterior of Bldg. 4475.

33. Partially legible historical sign near Western Slopes Area (WSA).

34. Fence line and warning sign along northern CITA expansion perimeter.

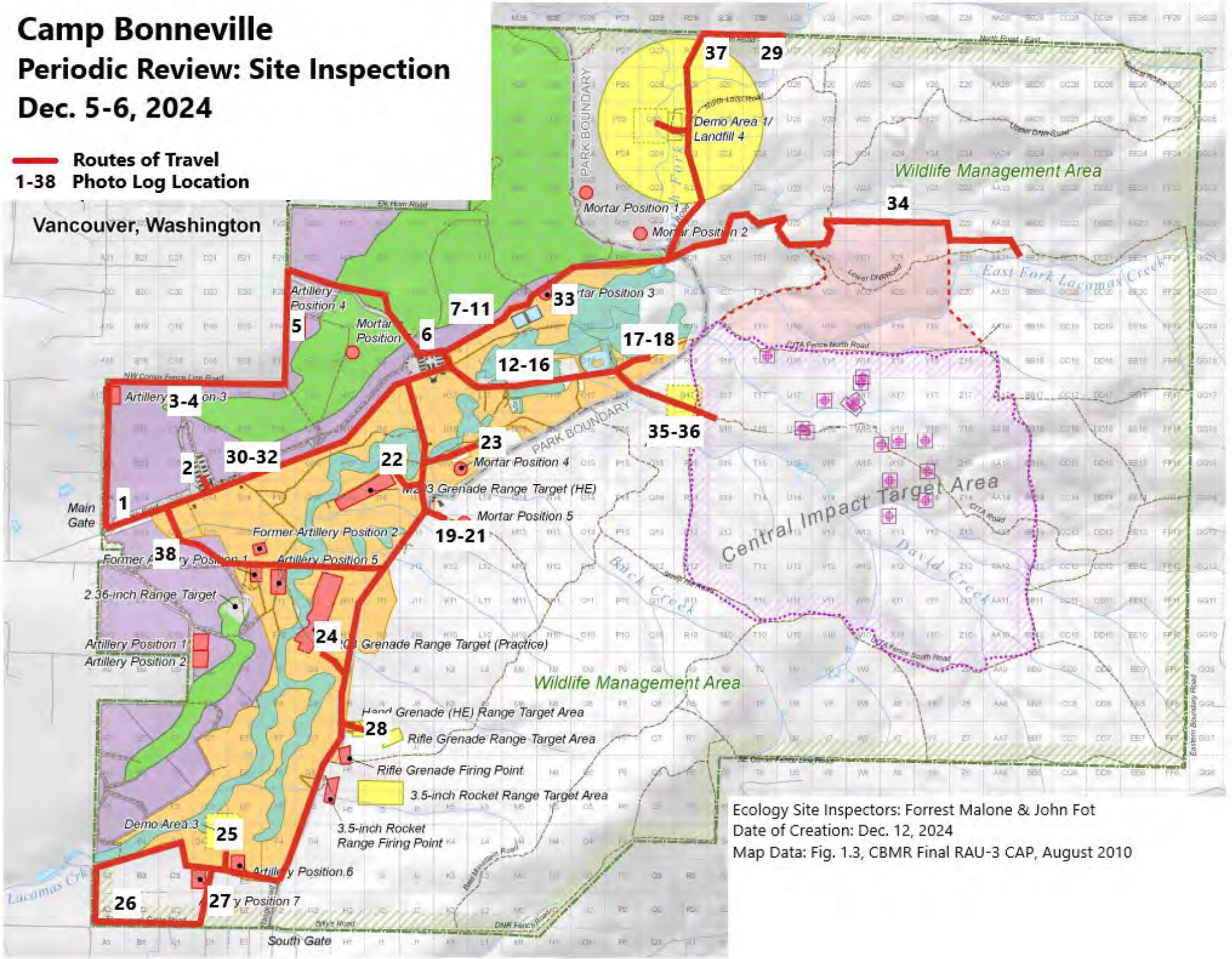
35. CITA through-road access open with tire tracks/rutting through access point leading into CITA.

36. Stranded barbed wire that is used as a “gate” for closing access to CITA through-road.

37. Tire tracks causing rutting of road/trail.

38. Historical warning sign that is partially illegible.

Camp Bonneville
Periodic Review: Site Inspection
Dec. 5-6, 2024



Ecology Site Inspectors: Forrest Malone & John Fot
Date of Creation: Dec. 12, 2024
Map Data: Fig. 1.3, CBMR Final RAU-3 CAP, August 2010

Periodic Review Site Inspection Field Report

Supplemental Inspection

Site Name: Camp Bonneville

Date of Inspection: May 12, 2025 & May 20th, 2025*

Location: Vancouver, WA

Agency Leading Periodic Review: Ecology

FS ID: 69965472

Cleanup Site ID: 11670

Site Inspectors: (Roster attached [ ])

Michael Cronin (Ecology), Forrest Malone (Ecology)**, accompanied by Betsy Wing and Gregg Johnson (Clark County Public Works).

Weather:

Approximately 50-60° F cloudy with light showers

*Ecology returned to the site on May 20th to take photographs of the perimeter fence, sewage lagoon and maintenance yard due to software issue which corrupted several photographs taken on May 12.

** Property Perimeter Fence and Maintenance yard was inspected by Michael Cronin on May 12 and again to take new photographs on May 20th.

UXO Awareness Briefing and Associated Materials

Notes:

Michael Cronin was briefed by Clark County Public Works, Gregg Johnson, Forrest Malone briefed by Betsy Wing. Public Works has a digital check-in system for documenting receipt of training. Training materials moved into range HQ.

Property Perimeter Fence Line

Notes:

Michael and Betsy drove the perimeter fence at the Northwest portion of the previous property inspected. Repairs to the fence line were noted but some damage from wildlife (assumed to be Elk) and fallen branches noted on the fence line with several strands of barbwire down including signage.

CITA "Gate"

Notes:

Inspected CITA entrance gate at the Central Valley Floor location. Barb Wire with flagging (for visibility) in place across the road.

Periodic Review Site Inspection Field Report

Supplemental Inspection

FBI Range and Associated Areas

Notes:

Clark County Sheriffs office storage shed was secured. Observed that within the fenced area that flammable fuel cabinet was blocked by materials and fuel canisters were visible underneath a tarp. Did not have key to access the storage area and to determine if canisters contained fuel. FBI storage shed was secured. Inspecting the range itself no hazardous materials or other chemicals observer. This is a change from the December 2024 inspection where gun cleaning solvent was observed in an unsecured area.

Sewage Lagoons

Notes:

Inspected the sewage lagoons. Observed berm for both lagoons had been excavated out on the southern end creating entrance at road level. According to Gregg Johnson these had been notched out by BCRRT when the lagoons were decommissioned. Entered the Western lagoon, generally the surface is flat, potentially made of concrete, some debris and dirt were observed on the southern end of the western lagoon. Lagoon sides are concrete with earthen berm outside. On May 13, 2020, we observed but did not enter eastern lagoon. From Entrance the floor of the lagoon appears to be uniform without soils.

On May 20, 2020 inspected the eastern lagoon floor. No soil observed and floor of the lagoon appeared to be concrete.

RAU 2A-21 & RAU 2A-16 Soil Caps

Notes:

No damage to the 2A-16 soil cap was observed. The area was clear of trees and covered in grassy vegetation. Silt fence was visible along the road forming boundary to the wetland area. When questioned about the unknown concrete structure at the eastern side, Gregg Johnson was able to confirm that the structure housed a pulley system for moving targets on the range, remnants of pully crank visible in structure.

2A-21 dead standing trees were observed in the soil cap area. Heavy Blackberry growth impeded access from the southern side of the soil cover area. No damage to the Soil cover was observed. Entering along the western side of the soil cover following the berm a fallen tree was observed. The tree had broken at the base of the trunk rather than falling over exposing soils beneath.

Periodic Review Site Inspection Field Report

Supplemental Inspection

Additional Notes

Entered the Maintenance Yard at Camp Kilpatrick. Observed two above ground storage tanks (ASTs). The larger of the two had secondary containment in place while the smaller tank had no containment and visible staining beneath the tank. According to Betsy Wing both tanks had been used to store diesel fuel and were no longer in use. County is exploring options to decommission these tanks including sampling of the strained area.

Examined the Culvert behind the former Fire Station at Camp Kilpatrick with Betsy Wing, Gregg Johnson, and Hunter Decker (County Forrester). Hunter had stated he noted odor at the location occasionally in the past. Walking the location there was water present in the culvert, appearing to be a spring or seep occurs at the intersection with the hillslope. No odor was noted, nor was any visible sheen present on the water. Examining the soil in the culvert no staining or discoloration was noted.

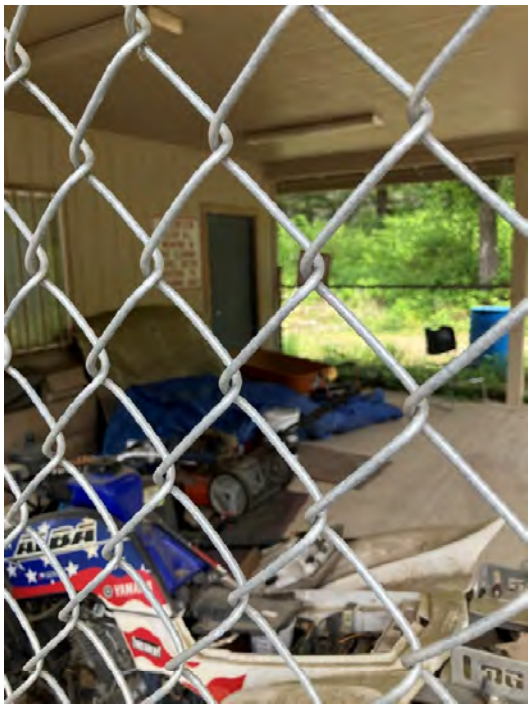
Camp Bonneville Military Reservation

Periodic Review Site Inspection Photo Log

Photos Taken By: M. Cronin on May 13 (photos 1 – 17) and May 20th (photos 18 – 28) 2025

1. Inert military munitions on display inside of Range HQ building. Briefing room moved to Conference room in Range HQ.

2. Inert military munitions on display inside of Range HQ building.



3. Clark Country Sheriff Office secured storage compound collocated at FBI shooting range.

4. Clark Country Sheriff Office secured storage compound collocated at FBI shooting range.

   obstructed access to flammable storage locker.

5. Clark Country Sheriff Office secured storage compound collocated at FBI shooting range.

6. Clark Country Sheriff Office secured storage compound collocated at FBI shooting range.

   Photograph through gate.

   Fuel containers visible in background and obstructed access to flammable storage locker.

7. FBI secured storage compound collocated at FBI shooting range.

8. FBI Range.

9. FBI Range

10. RAU 2A 2A-16 Range looking West from eastern edge of range

11. Image of Concrete structure adjacent to 2A-16 range. Structure housed control for pulley system use to move targets at adjacent range

12. Entrance to CITA from Central Valley Floor. Barb Wire across entrance with flagging for visibility.

13. RAU 2A 2A-21 Range facing north from southern edge of the soil cover. Himalayan blackberry growth is present along with multiple snags.

14. RAU 2A 2A-21 Range. Standing on soil cover taken from Western edge looking east. Snags present and fallen tree.

15. RAU 2A 2A-21 Range. Picture taken from western edge facing north.

16. Sewage Lagoon – Facing north at entrance to west lagoon. Former operation house present on berm between lagoons.

17. Sewage Lagoon (West) – Facing West-Northwest at entrance to west lagoon.

18. Sewage Lagoon (East) – Facing Northeast.

19. Sewage lagoon (east) facing Northeast corner – Location which had previously had RAU 2A soils.

20. Monitoring well west of lagoons. Well installed as part of RAU 1 investigations. Locked, protective bollards in place though damaged.

21. NW permitter fence showing repairs. Facing Northeast

22. Closeup of NW permitter fence showing animal fur.

23. NW Permitter fencing observed treefall damage

24. Maintenance Yard at Camp Killpack cantonment Facing East.

25. Maintenance Yard at Camp Killpack cantonment. Facing South. Above ground storage tank with stained soil. Clark County is planning removal of this AST and impact soil.

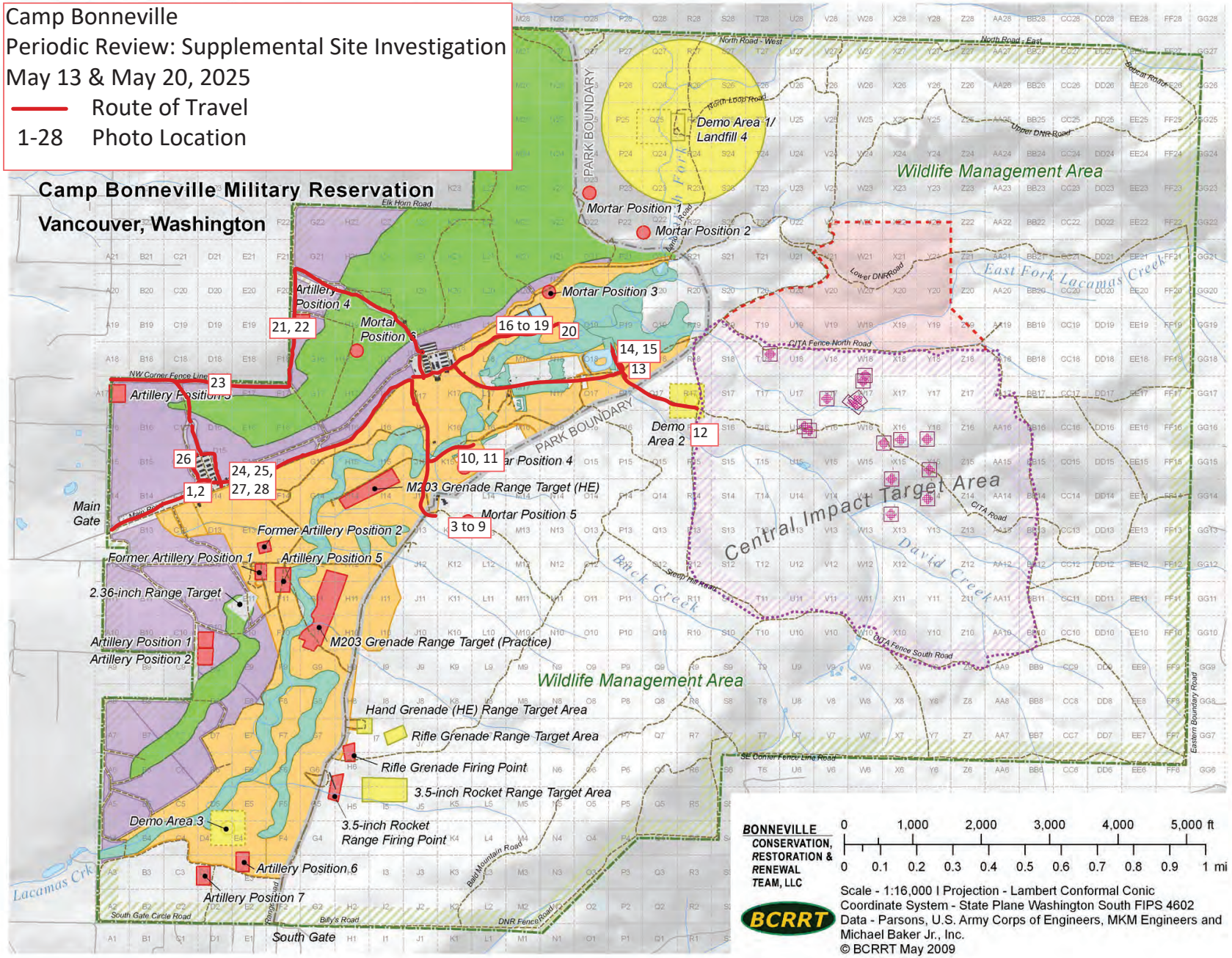
26. Camp Killpack cantonment – Damaged building. County is planning to demolish unsafe structure.

27. Camp Killpack – former fire station building.

Photos Taken By: M. Cronin on May 12 (Photos 1 – 17) and May 20th (photos 18 – 28) 2025

28. Camp Killpack – former fire station building. Ditch behind building had groundwater seep.

Camp Bonneville
Periodic Review: Supplemental Site Investigation
May 13 & May 20, 2025
Route of Travel
1-28 Photo Location



Recommended Clearance Depths

- Site grid (with grid # shown)
- CITA (Central Impact Target Area / Central Impact Area)
- CITA targets
- Northern CITA expansion (fence)
- Western Slopes - Surface clearance (areas less than 25% slope)
- Western Slopes - Site-wide IC's (areas greater than 25% slope)
- Surface clearance
- Firing points - Sub-surface (to 14-in)

Central Valley Floor

- Frost-depth clearance (to 14-in)
- Frost-depth clearance (to 14-in) with wetland protocols

Target areas and Open Burn / Open Demolition areas are identified by labels only

BONNEVILLE CONSERVATION, RESTORATION & RENEWAL TEAM, LLC

BCRRT

0 1,000 2,000 3,000 4,000 5,000 ft
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 mi

Scale - 1:16,000 I Projection - Lambert Conformal Conic
Coordinate System - State Plane Washington South FIPS 4602
Data - Parsons, U.S. Army Corps of Engineers, MKM Engineers and Michael Baker Jr., Inc.
© BCRRT May 2009

Appendix B. Site User and Former Site Manager Questionnaire

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property?
    a. The Clark County Forest Stewardship Plan guides forest practices and noxious weed control work at the site.
2. What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards?
    a. It is my understanding that this process has included a UXO briefing at Range Control for all new users of the site. Public Works is working to formalize this process with a procedure, training materials, and log of completed training.
3. Please describe who has access to the property and procedures for securing the property?
    a. Clark County Public Works employees who perform work on the property have access.
    b. Clark County Sheriff's Office employees have access.
    c. FBI employees have access.
    d. ATF employee(s) have access.
    e. Other service providers including garbage, port-a-potty, drinking water, etc. gain access to provide services.
    f. The property is behind a locked gate that uses an electronic key card for access. The Sheriff's Office currently maintains the list of employees who have key card access. FBI also maintains a key code entry system and maintains the security for that system.
4. Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?
    a. Clark County Public Works, Parks Operations and Maintenance, North Parks Crew currently maintains the fence lines at Camp Bonneville.
    b. Do not know the process and timeline for completing inspections, but fences have all be inspected and the crew is working on making repairs.
    c. Maintenance records are available in the county's asset management system (Cartegraph).

5. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property?
    a. Not aware of any.
6. Are chemicals or other hazardous materials stored at the Property? If yes:
    a. Please list the materials and approximate quantities.
        i. Tree marking paint, several cases
        ii. Small amounts (1-2 gallons) of fuel for chainsaw and ATV
        iii. Diesel fuel for vehicles, many gallons
    b. Please describe how and where these materials are stored?
        i. Stored on shelves in a storage building
        ii. Stored in cabinets in a storage building
        iii. Stored in an above-ground storage tank
    c. Please describe how these materials used?
        i. For marking trees for harvesting
        ii. For fueling chainsaw and ATVs
        iii. For fueling tractor and other small equipment
7. Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment?
    a. I am aware of only on such use. There is some munitions storage in the location of former building 2950 in storage magazines managed by the ATF.
8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
    a. Yes, one item a training timing fuse was found near landfill 4 by a noxious weed management staff a few years ago. It was reported to the site manager, who coordinated with the Clark County Sheriff's Office to remove the item from the property.
9. If munitions or explosives were discovered:
    a. Where were these items discovered? See explanation above
    b. What item was discovered?
    c. How were they reported?
    d. How was the item disposed of?
10. Are munitions stored on the property?
    a. If yes, where are munitions stored and by which agency? The FBI and Sheriff's office store ammunition at the shooting range.
11. Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.
    a. What activities requiring ground disturbance are you aware of occurring? Forest practices, road maintenance, bridge repair/replacement

   b. Were permits issued or a similar review process followed? Do not know about permits; a similar review process was performed by the site manager at the time

   c. Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities? Unexploded ordinance (UXO) technician performing approved anomaly avoidance practices was not deemed necessary since areas with forest management operations were previously cleared of UXO.

12. Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review? This will be developed in preparation for the property being opened to the public. Otherwise, please refer to the answer to question 2.

13. Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)?

    Not aware of any

LOCATION SPECIFIC QUESTIONS

1. Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.

   a. Who is responsible for maintaining this requirement? The site manager.

   b. Has maintenance of this signage been required? If yes, how is maintenance documented? No, signs are in good shape.

2. At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports.
   a. I have not been a part of developing the annual reports only finalizing the most recent annual report.

3. Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017?

   a. Do not know.

4. Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available?

   a. Do not know.

5. Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?

   a. Asked and answered under question 4 of sitewide questions.

6. Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available?

   a. Do not know.

7. Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available?

   a. Do not know.

8. Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)?
    a. The county has not reached the redevelopment phase of the project, so road and trail signs have not been installed.
9. Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please provide details when this training will be completed.
    a. The county currently has one level I UXO technician on staff and will be working to get a 2nd employee trained in 2025.
10. Has signage been installed at the target areas and firing points identified in the 2010 CAP?
    a. Do not know

Questionnaire Documentation Form

Name	Kevin Tyler
Title/Position	Lands Management Division Manager
Department	Public Work
Email Contact	Kevin.tyler@clark.wa.gov
Years Affiliated	12

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has printed this response as a PDF. Note: From an Inspection of records, Email to Erik Harrison from Ronnie Johnson (Former Ecology UXO Expert) on 4/10/2023, the Training Fuse Identified in Sitewide Question Number 9, was a "M-60 time fuze igniter".

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property? **Yes- only for road and fence maintenance**
2. What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards? **Do not know**
3. Please describe who has access to the property and procedures for securing the property? **Clark County Public Works, Clark County Sheriff's Office, FBI, Dept of Ecology, and contractors**
4. Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? **Clark County Public Works inspects and maintains fence lines, Do not know the answers to other questions**
5. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property? **No**
6. Are chemicals or other hazardous materials stored at the Property? If yes **Do not know**
    a. Please list the materials and approximate quantities.
    b. Please describe how and where these materials are stored?
    c. Please describe how these materials used?
7. Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment? **No**
8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities? **No**
9. If munitions or explosives were discovered:
    a. Where were these items discovered? **Do not know**
    b. What item was discovered? **Do not know**
    c. How were they reported? **Do not know**
    d. How was the item disposed of? **Do not know**
10. Are munitions stored on the property? **Do not know**
    a. If yes, where are munitions stored and by which agency? **Do not know**

11. Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.
    a. What activities requiring ground disturbance are you aware of occurring? **Do not know**
    b. Were permits issued or a similar review process followed? **Do not know**
    c. Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities? **Do not know**
12. Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review? **There is a description of UXO's, and an explanation of the CITA, Do not know about records**
13. Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)? **Do not know**

LOCATION SPECIFIC QUESTIONS

1. Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.
    a. Who is responsible for maintaining this requirement? **Do not know**
    b. Has maintenance of this signage been required? If yes, how is maintenance documented? **Do not know**
2. At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports. **Do not know**
3. Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017? **Do not know**
4. Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available? **Do not know**
5. Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? **Clark County Public Works maintains and inspects fence lines, do not know about documentation**
6. Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available? **Do not know**
7. Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available? **Do not know**
8. Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)? **Do not know**
9. Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please

provide details when this training will be completed. **Jacob Huston has completed this training, I don't have the documentation**

10. Has signage been installed at the target areas and firing points identified in the 2010 CAP? **Do not know**

Questionnaire Documentation Form

Name	**Jeremy Stevens**
Title/Position	**Grounds Maintenance Crew Chief**
Department	**Parks**
Email Contact	**Jeremy.stevens@clark.wa.gov**
Years Affiliated	**2 with Camp Bonneville, 10 with Clark County Public Works**

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has bolded the responses for clarity and removed formatting issues with Microsoft Word which changed the question numbering and printed this response as a PDF.

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. **Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property?**
    - Yes. Operation and maintenance (O&M) plans are in place for activities, including site access, UXO management, CITA fence inspections, and routine maintenance of infrastructure. These plans were informed by the extensive knowledge of past site managers, particularly Greg Johnson, who was instrumental in ensuring safety protocols during his tenure.
    - O&M plans include specific procedures for anomaly avoidance during ground disturbance, proper storage and disposal of hazardous materials, and timelines for recurring inspections. While much of this is documented, there has been a knowledge gap since Greg's departure, necessitating the county's reliance on available training records and ongoing personnel development.
2. **What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards?**
    - The process includes mandatory hazard briefings for all site users. These briefings cover the location and risks associated with UXO, procedures for anomaly avoidance, and compliance with site-specific safety requirements.
    - Contractors and law enforcement undergo specific orientation on restricted areas like the CITA and its fencing. While training is conducted regularly, there has been inconsistency in record-keeping due to staff transitions.
3. **Please describe who has access to the property and procedures for securing the property?**
    - Access is strictly limited to authorized personnel, including county staff, contractors, and law enforcement agencies like the FBI, which operates the shooting range.
    - Security measures include locked gates, perimeter fencing, and posted signage warning of hazardous conditions. After Greg Johnson's departure, the county has struggled with maintaining consistent access controls due to the lack of UXO-trained staff.
4. **Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?**
    - The responsibility falls under the county's operational team, with quarterly inspections conducted by designated staff. Maintenance involves clearing vegetation, repairing damage, and ensuring signage is visible and intact. Documentation is maintained digitally but may have gaps due to prior administrative transitions.

5. **Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property?**
    - No known spills have been reported in recent years. Historical activities, particularly during Greg Johnson's tenure, included stringent checks to prevent such incidents.
6. **Are chemicals or other hazardous materials stored at the Property? If yes:**
    - **Please list the materials and approximate quantities.**
        - Limited quantities of fuels, lubricants, and cleaning agents are stored for maintenance equipment.
    - **Please describe how and where these materials are stored?**
        - Stored in a designated shed with spill containment measures in place.
    - **Please describe how these materials used?**
        - Used for routine site maintenance, including vehicles and small equipment.
7. **Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment?**
    - No unauthorized use has been observed or reported. All firearm and explosives activities are confined to designated areas.
8. **Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?**
    - Yes, munitions have been found occasionally during site inspections, particularly in areas with historical military activity. These discoveries underscore the importance of UXO training and anomaly avoidance practices.
9. **If munitions or explosives were discovered:**
    - **Where were these items discovered?**
        - Primarily within the CITA and restricted zones.
    - **What item was discovered?**
        - Items included unexploded artillery shells and small ordnance.
    - **How were they reported?**
        - Reported immediately to county officials and UXO-certified personnel for assessment.
    - **How was the item disposed of?**
        - Disposed of by certified UXO technicians following approved protocols.
10. **Are munitions stored on the property?**
    - **If yes, where are munitions stored and by which agency?**
        - No munitions are stored on-site.
11. **Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.**
    - **What activities requiring ground disturbance are you aware of occurring?**
        - Fence repairs, road grading, and trail maintenance.
    - **Were permits issued or a similar review process followed?**
        - Yes, permits were reviewed for compliance with environmental and safety requirements.

- **Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities?**
    - Yes, all activities required oversight by UXO technicians, ensuring safe practices.

12. **Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review?**
    - The program includes mandatory safety briefings, informational pamphlets, and prominently placed warning signs. Training records are maintained, though gaps exist due to staffing changes.
13. **Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)?**

    Wildfire History at Camp Bonneville

    - **1902 Yacolt Burn**:
        - Burned 238,000 acres across Clark, Cowlitz, and Skamania counties, destroying nearly all original forests and many homesteads at Camp Bonneville.
    - **1929 Dole Valley Fire**:
        - Burned 2,088 acres within Camp Bonneville.
    - **1938 1st Livingston Mountain Fire**:
        - Burned 1,220 acres.
    - **1951 2nd Livingston Mountain Fire**:
        - Burned 1,400 acres.
    - **1970 North Fork Lacamas Creek Fire**:
        - Burned 160 acres.

    Fire Management Highlights

    - Fire suppression emphasizes safety due to unexploded ordnance (UXO) risks. The Department of Natural Resources (DNR) coordinates suppression.
    - Prevention includes thinning, pruning, controlled burns, and firebreaks to reduce wildfire risks.

LOCATION SPECIFIC QUESTIONS

1. **Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.**
    a. **Who is responsible for maintaining this requirement?**
        - County maintenance personnel oversee signage maintenance.
    b. **Has maintenance of this signage been required? If yes, how is maintenance documented?**
        - Records are kept in the county's facility management system.
2. **At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports.**
    - Do not know

3. **Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017?**
    - No additional cleanup actions have been undertaken,
4. **Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available?**
    - Do not know
5. **Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?**
    - Maintenance is performed by county staff.
6. **Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available?**
    - Do not know
7. **Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available?**
    - Do not know
8. **Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)?**
    - Do not know
9. **Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please provide details when this training will be completed.**
    - Currently, one technician is in training. Plans are being developed to certify additional personnel.
10. **Has signage been installed at the target areas and firing points identified in the 2010 CAP?**
    - Do not know

Questionnaire Documentation Form

Name	Hunter Decker
Title/Position	Clark County Forester / Natural Resources Specialist III
Department	Public Works - Lands - Forestry
Email Contact	Hunter.Decker@clark.wa.gov
Years Affiliated	8

Cronin, Michael (ECY)

From: Hunter Decker <Hunter.Decker@clark.wa.gov>
Sent: Wednesday, June 4, 2025 9:46 AM
To: Cronin, Michael (ECY)
Cc: Betsy Wing; Kevin Tyler; Hargrove, Amy (ECY); Malone, Forrest (ECY)
Subject: RE: Camp Bonneville Questionnaires Follow up

External Email

Hey Michael,

Here are my responses:

1. **Were the munitions finds you referenced found during formal remedial investigations and cleanup activities?**
    - The munitions finds I referenced were identified during formal remedial investigation and cleanup activities conducted at the site.
2. **OR were they discovered after remedial cleanup activities were completed (i.e., during routine inspections, unrelated land use, or other activities)?**
    - No, to my knowledge, the items were not discovered after cleanup activities had concluded. They were encountered within the scope of formal cleanup operations, not during routine inspections or unrelated land use.
3. **When we briefly spoke in person on May 12, 2025, you mentioned that these findings were based on what you had heard about previous work. Can you confirm whether your statement was based on direct observation/documentation or second-hand information?**
    - The information I shared during our May 12 conversation was based primarily on second-hand information relayed to me by Greg Johnson, the former UXO safety manager for the site. Greg worked at Camp Bonneville for nearly two decades and regularly shared historical context and operational insights with me, though I was not directly involved in the munition's removal process myself.

Let me know if you need anything else.

Sincerely,

Hunter Decker he/him/his
Forester 🌲 - Natural Resource Specialist III
PUBLIC WORKS - LANDS - FORESTRY

564.397.4852

[Forest Practice Permits]

[Sustainable Forestry Program]

[Forest Landowners Resources]

[Report a Park or Road Concern]

[Customer Feedback Survey]

From: Cronin, Michael (ECY) <micr461@ECY.WA.GOV>
Sent: Tuesday, June 3, 2025 3:40 PM
To: Hunter Decker <Hunter.Decker@clark.wa.gov>
Cc: Betsy Wing <Betsy.Wing@clark.wa.gov>; Kevin Tyler <Kevin.Tyler@clark.wa.gov>; Hargrove, Amy (ECY) <ahar461@ECY.WA.GOV>; Malone, Forrest (ECY) <fmal461@ECY.WA.GOV>
Subject: Camp Bonneville Questionnaires Follow up

EXTERNAL: This email originated from outside of Clark County. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good afternoon, Hunter,

I wanted to follow up on your response to the Questionnaire in writing:

I would like to follow up for clarification to ensure we have an accurate understanding of the site conditions. In particular, could you please clarify the following:

1. Were the munitions finds you referenced found during formal remedial investigations and cleanup activities?
2. OR were they discovered after remedial cleanup activities were completed (i.e., during routine inspections, unrelated land use, or other activities)?
3. When we briefly spoke in person on May 12, 2025, you mentioned that these findings were based on what you had heard about previous work. Can you confirm whether your statement was based on direct observation/documentation or second-hand information?

Warm regards,
Michael

Michael Cronin L.G.
Hydrogeologist 4 (in-training)
Department of Ecology – HQ
Toxics Cleanup Program
Michael.Cronin@ECY.WA.Gov
Cell: 564-233-9482

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property? **While the site is not currently undergoing active cleanup, routine activities such as general maintenance and repair of the fence line and landscaping are performed. A formal Standard Operating Procedure (SOP) for these activities has not yet been established.**
2. What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards? **Visitors to the site are required to sign in and receive a general map orientation of the property. A safety briefing is conducted, which includes an overview of ordinance and training materials previously identified on the site. The briefing also emphasizes the "3 R's" safety protocol: Recognize, Retreat, and Report.**
3. Please describe who has access to the property and procedures for securing the property? **Access to the property is managed by the Clark County Sheriff's Office, which oversees entry and enforces security measures. Authorized vendors and contractors are granted access as needed to perform their work, following established protocols to ensure site security and safety.**
4. Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? **Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? The Central Impact Target Area (CITA) fences require ongoing maintenance on an as-needed basis. There is no set timeline for repairs. Maintenance activities for the property, including fence inspections and repairs, are managed by Clark County Public Works and recorded in the county's internal asset management system, Cartegraph.**
5. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property? **No**
6. Are chemicals or other hazardous materials stored at the Property? If yes:
    a. Please list the materials and approximate quantities. **Large Diesel above-ground storage tank, unknown quantity.**
    b. Please describe how and where these materials are stored? **Stored near an old army maintenance building.**
    c. Please describe how these materials used? **For fueling equipment.**
7. Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment? **Yes, there was an instance where the Portland Bomb Squad conducted a controlled (Training) detonation near the Camp**

Bonneville cantonment area. This activity was promptly addressed by Clark County to ensure proper procedures were followed.

8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
9. If munitions or explosives were discovered:
    a. Where were these items discovered? **Training fuse was located near landfill # 4**
    b. What item was discovered? **Training Fuse**
    c. How were they reported? **By Clark County staff**
    d. How was the item disposed of? **The item in question was properly disposed of by Clark County Sheriff's Office bomb technicians. The specific methodology used is not known to me.**
10. Are munitions stored on the property? **No**
    a. If yes, where are munitions stored and by which agency?
11. Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.
    a. What activities requiring ground disturbance are you aware of occurring? **None**
    b. Were permits issued or a similar review process followed? **Unknown to me.**
    c. Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities? **No**
12. Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review? **Sign-in and sign-out procedures are in place for the property, which is not open to the public. Visitors to the site are required to sign in and receive a general map orientation of the property. A formal safety briefing is the current procedure, which includes an overview of ordnance and training materials previously identified on the site. The briefing also emphasizes the "3 R's" safety protocol: Recognize, Retreat, and Report.**
13. Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)? **No**

LOCATION SPECIFIC QUESTIONS

1. Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.
    a. Who is responsible for maintaining this requirement? **Clark County Public Works**
    b. Has maintenance of this signage been required? If yes, how is maintenance documented? **Inspected and repaired if needed, documented in asset management system if need.**
2. At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports. **These reports are included in the monthly updates submitted to the Army, ensuring that all activities and updates are communicated regularly. Additionally, an annual report is compiled and submitted each December, providing a comprehensive summary of the year's operation**

3. Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017? **Unknown**
4. Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available? **Unknown**
5. Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? **The Central Impact Target Area (CITA) fences require ongoing maintenance on an as-needed basis. There is no set timeline for repairs. Maintenance activities for the property, including fence inspections and repairs, are managed by Clark County Public Works and recorded in the county's internal asset management system, Cartegraph.**

6. Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available? **The language regarding annual inspections in the CAP is vague and lacks measurable criteria for proper documentation. This lack of clarity makes it difficult to confirm whether the required inspections have been completed and whether the available records meet the intended requirements. Clear guidance and measurable standards are needed to ensure proper compliance and record-keeping for these annual surface inspections within the CITA for MEC.**

7. Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available? **It is unclear to Clark County what constitutes a significant rain event as outlined in the CAP. The language used in the CAP lacks clarity and measurable criteria, making it challenging to determine when such inspections should be conducted. To effectively address this requirement, clearer and more specific language would be needed to define what qualifies as a significant rain event. Without this clarification, it is difficult to confirm whether the required inspections have been completed or provide consistent inspection records.**

8. Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)? **No**
9. Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please provide details when this training will be completed. **Yes, please consult with Jacob Huston**
10. Has signage been installed at the target areas and firing points identified in the 2010 CAP? **Unknown since 2021.**

Questionnaire Documentation Form

Name	**Erik Harrison**
Title/Position	**Parks Operations Superintendent**
Department	**Parks Department**
Email Contact	**Erik.harrison1@gmail.com**
Years Affiliated	**3 years**

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has bolded the responses for clarity and removed formatting mistakes which changed the questions number and printed this response as a PDF. Note: From an Inspection of records, Email to Erik Harrison from Ronnie Johnson (Former Ecology UXO Expert) on 4/10/2023, the Training Fuse Identified in Sitewide Question Number 9, was a "M-60 time fuze igniter".

Camp Bonneville Periodic Review
Periodic Review: Former Managers Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

You have been identified as a former employee of Ecology, DoD contractor, and/or Clark County involved in the oversight of the cleanup. Ecology is requesting your input as your employment covered the time period relevant to this periodic review.

Please complete this questionnaire by December 18, 2024, if you are unable to answer a question, please state "I Do not know".

Name: **Ronnie Johnson**
Date Submitted: **December 17, 2024**

QUESTIONNAIRE

1. What was your role and former agency, and how long did you work on the Camp Bonneville Cleanup?

I worked on Camp Bonneville from approximately 2012 – 2020. I was Ecology's munitions expert.

2. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property during your period of employment?

No

3. Are you aware of any firefighting activities on the Property?

No
If Yes:
3.1. When, where, and why did firefighting activities take place?

4. Were site specific operations and maintenance plans prepared for any of the Remedial Action Units?
No, only site wide.

5. What was the process for training users of the site about the site hazards?
UXO safety briefings, covering all associated explosive hazards. Briefings conducted by Clark county munitions safety advisor or contractor safety specialist.

6. What was the protocol for discovery of potential unexploded ordnance (UXO) outside of the remedial cleanup activities?

Mark the item conspicuously, preferably with engineer tape and notify range operations of the location and description of the item.

7. Are you aware of any UXO or potential UXO identified at the property outside of remedial cleanup activities during your period of employment?

   No

   If munitions or explosives were discovered:
   7.1. Where and when were these items discovered?

   7.2. What item was discovered?

   7.3. How were they reported?

   7.4. How was the item disposed of?

8. Describe how operations and maintenance activities in support of the institutional controls were managed and documented?

   Clark County was tasked by Ecology with developing a site wide O&M plan.

9. The RAU-1 CAP requires soil excavation permits and the RAU-3 CAP requires a permit notification program for construction and maintenance related excavation activities and other potential land disturbing tasks.

   9.1. What activities requiring ground disturbance are you aware of occurring? **None**

   9.2. Were permits issued or a similar process followed?

   9.3. Were safety measures (e.g. UXO technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities?

10. RAU 1 has restrictive covenants in place with a requirement for annual reporting. During your period on the project were annual reports prepared for these restrictive covenants? **I was not employed by Ecology at the time of RAU 1.**

11. The 2017 RAU 3 CAP Amendment requires annual inspections of the central impact target area (CITA) and inspections following storm events. Were these inspections performed during your period of employment and if performed how were these inspections documented? **No**

12. Did Clark County maintain Level I UXO technician certification for two Clark County Park employees during your period of employment? **No**

13. Have munitions been stored on the property since transfer of the property to Clark County? **Yes**

    If yes:

    13.1. where are munitions stored and by which agency? **The UXO contractors had 2 explosives magazines on site.**

14. At Camp Bonneville, there are two fenced areas with Type 2 portable storage magazines. One of these fenced compounds is unsecured with two empty and open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21. The other is a secured fenced yard adjacent/coinciding with Bldg 2950. In the secured yard, there are also two larger Type 2 portable storage magazines and one permanent, older magazine. These two larger magazines are closed, but with no access to the fenced yard, their usage cannot be determined.

    14.1. Were any of these magazines being utilized during your period on the project, if so, how were they being used and by whom? **One of them was utilized by the UXO contractors. The other I was not familiar with**..

    14.2. Who was responsible for maintaining the magazines, including documentation and inventory? **UXO contractor.**

    14.3. Which of these fenced compounds and associated magazines were utilized as a part of the cleanup? **Open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21**

    14.4. If any, or all, how were they procured for the cleanup? Were they rented or purchased? **Do not know**.

    14.5. If purchased, who assumed ownership after the conclusion of the cleanup? **Do not know**.

15. Are you aware of any law enforcement training activities occurring outside of the active shooting range (FBI range)? **Yes, room clearing activity, IED and breaching training**.

16. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? Ecology is interested in which range was used, how cleanup following training was completed and reported to Project Management. **No**

Ecology – 1/9/2025 Michael Cronin: Received as a word document to Ecology on 12/17/2024 via email. Ecology has bolded the responses for clarity and printed as a PDF.

Camp Bonneville Periodic Review
Periodic Review: Former Managers Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

You have been identified as a former employee of Ecology, DoD contractor, and/or Clark County involved in the oversight of the cleanup. Ecology is requesting your input as your employment covered the time period relevant to this periodic review.

Please complete this questionnaire by December 18, 2024, if you are unable to answer a question, please state "I Do not know".

Name: Hun S. Park
Date Submitted: 12/11/2024

QUESTIONNAIRE

1. What was your role and former agency, and how long did you work on the Camp Bonneville Cleanup?
   Site manager – mainly cleanup for 3 years
2. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property during your period of employment?
   Not that I know.
3. Are you aware of any firefighting activities on the Property?
   yes. There was a big wild-fire around the Area.

   If Yes:

   3.1. When, where, and why did firefighting activities take place?
   DNR used the property as a helicopter refueling base in 2023.
4. Were site specific operations and maintenance plans prepared for any of the Remedial Action Units?
   NO. The county was preparing/planning while I was working on 2023.
5. What was the process for training users of the site about the site hazards?
   I don't know. There must be a process between county.
6. What was the protocol for discovery of potential unexploded ordinance (UXO) outside of the remedial cleanup activities?
   I don't remember the detail.
7. Are you aware of any UXO or potential UXO identified at the property outside of remedial cleanup activities during your period of employment?
   NO. Not that I know.

   If munitions or explosives were discovered:

   7.1. Where and when were these items discovered?
   I don't know.

7.2. What item was discovered?

N/A

7.3. How were they reported?

N/A

7.4. How was the item disposed of?

N/A → See the Cleanup reports

8. Describe how operations and maintenance activities in support of the institutional controls were managed and documented?

These procedures are described in detail at First Consent decree/amended consent decree.

9. The RAU-1 CAP requires soil excavation permits and the RAU-3 CAP requires a permit notification program for construction and maintenance related excavation activities and other potential land disturbing tasks.

9.1. What activities requiring ground disturbance are you aware of occurring?

9.2. Were permits issued or a similar process followed?

9.3. Were safety measures (e.g. UXO technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities?

please refer to the clean-up report of RAU-1.

10. RAU 1 has restrictive covenants in place with a requirement for annual reporting. During your period on the project were annual reports prepared for these restrictive covenants?

NO

11. The 2017 RAU 3 CAP Amendment requires annual inspections of the central impact target area (CITA) and inspections following storm events. Were these inspections performed during your period of employment and if performed how were these inspections documented?

Annual reports including routine inspection was conducted. No report to Ecology.

12. Did Clark County maintain Level I UXO technician certification for two Clark County Park employees during your period of employment?

Please check with the County staff.

13. Have munitions been stored on the property since transfer of the property to Clark County?

If yes: I don't know.

13.1. where are munitions stored and by which agency?

14. At Camp Bonneville, there are two fenced areas with Type 2 portable storage magazines. One of these fenced compounds is unsecured with two empty and open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21. The other is a secured fenced yard adjacent/coinciding with Bldg 2950. In the secured yard, there are also two larger Type 2 portable storage magazines and one permanent, older magazine. These two larger magazines are closed, but with no access to the fenced yard, their usage cannot be determined.

I don't know anything about this stuff.

14.1. Were any of these magazines being utilized during your period on the project, if so, how were they being used and by whom?

14.2. Who was responsible for maintaining the magazines, including documentation and inventory?

14.3. Which of these fenced compounds and associated magazines were utilized as a part of the cleanup?

14.4. If any, or all, how were they procured for the cleanup? Were they rented or purchased?

14.5. If purchased, who assumed ownership after the conclusion of the cleanup?

15. Are you aware of any law enforcement training activities occurring outside of the active shooting range (FBI range)?

NO. Not that I know.

16. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? Ecology is interested in which range was used, how cleanup following training was completed and reported to Project Management.

NO.

Camp Bonneville Periodic Review
Periodic Review: ATF Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?

   The storage of explosives in approved magazines that are shared with Clark County Sheriff's Office.

2. How frequently does your agency use the property? Daily

3. At Camp Bonneville, there are two fenced areas with Type 2 portable storage magazines. One of these fenced compounds is unsecured with two empty and open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21. The other is a secured fenced yard adjacent/coinciding with Bldg 2950. In the secured yard, there are also two larger Type 2 portable storage magazines and one permanent, older magazine. These two larger magazines are closed, but with no access to the fenced yard, their usage cannot be determined.

   3.1. Which of these fenced compounds are under the supervision of the ATF? ATF uses the magazines in the secured yard where there are two larger Type 2 magazines and one permanent magazine.

   3.2. Are any of these magazines currently in use? All three are currently in use.

   3.3. Has the ATF formerly utilized any of these magazines? What was stored in them and when (how long)? Explosives evidence is stored within the magazines along with explosives. One magazine is for the storage of blasting caps, one magazine is for the storage of evidence, and one magazine is for the storage of explosives and evidence if need be. Each contains a small amount of net explosive weight.

   3.4. Does the ATF have an agreement with any other agencies for use of these magazines? If so, who maintains that documentation/inventory? ATF has an agreement with Clark County Sheriff's Office only.

   3.5. Does the ATF intend to use them in the future? Yes. We invested money into cleaning the area, brining two magazines into the location along with updating and outfitting the permanent magazine that was utilized by the military when the base was active. The site is important to our operation. It is a safe and secure location.

   3.6. If current or future use is planned, will the ATF provide appropriate signage, placarding, and maintenance to the fenced areas where the magazines are currently located. Yes, the magazines are in compliance with ATF Compliance Regulations and State of Washington Labor and Industries. The magazines are subject to inspection on an annual basis which was recently done in November 2024.

4. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?
   No. ATF does not use explosives on the base. It is only used to store explosives.

   If Yes:
   4.1. What do those activities entail?

   4.2. Where have these activities taken place?

   4.3. When or how frequently do these activities take place?

5. Are munitions, including small arms ammunition, stored by your agency on the property? No.

   If yes:
   5.1. where are munitions stored and how are they secured?

6. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property? No.

7. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property? No.

8. Has your agency performed any firefighting activities associated with your agency's use of the Property? No.

9. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities? No.

   If munitions or explosives were discovered:
   9.1. Where were these items discovered?

   9.2. What item was discovered?

   9.3. How were they reported?

   9.4. How was the item disposed of?

10. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? No.

Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Tony Schodowski	Special Agent	ATF	503-209-4499

Date Submitted: 12/16/2024

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has printed this response as a PDF.

Camp Bonneville Periodic Review
Periodic Review: < Law Enforcement AGENCY> Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?
   Our agency shoots at the range, conducts ATV driver's training on the gravel roads and occasionally the SWAT team uses wooded areas for land navigation training. We also use the encampment for entry training and building clearing training.

2. How frequently does your agency use the property?

~~2.~~ It varies depending on the month. Anywhere from four to 10 times a month depending on if we have a class scheduled at the range. The use of the encampment and roads is far less frequent.

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3. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?

~~3.~~ yes

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If Yes:

3.1. What do those activities entail?

~~3.1.~~ Details are described in question 1.

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3.2. Where have these activities taken place?

~~3.2.~~4. Gravel roads and the encampment

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4.1. When or how frequently do these activities take place?

~~3.3.~~5. It varies depending on the month but activities outside the range area may not occur at all or a couple of times per month.

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6. Are munitions, including small arms ammunition, stored by your agency on the property?

~~4.~~ yes

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If yes:

6.1. where are munitions stored and how are they secured?

~~4.1.~~ We store small arms ammunition which is secured inside a locked box, inside a locked room inside the locked building where the bathrooms are located at the range.

7. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?

~~5.~~ Yes, there are cleaning supplies for firearms and a small amount of gasoline for the power tools.

8. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?

~~6.~~ NO.

9. Has your agency performed any firefighting activities associated with your agency's use of the Property?

~~7.~~ No.

10. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?

11.

~~8.~~12. No.

If munitions or explosives were discovered:

~~8.1.~~12.1. Where were these items discovered?

~~8.2.~~12.2. What item was discovered?

~~8.3.~~12.3. How were they reported?

~~8.4.~~12.4. How was the item disposed of?

13. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training?

~~9.~~ I do not have any information regarding this training.

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Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Tom Dennison, Commander, Clark County Sheriff's Office, Enforcement Branch, 564-397-3393			

Date Submitted: 12/05/24

Camp Bonneville Periodic Review
Periodic Review: < Law Enforcement AGENCY> Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?

The Clark County Sheriff's Office conducts firearms, 40mm less lethal, and PepperBall training at the dedicated firearms range and hands-on/non-firearms training at the Barracks where one of the buildings is used for patrol tactics (building clearing, flashlight usage, movement).

2. How frequently does your agency use the property?
   The Sheriff's Office uses the range twice a month for a firearms open range day for deputies to practice and qualify. In addition, the Sheriff's Office reserves days in advance, up to fourteen days a year, to potentially use for Patrol Training Days, but those days are not always utilized. There are additional days during the year which the Mobile Response Team may use the range for training. A few additional days a year may be used for the citizens academy and new hire firearms orientation.

3. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?
   The Sheriff's Office has utilized trails on the property for our UTV (Utility Terrain Vehicle) unit to train on their equipment.

   If Yes:

   3.1. What do those activities entail?
   Training intended to familiarize deputies with safe operation of UTV in a variety of off-road environments.

   3.2. Where have these activities taken place?
   Instructors of these activities have been instructed to utilize the trails on the west and north ends of the property.

   3.3. When or how frequently do these activities take place?
   I am not certain, but I believe this was the first year and it was used for two to four days. Two of those days were the Sheriff's Office assisting the Cowlitz Tribal Police with their own UTV unit.

4. Are munitions, including small arms ammunition, stored by your agency on the property?
   Yes
   If yes:
   4.1. where are munitions stored and how are they secured?

Munitions are stored in a heavy-duty storage cabinet with a heavy-duty padlock. The cabinet is stored inside a locked room inside a locked building at the FBI Range.

5. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   There are spray paints kept inside a shed at the FBI Range that are use to mark targets and lane markings for the range. There are some firearms cleaning solvents kept in the "garage" at the FBI Range which is used for cleaning of weapons (the solvents are small bottle/spray bottle size).
6. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   I am not aware.
7. Has your agency performed any firefighting activities associated with your agency's use of the Property?
   Not that I am aware of.
8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
   I am not aware of any.
   If munitions or explosives were discovered:
   8.1. Where were these items discovered?

   8.2. What item was discovered?

   8.3. How were they reported?

   8.4. How was the item disposed of?

9. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training?
   I do not know

Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Thomas Yoder	Sergeant – Training Unit	Clark County Sheriff	Thomas.yoder@clark.wa.gov

Date Submitted: 12/10/2024

Ecology – Michael Cronin – Responses received via email 12/10/2024. Edited on 1/8/2025 to Bold answers and print Document as PDF

Camp Bonneville Periodic Review
Periodic Review: Law Enforcement Agency Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?
   The FBI conducts Quarterly Firearms Training for it's Law Enforcement Officials and monthly training for it's SWAT Operators. Quarterly Firearms Training is four sessions per quarter and involve pistol and rifle qualifications and marksmanship skill building. It also involves Medical Training and search/arrest procedures. SWAT trains four times per month and conducts firearms drills and close quarter clearing/arrest techniques.

2. How frequently does your agency use the property?
   The FBI uses Camp Bonneville between 70 and 80 days per year.

3. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?
   Yes

   If Yes:
   3.1. What do those activities entail?
   Group runs. Vehicle stop procedures

   3.2. Where have these activities taken place?
   On pre-existing roads.

   3.3. When or how frequently do these activities take place?
   Approximately 2x per year.

4. Are munitions, including small arms ammunition, stored by your agency on the property?
   Yes – The FBI stores small arms munitions in the form of 9mm, .223, and .40 cal.

   If yes:
   4.1. where are munitions stored and how are they secured?
   Munitions are stored in a double locked shed with a security gate (no windows exist on the shed)

5. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   Yes – The FBI stores small quantities of gasoline on site to operate an ATV and yard tools. Approximate amount of fuel stored on site is 2 gallons. The FBI also stores solvents on site for cleaning weapons. Approximate amount of solvent stored on site is 1 gallon.

6. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   No. The FBI is obligated to dispose and handle hazardous materials in accordance with OSHA standards.

7. Has your agency performed any firefighting activities associated with your agency's use of the Property?
   The FBI and CCSO have worked together to reduce risk of fires and increase our ability to suppress any fire should it occur, As an example, we have taken extra measures to ensure water can be delivered to all areas of the range and supplied extra fire extinguishers. No fires have ever occurred on site while the FBI was at the range.

8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
   Yes. Item was located in 2019.

   If munitions or explosives were discovered:
   8.1. Where were these items discovered?
   Near the barracks

   8.2. What item was discovered?
   A mortar round – likely inert (blue in color)

   8.3. How were they reported?
   Range Control (Greg Johnson) was notified.
   8.4. How was the item disposed of?
   Greg marked the location/item with a safety flag and notified the remediation crew.

9. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? **I do not currently have any information regarding this event; however, I can likely find out who coordinated the training.**

Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Chris Callahan	**Special Agent/Senior Team Leader**	**FBI**	**cacallahan@fbi.gov**

Date Submitted: **12/4/2024**

Note: Ecology accepted the response entries which added in Microsoft word "Track Changes" and highlighted responses in **Bold** to distinguish from questionnaire on 12/12/2024

Camp Bonneville Periodic Review
Periodic Review: Metropolitan Explosive Disposal Unit (MEDU) Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?

   Training is use of robots and other Bomb Squad training for the Metro Explosive Disposal Unit.

2. How frequently does your agency use the property?

   About 4-5 days a year.

3. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?

   Not currently. Any energetic tool use, ie firearm etc is confined to the range. In the past, we utilized other areas of the camp for non-energetic training, such as driving robots. Although we haven't used any areas outside of range for quite some time, the ability to use those areas for non-energetic training is important to our training mission.

   If Yes:
   3.1. What do those activities entail?

   3.2. Where have these activities taken place?

   3.3. When or how frequently do these activities take place?

4. Are munitions, including small arms ammunition, stored by your agency on the property?

   No

   If yes:
   4.1. where are munitions stored and how are they secured?

5. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?

   No

6. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?

   No

7. Has your agency performed any firefighting activities associated with your agency's use of the Property?

   No

8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?

   No

   If munitions or explosives were discovered:

   8.1. Where were these items discovered?

   8.2. What item was discovered?

   8.3. How were they reported?

   8.4. How was the item disposed of?

9. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training?

   No.

Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Jim DeFrain	**Supervisor**	**MEDU**	**503-823-2089**

Date Submitted: **1/28/25**

Ecology - 2/20/2025 ***Michael Cronin: Received as a word document to Ecology on 01/30/2025 via email. Ecology has bolded the responses for clarity and removed formatting issues with Microsoft Word and printed this response as a PDF.***

Camp Bonneville Periodic Review
Periodic Review: Former Managers Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

You have been identified as a former employee of Ecology, DoD contractor, and/or Clark County involved in the oversight of the cleanup. Ecology is requesting your input as your employment covered the time period relevant to this periodic review.

Please complete this questionnaire by December 18, 2024, if you are unable to answer a question, please state "I Do not know".

Name: Gregory A Johnson
Date Submitted: 16 Dec 2024

QUESTIONNAIRE

1. What was your role and former agency, and how long did you work on the Camp Bonneville Cleanup? I was employed on the site by Ecology from 2002 2010 and Clark County from 2010 -2021 as a munitions safety advisor for Ecology and a PM for Clark County

2. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property during your period of employment? A: No

3. Are you aware of any firefighting activities on the Property? A: No

If Yes:

3.1. When, where, and why did firefighting activities take place? I don't know

4. Were site specific operations and maintenance plans prepared for any of the Remedial Action Units? A: No

5. What was the process for training users of the site about site hazards? A: UXO safety briefings were held for new personnel before they performed work on site. These were conducted by Clark County Public works personnel, the contractor or law enforcement conducting the training.

6. What was the protocol for discovery of potential unexploded ordinance (UXO) outside of the remedial cleanup activities? Mark the item and inform range control this was covered in the UXO safety briefings.

7. Are you aware of any UXO or potential UXO identified at the property outside of remedial cleanup activities during your period of employment? No

   If munitions or explosives were discovered:

   7.1. Where and when were these items discovered?

   7.2. What item was discovered?

   7.3. How were they reported?

   7.4. How was the item disposed of?

8. Describe how operations and maintenance activities in support of the institutional controls were managed and documented? O&M\SOPs for sitewide institutional controls had not been developed when I left in January 2021.

9. The RAU-1 CAP requires soil excavation permits and the RAU-3 CAP requires a permit notification program for construction and maintenance related excavation activities and other potential land disturbing tasks.

   9.1. What activities requiring ground disturbance are you aware of occurring? None

   9.2. Were permits issued or a similar process followed? N/A

   9.3. Were safety measures (e.g. UXO technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities? N/A

10. RAU 1 has restrictive covenants in place with a requirement for annual reporting. During your period on the project were annual reports prepared for these restrictive covenants? No

11. The 2017 RAU 3 CAP Amendment requires annual inspections of the central impact target area (CITA) and inspections following storm events. Were these inspections performed during your period of employment and if performed how were these inspections documented? No

12. Did Clark County maintain Level I UXO technician certification for two Clark County Park employees during your period of employment? No

13. Have munitions been stored on the property since transfer of the property to Clark County? Yes

If yes:

13.1. where are munitions stored and by which agency? In the explosive magazines, by the UXO removal contractors and Law enforcement personnel.

14. At Camp Bonneville, there are two fenced areas with Type 2 portable storage magazines. One of these fenced compounds is unsecured with two empty and open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21. The other is a secured fenced yard adjacent/coinciding with Bldg 2950. In the secured yard, there are also two larger Type 2 portable storage magazines and one permanent, older magazine. These two larger magazines are closed, but with no access to the fenced yard, their usage cannot be determined.

14.1. Were any of these magazines being utilized during your period on the project, if so, how were they being used and by whom? Yes, UXO contractors and Law enforcement.

14.2. Who was responsible for maintaining the magazines, including documentation and inventory? The magazines with the "wooden canopy structures" were owned, operated and maintained by Weston Solutions the Counties UXO contractor for use during the cleanup. The other magazines were used as evidence storage by the Bureau of Alcohol Tobacco and Firearms (ATF).

14.3. Which of these fenced compounds and associated magazines were utilized as a part of the cleanup? The magazines with the "wooden canopy structures".

14.4. If any, or all, how were they procured for the cleanup? Were they rented or purchased? The Contractor Weston Solutions purchased used and maintained the magazines throughout the cleanup.

14.5. If purchased, who assumed ownership after the conclusion of the cleanup? I don't know they were still there when I left in January 2021.

15. Are you aware of any law enforcement training activities occurring outside of the active shooting range (FBI range)? Yes

16. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? Ecology is interested in which range was used, how cleanup following training was completed and reported to Project Management. The Clark County MEDU representative was Detective Steve Fox, I also attended the training and assisted. There were approximately 5 abandoned vehicles placed throughout the valley floor that were utilized for the training after the training the vehicles were removed from the site and the areas they were utilized were cleaned up.

Appendix C. Restrictive Covenants

4231239 D
RecFee - $115.00 Pages: 34 - CLARK COUNTY
Clark County, WA 10/04/2006 02:20

FILE #1615
Camp Bonneville Recordings
Sec 34 & 35-3-3 & 1,2,3, 10-2-3

RETURN ADDRESS
Bronson Potter
Clark County

Real Estate Excise Tax
Ch. 11 Rev. Laws 1951
EXEMPT
Affd. # 599469 Date 10/4/06
For Details of tax paid see
Affd. #
Doug Lasher
Clark County Treasurer
By Deputy

Please print neatly or type information
Document Title(s)

Quit Claim Deed

Reference Numbers(s) of related documents:

Additional Reference #'s on page ____

Grantor(s) (Last, First and Middle Initial)

U S of America

Additional grantors on page ___

Grantee(s) (Last, First and Middle Initial)

Clark County Washington

Additional grantees on page ____

Legal Description (abbreviated form: i.e. lot, block plat or section, township, range, quarter/quarter)

Sec 34 & 35 3 - 3 E SEC 1-2, 3 & 10 2, 3 E

Additional legal is on page ____

Assessor's Property Tax Parcel/Account Number

208417-000 167940-000 170186-000
167837-000 168044-000 208215-000

Additional parcel #'s on page ____

The Auditor/Recorder will rely on the information provided on this form. The staff will not read the document to verify the accuracy or completeness of the indexing information provided herein.

I am requesting an emergency nonstandard recording for an additional fee as provided in RCW 36.18.010. I *understand that the recording processing requirements may cover up* or otherwise obscure some part of the text of the original document.

Signature of Requesting Party

* 6 3 7 9 1 3 *

This deed was prepared/reviewed by:
Bruce G. Rohde, Attorney
U.S. Army Engineer District, Seattle
P.O. Box 3755
Seattle, WA 98124-3755

QUITCLAIM DEED
FORMER CAMP BONNEVILLE
CLARK COUNTY, WASHINGTON

THIS QUITCLAIM DEED, between the UNITED STATES OF AMERICA (hereinafter the "GRANTOR"), acting by and through the Deputy Assistant Secretary of the Army (Installations and Housing), pursuant to a delegation of authority from the SECRETARY OF THE ARMY (hereinafter the "SECRETARY"), under the authority of 10 U.S.C. § 2694a, as amended, and Clark County, Washington (hereinafter the "GRANTEE").

WITNESSETH THAT, the GRANTOR, for and in consideration of the benefit that will accrue to the United States from the use of the property conveyed herein for the conservation of natural resources and other good and valuable consideration the receipt of all of which is hereby acknowledged, does hereby REMISE, RELEASE, AND FOREVER QUITCLAIM unto the GRANTEE, its successors and assigns, all its right, title, and interest in the property situated, lying and being in the County of Clark, in the State of Washington, containing approximately 3,013 acres as more particularly described in Exhibit A, attached hereto and made a part hereof (hereinafter referred to as the "Property"); provided that the right of the GRANTEE to conduct revenue-producing activities on the Property shall be limited to the conduct of incidental revenue-producing activities that are compatible with the use of the Property for conservation purposes; provided further that the right of the GRANTEE to convey the Property shall be limited to conveyances to another eligible entity, as defined in 10 U.S.C. § 2694a(b), and shall be subject to the approval of the SECRETARY, and that any and all such further conveyances of the Property shall be subject to the same terms, reservations, restrictions, covenants and conditions set forth in this Deed; and provided that if any portion of the premises shall be used for any purpose other than natural resource conservation as provided in 10 U.S.C. § 2694a and incidental revenue-producing activities that are compatible with the use of the Property for conservation purposes, the title and interest in and to the portion of the premises so used shall revert to and become the property of the GRANTOR, at its option, and it shall have the immediate right of entry.

SUBJECT TO all valid and existing restrictions, reservations, covenants, conditions, and easements, including, but not limited to, rights-of-way for railroads, highways, pipelines, and public utilities, if any, whether of public record or not.

TO HAVE AND TO HOLD the Property granted herein to the GRANTEE and its successors and assigns, together with all and singular the appurtenances, rights, powers and privileges thereunto belonging or in anywise appertaining, and all the estate, right, title, interest, or claim whatsoever of the GRANTOR, either in law or in equity, and subject to the terms, reservations, restrictions, covenants, and conditions set forth in this Deed.

AND IT IS FURTHER AGREED AND UNDERSTOOD by and between the parties hereto that the GRANTEE, by its acceptance of this Deed, agrees that, as part of the consideration for this Deed, the GRANTEE covenants and agrees for itself, its successors and assigns, forever, that this Deed is made and accepted upon each of the following covenants, which covenants shall be binding upon and enforceable against the GRANTEE, its successors and assigns, in perpetuity by the GRANTOR and other interested parties as allowed by federal, state or local law; that the notices, use restrictions and restrictive covenants set forth herein are a binding servitude on the Property herein conveyed and shall be deemed to run with the land in perpetuity; and that the failure to include the notices, use restrictions and restrictive covenants in subsequent conveyances does not abrogate the status of these notices, use restrictions and restrictive covenants as binding upon the GRANTEE, its successors and assigns:

1. CERCLA NOTICE

A. Pursuant to section 120(h)(3)(A)(i)(I) and (II) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, (hereinafter "CERCLA") (42 U.S.C. § 9620(h)(3)(A)(i)(I) and (II)), available information regarding the type, quantity, and location of hazardous substances, as defined in section 101(14) of CERCLA, and the time at which such substances were stored, released, or disposed of, is provided in Exhibit B, attached hereto and made a part hereof. Additional information regarding the storage, release, and disposal of hazardous substances on the Property has been provided to the GRANTEE, receipt of which the GRANTEE hereby acknowledges. Such additional information includes, but is not limited to, the following documents: Final Environmental Baseline Survey Report, Final Multi-Sites Investigation Report, Final Environmental Assessment and other documents as listed in Attachment 3 to the Finding of Suitability for Early Transfer dated August 2006.

B. Pursuant to section 120(h)(3)(A)(i)(III) of CERCLA, (42 U.S.C. § 9620(h)(3)(A)(i)(III)), a description of the remedial action taken, if any, on the Property is provided in Exhibit B. Additional information regarding the remedial action taken, if any, has been provided to the GRANTEE, receipt of which the GRANTEE hereby acknowledges. Such additional information includes, but is not limited to, the following documents: Final Closure Report – Environmental Restoration, Multi-Sites; Final Closure Report, Environmental Restoration, Pesticide Building #4126 and Ammunition Bunkers #2953, #2951 and #2950; Final Landfill 4 Investigation Report; BRAC HTRW Site Closure Report for Landfills 1, 2 and 3, Former Burn Area, Buildings 1962 and 1963, Grease Pits at the Camp Bonneville and Camp Killpack Cantonments, Former Sewage Pond and Hazardous Materials Accumulation Point and other documents.

2. CERCLA COVENANT

Pursuant to section 120(h)(3)(A)(ii)(II) of CERCLA, the GRANTOR warrants that any additional remedial action found to be necessary after the date of this Deed with regard to any hazardous substances remaining on the Property as of the date of this Deed shall be conducted by the GRANTOR. This covenant shall not apply in any case in which the person or entity to whom the Property or any portion thereof, is transferred is a potentially responsible party with respect to the Property or any such portion thereof. For purposes of this covenant, the GRANTEE shall not be considered a potentially responsible party solely due to the presence of a hazardous substance remaining on the Property on the date of this Deed. Further, The GRANTOR shall not be relieved of any obligation under CERCLA to perform any remedial action found to be necessary after the date of this Deed with regard to any hazardous substances remaining on the Property as of the date of this Deed if the GRANTEE is

Clark Auditor Wed Oct 04 14:20:04 PDT 2006 4231239 Page 3

subsequently determined to be a potentially responsible party with respect to hazardous substances placed on the Property after the date of this Deed.

3. RIGHT OF ACCESS

A. Pursuant to section 120(h)(3)(A)(iii) of CERCLA, the GRANTOR retains and reserves a perpetual and assignable easement and right of access on, over, and through the Property, to enter upon the Property in any case in which an environmental response action or corrective action is found to be necessary on the part of the GRANTOR, without regard to whether such environmental response action or corrective action is on the Property or on adjoining or nearby lands. Such easement and right of access includes, without limitation, the right to perform any environmental investigation, survey, monitoring, sampling, testing, drilling, boring, coring, test-pitting, installing monitoring or pumping wells or other treatment facilities, response action, corrective action, or any other action necessary for the GRANTOR to meet its responsibilities under applicable laws and as provided for in this Deed. Such easement and right of access shall be binding on the GRANTEE, its successors and assigns, and shall run with the land.

B. In exercising such easement and right of access, the GRANTOR shall provide the GRANTEE or its successors or assigns, as the case may be, with reasonable notice of its intent to enter upon the Property and exercise its rights under this covenant, which notice may be severely curtailed or even eliminated in emergency situations. The GRANTOR shall use reasonable means, but without significant additional costs to the GRANTOR, to avoid and to minimize interference with the GRANTEE's and the GRANTEE's successors' and assigns' quiet enjoyment of the property. Such easement and right of access includes the right to obtain and use utility services, including water, gas, electricity, sewer, and communications services available on the Property at a reasonable charge to the GRANTOR. Excluding the reasonable charges for such utility services, no fee, charge, or compensation will be due the GRANTEE nor its successors and assigns, for the exercise of the easement and right of access hereby retained and reserved by the GRANTOR.

C. The GRANTOR and the GRANTEE agree that if any action of the GRANTOR's officers, employees, agents, contractors of any tier, or servants in the exercise of this right of access results in damage to the Property, the GRANTOR shall, at its sole discretion, make reasonable repairs to, or compensate for, such damage. In no event shall such repair, or compensation, exceed the fair market value of the damaged portion of the Property at the time immediately preceding such damage. The GRANTOR's liability under this clause shall be contingent upon the availability of, and shall not exceed, appropriations available for such payment and nothing contained in this Deed may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. In addition, the GRANTEE covenants for itself, its successors and assigns not to interfere with any response action or corrective action conducted by the GRANTOR on the Property.

4. "AS IS"

A. The GRANTEE acknowledges that it has inspected or has had the opportunity to inspect the Property and accepts the condition and state of repair of the Property. The GRANTEE understands and agrees that the Property and any part thereof is conveyed "AS IS" without any representation, warranty, or guaranty by the GRANTOR as to quantity, quality, title, character, condition, size, or kind, or that the same is in a condition or fit to be used for the purposes intended by the GRANTEE, and no claim for allowance or deduction upon such grounds will be considered.

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B. No warranties, either express or implied, are given with regard to the condition of the Property, including, without limitation, whether the Property does or does not contain asbestos or lead-based paint. The GRANTEE shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any asbestos, lead-based paint, or other conditions on the Property. The failure of the GRANTEE to inspect or to exercise due diligence to be fully informed as to the condition of all or any portion of the Property will not constitute grounds for any claim or demand against the GRANTOR.

C. Nothing in this "As Is" provision will be construed to modify or negate the GRANTOR's obligation under the "CERCLA Covenant" or any other statutory obligations.

5. HOLD HARMLESS

A. To the extent authorized by law, the GRANTEE, its successors and assigns, covenant and agree to indemnify and hold harmless the GRANTOR, its officers, agents, and employees from (1) any and all claims, damages, judgments, losses, and costs, including fines and penalties, arising out of the violation of the notices, use restrictions, and restrictive covenants in this Deed by the GRANTEE, its successors and assigns, and (2) any and all claims, damages, and judgments arising out of, or in any manner predicated upon any failure to comply with the provisions in this Deed regarding asbestos and lead-based paint after the date of conveyance.

B. The GRANTEE, its successors and assigns, covenant and agree that the GRANTOR shall not be responsible for any costs associated with modifications or termination of the notices, use restrictions, and restrictive covenants in this Deed, including, but not limited to, any costs associated with additional investigation or remediation of asbestos or lead-based paint.

C. Nothing in this "Hold Harmless" provision will be construed to modify or negate the GRANTOR's obligation under the "CERCLA Covenant" or any other statutory obligations.

6. ENVIRONMENTAL PROTECTION PROVISIONS

The GRANTEE shall neither transfer the Property, lease the Property, nor grant any interest, privilege, or license whatsoever in connection with the Property without the inclusion of the Environmental Protection Provisions set forth in Exhibit C, attached hereto and made a part hereof, and shall require the inclusion of the said Environmental Protection Provisions in all subsequent deeds, easements, transfers, leases, or grant of any interest, privilege, or license in, on, of, or to the Property or any portion thereof.

7. NON-DISCRIMINATION

The Grantee covenants for itself, its successors, and assigns and every successor in interest to the Property hereby conveyed, or any part thereof, that the said GRANTEE and such successors, and assigns shall not discriminate upon the basis of race, color, religion, age, gender, or national origin in the use, occupancy, sale, or lease of the Property, or in their employment practices conducted thereon. This covenant shall not apply, however, to the lease or rental of a room or rooms within a family dwelling unit; nor shall it apply with respect to religion to premises used primarily for religious purposes. The GRANTOR shall be deemed a beneficiary of this covenant without regard to whether it remains the owner of any land or interest therein in the locality of the Property hereby conveyed and shall have the sole right to enforce this covenant in any court of competent jurisdiction.

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8. INDEMNIFICATION OF TRANSFEREES OF CLOSING DEFENSE PROPERTY

The GRANTOR and the GRANTEE are aware of their respective obligations and responsibilities under section 330 of the National Defense Authorization Act for Fiscal Year 1993, Public Law 102-484, Oct. 23, 1992, 106 Stat. 2371, as amended by section 1002 of the National Defense Authorization Act for Fiscal Year 1994, Public Law 103-160, Nov. 30, 1993, 107 Stat. 1745.

9. ANTI-DEFICIENCY ACT

The GRANTOR's obligation to pay or reimburse any money under this Deed is subject to the availability of funds appropriated for this purpose to the Department of the Army and nothing in this Deed shall be interpreted to require obligations or payments by the GRANTOR in violation of the Anti-Deficiency Act, 31 U.S.C. § 1341.

10. NO WAIVER

The failure of the GRANTOR to insist in any one or more instances upon complete performance of any of the said notices, covenants, conditions, restrictions, or reservations shall not be construed as a waiver or a relinquishment of the future performance of any such covenants, conditions, restrictions, or reservations and the obligations of the GRANTEE, its successors and assigns with respect to such future performance shall continue in full force and effect.

IN WITNESS WHEREOF, the GRANTOR has caused this Deed to be executed in its name by the Deputy Assistant Secretary of the Army (Installations and Housing), this the 29th day of September 2006.

UNITED STATES OF AMERICA

By: _____
JOSEPH W. WHITAKER
Deputy Assistant Secretary of the Army
(Installations and Housing)
OASA(I&E)

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ACKNOWLEDGEMENT

COMMONWEALTH OF VIRGINIA)
) SS:
COUNTY OF ARLINGTON)

I, the undersigned, a Notary Public in and for the Commonwealth of Virginia, County of Arlington, do hereby certify that this day personally appeared before me in the Commonwealth of Virginia, County of Arlington, Joseph W. Whitaker, Deputy Assistant Secretary of the Army (Installations and Housing), whose name is signed to the foregoing instrument and who acknowledged the foregoing instrument to be his free act and deed on the date shown, and acknowledged the same for and on behalf of the UNITED STATES OF AMERICA.

Elizabeth Hitchcock
Notary Public

My commission expires: March 31st 2010 EH

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ACCEPTANCE BY GRANTEE

Clark County, a political subdivision of the State of Washington, GRANTEE, hereby accepts this Quitclaim Deed for itself, its successors and assigns, subject to all of the covenants, conditions, reservations, restrictions and terms contained herein, this 3 day of October 2006.

CLARK COUNTY

By: _____
Marc Boldt
Chair, Board of County Commissioners

ACKNOWLEDGEMENT

STATE OF WASHINGTON)
) SS.
COUNTY OF CLARK)

On this 3 day of October, 2006 before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared before me Marc Boldt, to me personally known, or proven on the basis of satisfactory evidence, to be the Chair, Board of County Commissioners, Clark County, Washington, whose name is subscribed to the foregoing instrument and who acknowledged the same to be the free and voluntary act and deed of Clark County, Washington on the date shown, and for the purposes therein mentioned, and on oath stated that he was authorized to execute the said instrument for and on behalf of Clark County Washington.

WITNESS my hand and seal hereto affixed the day and year in this certificate above written.

LOUISE DARLENE RICHARDS NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES JANUARY 26, 2008

_____
Notary Public in and for the State of Washington, residing at Vancouver, WA

My commission expires:
1-26-08

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ATTORNEY'S CERTIFICATE

I, E. Bronson Potter, acting as Senior Deputy Prosecuting Attorney for Clark County, Washington, referred to as the "GRANTEE" in the foregoing Quitclaim Deed, do hereby certify that I have examined the said Quitclaim Deed and the proceedings taken by the GRANTEE relating thereto, and find that the acceptance thereof by the GRANTEE has been duly authorized and that the execution thereof is in all respects due and proper and in accordance with the laws of the State of Washington, and further that, in my opinion, the said Quitclaim Deed constitutes a legal and binding compliance obligation of the GRANTEE in accordance with the terms thereof.

Dated this 3RD day of OCTOBER 2006.

By: _____
E. Bronson Potter
Senior Deputy Prosecuting Attorney
Clark County, Washington

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EXHIBIT A

LEGAL DESCRIPTION

A parcel of land located in Sections 34 and 35 of Township 3 North, Range 3 East of the Willamette Meridian, and in Sections 1, 2, 3, and 10 of Township 2 North, Range 3 East of the Willamette Meridian, all in Clark County, Washington, more particularly described as follows:

BEGINNING at a 3 inch aluminum cap marking the southwest corner of Section 34 Township 3 North, Range 3 East, Willamette Meridian; thence South 88° 25' 57' East, 2,635.07 feet along the south line of the southwest quarter (SW¼) of said Section 34 to a 3¼ inch aluminum cap marking the south quarter corner of said Section 34; thence North 02° 00' 17" East, 2,648.35 feet along the west line of the southeast quarter (SE¼) of said Section 34 to a ½ inch iron rod with yellow plastic cap marked "Hart 12974" marking the center of said Section 34 per that record of survey recorded in book 39 of Surveys at page 34, Records of Clark County, Washington; thence South 88° 11' 19" East, 2,643.06 feet along the north line of the southeast quarter (SE¼) of said Section 34 to the east quarter corner of said Section 34, as calculated per that Record of Survey recorded in Book 21 of Surveys, at Page 132, Records of Clark County, Washington; thence North 02° 11' 12" East, 2,637.25 feet along the west line of the northwest quarter (NW¼) of Section 35 to a 3 inch brass cap marking the northwest corner of said Section 34, being also the northeast corner of Section 35, Township 3 North, Range 3 East; thence South 88° 07' 36" East, 2,644.51 feet along the north line of the northwest quarter (NW¼) of said Section 35 to a 3¼ inch aluminum cap marking the north quarter corner of said Section 35; thence South 88° 07' 57" East, 2,644.52 feet to the northeast corner of said Section 35, said corner having a witness corner marked by a 3 inch brass cap bearing North 02° 13' 29" East, 5.00 feet, as set per that Record of Survey recorded in Book 21 of Surveys, at Page 132, Records of Clark County, Washington; thence South 02° 13' 29" West, 5,196.56 feet along the east line of said Section 35, to a 3 inch brass cap marking the southeast corner of said Section 35, being also the southwest corner of Section 36, Township 3 North, Range 3 East, as calculated per that Record of Survey recorded in Book 21 of Surveys, at page 132, records of Clark County, Washington; thence South 89° 00' 11" East, 5,286.83 feet along the south line of said Section 36, to a 3 inch brass cap marking the southeast corner of said Section 36, being also the northeast corner of Section 1, Township 2 North, Range 3 East; thence South 01° 10' 01" West, 5,302.22 feet along the east line of said Section 1, to a 3 inch brass cap marking the southeast corner of said Section 1; thence North 88° 46' 24" West, 5,266.51 feet along the south line of said Section 1, to a ½ inch iron rod with yellow plastic cap marked "TBH PLS 10920" marking the southwest corner of said Section 1, per that Record of Survey recorded in Book 21 of Surveys, at Page 95, Records of Clark County, Washington, being also the southeast corner of Section 2, Township 2 North, Range 3 East; thence North 88° 31' 25" West, 2,637.03 feet along the south line of the southeast quarter (SE¼) of said Section 2, to a ⅞ inch drill shaft marking the south quarter corner of said Section 2; thence North 88° 40' 34" West, 2,621.18 feet to a 3¼ inch aluminum cap marking the southwest corner of said Section 2, being also the northeast corner of Section 10, Township 2 North, Range 3 East; thence South 01° 25' 00" West, 2.640.69 feet to a 3¼ inch aluminum cap marking the east quarter corner of said Section 10; thence North 89° 15' 33" West, 5,294.16 feet along the south line of the North half (N½) of said Section 10 to a 3½ inch brass cap marking the west quarter corner of said Section 10; thence North 01° 27' 42" East, 2.641.85 feet along the west line of the northwest quarter (NW¼) of said Section 10 to a 1¼ inch iron pipe marking the northwest corner of said Section 10, being also the southwest corner of Section 3, Township 2 North, Range 3 East, per that Record of Survey recorded in Book 17 of Surveys, at Page 87, Records of Clark County, Washington;. thence North 00° 52' 55" East, 2650.31 feet along the west line of the southwest

quarter (SW¼) of said Section 3, to a ¾ inch iron pipe marking the west quarter corner of said Section 3, per said Record of Survey in Book 17 of Surveys, at Page 87; thence North 00° 52' 57' East, 2,671.49 feet to the northwest corner of said Section 3, being also the southwest corner of Section 34, Township 3 North, Range 3 East and the **POINT OF BEGINNING.**

EXCEPT the north half of the southwest quarter of the southwest quarter (N½SW¼SW¼) of Section 3, Township 3 North, Range 3 East, Willamette Meridian, per that Record of Survey recorded in Book 23 of Surveys, at Page 91, Records of Clark County, Washington.

ALSO EXCEPT that tract of land conveyed to the Public, by Quit Claim Deed recorded under Auditor's File Book 24, Page 223 on August 29, 1894, in Clark County, Washington, being a portion of the southwest quarter of the northwest quarter (SW¼NW¼) of Section 3, Township 2 North, Range 3 East, of the Willamette Meridian, described as follows:

BEGINNING at the southwest corner of the northwest quarter (NW¼) of said Section 3; thence east along the south line or said northwest quarter (NW¼), 330 feet (20 rods); thence north parallel with the west line of said northwest quarter (NW¼), 264 feet (16 rods); thence west parallel with the south line of said northwest quarter (NW¼), 330 feet (20 rods), to the west line of northwest quarter (NW¼) of Section 3; thence south along said west line 264 feet (16 rods), to the **POINT OF BEGINNING.**

ALSO EXCEPT any portion lying within the right of way of Northeast 232nd Avenue, and

ALSO EXCEPTING any portion lying within the right of way of Northeast 68th Street.

This description contains 3,013 acres, more or less.

This description based on survey preformed by Clark County, Washington 15 May 2006 as recorded in Book 56 of Surveys, at page 007, Records of Clark County, Washington. The Basis of Bearing is the south line of the southwest quarter of Section 34, Township 3 North, Range 3 East, Willamette Meridian, being held as South 88° 25' 57" East and distances are based on grid distances with a combined factor of 1.0000365 to obtain ground distances. Survey is based on the Washington State Plane Coordinate System, South Zone, NAD83/91 Adjustment.

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
Remedial Action Unit 1			
Building 1864 Pesticide Storage/Mixing Building	**2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid, 4,4-dishlorodiphenotrichloroethant (DDT)** Cadmium Lead	**1977 - 1980** Unknown	**Records indicate that this facility stored 55-gallon drums of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid, and an unknown amount of 4,4-dishlorodiphenotrichloroethant (DDT). These materials came from Building 4126 in 1977 and in 1980 were moved to Fort Lewis.** Surface, subsurface, and groundwater samples were collected at the site and tested for TPH, VOCs, (subsurface samples only) SVOCs, chlorinated pesticides, PCBs, organophosphorus pesticides, chlorinated herbicides, and PL metals. Test results indicate that surface and sub-surface soil samples had concentrations of various metals (cadmium, chromium and lead) above regulatory cleanup levels. The concentrations of cadmium and lead exceeded background levels. Groundwater samples collected from the two monitoring wells installed at the site contained no analytes above regulatory criteria. Remediations began in June 2000 that included soil excavations to a depth of 0.8 feet bgs (on average). Confirmatory samples were collected from the excavation, and the test results indicated that the concentration of TPH (diesel and heavy oil range) and lead exceeded cleanup criteria. Based on that data, the excavation was extended to 2.7 feet bgs (on average). Confirmatory samples were collected, and all test results showed target analyte concentrations to be below their respective cleanup criteria. The contaminated soil excavation was completed in 2000, and all contaminated soil was disposed of at an off-site facility. The excavation was backfilled to grade.
Building 4126 Pesticide Storage	**2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid,**	**Unknown to 1977**	**Records indicate that this building stored 55-gallon drums of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid, and 4,4-dishlorodiphenotrichloroethant (DDT) until 1977 when these**

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
	4,4-dishloredipheno trichloroethant (DDT) Lead	Unknown	materials were moved to Building 1864, see above. Soil samples and an indoor floor sample were collected and tested for chlorinated pesticides and herbicides, PCBs, PPL metals (plus barium) and *TPH (gasoline and diesel ranges).* Test results on these samples indicate that pesticides (4,4-DDT, 4,4-DDD, 4,4-DDE, beta-BHC, lindane, 2,4-D, 2,4-DB, 2,4,5-T, and MCPP), petroleum hydrocarbons, and several metals were detected but at concentrations below regulatory cleanup and background concentrations. Polychlorinated biphenyls were not detected at concentrations exceeding the laboratory reporting limit. Petroleum hydrocarbons were detected in floor samples above regulatory cleanup standards. Lead was detected in a surface soil sample above regulatory cleanup and background concentrations. Based on the floor and soil sample results, the building was dismantled and soil was excavated under the building footprint to a depth of 1-foot. Confirmatory samples were collected and test results show no analyte concentration above regulatory cleanup criteria. The building debris and excavated soils were disposed of at an off-site facility. The excavation was backfilled to grade.
4475	Broad-leaf herbicides	Unknown	Pesticides were formerly stored in this building. The duration and volume of pesticide storage is not known.
Building 4475 (Maintenance Pit)	Lead	Unknown	Six soil samples were collected from two borings advanced at the Maintenance pit. The soil samples collected at the drainage pit were tested, and the results showed unidentified hydrocarbons, VOCs, SVOCs and chlorinated pesticides at concentrations below regulatory criteria. No PCBs were detected in any of the samples. Several metals were detected above the regulatory cleanup concentration (arsenic, chromium, and lead) but below site-specific background concentrations with the exception of one sample, which had a lead concentration above background. *In June 2000, all accessible lead-contaminated soils were excavated and* disposed of at an off-site facility. The excavation was stopped to avoid undermining the building. Contaminated soil may be present beneath the

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
			building. Potential contaminants may include petroleum hydrocarbons, VOCs, SVOCs, metals. The excavation was backfilled to grade.
Suspect Drum Burial Site (Drum Disposal Area)	Arsenic Barium Chromium Methoxychlor Toluene	Unknown	An electromagnetic survey of the area identified anomalies. Soil borings were advanced in this area and samples collected. No SVOCs, PCBs, pesticides, or explosive compounds were detected in the samples, and there was no evidence of the presence of explosives. Petroleum hydrocarbons, certain VOCs, and metals were detected, but at concentrations below regulatory cleanup criteria and/or background concentrations. In 2000, the area was excavated to remove buried drums and debris (paint cans, corrugated metal, scrap metal and barbed wire). Twenty-six test pits were excavated to assess the area of drum disposal. Soil samples collected from the tests pits, and at some locations rainwater that accumulated in the pits, were tested. The soil sample test results indicate that toluene, arsenic, barium, chromium and methoxychlor exceeded regulatory cleanup criteria. The rainwater sample test results indicate that naphthalene, ethyl benzene, toluene, and lead above cleanup levels. A second EM survey was conducted to determine if buried objects could have caused or contributed to the contamination. Thirteen additional anomalies were identified and investigated by trenching. One excavation contained among other things, paint cans and paint. The other trenches contained scrap metal, reinforcement bars, barbed wire and firing point survey markers. Cleanup activities were initially conducted to address the debris, but later to address the organic compounds and metals detected in the test pits. Approximately 110 tons of soil and debris was excavated and disposed of at an off-site facility. Confirmatory sample results indicate all target analyte concentrations were either not detected or below regulatory cleanup criteria. The excavation was backfilled to grade.
Former CS Gas Training Building (Former CS Gas Training Building Site)	Lead	Unknown	Five soil borings were advanced in the area and soil samples were collected. Test results indicate that CS gas and cyanide were not detected. Semi-volatile organic compounds were detected but at concentrations below regulatory criteria. Lead was detected above regulatory cleanup and background criteria. In June 2000, contaminated soil excavation activities were commenced. The excavation extended to 3-feet below grade. Confirmatory sample test results indicate that all analyte concentrations were below MTCA cleanup criteria. The excavation was backfilled to grade and all contaminated soil was disposed of at an off-site facility.

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release or Disposal	Remedial Actions
Ammunitions Storage Bunkers (Facility Nos. 2950, 2951, and 2953)	Lead	Unknown	In 1998, fifteen sampling locations (nine at the largest magazine and three each at the two smaller magazines) were selected for the collection of surface and subsurface soil samples. A soil boring was also advanced at each magazine based on the results of the surface soil tests from soil samples collected from inside the magazines. Wipe samples were collected from the floors in each magazine. The soil samples collected from inside the magazines, and the wipe sample tests results show RDX (below reporting levels) and all the PPL metals except selenium and thallium in Building 2950. Arsenic, beryllium, cadmium, chromium, lead, and mercury were detected in the soil samples collected from inside the magazines at concentrations that exceed the MTCA cleanup criteria. Arsenic, beryllium, and cadmium concentrations were also above background levels. PETN was detected in one magazine; however, there is no established cleanup concentration for PETN. No organic compounds were detected above reporting limits in the surface soil samples collected outside the magazines. Arsenic, cadmium, chromium, and lead were detected at concentrations above MTCA cleanup criteria and background levels in the surface soil samples collected outside the magazines. In 2001, surface and subsurface soil samples were collected from Building 2953. PETN, picric acid, and 2,4-dinitrotoulene were detected in the surface soil samples at concentrations below MTCA cleanup criteria. No ordnance compounds or propellants were detected in the subsurface soil samples. Metals were detected in the surface soil samples. Arsenic and chromium were detected above MTCA cleanup criteria. Lead was detected above the MTCA cleanup criteria and background levels. In May 2001, contaminated soils at the three magazines were excavated to one foot below grade. Confirmatory samples were collected and the test results indicated no residual contaminants above regulatory criteria or background levels. The excavations were backfilled and the contaminated soil and wood from pallets inside the magazines were disposed of at an off-site facility. The interior surfaces of the magazines were cleaned.
Remedial Action Unit 2A			
25Meter M60/Pistol Range	Lead	Unknown	Two soil samples collected from this site had lead concentrations of 136 mg/kg and 219 mg/kg.
25Meter Machine Gun Range	Lead	Unknown	The explosive residue (DNT) was detected in soil samples collected from the muzzle blast zone at concentrations that range from 4.9 mg/kg to 20 mg/kg, which are below regulatory criteria. Eleven soil samples had lead concentrations that ranged from 120 mg/kg to 26,300 mg/kg.

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
25Meter Record Fire Field Range	Lead	Unknown	Six soil samples collected from this site had lead concentrations that ranged from 150 mg/kg to 8,880 mg/kg.
Machine Gun Range- North	Barium and Lead	Unknown	Barium was detected in two soil samples at concentrations of 178 mg/kg and 200 mg/kg. Lead was detected in one soil sample at a concentration of 158 mg/kg.
Machine Gun Range- South	Barium and Lead	Unknown	Barium was detected in one soil sample at concentration of 192 mg/kg. Lead was detected in two soil samples at concentrations of 135 mg/kg and 423 mg/kg.
Infiltration Course-South	Lead	Unknown	Lead was detected in one soil sample at a concentration of 151 mg/kg.
Sub-machine Gun Range	Barium	Unknown	Barium was detected in one soil sample at a concentration of 133 mg/kg.
Field Firing Ranges 1 & 2	Lead	Unknown	Eight soil samples had lead concentrations that range from 125mg/kg to 7,150 mg/kg.
TF Range	Barium	Unknown	Barium was detected in one soil sample at a concentration of 163 mg/kg.
Combat Pistol Range	Lead	Unknown	Two soil samples contained lead at concentrations of 165 mg/kg and 785 mg/kg.
Close Combat Range	Barium	Unknown	Barium was detected in two soil samples at concentrations of 145 mg/kg and 227 mg/kg.
Rifle Ranges 1&2	Arsenic, Barium and Lead	Unknown	Arsenic and barium were detected in soil samples at 22.9 mg/kg and 202 mg/kg, respectively. Eighteen soil samples had lead concentrations that ranged from 130 mg/kg to 4,330 mg/kg.
Field Fire Rifle Ranges 1 & 2	Barium and Lead	Unknown	Soil test results show two samples with barium detected at concentrations of 146 mg/kg and 194 mg/kg. Two soil samples contained lead in concentrations of 149 mg/kg and 2,300 mg/kg.
Undocumented Pistol Range	Lead	Unknown	Lead was detected in one soil samples at a concentration of 154 mg/kg.
Remedial Action Unit 2B			
No sites			
Remedial Action Unit 2C			

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
Demolition Area 1 and Landfill 4	RDX 2,4-DNT Perchlorate Dichlorofluoromethane 1,1,1-TCA 1,1-DCE PCE	Unknown	A site investigation (SI) was conducted in 1998-1999 4 to evaluate the potential for contamination resulting from past uses of the landfill. The SI included a UXO avoidance survey, geophysical survey, surface and subsurface sampling, and groundwater sampling. Test results of soil samples indicate concentrations of various metals. Only barium, copper, and chromium were detected at concentrations exceeding the regulatory/risk-based criteria. One or more SVOCs, insecticides, herbicides and VOCs were detected, but at concentrations below screening criteria. The only groundwater constituent detected at a concentration exceeding a screening level was RDX (44 ug/l). This compound was detected in the down-gradient well only. Surface water investigations of nearby streams were conducted in 1998 and 1999. Both investigations included the collection and analysis of stream water samples, which were extensively tested. Both investigations concluded that the activities conducted at the landfill do not appear to have affected the stream(s) investigated (primarily Lacamas Creek). In 2001, an expanded site investigation (ESI) of the landfill was conducted based on the previous detection of RDX. The ESI focused primarily on groundwater and included the installation of eight monitoring wells (one well could not be used because it was dry). Four quarterly rounds (July 2001, October 2001, January 2002, and April 2002) of groundwater sampling were conducted. Well samples were also collected in January 2003. Samples collected from the wells were tested for explosives residues, nitroguanidine, perchlorate ion, VOCs, SVOCs, organochlorine herbicides PPL metals (total and dissolved), total cyanide TPH and water quality parameters. Tests results indicate that explosives and propellants (2,4-DNT, RDX, and perchlorate) were detected in all but one monitoring well, and were also detected in the up-gradient well. These constituents were detected in concentrations exceeding screening criteria in the initial groundwater sampling rounds and the final sampling round. Dichlorofluoromethane, 1,1,1-TCA, 1,1-DCE, and PCE were also detected above screening levels. In 2004, approximately 5,000 cys of contaminated soil was removed (interim action) and disposed of at an off-site facility. The excavation was backfilled to grade. The monitoring wells at the site will be sampled on a quarterly basis.

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
Remedial Action Unit 3			
No sites			

The information contained in this notice is required under the authority of regulations promulgated under section 120(h) of the Comprehensive Environmental Response, Liability, and Compensation Act (CERCLA or 'Superfund') 42 U.S.C. §9620(h). This table provides information on the storage of hazardous substances for one year or more in quantities greater than or equal to 1,000 kilograms or the hazardous substance's CERCLA reportable quantity (which ever is greater). In addition, it provides information on the known release of hazardous substances in quantities greater than or equal to the substances CERCLA reportable quantity. See 40 CFR Part 373.

Notes:

1) Sites and chemical compounds shown in bold type: records indicate that a CERCLA hazardous substance was stored, released, or disposed of at the identified facility at or above its reportable quantity.
2) Sites and chemical compounds not shown in bold type: records indicate a CERCLA hazardous substance was released or disposed of at the site/area indicated; however, the quantity is not known. These sites generally relate to a known or suspected release of a CERCLA hazardous substance that was detected at concentrations that require cleanup, the hazardous substance.
3) Chemical Abstract Service Registry Numbers:

Analyte	Case #	Reportable Quantity (lbs)
• Arsenic	7440382	1
• Barium	7440-39-3	-
• beta-BHC	319857	1
• Cadmium	7440439	1
• Chromium	440473	1

Acronyms:

CERCLA = Comprehensive Environmental Compensation liability Act
CFR = Code of Federal Regulations
CS = 2-chlorobenzalmalononitrile
D = dichlorophenoxy acetic acid
DB = dichlorophenoxy butyric acid
DCE = dichloroethylene
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
DDT =dichlorodiphenyltrichloroethane
DNT = 2,4-dinitrotoluene
EM = electromegnetic
ESI = expanded site investigation
Lbs = pounds
MCPP =2-(2-methyl-4-chlorophenoxy) propionic acid
MTCA = Model Toxics Control Act
PCB = polychlorinated biphenyls
PCE = Tetrachloroethylene

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)		Date of Storage, Release, or Disposal	Remedial Actions
•	Chlorobenzalmalononitrile	2698411	-	PETN = pentaerythritol tetranitrate
•	2,4-D	94757	100	PPL Metals = priority pollutant metals
•	2,4-DB	94826	-	T = trichlorophenoxyacetic acid
•	1,1-DCE	75354	5000	TCA = trichloroethane
•	4,4-DDT	50293	1	TCE = Trichloroethylene
•	4,4-DDD	72548	1	TPH = total petroleum hydrocarbons
•	4,4-DDE	72559	1	RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
•	Dichlorofluoromethane	75434	-	SVOC = semi-volatile organic compounds
•	DNT	121142	1000	U.S.C. = United States Code
•	Lead	7439921	1	U.S. EPA = United States, Environmental Protection Agency
•	Lindane	58999	1	VOC = volatile organic compounds
•	Methoxychlor	72435	1	
•	MCPP	7085190		
•	2,4,5-T	93765	100	
•	1,1,1-TCA	71556	1	
•	TCE	79016	1000	
•	Toluene	108-88-3	1000	
•	PCB	1336363	10	
•	PCE	127184	1	
•	Perchlorate	14797730	-	
•	RDX	121824	-	
•	Sodium hypochlorite	7681529	100	

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EXHIBIT C

ENVIRONMENTAL PROTECTION PROVISIONS

1. LAND USE RESTRICTIONS

A. The United States Department of the Army (hereinafter the "Army") has undertaken careful environmental study of the Property and concluded that the land use restrictions set forth below are required to ensure protection of human health and the environment. The GRANTEE, its successors or assigns, shall not undertake nor allow any activity on or use of the Property that would violate the land use restrictions contained herein.

(1) Residential Use Restriction. The GRANTEE, its successors and assigns, shall use the Property solely for conservation of natural resources and not for residential purposes. For purposes of this provision, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; provided, however, that residential purposes do not include multiple overnight stays associated with the Rustic Retreat Center and Outdoor School, day camping or overnight camping within existing or new buildings on the Property; provided further, however, that prior to the use of any buildings on the Property for such purposes, the responsible State of Washington and/or local government agency or agencies shall have made a written determination that the buildings are habitable and safe for such use under applicable state and/or local laws and regulations. Caretaker, security, and/or Parks & Recreation Department personnel wishing to live in existing buildings or newly-constructed buildings on the Property during remediation and post-remediation of the Property may not reside in such buildings until the responsible State of Washington and/or local government agency or agencies shall have made a written determination that such buildings are habitable and safe for such use under applicable state and/or local laws and regulations.

(2) Ground Water Restriction. The GRANTEE is hereby informed and acknowledges that there is limited contamination of the ground water under the Demolition Area 1/Landfill 4 area more particularly described in Exhibit D, attached hereto and made a part hereof. The GRANTEE, its successors and assigns, shall not have the right to access or use ground water underlying the Property for any purpose without the prior written approval of the Army and the Washington State Department of Ecology (hereinafter the "WDOE"). For the purpose of this restriction, "ground water" shall have the same meaning as in section 101(12) of CERCLA. The GRANTEE may, however, use the existing water systems at the Camp Killpack and Camp Bonneville cantonment areas and the caretaker's building for purposes of continuing to provide non-potable water to said facilities or for the provision of potable water provided that prior to use of said water systems for the provision of potable water, the responsible State of Washington and/or local government agency or agencies must make a determination that the water is suitable and safe for such use under applicable state and/or local laws and regulations. The GRANTEE shall have the right to develop other water systems, including those using groundwater underlying other areas of the Property, excluding the area underlying Demolition Area 1/Landfill 4 and the associated contaminant plume, provided, that the GRANTEE shall obtain the prior written approval of the WDOE and the Army.

(3) Excavation/Land Disturbance Restriction. The GRANTEE, its successors and assigns, shall not have the right to conduct, or permit others to conduct, any excavation or other intrusive activity on the Property, without qualified unexploded ordnance (hereinafter "UXO") personnel on staff or available and a Department of Defense (hereinafter "DoD") approved Explosives Safety Submission and/or explosives site plan.

(4) Public Access Restriction. The GRANTEE, its successors and assigns shall not have the right to provide access to the Property to members of the general public until such time as all remedial

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action necessary to protect human health and the environment with respect to hazardous substances remaining on the Property as of the date of this Deed, including munitions and explosives of concern (hereinafter "MEC"), has been taken and this restriction is modified or released by the GRANTOR. The restriction imposed herein shall not restrict the right of the GRANTEE, its successors and assigns to provide access to the Property to officers, employees, agents, and contractors of any tier for the purpose of conducting environmental remediation and MEC response actions. The GRANTEE covenants and agrees to construct and maintain a fence along the perimeter of the Property to control or restrict public access as needed. The GRANTEE further covenants and agrees to provide and maintain appropriate signage to inform its officers, employees, agents, and contractors of any tier and the general public about potential hazards on the Property.

(5) Notice of Archaeological Site and Preservation Covenant. In consideration of the conveyance of the Property that includes site 45-CL-318, and may include other as yet undiscovered archaeological sites on the Property, the GRANTEE hereby covenants on behalf of itself, its successors, and assigns at all times to the Washington State Historic Preservation Officer (hereinafter the "SHPO") to maintain and preserve site 45-CL-318 and all other as yet undiscovered archaeological sites in accordance with the provisions of the following paragraphs of this covenant.

a. The GRANTEE, its successors or assigns shall notify the SHPO and the Cowlitz Indian Tribe in writing prior to undertaking any disturbance of the ground surface or any other action within 300 feet of the center of site 45-CL-318 that would affect its physical integrity. The center point of site 45-CL-318 is described as being located at 134810 E, 1150207 N, NAD 1983 HARN State Plane Washington South FIPS 4602 feet. Said site is more particularly described in Exhibit E, attached hereto and made a part hereof. Such notice shall describe in reasonable detail the proposed undertaking and its expected effect on the physical integrity of site 45-CL-318.

b. For ground-disturbing activities other than remediation of MEC, the GRANTEE, its successors or assigns shall prepare and submit to the SHPO and the Cowlitz Indian Tribe a written assessment of project effects in advance of any ground-disturbing activity having moderate to high potential impacts within areas mapped as "20-100% probability" in the Clark County Archaeological Predictive Model Map, attached hereto as Exhibit F and made a part hereof, and having slopes less than 5%. The assessment of project effects will describe the proposed undertaking in reasonable detail, discuss its expected effects upon recorded or unrecorded archaeological resources, and will conclude with recommendations concerning the need for additional archaeological survey or other actions to avoid or mitigate adverse effects to archaeological resources, taking into account previous cultural resource surveys at the Property and other recorded archaeological sites in close proximity to the proposed project.

c. The GRANTEE, its successors or assigns shall make every reasonable effort to prohibit any person from knowingly or inadvertently disturbing any archaeological object or archaeological site, as defined in RCW 27.53.030. In the event that any archaeological object or archaeological site is knowingly or inadvertently disturbed, the GRANTEE, its successors or assigns shall immediately stop the activity causing the disturbance and make a reasonable effort to protect the archaeological object or archaeological site from further disturbance. The GRANTEE, its successors or assigns shall provide written notification to the SHPO and the Cowlitz Indian Tribe within one (1) working day of the discovery. Within fifteen (15) calendar days of the discovery, the GRANTEE, its successors or assigns shall provide to the SHPO and the Cowlitz Indian Tribe a Draft Site Treatment and Restoration Plan to describe the actions the GRANTEE, its successors or assigns will take to mitigate the damage, restore the site of discovery, and provide for the treatment and disposition of any archaeological resources recovered.

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d. Within thirty (30) calendar days of the SHPO's and Cowlitz Indian Tribe's receipt of notification provided by the GRANTEE, or its successors or assigns pursuant to paragraphs (a), (b), or (c) of this covenant, the SHPO and the Cowlitz Indian Tribe will respond to the GRANTEE, its successors or assigns in writing as follows:
   1. That the GRANTEE, its successors or assigns may proceed with the proposed undertaking without further consultation; or
   2. That the GRANTEE, its successors or assigns must initiate and complete consultation with the SHPO before it can proceed with the proposed undertaking.

   If the SHPO and the Cowlitz Indian Tribe fail to respond to the GRANTEE's or its successors' or assigns' written notice within thirty (30) calendar days of the SHPO's and the Cowlitz Indian Tribe's receipt of the same, then the GRANTEE may proceed with the proposed undertaking without further consultation.

e. If the response provided to the GRANTEE, its successors or assigns by the SHPO and the Cowlitz Indian Tribe pursuant to paragraph d.2. of this covenant requires consultation with the SHPO and the Cowlitz Indian Tribe, then all parties will so consult in good faith to arrive at mutually-agreeable and appropriate measures that GRANTEE, its successors or assigns will employ to mitigate any adverse effects associated with the proposed undertaking. Pursuant to this covenant, any mitigation measures to which GRANTEE, its successors or assigns and the SHPO mutually agree shall be carried out solely at the expense of GRANTEE, its successors or assigns.

f. The SHPO and the Cowlitz Indian Tribe shall be permitted at all reasonable times to inspect the Property in order to ascertain its condition and to fulfill their responsibilities hereunder.

g. In the event that another Indian tribe should request consultation regarding activities described in paragraphs (a), (b), or (c) of this covenant, the GRANTEE, its successors or assigns shall consult with such tribes consistent with Washington state law and ordinances of the GRANTEE.

h. In the event of a knowing violation of this covenant, and in addition to any remedy now or hereafter provided by law, the SHPO may, following reasonable notice to the GRANTEE, its successors or assigns, institute suit to enjoin said violation or to require the restoration of any archaeological site affected by such violation. The successful party shall be entitled to recover all costs or expenses incurred in connection with any such suit, including all court costs and attorney's fees.

i. This covenant is binding on the GRANTEE, its successors, and assigns in perpetuity. Restrictions, stipulations, and covenants contained herein shall be inserted by the GRANTEE verbatim or by express reference in any deed or other legal instrument by which it divests itself of either the fee simple title or any other lesser estate in site 45-CL-318 or any other portion of the Property.

j. The failure of the SHPO to exercise any right or remedy granted under this instrument shall not have the effect of waiving or limiting the exercise of any other right or remedy or the use of such right or remedy at any other time.

k. This covenant shall be a binding servitude upon the Property and shall be deemed to run with the land.

l. Execution of this Deed shall constitute conclusive evidence that GRANTEE agrees to be bound by the foregoing conditions and restrictions and to perform the obligations herein set forth.

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B. Modifying Land Use Restrictions.

(1) The GRANTEE shall prepare Long Term Operation and Maintenance Plans (hereinafter "LTO&M Plans") as required by the Prospective Purchaser Consent Decree between the GRANTEE and Bonneville Conservation, Restoration, and Renewal Trust, LLC (hereinafter the "BCRRT") and Washington State Department of Ecology (hereinafter "WDOE") filed in the Clark County Superior Court. The LTO&M Plans shall identify any new land use restrictions or appropriate modifications to, or termination of, the land use restrictions established in this Deed based upon additional site characterization and remediation that will be completed pursuant to the Environmental Services Cooperative Agreement (hereinafter "ESCA") between the GRANTOR and the GRANTEE dated July 28, 2006, as modified. The LTO&M Plans must be reviewed by and agreed to by the GRANTOR prior to their submission to WDOE and must be approved by WDOE. Within 30 days of WDOE's approval of a LTO&M Plan, the GRANTOR and the GRANTEE shall prepare an appropriate instrument to revise, as necessary, the land use controls contained in this Deed to be consistent with those specified in the LTO&M Plan. This instrument shall be executed and recorded within 15 days of completion of the preparation of a mutually-satisfactory instrument.

(2) Nothing contained herein shall preclude the GRANTEE, its successors or assigns, from undertaking, in accordance with applicable laws and regulations and without any cost to the GRANTOR, such additional action necessary to allow for other less restrictive land use, groundwater, excavation/land disturbance or public access uses of the Property. Prior to such use of the Property, the GRANTEE, its successors or assigns shall consult with and obtain the approval of the GRANTOR, and, as appropriate, the State or Federal regulators, or the local authorities. Upon the GRANTEE's or its successors' or assigns' obtaining the approval of the GRANTOR and, as appropriate, state or federal regulators, or local authorities, the GRANTOR agrees to execute an instrument suitable for recordation in the local land records and modifying, as appropriate, the land use restrictions imposed hereunder. The recordation of any such instrument shall be the responsibility of the GRANTEE, or its successors or assigns and shall be accomplished at no additional cost to the GRANTOR.

(3) The GRANTEE, its successors and assigns, shall submit any requests for modifications to the land use restrictions set forth herein to the GRANTOR and the WDOE, by first class mail, postage prepaid, addressed as follows:

GRANTOR: U.S. Army Engineer District, Seattle
ATTN: CENWS-RE
3015 NW 54th Street,
Seattle, WA 98107

WDOE: Washington State Department of Ecology
Toxics Cleanup Program
P.O. Box 47600
Olympia, WA 98504-7600

2. ENVIRONMENTAL PROTECTION PROVISIONS BINDING AND ENFORCEABLE

The Environmental Protection Provisions in this Deed are binding on the GRANTEE, its successors and assigns and shall be included in subsequent deeds, shall run with the land, and are forever enforceable by the Grantor and appropriate regulatory agencies.

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3. DISRUPTION OF REMEDIES PROHIBITED

Pursuant to section 120(h)(3)(C)(ii)(II), the GRANTEE covenants and agrees for itself, its successors, and assigns, that it shall not, nor shall it allow its sublessees, tenants, invitees or licensees to engage in activities that will disrupt any remedial investigation, response action, and/or oversight activities on the Property related to hazardous substances or MEC.

4. NOTICE OF THE POTENTIAL PRESENCE OF MUNITIONS AND EXPLOSIVES OF CONCERN (MEC)

A. The GRANTEE is hereby notified that due to the former use of the Property as a military installation, the Property may contain MEC. The term "MEC" means specific categories of military munitions that may pose unique explosives safety risks and includes: (1) unexploded ordnance ("UXO"), as defined in 10 U.S.C. § 101(e)(5); (2) discarded military munitions ("DMM"), as defined in 10 U.S.C. § 2710(e)(2); and (3) munitions constituents (e.g. TNT, RDX), as defined in 10 U.S.C. § 2710(e)(3), present in high enough concentrations to pose an explosive hazard.)

B. The Property was previously used as an operational range for live-fire training or testing, open burning, and for open detonation of munitions. A munitions response was conducted in 1998 and 2000. Munitions response activities have not been completed. A summary of MEC discovered on the Property is provided in Exhibit G, attached hereto and made a part hereof.

C. If the GRANTEE, its successors or assigns, any subsequent owner, or any other person should find any MEC on the Property after response activities are completed, they shall immediately stop any intrusive or ground-disturbing work in the area or in any adjacent areas and shall not attempt to disturb, remove or destroy it, but shall immediately notify Local Law Enforcement so that appropriate explosive ordnance disposal personnel can be dispatched to address such MEC as required under applicable law and regulations and the ESCA. This requirement does not apply while conducting munitions response. During such munitions responses, any MEC encountered will be addressed per the procedures outlined in the DDESB-approved explosives safety submission and/or the explosives site plan.

D. Easement and Access Rights.

(1) The GRANTOR reserves a perpetual and assignable easement and right of access on, over, and through the Property, to access and enter upon the Property in any case in which a munitions response action is found to be necessary or such access and entrance is necessary to carry out a munitions response action on adjoining property. Such easement and right of access includes, without limitation, the right to perform any additional investigation, sampling, testing, test-pitting, surface and subsurface clearance operations, or any other munitions response action necessary for the GRANTOR to meet its responsibilities under applicable laws and as provided for in this Deed. This easement and right of access shall be binding on the GRANTEE, its successors and assigns, and shall run with the land.

(2) In exercising this easement and right of access, the GRANTOR shall give the GRANTEE or the then record owner, reasonable notice of the intent to enter on the Property, except in emergency situations. The GRANTOR shall use reasonable means, without significant additional cost to the GRANTOR, to avoid and/or minimize interference with the GRANTEE's and the GRANTEE's successors' and assigns' quiet enjoyment of the Property. Such easement and right of access includes the right to obtain and use utility services, including water, gas, electricity, sewer, and communications services available on the property at a reasonable charge to the GRANTOR. Excluding the reasonable charges for such utility services, no fee, charge, or compensation will be due the GRANTEE or its

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successors or assigns, for the exercise of the easement and right of access hereby retained and reserved by the GRANTOR.

(3) The GRANTOR and the GRANTEE agree that if any action of the GRANTOR's officers, employees, agents, contractors of any tier, or servants in the exercise of this right of access results in damage to the Property, the GRANTOR shall, at its sole discretion, either make reasonable repairs to or compensate for such damage. In no event shall such repair, or compensation, exceed the fair market value of the damaged portion of the Property at the time immediately preceding such damage. The GRANTOR's liability under this clause shall be contingent upon the availability of, and shall not exceed, appropriations available for such payment and nothing contained in this Deed may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The GRANTEE covenants and agrees for itself, its successors and assigns that it shall not cause or permit any interference with any munitions response action conducted by the GRANTOR on the Property

E. The GRANTEE acknowledges receipt of or access to the Administrative Record which contains MEC related documents.

5. NOTICE OF THE PRESENCE OF ASBESTOS AND COVENANT

A. The GRANTEE is hereby informed and does acknowledge that friable and non-friable asbestos or asbestos containing material (hereinafter "ACM") has been found on the Property. The Property may also contain improvements, such as buildings, facilities, equipment, and pipelines, above and below the ground, that contain friable and non-friable asbestos or ACM. The Occupational Safety and Health Administration (OSHA) and the U.S. Environmental Protection Agency have determined that unprotected or unregulated exposure to airborne asbestos fibers increases the risk of asbestos-related diseases, including certain cancers that can result in disability or death.

B. The following buildings on the Property have been determined to contain friable asbestos: 1828, 1864, 1930, 1934, 1980, and 4155. The GRANTEE agrees to undertake any and all asbestos abatement or remediation in the aforementioned buildings that may be required under applicable law or regulation at no expense to the GRANTOR. The GRANTOR has agreed to transfer said buildings to the GRANTEE, prior to remediation or abatement of asbestos hazards, in reliance upon the GRANTEE's express representation and covenant to perform the required asbestos abatement or remediation of the said buildings.

C. The GRANTEE covenants and agrees that its use and occupancy of the Property will be in compliance with all applicable laws relating to asbestos. The GRANTEE agrees to be responsible for any future remediation or abatement of asbestos found to be necessary on the Property to include ACM in or on buried pipelines that may be required under applicable law or regulation.

D. The GRANTEE acknowledges that it has inspected or has had the opportunity to inspect the Property as to its asbestos and ACM condition and any hazardous or environmental conditions relating thereto. The GRANTEE shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any asbestos or ACM hazards or concerns.

6. NOTICE OF THE PRESENCE OF LEAD-BASED PAINT (LBP) AND COVENANT AGAINST THE USE OF THE PROPERTY FOR RESIDENTIAL PURPOSES

A. The GRANTEE is hereby informed and does acknowledge that all buildings on the Property, which were constructed or rehabilitated prior to 1978, are presumed to contain lead-based paint. Lead

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from paint, paint chips, and dust can pose health hazards if not managed properly. Every purchaser of any interest in residential real property on which a residential dwelling was built prior to 1978 is notified that there is a risk of exposure to lead from lead-based paint that may place young children at risk of developing lead poisoning.

B. The GRANTEE covenants and agrees for itself, its successors and assigns that it shall not permit the occupancy or use of any buildings or structures on the Property as Residential Property, as defined under 24 Code of Federal Regulations Part 35, without complying with this notice and covenant and all applicable federal, state, and local laws and regulations pertaining to lead-based paint and/or lead-based paint hazards. Prior to permitting the occupancy of the Property where its use subsequent to conveyance is intended for residential habitation, the GRANTEE specifically agrees to perform, at its sole expense, the Army's abatement requirements under Title X of the Housing and Community Development Act of 1992 (Residential Lead-Based Paint Hazard Reduction Act of 1992), as amended.

C. The GRANTEE acknowledges that it has inspected or has had the opportunity to inspect the Property as to its lead-based paint content and condition and any hazardous or environmental conditions relating thereto. The GRANTEE shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any lead-based paint hazards or concerns.

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EXHIBIT D

Demolition Area 1/Landfill 4

A parcel of land located in the northeast quarter (NE¼) of Section 35, Township 3 North, Range 3 East, Willamette Meridian, situate in Clark County, Washington; and more particularly described as follows:

Commencing at the north quarter corner of the said Section 35, thence south 08°10'13" east, a distance of 975.35 feet to the northwest (NW) corner of said parcel and the **TRUE POINT OF BEGINNING;** thence north 90°00'00" east , a distance of 500 feet; thence south 0°00'00" east, a distance of 100 feet; thence south 90°00'00"east, a distance of 100 feet; thence south 0°00'00" east, a distance of 600 feet; thence south 90°00'00" west, a distance of 500 feet; thence north 0°00'00" east, a distance of 100 feet; thence south 90°00'00" west, a distance of 100 feet; thence north 0°00'00" east, a distance of 100 feet; thence south 90°00'00" west, a distance of 100 feet; thence north 0°00'00" east, a distance of 400 feet; thence south 90°00'00" east, a distance of 100 feet; thence north 0°00'00" east, a distance of 100 feet to the **TRUE POINT OF BEGINNING**.

Contains 10.1 acres, more or less.

This description is based on GIS data used for a map known as figure 5.1 (page 5.3) which is attached to a report titled "Camp Bonneville, Site Specific Fact Sheets, Remedial Action Unit 3, Vancouver, Washington". The report was provided by Parsons for the U.S. Army Corps of Engineers, Seattle District and Huntsville Center (dated August 2005, Contract No DACA87-00D-0038, delivery order 0017).

Doc. 001930.

All Public Land Survey section corners and section lines are based on a record of survey (ROS) performed by the county surveyor of Clark County, Washington (dated May 15, 2006 and filed in Book 56, page 7). The basis of bearing according to said ROS is grid and adjusted to the Washington State Plane Coordinate System, south zone, NAD 83 (91). All distances are grid.

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EXHIBIT G

NOTIFICATION OF MUNITIONS AND EXPLOSIVES OF CONCERN			
Site	Site Description	Date of MEC Activity	Munitions Response Actions
Unexploded Ordnance – Based on past reuse of the Property, the potential for MEC exists anywhere on site. Specific information regarding known target areas with higher likelihood of MEC is included below.			
Landfill 2 (Sewage Lagoons and Historic Landfill)	This landfill was discovered in 1978 during the construction of the sewage lagoon. The landfill may have been used from the 1940s to the 1950s; however, the type and quantity of material located at this site is unknown.	Unknown	A UXO avoidance/screening and electromagnetic survey identified pipes, vehicle parts, wiring and one undetonated 2.36-inch light anti-tank weapon, which was disposed of by the Ft Lewis EOD.
Demolition Area 3 (DA 3)	DA 3 is a surface depression that may be an excavation or possibly a detonation crater. The location is about 2000 feet upstream of the base boundary in Lacamas Creek Valley. The crater is approximately 20 feet in diameter and 10 feet deep. DA 3 is located west of the gas pipeline right-of-way that crosses Camp Bonneville. DA 3 may have been used for detonation of unwanted ordnance. The crater is situated several hundred feet south of Lacamas Creek in an area where the valley is wide and relatively flat. The ground surface at DA 3 is hummocky with seasonal wetland vegetation.	Unknown	Soil samples were collected from borings advanced immediately around the depression and from a nearby location where metallic debris (one drum and shell fragments) was found and later removed and disposed of. All soil samples were tested for explosives, perchlorate, and total metals. Test results of soil boring samples indicate no explosives or perchlorate concentrations above the testing instrument's reporting limit. Test results of soil samples collected from the former debris piles indicate no explosives, perchlorate, or picric acid. Metals were detected in samples collected from the borings and the debris pile but at concentrations at background levels and/or below screening or cleanup levels. Arsenic, barium, copper, and mercury were detected at concentrations that required a terrestrial ecological evaluation. The evaluation determined that these metals are not a potential threat to ecological receptors. No ordnance and explosives sampling and removal activities were conducted at this site, but a 37mm practice round was recovered form an old crushed burn barrel found at the site.
Small-arms Ranges – not considered/included as MEC	There are 21 small-arms ranges on the Property. For a description of the small-arms ranges see Table 1-Description of Property.	Unknown	The following is a general description of the investigations and remediations conducted at the 21 small-arms ranges. The U.S. Army Corps of Engineers (1997) prepared an archive search report (ASR) to collect information pertinent to the small-arms ranges at Camp Bonneville. The small arms ranges were investigated as part of the base-wide reconnaissance effort. As a result of this reconnaissance, a site investigation was conducted that consist of gridding the small-arms ranges and collecting soil samples. The soil samples were tested for total metals, perchlorate, explosives, and lead. Arsenic and barium were the only metals detected above background levels. Perchlorate was not detected in the soil samples. The compound 2, 4-dinitrotoluene (DNT) was the only explosive compound detected in the soil (small-arms range: 25M Machine Gun Range), and at concentrations that range from 4.9 to 20 mg/kg. The U.S. EPA Region 9 residential and industrial

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NOTIFICATION OF MUNITIONS AND EXPLOSIVES OF CONCERN			
Site	Site Description	Date of MEC Activity	Munitions Response Actions
			use criteria for DNT in soil are 120 and 1,800 mg/kg, respectively. Some OE sampling and removal activities were conducted in the area of the small-arms ranges as part of a site-wide effort performed by UXB (1998).
Site-wide Actions	This site/area is RAU 3, which consists of all artillery and mortar firing points and safety fans. Collectively these sites cover most of he Property. OE removal actions were conducted at Training Areas 8 (TA 8) and Training Area 9 (TA 9). These areas are located southeast of the cantonment areas and include portions of Sub-caliber Range 1 and Machine Gun Range-North. See Figures 6 Remedial Action Unit 2A and Figure 11 Training Ranges 8 and 9 for the location of the aforementioned ranges.	Unknown	MEC characterization and removal activities have been conducted at Camp Bonneville. UXB International, Inc. (1998) conducted a site-wide OE sampling and removal action; UXB (2000) also conducted an OE sampling and removal action at Training Area 8 (TA 8) and at TA 9, and Parsons Engineering Science, Inc. (2004) completed a remedial investigation/feasibility study (RI/FS) of RAU 3. Two hundred and seven grids were established throughout the site. Each grid measured 100 x 100 feet (a total area of approximately 50 acres). UXO technicians investigated 2,468 anomalies finding 25 live UXO; 212.7 pounds of OE-related scrap, and 185 pounds of non-OE related scrap. As a result of this effort, UXB returned and conducted a sampling and removal action in an 18.9-acre area encompassing TA 8 and TA 9. In addition, UXB conducted a preliminary survey of 1.5 acres at Demolition Area 1. During this action, 106, 341 areas were excavated. Nine UXO items were removed and disposed of. In addition, 3,888 pounds of OE scrap and 683 pounds of non-OE scrap were removed. A total of 16,004 discrete reconnaissance data waypoints have been collected, analyzed, and mapped using digital technology and GIS geo-spatial analysis during the 2001/2002 site reconnaissance efforts. Over 2,400 acres of the 3,980 total acres were characterized for munitions and explosives of concern (MEC) and related activities. A solitary UXO item (105 mm artillery shell) was located in the Central Impact Target Area. A total of 58 inert munitions debris (MD) were located and recovered during the reconnaissance field efforts. The MD items included a total of 27 expended pyrotechnic devices, 7 expended smoke grenades, 9 expended practice 40mm projectiles, and 15 expended practice rockets and rocket motors. Depending upon the location of a training area, the training area may include undeveloped land, firing points and ranges. Ordnance and explosives removal actions were conducted in Training areas 8 and 9, which are located southeast of the cantonment areas, Figure 12. The August 2000 *Final Removal Report Ordnance and Explosives Removal Actions Camp Bonneville, Vancouver, Washington* indicates that TA 8 and TA 9 were impact areas 60mm and 81mm full-size practice rounds, 35mm light anti-tank weapon rounds, and 40mm practice grenades.
Discarded Military Munitions			
Demolition Area 1 and Landfill 4	This area, located in the north-central part of the Property, was a former	Unknown	A site investigation (SI) was conducted in 1998-1999 4 to evaluate the potential for contamination resulting from past uses of the

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NOTIFICATION OF MUNITIONS AND EXPLOSIVES OF CONCERN			
Site	Site Description	Dates of MEC Activity	Munitions Response Actions
	ordnance burn and ordnance detonation site and a landfill. The site slopes downward to the west, toward the north fork of Lacamas Cree which flows southward into the main branch of Lacamas Creek. Several patches of soil on the site surface were reported to have a pinkish-red hue and were generally devoid of vegetation. The cause of this discoloration was not known; however, similarly discolored soil had been reported at other sites where explosives contamination had been detected in shallow soil. A firebreak surrounds the area just outside of a barbed-wire fence line. Surface debris consisted primarily of metal scraps such as wiring, metal shards, and automobile parts. Vancouver Barracks reportedly used the site for the disposal of building demolition debris during the mid-1960s. In addition, the site has been used by a number of groups and agencies, including the Army, Portland Air National Guard (PANG), local fire departments and law-enforcement for training and disposal operations. Reportedly, the site has been used for the disposal of firearms, destruction of AIM 7E Sparrow Missiles and Mark 38 rocket motors, and for demolition training.		landfill. The SI included a UXO avoidance survey, geophysical survey, surface and subsurface sampling, and groundwater sampling. Test results of soil samples indicate concentrations of various metals. Only barium, copper, and chromium were detected at concentrations exceeding the regulatory/risk-based criteria. One or more SVOCs, insecticides, herbicides and VOCs were detected, but at concentrations below screening criteria. The only groundwater constituent detected at a concentration exceeding a screening level was RDX (44 ug/l). This compound was detected in the down-gradient well only. In 2001, an expanded site investigation (ESI) of the landfill was conducted based on the previous detection of RDX. The ESI focused primarily on groundwater and included the installation of eight monitoring wells (one well could not be used because it was dry). Four quarterly rounds (July 2001, October 2001, January 2002, and April 2002) of groundwater sampling were conducted. Well samples were also collected in January 2003. Samples collected from the wells were tested for explosives residues, nitroguanidine, perchlorate ion, VOCs, SVOCs, organochlorine herbicides PPL metals (total and dissolved), total cyanide TPH and water quality parameters. Tests results indicate that explosives and propellants (2, 4-DNT, RDX, and perchlorate) were detected in all but one monitoring well, and were also detected in the up-gradient well. These constituents were detected in concentrations exceeding screening criteria in the initial groundwater sampling rounds and the final sampling round. Dichlorofluoromethane, 1,1,1-TCA, 1,1-DCE, and PCE were also detected above screening levels. In 2004, approximately 5,000 cys of contaminated soil (metals and commercially available fireworks) was removed (interim action) and disposed of at an off-site facility. The excavation was backfilled to grade. The monitoring wells at the site will be sampled on a quarterly basis.
Munitions Constituents			
Ammunitions Storage Bunkers (Facility Nos. 2950, 2951, and 2953)	These bunkers were constructed in 1976 to store various munitions. They range in size from 4 sq. ft. to 100 sq. ft. The magazines are fenced.	Unknown	In 1998, fifteen sampling locations (nine at the largest bunker and three each at the two smaller bunkers) were selected for the collection of surface and subsurface soil samples. A soil boring was also advanced at each bunker based on the results of the surface soil tests from soil samples collected from inside the bunkers. Wipe samples were collected from the floors in each magazine. The soil samples collected from inside the bunker and the wipe sample tests results show RDX (below reporting levels) and all the PPL metals except selenium and thallium in Facility 2950. Arsenic, beryllium, cadmium, chromium, lead, and mercury were detected in the soil samples collected from inside the bunker at concentrations that

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K. NOTIFICATION OF MUNITIONS AND EXPLOSIVES OF CONCERN

Site	Site Description	Date of MEC Activity	Munitions Response Actions
			exceed the MTCA cleanup criteria. Arsenic, beryllium, and cadmium concentrations were also above background levels. PETN was detected in one bunker; however, there is no established cleanup concentration for PETN. No organic compounds were detected above reporting limits in the surface soil samples collected outside the bunker. Arsenic, cadmium, chromium, and lead were detected at concentrations above MTCA cleanup criteria and background levels in the surface soil samples collected outside the bunker. In 2001, surface and subsurface soil samples were collected from Facility 2953. PETN, picric acid, and 2,4-dinitrotoulene were detected in the surface soil samples at concentrations below MTCA cleanup criteria. No ordnance compounds or propellants were detected in the subsurface soil samples. Metals were detected in the surface soil samples. Arsenic and chromium were detected above MTCA cleanup criteria. Lead was detected above the MTCA cleanup criteria and background levels. In May 2001, contaminated soils at the three bunkers were excavated to 1-foot below grade. Confirmatory samples were collected and the test results indicated no residual contaminants above regulatory criteria or background levels. The excavations were backfilled and the contaminated soil and wood from pallets inside the bunker were disposed of at an off-site facility. The interior surfaces of the bunker were cleaned.
Demolition Area 1 and Landfill 4	See Discarded Military Munitions	Unknown	See Discarded Military Munitions
Airstrip	The 4.5- acre airstrip is located along an open area near the main entrance.	Unknown.	No MEC was found during an investigation of this area.
Camp Bonneville Cantonment	This 5.1-acre area is comprised of buildings and open grassy areas.	Unknown	No MEC was found during an investigation of this area.
Camp Killpack	This 5-acre area was previously used for troop barracks.	Unknown.	No MEC was found during an investigation of this area.
Bonneville Parade Ground	This is an open grassy area.	Unknown.	No MEC was found during an investigation of this area.

NOTIFICATION OF MUNITIONS AND EXPLOSIVES OF CONCERN

Site	Site Description	Date of MEC Activity	Munitions Response Actions
OB/OD Areas	This 6.5-acre area consists of 3 demolition areas.	Unknown.	Subsurface removal action is completed at demolition area 1.
Target Area	These areas combine to be approximately 12 acres.	Unknown.	A potential MEC–risk was identified during investigation.
Central Impact Target Area	This 465-acre area was previously used as an artillery target area.	Unknown.	A MEC–risk was identified during investigation.
Firing Points	The 19-acre Firing Points area consists of 6 mortar firing points, 7 artillery firing points, 1 rifle grenade firing point and 1 3.5-inch rocket firing point.	Unknown.	No MEC was found during an investigation of this area.
West Side of Proposed Park	This 600-acre area was historically used as a maneuver area.	Unknown.	No MEC was found during an investigation of this area.
Roads and Trails	The roads and trails have been in use for approximately 35 years. No MEC risk has been identified.	Unknown.	No MEC was found during an investigation of this area.
Wildlife Management Area	This 2050-acrea area was used as a former range fans and maneuver areas.	Unknown.	A potential MEC–risk was identified during investigation.
Current FBI Training Area	The parcel will continue to be used for FBI training until October 2006.	Unknown.	A potential MEC–risk was identified during investigation.
Designated Reuse Areas Located Outside the Park	This area includes a former combat pistol range.	Unknown.	A potential MEC–risk was identified during investigation.
Southwest Lacamas Valley	This 98-acre area was historically used for small arms training.	Unknown.	A potential MEC–risk was identified during investigation.

Notes:

1) Munitions and Explosives of Concern (MECs) distinguishes specific categories of military munitions that may pose unique explosives safety risks, means: (A) Unexploded Ordnance (UXO), as defined in 10 §101(e)(5); (B) Discarded military munitions (DMM), as defined in 10 U.S.C. §2710(e)(2); or (C) Munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. §2710(e)(3), present in high enough concentrations to pose an explosive hazard.
2) See, Attachment 1-Document List for documents that pertain to MECs.

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4231240 D
RecFee - $115.00 Pages: 34 - CLARK COUNTY
Clark County, WA 10/04/2006 02:20

RETURN ADDRESS
Bronson Potter
Clark County

Real Estate Excise Tax
Ch. 11 Rev. Laws 1951
Affd. # 599468 EXEMPT Date 10/4/06
For Details of tax paid see
Affd. #
Doug Lasher
Clark County Treasurer
By Deputy

Please print neatly or type information
Document Title(s)

Quit Claim Deed

Reference Numbers(s) of related documents:

Additional Reference #'s on page ____

Grantor(s) (Last, First and Middle Initial)

Clark County Washington

Additional grantors on page ___

Grantee(s) (Last, First and Middle Initial)

Bonneville Conservation, Restoration & Renewal Team LLC

Additional grantees on page ___

Legal Description (abbreviated form: i.e. lot, block plat or section, township, range, quarter/quarter)

Sec 34 35, 3, 3E Sec 1,2,3 & 10, 2, 3E

Additional legal is on page ___

Assessor's Property Tax Parcel/Account Number

208417-000 167940-000 170186-000
167837-000 168044-000 208215-000

Additional parcel #'s on page ___

The Auditor/Recorder will rely on the information provided on this form. The staff will not read the document to verify the accuracy or completeness of the indexing information provided herein.

I am requesting an emergency nonstandard recording for an additional fee as provided in RCW 36.18.010. I understand that the recording processing requirements may cover up or otherwise obscure some part of the text of the original document.

Signature of Requesting Party

QUITCLAIM DEED
FORMER CAMP BONNEVILLE
CLARK COUNTY, WASHINGTON

THIS QUITCLAIM DEED, between Clark County, Washington (hereinafter the "GRANTOR"), and the Bonneville Conservation, Restoration and Renewal Team, LLC a California not for profit limited liability corporation authorized to do business within the State of Washington (hereinafter the "GRANTEE").

WITNESSETH THAT, the GRANTOR, for and in consideration of the agreements entered into between GRANTOR and GRANTEE relating to the environmental remediation of the Property conveyed herein for the conservation of natural resources and other good and valuable consideration the receipt of all of which is hereby acknowledged, does hereby REMISE, RELEASE, AND FOREVER QUITCLAIM unto the GRANTEE, its successors and assigns, all its right, title, and interest in the property situated, lying and being in the County of Clark, in the State of Washington, containing approximately 3,013 acres as more particularly described in Exhibit A, attached hereto and made a part hereof (hereinafter referred to as the "Property"); provided that the right of the GRANTEE to conduct revenue-producing activities on the Property shall be limited to the conduct of incidental revenue-producing activities that are compatible with the use of the Property for conservation purposes; provided further that the right of the GRANTEE to convey the Property shall be limited to reconveying the Property to the Grantor upon the completion of environmental remediation as agreed to by the GRANTOR and GRANTEE, and shall be subject to the approval of the SECRETARY, and that any and all such further conveyances of the Property shall be subject to the same terms, reservations, restrictions, covenants and conditions set forth in this Deed; and provided that if any portion of the premises shall be used for any purpose other than natural resource conservation as provided in 10 U.S.C. § 2694a and incidental revenue-producing activities that are compatible with the use of the Property for conservation purposes, the title and interest in and to the portion of the premises so used shall revert to and become the property of the GRANTOR, at its option, and it shall have the immediate right of entry.

SUBJECT TO all valid and existing restrictions, reservations, covenants, conditions, and easements, including, but not limited to, rights-of-way for railroads, highways, pipelines, and public utilities, if any, whether of public record or not.

TO HAVE AND TO HOLD the Property granted herein to the GRANTEE and its successors and assigns, together with all and singular the appurtenances, rights, powers and privileges thereunto belonging or in anywise appertaining, and all the estate, right, title, interest, or claim whatsoever of the GRANTOR, either in law or in equity, and subject to the terms, reservations, restrictions, covenants, and conditions set forth in this Deed.

AND IT IS FURTHER AGREED AND UNDERSTOOD by and between the parties hereto that the GRANTEE, by its acceptance of this Deed, agrees that, as part of the consideration for this Deed, the GRANTEE covenants and agrees for itself, its successors and assigns, forever, that this Deed is made and accepted upon each of the following covenants, which covenants shall be binding upon and enforceable against the GRANTEE, its successors and assigns, in perpetuity by the GRANTOR and other interested parties as allowed by federal, state or local law; that the notices, use restrictions and restrictive covenants set forth herein are a binding servitude on the Property herein conveyed and shall be deemed to run with the land in perpetuity; and that the failure to include the notices, use restrictions and restrictive covenants in subsequent conveyances does not abrogate the status of these notices, use restrictions and restrictive covenants as binding upon the GRANTEE, its successors and assigns:

1. CERCLA NOTICE

A. Pursuant to section 120(h)(3)(A)(i)(I) and (II) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, (hereinafter "CERCLA") (42 U.S.C. § 9620(h)(3)(A)(i)(I) and (II)), available information regarding the type, quantity, and location of hazardous substances, as defined in section 101(14) of CERCLA, and the time at which such substances were stored, released, or disposed of, is provided in Exhibit B, attached hereto and made a part hereof. Additional information regarding the storage, release, and disposal of hazardous substances on the Property has been provided to the GRANTEE, receipt of which the GRANTEE hereby acknowledges. Such additional information includes, but is not limited to, the following documents: Final Environmental Baseline Survey Report, Final Multi-Sites Investigation Report, Final Environmental Assessment and other documents as listed in Attachment 3 to the Finding of Suitability for Early Transfer dated August 2006.

B. Pursuant to section 120(h)(3)(A)(i)(III) of CERCLA, (42 U.S.C. § 9620(h)(3)(A)(i)(III)), a description of the remedial action taken, if any, on the Property is provided in Exhibit B. Additional information regarding the remedial action taken, if any, has been provided to the GRANTEE, receipt of which the GRANTEE hereby acknowledges. Such additional information includes, but is not limited to, the following documents: Final Closure Report – Environmental Restoration, Multi-Sites; Final Closure Report, Environmental Restoration, Pesticide Building #4126 and Ammunition Bunkers #2953, #2951 and #2950; Final Landfill 4 Investigation Report; BRAC HTRW Site Closure Report for Landfills 1, 2 and 3, Former Burn Area, Buildings 1962 and 1963, Grease Pits at the Camp Bonneville and Camp Killpack Cantonments, Former Sewage Pond and Hazardous Materials Accumulation Point and other documents.

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2. RIGHT OF ACCESS

A. The GRANTOR retains and reserves a perpetual and assignable easement and right of access on, over, and through the Property, to enter upon the Property in any case in which an environmental response action or corrective action is found to be necessary on the part of the GRANTOR, without regard to whether such environmental response action or corrective action is on the Property or on adjoining or nearby lands. Such easement and right of access includes, without limitation, the right to perform any environmental investigation, survey, monitoring, sampling, testing, drilling, boring, coring, test-pitting, installing monitoring or pumping wells or other treatment facilities, response action, corrective action, or any other action necessary for the GRANTOR to meet its responsibilities under applicable laws and as provided for in this Deed. Such easement and right of access shall be binding on the GRANTEE, its successors and assigns, and shall run with the land.

B. In exercising such easement and right of access, the GRANTOR shall provide the GRANTEE or its successors or assigns, as the case may be, with reasonable notice of its intent to enter upon the Property and exercise its rights under this covenant, which notice may be severely curtailed or even eliminated in emergency situations. The GRANTOR shall use reasonable means, but without significant additional costs to the GRANTOR, to avoid and to minimize interference with the GRANTEE's and the GRANTEE's successors' and assigns' quiet enjoyment of the property. Such easement and right of access includes the right to obtain and use utility services, including water, gas, electricity, sewer, and communications services available on the Property at a reasonable charge to the GRANTOR. Excluding the reasonable charges for such utility services, no fee, charge, or compensation will be due the GRANTEE nor its successors and assigns, for the exercise of the easement and right of access hereby retained and reserved by the GRANTOR.

C. The GRANTOR and the GRANTEE agree that if any action of the GRANTOR's officers, employees, agents, contractors of any tier, or servants in the exercise of this right of access results in damage to the Property, the GRANTOR shall, at its sole discretion, make reasonable repairs to, or compensate for, such damage. In no event shall such repair, or compensation, exceed the fair market value of the damaged portion of the Property at the time immediately preceding such damage. The GRANTOR's liability under this clause shall be contingent upon the availability of, and shall not exceed, appropriations available for such payment and nothing contained in this Deed may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. In addition, the GRANTEE covenants for itself, its successors and assigns not to interfere with any response action or corrective action conducted by the GRANTOR on the Property.

D. The GRANTEE acknowledges that the United States of America has the same Right of Access as described herein and accepts the Property subject to the Right of Access.

3. "AS IS"

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A. The GRANTEE acknowledges that it has inspected or has had the opportunity to inspect the Property and accepts the condition and state of repair of the Property. The GRANTEE understands and agrees that the Property and any part thereof is conveyed "AS IS" without any representation, warranty, or guaranty by the GRANTOR as to quantity, quality, title, character, condition, size, or kind, or that the same is in a condition or fit to be used for the purposes intended by the GRANTEE, and no claim for allowance or deduction upon such grounds will be considered.

B. No warranties, either express or implied, are given with regard to the condition of the Property, including, without limitation, whether the Property does or does not contain asbestos or lead-based paint. The GRANTEE shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any asbestos, lead-based paint, or other conditions on the Property. The failure of the GRANTEE to inspect or to exercise due diligence to be fully informed as to the condition of all or any portion of the Property will not constitute grounds for any claim or demand against the GRANTOR.

4. HOLD HARMLESS

A. To the extent authorized by law, the GRANTEE, its successors and assigns, covenant and agree to indemnify and hold harmless the GRANTOR, its officers, agents, and employees from (1) any and all claims, damages, judgments, losses, and costs, including fines and penalties, arising out of the violation of the notices, use restrictions, and restrictive covenants in this Deed by the GRANTEE, its successors and assigns, and (2) any and all claims, damages, and judgments arising out of, or in any manner predicated upon any failure to comply with the provisions in this Deed regarding asbestos and lead-based paint after the date of conveyance.

B. The GRANTEE, its successors and assigns, covenant and agree that the GRANTOR shall not be responsible for any costs associated with modifications or termination of the notices, use restrictions, and restrictive covenants in this Deed, including, but not limited to, any costs associated with additional investigation or remediation of asbestos or lead-based paint.

5. ENVIRONMENTAL PROTECTION PROVISIONS

The GRANTEE shall neither transfer the Property, lease the Property, nor grant any interest, privilege, or license whatsoever in connection with the Property without the inclusion of the Environmental Protection Provisions set forth in Exhibit C, attached hereto and made a part hereof, and shall require the inclusion of the said Environmental Protection Provisions in all subsequent deeds, easements, transfers, leases, or grant of any interest, privilege, or license in, on, of, or to the Property or any portion thereof.

6. NON-DISCRIMINATION

The Grantee covenants for itself, its successors, and assigns and every successor in interest to the Property hereby conveyed, or any part thereof, that the said GRANTEE and such

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successors, and assigns shall not discriminate upon the basis of race, color, religion, age, gender, or national origin in the use,
occupancy, sale, or lease of the Property, or in their employment practices conducted thereon. This covenant shall not apply, however, to the lease or rental of a room or rooms within a family dwelling unit; nor shall it apply with respect to religion to premises used primarily for religious purposes.
The GRANTOR shall be deemed a beneficiary of this covenant without regard to whether it remains the owner of any land or interest therein in the locality of the Property hereby conveyed and shall
have the sole right to enforce this covenant in any court of competent jurisdiction.

7. NO WAIVER

The failure of the GRANTOR to insist in any one or more instances upon complete performance of any of the said notices, covenants, conditions, restrictions, or reservations shall not be construed as a waiver or a relinquishment of the future performance of any such covenants, conditions, restrictions, or reservations and the obligations of the GRANTEE, its successors and assigns with respect to such future performance shall continue in full force and effect.

IN WITNESS WHEREOF, the GRANTOR has caused this Deed to be executed in its name this the 3 day of October 2006.

CLARK COUNTY, WASHINGTON

By: _____
Marc Boldt
Chair

ACKNOWLEDGEMENT

STATE OF WASHINGTON)
) SS:
COUNTY OF CLARK)

I, the undersigned, a Notary Public in and for the Sate of washington, County of Clark, do hereby certify that this day personally appeared before me Marc Boldt, Chair of the Board of

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Commissioners for Clark County, Washington whose name is signed to the foregoing instrument and who acknowledged the foregoing instrument to be his free act and deed on the date shown, and acknowledged the same for and on behalf of Clark County, Washington.

Louise Darlene Richards
Notary Public

My commission expires: 1-26-08

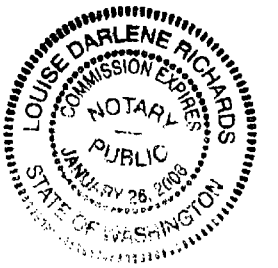

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EXHIBIT A

LEGAL DESCRIPTION

A parcel of land located in Sections 34 and 35 of Township 3 North, Range 3 East of the Willamette Meridian, and in Sections 1, 2, 3, and 10 of Township 2 North, Range 3 East of the Willamette Meridian, all in Clark County, Washington, more particularly described as follows:

BEGINNING at a 3 inch aluminum cap marking the southwest corner of Section 34 Township 3 North, Range 3 East, Willamette Meridian; thence South 88° 25' 57' East, 2,635.07 feet along the south line of the southwest quarter (SW¼) of said Section 34 to a 3¼ inch aluminum cap marking the south quarter corner of said Section 34; thence North 02° 00' 17" East, 2,648.35 feet along the west line of the southeast quarter (SE¼) of said Section 34 to a ½ inch iron rod with yellow plastic cap marked "Hart 12974" marking the center of said Section 34 per that record of survey recorded in book 39 of Surveys at page 34, Records of Clark County, Washington; thence South 88° 11' 19" East, 2,643.06 feet along the north line of the southeast quarter (SE¼) of said Section 34 to the east quarter corner of said Section 34, as calculated per that Record of Survey recorded in Book 21 of Surveys, at Page 132, Records of Clark County, Washington; thence North 02° 11' 12" East, 2,637.25 feet along the west line of the northwest quarter (NW¼) of Section 35 to a 3 inch brass cap marking the northwest corner of said Section 34, being also the northeast corner of Section 35, Township 3 North, Range 3 East; thence South 88° 07' 36" East, 2,644.51 feet along the north line of the northwest quarter (NW¼) of said Section 35 to a 3¼ inch aluminum cap marking the north quarter corner of said Section 35; thence South 88° 07' 57" East, 2,644.52 feet to the northeast corner of said Section 35, said corner having a witness corner marked by a 3 inch brass cap bearing North 02° 13' 29" East, 5.00 feet, as set per that Record of Survey recorded in Book 21 of Surveys, at Page 132, Records of Clark County, Washington; thence South 02° 13' 29" West, 5,196.56 feet along the east line of said Section 35, to a 3 inch brass cap marking the southeast corner of said Section 35, being also the southwest corner of Section 36, Township 3 North, Range 3 East, as calculated per that Record of Survey recorded in Book 21 of Surveys, at page 132, records of Clark County, Washington; thence South 89° 00' 11" East, 5,286.83 feet along the south line of said Section 36, to a 3 inch brass cap marking the southeast corner of said Section 36, being also the northeast corner of Section 1, Township 2 North, Range 3 East; thence South 01° 10' 01" West, 5,302.22 feet along the east line of said Section 1, to a 3 inch brass cap marking the southeast corner of said Section 1; thence North 88° 46' 24" West, 5,266.51 feet along the south line of said Section 1, to a ½ inch iron rod with yellow plastic cap marked "TBH PLS 10920" marking the southwest corner of said Section 1, per that Record of Survey recorded in Book 21 of Surveys, at Page 95, Records of Clark County, Washington, being also the southeast corner of Section 2, Township 2 North, Range 3 East; thence North 88° 31' 25" West, 2,637.03 feet along the south line of the southeast quarter (SE¼) of said Section 2, to a ⅞ inch drill shaft marking the south quarter corner of said Section 2; thence North 88° 40' 34" West, 2,621.18 feet to a 3¼ inch aluminum cap marking the southwest corner of said Section 2, being also the northeast corner of Section 10, Township 2 North, Range 3 East; thence South 01° 25' 00" West, 2.640.69 feet to a 3¼ inch

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aluminum cap marking the east quarter corner of said Section 10; thence North 89° 15' 33" West, 5,294.16 feet along the south line of the North half (N½) of said Section 10 to a 3½ inch brass cap marking the west quarter corner of said Section 10; thence North 01° 27' 42" East, 2.641.85 feet along the west line of the northwest quarter (NW¼) of said Section 10 to a 1¼ inch iron pipe marking the northwest corner of said Section 10, being also the southwest corner of Section 3, Township 2 North, Range 3 East, per that Record of Survey recorded in Book 17 of Surveys, at Page 87, Records of Clark County, Washington;. thence North 00° 52' 55" East, 2650.31 feet along the west line of the southwest quarter (SW¼) of said Section 3, to a ¾ inch iron pipe marking the west quarter corner of said Section 3, per said Record of Survey in Book 17 of Surveys, at Page 87; thence North 00° 52' 57' East, 2,671.49 feet to the northwest corner of said Section 3, being also the southwest corner of Section 34, Township 3 North, Range 3 East and the **POINT OF BEGINNING**.

EXCEPT the north half of the southwest quarter of the southwest quarter (N½SW¼SW¼) of Section 3, Township 3 North, Range 3 East, Willamette Meridian, per that Record of Survey recorded in Book 23 of Surveys, at Page 91, Records of Clark County, Washington.

ALSO EXCEPT that tract of land conveyed to the Public, by Quit Claim Deed recorded under Auditor's File Book 24, Page 223 on August 29, 1894, in Clark County, Washington, being a portion of the southwest quarter of the northwest quarter (SW¼NW¼) of Section 3, Township 2 North, Range 3 East, of the Willamette Meridian, described as follows:

BEGINNING at the southwest corner of the northwest quarter (NW¼) of said Section 3; thence east along the south line or said northwest quarter (NW¼), 330 feet (20 rods); thence north parallel with the west line of said northwest quarter (NW¼), 264 feet (16 rods); thence west parallel with the south line of said northwest quarter (NW¼), 330 feet (20 rods), to the west line of northwest quarter (NW¼) of Section 3; thence south along said west line 264 feet (16 rods), to the **POINT OF BEGINNING**.

ALSO EXCEPT any portion lying within the right of way of Northeast 232nd Avenue, and

ALSO EXCEPTING any portion lying within the right of way of Northeast 68th Street.

This description contains 3,013 acres, more or less.

This description based on survey preformed by Clark County, Washington 15 May 2006 as recorded in Book 56 of Surveys, at page 007, Records of Clark County, Washington. The Basis of Bearing is the south line of the southwest quarter of Section 34, Township 3 North, Range 3 East, Willamette Meridian, being held as South 88° 25' 57" East and distances are based on grid distances with a combined factor of 1.0000365 to obtain ground distances. Survey is based on the Washington State Plane Coordinate System, South Zone, NAD83/91 Adjustment.

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
Remedial Action Unit 1			
Building 1864 Pesticide Storage/Mixing Building	**2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid, 4,4-dishlorodiphenotrichloroethant (DDT)** Cadmium Lead	**1977 - 1980** Unknown	**Records indicate that this facility stored 55-gallon drums of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid, and an unknown amount of 4,4-dishlorodiphenotrichloroethant (DDT). These materials came from Building 4126 in 1977 and in 1980 were moved to Fort Lewis.** Surface, subsurface, and groundwater samples were collected at the site and tested for TPH, VOCs, (subsurface samples only) SVOCs, chlorinated pesticides, PCBs, organophosphorus pesticides, chlorinated herbicides, and PL metals. Test results indicate that surface and sub-surface soil samples had concentrations of various metals (cadmium, chromium and lead) above regulatory cleanup levels. The concentrations of cadmium and lead exceeded background levels. Groundwater samples collected from the two monitoring wells installed at the site contained no analytes above regulatory criteria. Remediations began in June 2000 that included soil excavations to a depth of 0.8 feet bgs (on average). Confirmatory samples were collected from the excavation, and the test results indicated that the concentration of TPH (diesel and heavy oil range) and lead exceeded cleanup criteria. Based on that data, the excavation was extended to 2.7 feet bgs (on average). Confirmatory samples were collected, and all test results showed target analyte concentrations to be below their respective cleanup criteria. The contaminated soil excavation was completed in 2000, and all contaminated soil was disposed of at an off-site facility. The excavation was backfilled to grade.
Building 4126 Pesticide Storage	**2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid,**	**Unknown to 1977**	**Records indicate that this building stored 55-gallon drums of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid, and 4,4-dishlorodiphenotrichloroethant (DDT) until 1977 when these**

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
	4,4-dichlorodiphenotrichloroethant (DDT) Lead	Unknown	materials were moved to Building 1864, see above. Soil samples and an indoor floor sample were collected and tested for chlorinated pesticides and herbicides, PCBs, PPL metals (plus barium) and TPH (gasoline and diesel ranges). Test results on these samples indicate that pesticides (4,4-DDT, 4,4-DDD, 4,4-DDE, beta-BHC, lindane, 2,4-D, 2,4-DB, 2,4,5-T, and MCPP), petroleum hydrocarbons, and several metals were detected but at concentrations below regulatory cleanup and background concentrations. Polychlorinated biphenyls were not detected at concentrations exceeding the laboratory reporting limit. Petroleum hydrocarbons were detected in floor samples above regulatory cleanup standards. Lead was detected in a surface soil sample above regulatory cleanup and background concentrations. Based on the floor and soil sample results, the building was dismantled and soil was excavated under the building footprint to a depth of 1-foot. Confirmatory samples were collected and test results show no analyte concentration above regulatory cleanup criteria. The building debris and excavated soils were disposed of at an off-site facility. The excavation was backfilled to grade.
4475	Broad-leaf herbicides	Unknown	Pesticides were formerly stored in this building. The duration and volume of pesticide storage is not known.
Building 4475 (Maintenance Pit)	Lead	Unknown	Six soil samples were collected from two borings advanced at the Maintenance pit. The soil samples collected at the drainage pit were tested, and the results showed unidentified hydrocarbons, VOCs, SVOCs and chlorinated pesticides at concentrations below regulatory criteria. No PCBs were detected in any of the samples. Several metals were detected above the regulatory cleanup concentration (arsenic, chromium, and lead) but below site-specific background concentrations with the exception of one sample, which had a lead concentration above background. In June 2000, all accessible lead-contaminated soils were excavated and disposed of at an off-site facility. The excavation was stopped to avoid undermining the building. Contaminated soil may be present beneath the

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
			building. Potential contaminants may include petroleum hydrocarbons, VOCs, SVOCs, metals. The excavation was backfilled to grade.
Suspect Drum Burial Site (Drum Disposal Area)	Arsenic Barium Chromium Methoxychlor Toluene	Unknown	An electromagnetic survey of the area identified anomalies. Soil borings were advanced in this area and samples collected. No SVOCs, PCBs, pesticides, or explosive compounds were detected in the samples, and there was no evidence of the presence of explosives. Petroleum hydrocarbons, certain VOCs, and metals were detected, but at concentrations below regulatory cleanup criteria and/or background concentrations. In 2000, the area was excavated to remove buried drums and debris (paint cans, corrugated metal, scrap metal and barbed wire). Twenty-six test pits were excavated to assess the area of drum disposal. Soil samples collected from the tests pits, and at some locations rainwater that accumulated in the pits, were tested. The soil sample test results indicate that toluene, arsenic, barium, chromium and methoxychlor exceeded regulatory cleanup criteria. The rainwater sample test results indicate that naphthalene, ethyl benzene, toluene, and lead above cleanup levels. A second EM survey was conducted to determine if buried objects could have caused or contributed to the contamination. Thirteen additional anomalies were identified and investigated by trenching. One excavation contained among other things, paint cans and paint. The other trenches contained scrap metal, reinforcement bars, barbed wire and firing point survey markers. Cleanup activities were initially conducted to address the debris, but later to address the organic compounds and metals detected in the test pits. Approximately 110 tons of soil and debris was excavated and disposed of at an off-site facility. Confirmatory sample results indicate all target analyte concentrations were either not detected or below regulatory cleanup criteria. The excavation was backfilled to grade.
Former CS Gas Training Building (Former CS Gas Training Building Site)	Lead	Unknown	Five soil borings were advanced in the area and soil samples were collected. Test results indicate that CS gas and cyanide were not detected. Semi-volatile organic compounds were detected but at concentrations below regulatory criteria. Lead was detected above regulatory cleanup and background criteria. In June 2000, contaminated soil excavation activities were commenced. The excavation extended to 3-feet below grade. Confirmatory sample test results indicate that all analyte concentrations were below MTCA cleanup criteria. The excavation was backfilled to grade and all contaminated soil was disposed of at an off-site facility.

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
Ammunitions Storage Bunkers (Facility Nos. 2950, 2951, and 2953)	Lead	Unknown	In 1998, fifteen sampling locations (nine at the largest magazine and three each at the two smaller magazines) were selected for the collection of surface and subsurface soil samples. A soil boring was also advanced at each magazine based on the results of the surface soil tests from soil samples collected from inside the magazines. Wipe samples were collected from the floors in each magazine. The soil samples collected from inside the magazines, and the wipe sample tests results show RDX (below reporting levels) and all the PPL metals except selenium and thallium in Building 2950. Arsenic, beryllium, cadmium, chromium, lead, and mercury were detected in the soil samples collected from inside the magazines at concentrations that exceed the MTCA cleanup criteria. Arsenic, beryllium, and cadmium concentrations were also above background levels. PETN was detected in one magazine; however, there is no established cleanup concentration for PETN. No organic compounds were detected above reporting limits in the surface soil samples collected outside the magazines. Arsenic, cadmium, chromium, and lead were detected at concentrations above MTCA cleanup criteria and background levels in the surface soil samples collected outside the magazines. In 2001, surface and subsurface soil samples were collected from Building 2953. PETN, picric acid, and 2,4-dinitrotoulene were detected in the surface soil samples at concentrations below MTCA cleanup criteria. No ordnance compounds or propellants were detected in the subsurface soil samples. Metals were detected in the surface soil samples. Arsenic and chromium were detected above MTCA cleanup criteria. Lead was detected above the MTCA cleanup criteria and background levels. In May 2001, contaminated soils at the three magazines were excavated to one foot below grade. Confirmatory samples were collected and the test results indicated no residual contaminants above regulatory criteria or background levels. The excavations were backfilled and the contaminated soil and wood from pallets inside the magazines were disposed of at an off-site facility. The interior surfaces of the magazines were cleaned.
Remedial Action Unit 2A			
25Meter M60/Pistol Range	Lead	Unknown	Two soil samples collected from this site had lead concentrations of 136 mg/kg and 219 mg/kg.
25Meter Machine Gun Range	Lead	Unknown	The explosive residue (DNT) was detected in soil samples collected from the muzzle blast zone at concentrations that range from 4.9 mg/kg to 20 mg/kg, which are below regulatory criteria. Eleven soil samples had lead concentrations that ranged from 120 mg/kg to 26,300 mg/kg.

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
25Meter Record Fire Field Range	Lead	Unknown	Six soil samples collected from this site had lead concentrations that ranged from 150 mg/kg to 8,880 mg/kg.
Machine Gun Range- North	Barium and Lead	Unknown	Barium was detected in two soil samples at concentrations of 178 mg/kg and 200 mg/kg. Lead was detected in one soil sample at a concentration of 158 mg/kg.
Machine Gun Range- South	Barium and Lead	Unknown	Barium was detected in one soil sample at concentration of 192 mg/kg. Lead was detected in two soil samples at concentrations of 135 mg/kg and 423 mg/kg.
Infiltration Course-South	Lead	Unknown	Lead was detected in one soil sample at a concentration of 151 mg/kg.
Sub-machine Gun Range	Barium	Unknown	Barium was detected in one soil sample at a concentration of 133 mg/kg.
Field Firing Ranges 1 & 2	Lead	Unknown	Eight soil samples had lead concentrations that range from 125mg/kg to 7,150 mg/kg.
TF Range	Barium	Unknown	Barium was detected in one soil sample at a concentration of 163 mg/kg.
Combat Pistol Range	Lead	Unknown	Two soil samples contained lead at concentrations of 165 mg/kg and 785 mg/kg.
Close Combat Range	Barium	Unknown	Barium was detected in two soil samples at concentrations of 145 mg/kg and 227 mg/kg.
Rifle Ranges 1&2	Arsenic, Barium and Lead	Unknown	Arsenic and barium were detected in soil samples at 22.9 mg/kg and 202 mg/kg, respectively. Eighteen soil samples had lead concentrations that ranged from 130 mg/kg to 4,330 mg/kg.
Field Fire Rifle Ranges 1 & 2	Barium and Lead	Unknown	Soil test results show two samples with barium detected at concentrations of 146 mg/kg and 194 mg/kg. Two soil samples contained lead in concentrations of 149 mg/kg and 2,300 mg/kg.
Undocumented Pistol Range	Lead	Unknown	Lead was detected in one soil samples at a concentration of 154 mg/kg.
Remedial Action Unit 2B			
No sites			
Remedial Action Unit 2C			

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
Demolition Area 1 and Landfill 4	RDX 2,4-DNT Perchlorate Dichlorofluoromethane 1,1,1-TCA 1,1-DCE PCE	Unknown	A site investigation (SI) was conducted in 1998-1999 4 to evaluate the potential for contamination resulting from past uses of the landfill. The SI included a UXO avoidance survey, geophysical survey, surface and subsurface sampling, and groundwater sampling. Test results of soil samples indicate concentrations of various metals. Only barium, copper, and chromium were detected at concentrations exceeding the regulatory/risk-based criteria. One or more SVOCs, insecticides, herbicides and VOCs were detected, but at concentrations below screening criteria. The only groundwater constituent detected at a concentration exceeding a screening level was RDX (44 ug/l). This compound was detected in the down-gradient well only. Surface water investigations of nearby streams were conducted in 1998 and 1999. Both investigations included the collection and analysis of stream water samples, which were extensively tested. Both investigations concluded that the activities conducted at the landfill do not appear to have affected the stream(s) investigated (primarily Lacamas Creek). In 2001, an expanded site investigation (ESI) of the landfill was conducted based on the previous detection of RDX. The ESI focused primarily on groundwater and included the installation of eight monitoring wells (one well could not be used because it was dry). Four quarterly rounds (July 2001, October 2001, January 2002, and April 2002) of groundwater sampling were conducted. Well samples were also collected in January 2003. Samples collected from the wells were tested for explosives residues, nitroguanidine, perchlorate ion, VOCs, SVOCs, organochlorine herbicides PPL metals (total and dissolved), total cyanide TPH and water quality parameters. Tests results indicate that explosives and propellants (2,4-DNT, RDX, and perchlorate) were detected in all but one monitoring well, and were also detected in the up-gradient well. These constituents were detected in concentrations exceeding screening criteria in the initial groundwater sampling rounds and the final sampling round. Dichlorofluoromethane, 1,1,1-TCA, 1,1-DCE, and PCE were also detected above screening levels. In 2004, approximately 5,000 cys of contaminated soil was removed (interim action) and disposed of at an off-site facility. The excavation was backfilled to grade. The monitoring wells at the site will be sampled on a quarterly basis.

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NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release, or Disposal	Remedial Actions
Remedial Action Unit 3			
No sites			

The information contained in this notice is required under the authority of regulations promulgated under section 120(h) of the Comprehensive Environmental Response, Liability, and Compensation Act (CERCLA or 'Superfund') 42 U.S.C. §9620(h). This table provides information on the storage of hazardous substances for one year or more in quantities greater than or equal to 1,000 kilograms or the hazardous substance's CERCLA reportable quantity (which ever is greater). In addition, it provides information on the known release of hazardous substances in quantities greater than or equal to the substances CERCLA reportable quantity. See 40 CFR Part 373.

Notes:

1) Sites and chemical compounds shown in bold type: records indicate that a CERCLA hazardous substance was stored, released, or disposed of at the identified facility at or above its reportable quantity.

2) Sites and chemical compounds not shown in bold type: records indicate a CERCLA hazardous substance was released or disposed of at the site/area indicated; however, the quantity is not known. These sites generally relate to a known or suspected release of a CERCLA hazardous substance that was detected at concentrations that require cleanup, the hazardous substance.

3) Chemical Abstract Service Registry Numbers:

Analyte	Case #	Reportable Quantity (lbs)
• Arsenic	7440382	1
• Barium	7440-39-3	-
• beta-BHC	319857	1
• Cadmium	7440439	1
• Chromium	440473	1

Acronyms:

CERCLA = Comprehensive Environmental Compensation liability Act
CFR = Code of Federal Regulations
CS = 2-chlorobenzalmalononitrile
D = dichlorophenoxy acetic acid
DB = dichlorophenoxy butyric acid
DCE = dichloroethylene
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
DDT =dichlorodiphenyltrichloroethane
DNT = 2,4-dinitrotoluene
EM = electromegnetic
ESI = expanded site investigation
Lbs = pounds
MCPP =2-(2-methyl-4-chlorophenoxy) propionic acid
MTCA = Model Toxics Control Act
PCB = polychlorinated biphenyls
PCE = Tetrachloroethylene

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EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)		Date of Storage, Release, or Disposal	Remedial Actions
•	Chlorobenzalmalononitrile	2698411	-	PETN = pentaerythritol tetranitrate
•	2,4-D	94757	100	PPL Metals = priority pollutant metals
•	2,4-DB	94826	-	T = trichlorophenoxyacetic acid
•	1,1-DCE	75354	5000	TCA = trichloroethane
•	4,4-DDT	50293	1	TCE = Trichloroethylene
•	4,4-DDD	72548	1	TPH = total petroleum hydrocarbons
•	4,4-DDE	72559	1	RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
•	Dichlorofluoromethane	75434	-	SVOC = semi-volatile organic compounds
•	DNT	121142	1000	U.S.C. = United States Code
•	Lead	7439921	1	U.S. EPA = United States, Environmental Protection Agency
•	Lindane	58999	1	VOC = volatile organic compounds
•	Methoxychlor	72435	1	
•	MCPP	7085190	-	
•	2,4,5-T	93765	100	
•	1,1,1-TCA	71556	1	
•	TCE	79016	1000	
•	Toluene	108-88-3	1000	
•	PCB	1336363	10	
•	PCE	127184	1	
•	Perchlorate	14797730	-	
•	RDX	121824	-	
•	Sodium hypochlorite	7681529	100	

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EXHIBIT C

ENVIRONMENTAL PROTECTION PROVISIONS

1. LAND USE RESTRICTIONS

A. The United States Department of the Army (hereinafter the "Army") and the GRANTOR have undertaken careful environmental study of the Property and concluded that the land use restrictions set forth below are required to ensure protection of human health and the environment. The GRANTEE, its successors or assigns, shall not undertake nor allow any activity on or use of the Property that would violate the land use restrictions contained herein.

(1) Residential Use Restriction. The GRANTEE, its successors and assigns, shall use the Property solely for conservation of natural resources and not for residential purposes. For purposes of this provision, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; provided, however, that residential purposes do not include multiple overnight stays associated with the Rustic Retreat Center and Outdoor School, day camping or overnight camping within existing or new buildings on the Property; provided further, however, that prior to the use of any buildings on the Property for such purposes, the responsible State of Washington and/or local government agency or agencies shall have made a written determination that the buildings are habitable and safe for such use under applicable state and/or local laws and regulations. Caretaker, security, and/or Parks & Recreation Department personnel wishing to live in existing buildings or newly-constructed buildings on the Property during remediation and post-remediation of the Property may not reside in such buildings until the responsible State of Washington and/or local government agency or agencies shall have made a written determination that such buildings are habitable and safe for such use under applicable state and/or local laws and regulations.

(2) Ground Water Restriction. The GRANTEE is hereby informed and acknowledges that there is limited contamination of the ground water under the Demolition Area 1/Landfill 4 area more particularly described in Exhibit D, attached hereto and made a part hereof. The GRANTEE, its successors and assigns, shall not have the right to access or use ground water underlying the Property for any purpose without the prior written approval of the Army and the Washington State Department of Ecology (hereinafter the "WDOE"). For the purpose of this restriction, "ground water" shall have the same meaning as in section 101(12) of CERCLA. The GRANTEE may, however, use the existing water systems at the Camp Killpack and Camp Bonneville cantonment areas and the caretaker's building for purposes of continuing to provide non-potable water to said facilities or for the provision of potable water provided that prior to use of said water systems for the provision of potable water, the responsible State of Washington and/or local government agency or agencies must make a determination that the water is suitable and safe for such use under applicable state and/or local laws and regulations. The GRANTEE shall have the right to develop other water systems, including those using groundwater underlying other areas of the Property, excluding the area underlying Demolition Area 1/Landfill

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4 and the associated contaminant plume, provided, that the GRANTEE shall obtain the prior written approval of the WDOE and the Army.

(3) Excavation/Land Disturbance Restriction. The GRANTEE, its successors and assigns, shall not have the right to conduct, or permit others to conduct, any excavation or other intrusive activity on the Property, without qualified unexploded ordnance (hereinafter "UXO") personnel on staff or available and a Department of Defense (hereinafter "DoD") approved Explosives Safety Submission and/or explosives site plan.

(4) Public Access Restriction. The GRANTEE, its successors and assigns shall not have the right to provide access to the Property to members of the general public until such time as all remedial action necessary to protect human health and the environment with respect to hazardous substances remaining on the Property as of the date of this Deed, including munitions and explosives of concern (hereinafter "MEC"), has been taken and this restriction is modified or released by the GRANTOR. The restriction imposed herein shall not restrict the right of the GRANTEE, its successors and assigns to provide access to the Property to officers, employees, agents, and contractors of any tier for the purpose of conducting environmental remediation and MEC response actions. The GRANTEE covenants and agrees to construct and maintain a fence along the perimeter of the Property to control or restrict public access as needed. The GRANTEE further covenants and agrees to provide and maintain appropriate signage to inform its officers, employees, agents, and contractors of any tier and the general public about potential hazards on the Property.

(5) Notice of Archaeological Site and Preservation Covenant. In consideration of the conveyance of the Property that includes site 45-CL-318, and may include other as yet undiscovered archaeological sites on the Property, the GRANTEE hereby covenants on behalf of itself, its successors, and assigns at all times to the Washington State Historic Preservation Officer (hereinafter the "SHPO") to maintain and preserve site 45-CL-318 and all other as yet undiscovered archaeological sites in accordance with the provisions of the following paragraphs of this covenant.

a. The GRANTEE, its successors or assigns shall notify the SHPO and the Cowlitz Indian Tribe in writing prior to undertaking any disturbance of the ground surface or any other action within 300 feet of the center of site 45-CL-318 that would affect its physical integrity. The center point of site 45-CL-318 is described as being located at 134810 E, 1150207 N, NAD 1983 HARN State Plane Washington South FIPS 4602 feet. Said site is more particularly described in Exhibit E, attached hereto and made a part hereof. Such notice shall describe in reasonable detail the proposed undertaking and its expected effect on the physical integrity of site 45-CL-318.

b. For ground-disturbing activities other than remediation of MEC, the GRANTEE, its successors or assigns shall prepare and submit to the SHPO and the Cowlitz Indian Tribe a written assessment of project effects in advance of any ground-disturbing activity having moderate to high potential impacts within areas mapped as "20-100% probability" in the Clark County Archaeological Predictive Model Map, attached hereto as Exhibit F and

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made a part hereof, and having slopes less than 5%. The assessment of project effects will describe the proposed undertaking in reasonable detail, discuss its expected effects upon recorded or unrecorded archaeological resources, and will conclude with recommendations concerning the need for additional archaeological survey or other actions to avoid or mitigate adverse effects to archaeological resources, taking into account previous cultural resource surveys at the Property and other recorded archaeological sites in close proximity to the proposed project.

c. The GRANTEE, its successors or assigns shall make every reasonable effort to prohibit any person from knowingly or inadvertently disturbing any archaeological object or archaeological site, as defined in RCW 27.53.030. In the event that any archaeological object or archaeological site is knowingly or inadvertently disturbed, the GRANTEE, its successors or assigns shall immediately stop the activity causing the disturbance and make a reasonable effort to protect the archaeological object or archaeological site from further disturbance. The GRANTEE, its successors or assigns shall provide written notification to the SHPO and the Cowlitz Indian Tribe within one (1) working day of the discovery. Within fifteen (15) calendar days of the discovery, the GRANTEE, its successors or assigns shall provide to the SHPO and the Cowlitz Indian Tribe a Draft Site Treatment and Restoration Plan to describe the actions the GRANTEE, its successors or assigns will take to mitigate the damage, restore the site of discovery, and provide for the treatment and disposition of any archaeological resources recovered.

d. Within thirty (30) calendar days of the SHPO's and Cowlitz Indian Tribe's receipt of notification provided by the GRANTEE, or its successors or assigns pursuant to paragraphs (a), (b), or (c) of this covenant, the SHPO and the Cowlitz Indian Tribe will respond to the GRANTEE, its successors or assigns in writing as follows:
    1. That the GRANTEE, its successors or assigns may proceed with the proposed undertaking without further consultation; or
    2. That the GRANTEE, its successors or assigns must initiate and complete consultation with the SHPO before it can proceed with the proposed undertaking.

    If the SHPO and the Cowlitz Indian Tribe fail to respond to the GRANTEE's or its successors' or assigns' written notice within thirty (30) calendar days of the SHPO's and the Cowlitz Indian Tribe's receipt of the same, then the GRANTEE may proceed with the proposed undertaking without further consultation.

e. If the response provided to the GRANTEE, its successors or assigns by the SHPO and the Cowlitz Indian Tribe pursuant to paragraph d.2. of this covenant requires consultation with the SHPO and the Cowlitz Indian Tribe, then all parties will so consult in good faith to arrive at mutually-agreeable and appropriate measures that GRANTEE, its successors or assigns will employ to mitigate any adverse effects associated with the proposed undertaking. Pursuant to this covenant, any mitigation measures to which GRANTEE, its successors or assigns and the SHPO mutually agree shall be carried out solely at the expense of GRANTEE, its successors or assigns.

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f. The SHPO and the Cowlitz Indian Tribe shall be permitted at all reasonable times to inspect the Property in order to ascertain its condition and to fulfill their responsibilities hereunder.

g. In the event that another Indian tribe should request consultation regarding activities described in paragraphs (a), (b), or (c) of this covenant, the GRANTEE, its successors or assigns shall consult with such tribes consistent with Washington state law and ordinances of the GRANTEE.

h. In the event of a knowing violation of this covenant, and in addition to any remedy now or hereafter provided by law, the SHPO may, following reasonable notice to the GRANTEE, its successors or assigns, institute suit to enjoin said violation or to require the restoration of any archaeological site affected by such violation. The successful party shall be entitled to recover all costs or expenses incurred in connection with any such suit, including all court costs and attorney's fees.

i. This covenant is binding on the GRANTEE, its successors, and assigns in perpetuity. Restrictions, stipulations, and covenants contained herein shall be inserted by the GRANTEE verbatim or by express reference in any deed or other legal instrument by which it divests itself of either the fee simple title or any other lesser estate in site 45-CL-318 or any other portion of the Property.

j. The failure of the SHPO to exercise any right or remedy granted under this instrument shall not have the effect of waiving or limiting the exercise of any other right or remedy or the use of such right or remedy at any other time.

k. This covenant shall be a binding servitude upon the Property and shall be deemed to run with the land.

l. Execution of this Deed shall constitute conclusive evidence that GRANTEE agrees to be bound by the foregoing conditions and restrictions and to perform the obligations herein set forth.

B. Modifying Land Use Restrictions.

(1) The GRANTEE shall prepare Long Term Operation and Maintenance Plans (hereinafter "LTO&M Plans") as required by the Prospective Purchaser Consent Decree between the GRANTOR and GRANTEE and Washington State Department of Ecology (hereinafter "WDOE") filed in the Clark County Superior Court. The LTO&M Plans shall identify any new land use restrictions or appropriate modifications to, or termination of, the land use restrictions established in this Deed based upon additional site characterization and remediation that will be completed pursuant to the Environmental Services Cooperative Agreement (hereinafter "ESCA") between the GRANTOR and the GRANTEE dated July 28, 2006, as modified. The LTO&M Plans must be reviewed by and agreed to by the GRANTOR and the Army prior to their submission to WDOE and must be approved by WDOE. Within 30 days of WDOE's approval

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of a LTO&M Plan, the Army, GRANTOR and the GRANTEE shall prepare an appropriate instrument to revise, as necessary, the land use controls contained in this Deed to be consistent with those specified in the LTO&M Plan. This instrument shall be executed and recorded within 15 days of completion of the preparation of a mutually-satisfactory instrument.

(2) Nothing contained herein shall preclude the GRANTEE, its successors or assigns, from undertaking, in accordance with applicable laws and regulations and without any cost to the GRANTOR, such additional action necessary to allow for other less restrictive land use, groundwater, excavation/land disturbance or public access uses of the Property. Prior to such use of the Property, the GRANTEE, its successors or assigns shall consult with and obtain the approval of the GRANTOR, and, as appropriate, the State or Federal regulators, or the local authorities. Upon the GRANTEE's or its successors' or assigns' obtaining the approval of the GRANTOR and, as appropriate, state or federal regulators, or local authorities, the GRANTOR agrees to execute an instrument suitable for recordation in the local land records and modifying, as appropriate, the land use restrictions imposed hereunder. The recordation of any such instrument shall be the responsibility of the GRANTEE, or its successors or assigns and shall be accomplished at no additional cost to the GRANTOR.

(3) The GRANTEE, its successors and assigns, shall submit any requests for modifications to the land use restrictions set forth herein to the Army, GRANTOR and the WDOE, by first class mail, postage prepaid, addressed as follows:

Army: U.S. Army Engineer District, Seattle
ATTN: CENWS-RE
3015 NW 54th Street,
Seattle, WA 98107

GRANTOR: Pete Cappel
Department of Public Works
Clark County
Vancouver, Wa. 98666-5000

WDOE: Washington State Department of Ecology
Toxics Cleanup Program
P.O. Box 47600
Olympia, WA 98504-7600

2. ENVIRONMENTAL PROTECTION PROVISIONS BINDING AND ENFORCEABLE

The Environmental Protection Provisions in this Deed are binding on the GRANTEE, its successors and assigns and shall be included in subsequent deeds, shall run with the land, and are forever enforceable by the Grantor and appropriate regulatory agencies.

3. DISRUPTION OF REMEDIES PROHIBITED

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Pursuant to section 120(h)(3)(C)(ii)(II), the GRANTEE covenants and agrees for itself, its successors, and assigns, that it shall not, nor shall it allow its sublessees, tenants, invitees or licensees to engage in activities that will disrupt any remedial investigation, response action, and/or oversight activities on the Property related to hazardous substances or MEC.

4. NOTICE OF THE POTENTIAL PRESENCE OF MUNITIONS AND EXPLOSIVES OF CONCERN (MEC)

A. The GRANTEE is hereby notified that due to the former use of the Property as a military installation, the Property may contain MEC. The term "MEC" means specific categories of military munitions that may pose unique explosives safety risks and includes: (1) unexploded ordnance ("UXO"), as defined in 10 U.S.C. § 101(e)(5); (2) discarded military munitions ("DMM"), as defined in 10 U.S.C. § 2710(e)(2); and (3) munitions constituents (e.g. TNT, RDX), as defined in 10 U.S.C. § 2710(e)(3), present in high enough concentrations to pose an explosive hazard.)

B. The Property was previously used as an operational range for live-fire training or testing, open burning, and for open detonation of munitions. A munitions response was conducted in 1998 and 2000. Munitions response activities have not been completed. A summary of MEC discovered on the Property is provided in Exhibit G, attached hereto and made a part hereof.

C. If the GRANTEE, its successors or assigns, any subsequent owner, or any other person should find any MEC on the Property after response activities are completed, they shall immediately stop any intrusive or ground-disturbing work in the area or in any adjacent areas and shall not attempt to disturb, remove or destroy it, but shall immediately notify Local Law Enforcement so that appropriate explosive ordnance disposal personnel can be dispatched to address such MEC as required under applicable law and regulations and the ESCA. This requirement does not apply while conducting munitions response. During such munitions responses, any MEC encountered will be addressed per the procedures outlined in the DDESB-approved explosives safety submission and/or the explosives site plan.

D. Easement and Access Rights.

(1) The GRANTOR reserves a perpetual and assignable easement and right of access on, over, and through the Property, to access and enter upon the Property in any case in which a munitions response action is found to be necessary or such access and entrance is necessary to carry out a munitions response action on adjoining property. Such easement and right of access includes, without limitation, the right to perform any additional investigation, sampling, testing, test-pitting, surface and subsurface clearance operations, or any other munitions response action necessary for the GRANTOR to meet its responsibilities under applicable laws and as provided for in this Deed. This easement and right of access shall be binding on the GRANTEE, its successors and assigns, and shall run with the land.

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(2) In exercising this easement and right of access, the GRANTOR shall give the GRANTEE or the then record owner, reasonable notice of the intent to enter on the Property, except in emergency situations. The GRANTOR shall use reasonable means, without significant additional cost to the GRANTOR, to avoid and/or minimize interference with the GRANTEE's and the GRANTEE's successors' and assigns' quiet enjoyment of the Property. Such easement and right of access includes the right to obtain and use utility services, including water, gas, electricity, sewer, and communications services available on the property at a reasonable charge to the GRANTOR. Excluding the reasonable charges for such utility services, no fee, charge, or compensation will be due the GRANTEE or its successors or assigns, for the exercise of the easement and right of access hereby retained and reserved by the GRANTOR.

(3) The GRANTOR and the GRANTEE agree that if any action of the GRANTOR's officers, employees, agents, contractors of any tier, or servants in the exercise of this right of access results in damage to the Property, the GRANTOR shall, at its sole discretion, either make reasonable repairs to or compensate for such damage. In no event shall such repair, or compensation, exceed the fair market value of the damaged portion of the Property at the time immediately preceding such damage. The GRANTOR's liability under this clause shall be contingent upon the availability of, and shall not exceed, appropriations available for such payment and nothing contained in this Deed may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The GRANTEE covenants and agrees for itself, its successors and assigns that it shall not cause or permit any interference with any munitions response action conducted by the GRANTOR on the Property

(4) The GRANTEE acknowledges that the Army has the same Access Rights as described above and accepts the Property subject to those Access Rights.

E. The GRANTEE acknowledges receipt of or access to the Administrative Record which contains MEC related documents.

5. NOTICE OF THE PRESENCE OF ASBESTOS AND COVENANT

A. The GRANTEE is hereby informed and does acknowledge that friable and non-friable asbestos or asbestos containing material (hereinafter "ACM") has been found on the Property. The Property may also contain improvements, such as buildings, facilities, equipment, and pipelines, above and below the ground, that contain friable and non-friable asbestos or ACM. The Occupational Safety and Health Administration (OSHA) and the U.S. Environmental Protection Agency have determined that unprotected or unregulated exposure to airborne asbestos fibers increases the risk of asbestos-related diseases, including certain cancers that can result in disability or death.

B. The following buildings on the Property have been determined to contain friable asbestos: 1828, 1864, 1930, 1934, 1980, and 4155. The GRANTEE agrees to undertake any and all asbestos abatement or remediation in the aforementioned buildings that may be required under applicable law or regulation at no expense to the GRANTOR. The GRANTOR has agreed to transfer said buildings to the GRANTEE, prior to remediation or abatement of asbestos hazards,

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in reliance upon the GRANTEE's express representation and covenant to perform the required asbestos abatement or remediation of the said buildings.

C. The GRANTEE covenants and agrees that its use and occupancy of the Property will be in compliance with all applicable laws relating to asbestos. The GRANTEE agrees to be responsible for any future remediation or abatement of asbestos found to be necessary on the Property to include ACM in or on buried pipelines that may be required under applicable law or regulation.

D. The GRANTEE acknowledges that it has inspected or has had the opportunity to inspect the Property as to its asbestos and ACM condition and any hazardous or environmental conditions relating thereto. The GRANTEE shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any asbestos or ACM hazards or concerns.

6. NOTICE OF THE PRESENCE OF LEAD-BASED PAINT (LBP) AND COVENANT AGAINST THE USE OF THE PROPERTY FOR RESIDENTIAL PURPOSES

A. The GRANTEE is hereby informed and does acknowledge that all buildings on the Property, which were constructed or rehabilitated prior to 1978, are presumed to contain lead-based paint. Lead from paint, paint chips, and dust can pose health hazards if not managed properly. Every purchaser of any interest in residential real property on which a residential dwelling was built prior to 1978 is notified that there is a risk of exposure to lead from lead-based paint that may place young children at risk of developing lead poisoning.

B. The GRANTEE covenants and agrees for itself, its successors and assigns that it shall not permit the occupancy or use of any buildings or structures on the Property as Residential Property, as defined under 24 Code of Federal Regulations Part 35, without complying with this notice and covenant and all applicable federal, state, and local laws and regulations pertaining to lead-based paint and/or lead-based paint hazards. Prior to permitting the occupancy of the Property where its use subsequent to conveyance is intended for residential habitation, the GRANTEE specifically agrees to perform, at its sole expense, the Army's abatement requirements under Title X of the Housing and Community Development Act of 1992 (Residential Lead-Based Paint Hazard Reduction Act of 1992), as amended.

C. The GRANTEE acknowledges that it has inspected or has had the opportunity to inspect the Property as to its lead-based paint content and condition and any hazardous or environmental conditions relating thereto. The GRANTEE shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any lead-based paint hazards or concerns.

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EXHIBIT D

Demolition Area 1/Landfill 4

A parcel of land located in the northeast quarter (NE¼) of Section 35, Township 3 North, Range 3 East, Willamette Meridian, situate in Clark County, Washington; and more particularly described as follows:

Commencing at the north quarter corner of the said Section 35, thence south 08°10'13" east, a distance of 975.35 feet to the northwest (NW) corner of said parcel and the **TRUE POINT OF BEGINNING;** thence north 90°00'00" east , a distance of 500 feet; thence south 0°00'00" east, a distance of 100 feet; thence south 90°00'00"east, a distance of 100 feet; thence south 0°00'00" east, a distance of 600 feet; thence south 90°00'00" west, a distance of 500 feet; thence north 0°00'00" east, a distance of 100 feet; thence south 90°00'00" west, a distance of 100 feet; thence north 0°00'00" east, a distance of 100 feet; thence south 90°00'00" west, a distance of 100 feet; thence north 0°00'00" east, a distance of 400 feet; thence south 90°00'00" east, a distance of 100 feet; thence north 0°00'00" east, a distance of 100 feet to the **TRUE POINT OF BEGINNING**.

Contains 10.1 acres, more or less.

This description is based on GIS data used for a map known as figure 5.1 (page 5.3) which is attached to a report titled "Camp Bonneville, Site Specific Fact Sheets, Remedial Action Unit 3, Vancouver, Washington". The report was provided by Parsons for the U.S. Army Corps of Engineers, Seattle District and Huntsville Center (dated August 2005, Contract No DACA87-00D-0038, delivery order 0017).

Doc. 001930.

All Public Land Survey section corners and section lines are based on a record of survey (ROS) performed by the county surveyor of Clark County, Washington (dated May 15, 2006 and filed in Book 56, page 7). The basis of bearing according to said ROS is grid and adjusted to the Washington State Plane Coordinate System, south zone, NAD 83 (91). All distances are grid.

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EXHIBIT G

NOTIFICATION OF MUNITIONS AND EXPLOSIVES OF CONCERN			
Site	**Site Description**	**Date of MEC Activity**	**Munitions Response Actions**
Unexploded Ordnance – Based on past reuse of the Property, the potential for MEC exists anywhere on site. Specific information regarding known target areas with higher likelihood of MEC is included below.			
Landfill 2 (Sewage Lagoons and Historic Landfill)	This landfill was discovered in 1978 during the construction of the sewage lagoon. The landfill may have been used from the 1940s to the 1950s; however, the type and quantity of material located at this site is unknown.	Unknown	A UXO avoidance/screening and electromagnetic survey identified pipes, vehicle parts, wiring and one undetonated 2.36-inch light anti-tank weapon, which was disposed of by the Ft Lewis EOD.
Demolition Area 3 (DA 3)	DA 3 is a surface depression that may be an excavation or possibly a detonation crater. The location is about 2000 feet upstream of the base boundary in Lacamas Creek Valley. The crater is approximately 20 feet in diameter and 10 feet deep. DA 3 is located west of the gas pipeline right-of-way that crosses Camp Bonneville. DA 3 may have been used for detonation of unwanted ordnance. The crater is situated several hundred feet south of Lacamas Creek in an area where the valley is wide and relatively flat. The ground surface at DA 3 is hummocky with seasonal wetland vegetation.	Unknown	Soil samples were collected from borings advanced immediately around the depression and from a nearby location where metallic debris (one drum and shell fragments) was found and later removed and disposed of. All soil samples were tested for explosives, perchlorate, and total metals. Test results of soil boring samples indicate no explosives or perchlorate concentrations above the testing instrument's reporting limit. Test results of soil samples collected from the former debris piles indicate no explosives, perchlorate, or picric acid. Metals were detected in samples collected from the borings and the debris pile but at concentrations at background levels and/or below screening or cleanup levels. Arsenic, barium, copper, and mercury were detected at concentrations that required a terrestrial ecological evaluation. The evaluation determined that these metals are not a potential threat to ecological receptors. No ordnance and explosives sampling and removal activities were conducted at this site, but a 37mm practice round was recovered form an old crushed burn barrel found at the site.
Small-arms Ranges – not considered/included as MEC	There are 21 small-arms ranges on the Property. For a description of the small-arms ranges see Table 1 - Description of Property.	Unknown	The following is a general description of the investigations and remediations conducted at the 21 small-arms ranges. The U.S. Army Corps of Engineers (1997) prepared an archive search report (ASR) to collect information pertinent to the small-arms ranges at Camp Bonneville. The small arms ranges were investigated as part of the base-wide reconnaissance effort. As a result of this reconnaissance, a site investigation was conducted that consist of gridding the small-arms ranges and collecting soil samples. The soil samples were tested for total metals, perchlorate, explosives, and lead. Arsenic and barium were the only metals detected above background levels. Perchlorate was not detected in the soil samples. The compound 2, 4-dinitrotoluene (DNT) was the only explosive compound detected in the soil (small-arms range: 25M Machine Gun Range), and at concentrations that range from 4.9 to 20 mg/kg. The U.S. EPA Region 9 residential and industrial

NOTIFICATION OF MUNITIONS AND EXPLOSIVES OF CONCERN			
Site	Site Description	Potential MEC Activity	Munitions Response Actions
			use criteria for DNT in soil are 120 and 1,800 mg/kg, respectively. Some OE sampling and removal activities were conducted in the area of the small-arms ranges as part of a site-wide effort performed by UXB (1998).
Site-wide Actions	This site/area is RAU 3, which consists of all artillery and mortar firing points and safety fans. Collectively these sites cover most of he Property. OE removal actions were conducted at Training Areas 8 (TA 8) and Training Area 9 (TA 9). These areas are located southeast of the cantonment areas and include portions of Sub-caliber Range 1 and Machine Gun Range-North. See Figures 6 Remedial Action Unit 2A and Figure 11 Training Ranges 8 and 9 for the location of the aforementioned ranges.	Unknown	MEC characterization and removal activities have been conducted at Camp Bonneville. UXB International, Inc. (1998) conducted a site-wide OE sampling and removal action; UXB (2000) also conducted an OE sampling and removal action at Training Area 8 (TA 8) and at TA 9, and Parsons Engineering Science, Inc. (2004) completed a remedial investigation/feasibility study (RI/FS) of RAU 3. Two hundred and seven grids were established throughout the site. Each grid measured 100 x 100 feet (a total area of approximately 50 acres). UXO technicians investigated 2,468 anomalies finding 25 live UXO; 212.7 pounds of OE-related scrap, and 185 pounds of non-OE related scrap. As a result of this effort, UXB returned and conducted a sampling and removal action in an 18.9-acre area encompassing TA 8 and TA 9. In addition, UXB conducted a preliminary survey of 1.5 acres at Demolition Area 1. During this action, 106, 341 areas were excavated. Nine UXO items were removed and disposed of. In addition, 3,888 pounds of OE scrap and 683 pounds of non-OE scrap were removed. A total of 16,004 discrete reconnaissance data waypoints have been collected, analyzed, and mapped using digital technology and GIS geo-spatial analysis during the 2001/2002 site reconnaissance efforts. Over 2,400 acres of the 3,980 total acres were characterized for munitions and explosives of concern (MEC) and related activities. A solitary UXO item (105 mm artillery shell) was located in the Central Impact Target Area. A total of 58 inert munitions debris (MD) were located and recovered during the reconnaissance field efforts. The MD items included a total of 27 expended pyrotechnic devices, 7 expended smoke grenades, 9 expended practice 40mm projectiles, and 15 expended practice rockets and rocket motors. Depending upon the location of a training area, the training area may include undeveloped land, firing points and ranges. Ordnance and explosives removal actions were conducted in Training areas 8 and 9, which are located southeast of the cantonment areas, Figure 12. The August 2000 *Final Removal Report Ordnance and Explosives Removal Actions Camp Bonneville, Vancouver, Washington* indicates that TA 8 and TA 9 were impact areas 60mm and 81mm full-size practice rounds, 35mm light anti-tank weapon rounds, and 40mm practice grenades.
Discarded Military Munitions			
Demolition Area 1 and Landfill 4	This area, located in the north-central part of the Property, was a former	Unknown	A site investigation (SI) was conducted in 1998-1999 4 to evaluate the potential for contamination resulting from past uses of the

NOTIFICATION OF MUNITIONS AND EXPLOSIVES OF CONCERN			
Site	Site Description	Date of MEC Activity	Munitions Response Actions
	ordnance burn and ordnance detonation site and a landfill. The site slopes downward to the west, toward the north fork of Lacamas Cree which flows southward into the main branch of Lacamas Creek. Several patches of soil on the site surface were reported to have a pinkish-red hue and were generally devoid of vegetation. The cause of this discoloration was not known; however, similarly discolored soil had been reported at other sites where explosives contamination had been detected in shallow soil. A firebreak surrounds the area just outside of a barbed-wire fence line. Surface debris consisted primarily of metal scraps such as wiring, metal shards, and automobile parts. Vancouver Barracks reportedly used the site for the disposal of building demolition debris during the mid-1960s. In addition, the site has been used by a number of groups and agencies, including the Army, Portland Air National Guard (PANG), local fire departments and law-enforcement for training and disposal operations. Reportedly, the site has been used for the disposal of firearms, destruction of AIM 7E Sparrow Missiles and Mark 38 rocket motors, and for demolition training.		landfill. The SI included a UXO avoidance survey, geophysical survey, surface and subsurface sampling, and groundwater sampling. Test results of soil samples indicate concentrations of various metals. Only barium, copper, and chromium were detected at concentrations exceeding the regulatory/risk-based criteria. One or more SVOCs, insecticides, herbicides and VOCs were detected, but at concentrations below screening criteria. The only groundwater constituent detected at a concentration exceeding a screening level was RDX (44 ug/l). This compound was detected in the down-gradient well only. In 2001, an expanded site investigation (ESI) of the landfill was conducted based on the previous detection of RDX. The ESI focused primarily on groundwater and included the installation of eight monitoring wells (one well could not be used because it was dry). Four quarterly rounds (July 2001, October 2001, January 2002, and April 2002) of groundwater sampling were conducted. Well samples were also collected in January 2003. Samples collected from the wells were tested for explosives residues, nitroguanidine, perchlorate ion, VOCs, SVOCs, organochlorine herbicides PPL metals (total and dissolved), total cyanide TPH and water quality parameters. Tests results indicate that explosives and propellants (2, 4-DNT, RDX, and perchlorate) were detected in all but one monitoring well, and were also detected in the up-gradient well. These constituents were detected in concentrations exceeding screening criteria in the initial groundwater sampling rounds and the final sampling round. Dichlorofluoromethane, 1,1,1-TCA, 1,1-DCE, and PCE were also detected above screening levels. In 2004, approximately 5,000 cys of contaminated soil (metals and commercially available fireworks) was removed (interim action) and disposed of at an off-site facility. The excavation was backfilled to grade. The monitoring wells at the site will be sampled on a quarterly basis.
Munitions Constituents			
Ammunitions Storage Bunkers (Facility Nos. 2950, 2951, and 2953)	These bunkers were constructed in 1976 to store various munitions. They range in size from 4 sq. ft. to 100 sq. ft. The magazines are fenced.	Unknown	In 1998, fifteen sampling locations (nine at the largest bunker and three each at the two smaller bunkers) were selected for the collection of surface and subsurface soil samples. A soil boring was also advanced at each bunker based on the results of the surface soil tests from soil samples collected from inside the bunkers. Wipe samples were collected from the floors in each magazine. The soil samples collected from inside the bunker and the wipe sample tests results show RDX (below reporting levels) and all the PPL metals except selenium and thallium in Facility 2950. Arsenic, beryllium, cadmium, chromium, lead, and mercury were detected in the soil samples collected from inside the bunker at concentrations that

NOTIFICATION OF MUNITIONS AND EXPLOSIVES OF CONCERN			
Site	Site Description	Date of MEC Activity	Munitions Response Actions
			exceed the MTCA cleanup criteria. Arsenic, beryllium, and cadmium concentrations were also above background levels. PETN was detected in one bunker; however, there is no established cleanup concentration for PETN. No organic compounds were detected above reporting limits in the surface soil samples collected outside the bunker. Arsenic, cadmium, chromium, and lead were detected at concentrations above MTCA cleanup criteria and background levels in the surface soil samples collected outside the bunker. In 2001, surface and subsurface soil samples were collected from Facility 2953. PETN, picric acid, and 2,4-dinitrotoulene were detected in the surface soil samples at concentrations below MTCA cleanup criteria. No ordnance compounds or propellants were detected in the subsurface soil samples. Metals were detected in the surface soil samples. Arsenic and chromium were detected above MTCA cleanup criteria. Lead was detected above the MTCA cleanup criteria and background levels. In May 2001, contaminated soils at the three bunkers were excavated to 1-foot below grade. Confirmatory samples were collected and the test results indicated no residual contaminants above regulatory criteria or background levels. The excavations were backfilled and the contaminated soil and wood from pallets inside the bunker were disposed of at an off-site facility. The interior surfaces of the bunker were cleaned.
Demolition Area 1 and Landfill 4	See Discarded Military Munitions	Unknown	See Discarded Military Munitions
Airstrip	The 4.5- acre airstrip is located along an open area near the main entrance.	Unknown.	No MEC was found during an investigation of this area.
Camp Bonneville Cantonment	This 5.1-acre area is comprised of buildings and open grassy areas.	Unknown.	No MEC was found during an investigation of this area.
Camp Killpack	This 5-acre area was previously used for troop barracks.	Unknown.	No MEC was found during an investigation of this area.
Bonneville Parade Ground	This is an open grassy area.	Unknown.	No MEC was found during an investigation of this area.

NOTIFICATION OF MUNITIONS AND EXPLOSIVES OF CONCERN

Site	Site Description	Date of MEC Activity	Munitions Response Actions
OB/OD Areas	This 6.5-acre area consists of 3 demolition areas.	Unknown.	Subsurface removal action is completed at demolition area 1.
Target Area	These areas combine to be approximately 12 acres.	Unknown.	A potential MEC–risk was identified during investigation.
Central Impact Target Area	This 465-acre area was previously used as an artillery target area.	Unknown.	A MEC–risk was identified during investigation.
Firing Points	The 19-acre Firing Points area consists of 6 mortar firing points, 7 artillery firing points, 1 rifle grenade firing point and 1 3.5-inch rocket firing point.	Unknown.	No MEC was found during an investigation of this area.
West Side of Proposed Park	This 600-acre area was historically used as a maneuver area.	Unknown.	No MEC was found during an investigation of this area.
Roads and Trails	The roads and trails have been in use for approximately 35 years. No MEC risk has been identified.	Unknown.	No MEC was found during an investigation of this area.
Wildlife Management Area	This 2050-acrea area was used as a former range fans and maneuver areas.	Unknown.	A potential MEC–risk was identified during investigation.
Current FBI Training Area	The parcel will continue to be used for FBI training until October 2006.	Unknown.	A potential MEC–risk was identified during investigation.
Designated Reuse Areas Located Outside the Park	This area includes a former combat pistol range.	Unknown.	A potential MEC–risk was identified during investigation.
Southwest Lacamas Valley	This 98-acre area was historically used for small arms training.	Unknown.	A potential MEC–risk was identified during investigation.

Notes:

1) Munitions and Explosives of Concern (MECs) distinguishes specific categories of military munitions that may pose unique explosives safety risks, means: (A) Unexploded Ordnance (UXO), as defined in 10 §101(e)(5); (B) Discarded military munitions (DMM), as defined in 10 U.S.C. §2710(e)(2); or (C) Munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. §2710(e)(3), present in high enough concentrations to pose an explosive hazard.

2) See, Attachment 1-Document List for documents that pertain to MECs.

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Commissioners

Please print neatly or type information
Document Title(s)
Restrictive Covenants Camp Bonneville Military Reserve PA 06-167

Reference Numbers(s) of related documents: Remedial Action Unit 1

Additional Reference #'s on page ____

Grantor(s) (Last, First and Middle Initial)
Clark County

Additional grantors on page ___

Grantee(s) (Last, First and Middle Initial)
Public

Additional grantees on page ____

Legal Description (abbreviated form: i.e. lot, block plat or section, township, range, quarter/quarter)
Restrictive Covenants

Additional legal is on page ____

Assessor's Property Tax Parcel/Account Number

Additional parcel #'s on page ____

The Auditor/Recorder will rely on the information provided on this form. The staff will not read the document to verify the accuracy or completeness of the indexing information provided herein.

I am requesting an emergency nonstandard recording for an additional fee as provided in RCW 36.18.010. I understand that the recording processing requirements may cover up or otherwise obscure some part of the text of the original document.

Louise Richards
Signature of Requesting Party

PA 06-167

RESTRICITVE COVENANTS
CAMP BONNEVILLE MILITARY RESERVE
REMEDIAL ACTION UNIT 1

Comes now the Bonneville Conservation Restoration and Renewal Team, LLC, a California nonprofit limited liability company, authorized to do business in the State of Washington, and hereby files this restrictive covenant, pursuant to the (1) Prospective Purchaser Consent Decree ("PPCD"), filed in the Superior Court, County of Clark, State of Washington, on October 13, 2006, in Cause No. _____, and (2) the Final Cleanup Action Plan for Remedial Action Unit (RAU) 1 ("CAP RAU 1"), and (3) the Finding of Suitability for Early Transfer ("FOSET") (Camp Bonneville, Clark County, Washington) prepared and published by the U.S. Department of Army in July 2006.

RAU 1 consists of the 20 areas at the Property identified and illustrated in Exhibit A. The documents referenced above require the imposition of certain specific restrictive covenants on two of the buildings within RAU 1. Specifically, institutional controls, which this Restrictive Covenant constitutes, are required for (1) the maintenance pit within Building 4475 at the Camp Killpack cantonment, a map of which is attached as Exhibit B hereto and incorporated herein by reference, and (2) the subsurface area underlying Building T-1932 in the Camp Bonneville cantonment, a map of which is attached as Exhibit C hereto and incorporated herein by reference. Building 4475 and Building T-1932 are hereinafter together referred to as the "Buildings".

In Building 4475, a maintenance pit is located under a concrete slab within the west end of the building. The pit is abandoned and covered with a slab and was an area in which vehicles were repaired and maintained. Based on this use, it is possible that vehicle fluids such as gasoline, used oil, lubricants, antifreeze, and solvents may have been released to the ground. This pit could not be sampled in the past. If in the future the building is demolished, additional soil sample will be required.

In Building T-1932, one sample previously collected contaqined concentrations of contaminated soil which exceeded the Model Toxics Control Act ("MTCA") Method A cleanup level used at the time. It was determined after an attempt at excavation that further attempts at evaluation would undermine the foundation of the building. Therefore, with the concurrence of the Washington Department of Ecology, or any successor agency (collectively the "WDOE"), excavation was terminated and the site was backfilled using clean, imported soil. If in the future, the building is demolished, additional soil sampling will be required and removal may be required.

BCRRT hereby covenants, as current owner of the Camp Bonneville property, a description of which is attached as Exhibit D hereto and incorporated

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PAGE 3/21 * RCVD AT 10/2/2007 11:43:11 AM [Pacific Daylight Time] * SVR:NT23/22 * DNIS:7595284 * CSID:360 694 4734 * DURATION (mm-ss):05-38

herein by reference, with the understanding that this Restrictive Covenant shall run with the Camp Bonneville property and obligate future owners to its terms, conditions and requirements, that (1) in the event that Building 4475 or Building T-1932 are demolished at any time in the future, that additional soil sampling shall be performed and that in the event that such soil sampling reveals a need for further remediation, that such remediation will be undertaken such that the Washington Department of Ecology (Ecology), or it successor agency is satisfied that the Buildings, or either one of them, so remediated are safe for their then intended use, (2) that a sign shall be posted permanently on or in each Building identifying the potential environmental contamination associated with the particular Building and providing notification that upon demolition that additional soil sampling is required and additional remediation may be required, and (3) that such permits, if and as are required by law at the time of demolition and soil excavation, shall be obtained prior to initiating any such work on the Buildings.

Authority to enforce these restrictive covenants is hereby specifically granted to the United States Department of Army, Ecology, and during the time of ownership of the Camp Bonneville property by the BCRRT, to Clark County, a political subdivision of the State of Washington. Any party becoming aware of any violation of these restrictive covenants shall report same to each of the entities referenced in this paragraph in timely fashion. Each agency identified above shall have authority to judicially enforce the terms of these restrictive covenants in order to compel cessation of any behavior which violates the terms of these restrictive covenants.

In the event that at any time in the future the Ecology determines that these restrictive covenants are no longer necessary for the protection of the safety and health of those utilizing the Buildings and that the sites on which these Buildings stood are suitable for unrestricted use, then Ecology shall execute a document to be filed in the real property records of Clark County, Washington, which shall release the Camp Bonneville property from these restrictive covenants.

The owner of the Camp Bonneville property shall make annual reports on these restrictive covenants such that their effectiveness can be assessed as part of the MTCA 5-year review process. Additionally, the existence of these restrictive covenants shall be incorporated into any hazard awareness program adopted for the Camp Bonneville property.

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IN WITNESS WHEREOF, these restrictive covenants are executed this 21 day of November, 2006, and shall be filed of record in the Clark County, Washington real property records upon being fully executed.

BONNEVILLE CONSERVATION RESTORATION AND RENEWAL TEAM, LLC, a California nonprofit limited liability company authorized to do business in the State of Washington

By: CONSERVATION RESTORATION AND RENEWAL TEAM, a California nonprofit public benefit corporation
ITS SOLE MEMBER

By: _____
Michael J. Gage, President

STATE OF WASHINGTON)
) ss.
COUNTY OF CLARK)

SUBSCRIBED AND SWORN TO before me a notary public this 21 day of November, 2006, by Michael J. Gage, President of the Conservation Restoration and Renewal Team, a California nonprofit public benefit corporation, Sole Member of the Bonneville Conservation Restoration and Renewal Team, LLC, a California nonprofit limited liability company, on behalf of said company.

_____
Notary Public

My commission expires:
1-26-08
(SEAL)

LOUISE DARLENE RICHARDS NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES JANUARY 26, 2008

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REVIEWED AND APPROVED:

CLARK COUNTY, a political subdivision of the State of Washington

By: _____

Name: Marc Boldt

Title: Chair - Commissioner

Date: 11-21-06

Approved as to form only:

By: _____
Deputy Prosecuting Attorney

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EXHIBIT A to Restrictive Covenant
(Identification of RAU 1 Sites, Camp Bonneville, FOSET Table 1)

Table 1- Description of Property

Site Name	Site Category Designation	Description	Investigation/Remediation	Map Number
Remedial Action Unit 1				
Landfill 1 (Historic Landfill)	2 (7) HR(P)	This site (small shallow depression) was identified as a landfill based on the presence of bottle fragments. There is no record of when the site may have been used or what other materials it may contain.	In December 1997, a field reconnaissance and geophysical survey were performed in the area of landfill 1. The exact location of the landfill could not be determined and it was determined that the site may have been a former homestead.	1
Landfill 2 (Sewage Lagoons and Historic Landfill)	3 (7) HR(P)	This landfill was discovered in 1978 during the construction of the sewage lagoon. The landfill may have been used from the 1940s to the 1950s; however, the type and quantity of material located at this site is unknown.	A UXO avoidance/screening and electromagnetic survey identified pipes, vehicle parts, wiring and one undetonated 2.76-inch light anti-tank weapon, which was disposed of by the Ft Lewis EOD. A soil gas survey of the site detected chloroform, which was determined to be a possible sample or analytical procedure contaminant. Three borings were advanced around the landfill (one up-gradient and two down-gradient), sampled and converted to monitoring wells. One soil sample was collected from each boring and tested for TPH, VOCs, SVOCs, PCBs, pesticides, nitroaromatic and nitramine explosives, PETN, cyanide, TOC, and PPL metals. Test results of soil samples indicate TPH, VOCs, SVOCs, PCBs, pesticides, cyanide, and explosive compounds including PETN and PA were below the detection limit for all samples. PETN was detected in one sample at an estimated concentration of 0.22 mg/kg. There are no regulatory screening levels for PETN. Various metals were detected at concentrations above one or more of the regulatory cleanup criteria for soils; however, only copper (134 mg/kg) was detected above background levels (114 mg/kg). Groundwater samples were collected from the two down-gradient wells and tested for TPH, VOCs, SVOCs, PCBs, pesticides, nitroaromatic and nitramine explosives, PETN, cyanide, TOC, and PPL metals (total and dissolved). Test results show no detectable levels of TPH, SVOCs,	3

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Table 1

DESCRIPTION OF PROPERTY

			explosives compounds, PCBs, and pesticides. Naphthalene was detected at an estimated quantity (below its cleanup criteria). Numerous metals were detected in the groundwater samples but at concentrations below regulatory cleanup levels except for arsenic. Arsenic was detected above the U.S. EPA Region 3 risk-based criterion (0.000045 mg/l) and the MTCA screening level (0.00005 mg/l), but below the Federal MCL.	
Former Burn Area (Historic Burn Site)	4 (7) HR(P)	The former burn area is located immediately north of Landfill 3 and southeast of the existing sewage lagoon. The area was reportedly used to burn wood and debris, although there is no record of the length of use or list of materials burned. The area has apparently not been used since the 1980s.	A UXO avoidance/screening survey was performed across the former burn site. In December 1997, surface and near-surface soil samples were collected in and adjacent to the area. All test results were below regulatory cleanup levels, site-specific background concentrations for metals, or below MTCA levels for thallium and zinc.	3
Landfill 3 (Trash Burial Site)	5 (7) HR(P)	This former landfill is located southeast of the existing sewage plant, and at its closest point is 20 feet west of Lacamas Creek. The landfill was reportedly used in the 1970s and 1980s. Uncovered objects include domestic appliances and paint cans.	A UXO avoidance/screening and electromagnetic survey identified corrugated metal, pipes, drums, and wiring. No UXO debris was observed. A soil gas survey of the Landfill 3 area detected no analytes above the testing instrument's detection limit. The results of soil sampling conducted around the perimeter of the landfill showed no analyte concentrations above regulatory cleanup levels or site-specific background levels for metals. Groundwater samples were collected from one up gradient and three down-gradient wells located at the perimeter of the landfill. All test results were below regulatory cleanup levels.	3
Grease Pits - Bonneville	6 (7) HR(P)	There are two former grease pits north of Building 1828. The grease pits consist of corrugated metal pipes that extend into an underground pit filled with gravel. The pits were built to accept grease from nearby mess halls and are reported to have been used from the mid-1930s to the 1990s.	Two soil borings were advanced immediately adjacent to the grease pit. Two soil samples were collected from each boring and tested for TPH, VOCs, SVOCs, PCBs, pesticides, and PPL metals. One of the two soil samples collected at the grease pit contained the pesticide lindane at 2.0 mg/kg (cleanup concentration is 0.769 mg/kg). The presence of lindane at this concentration does not pose an unacceptable risk to human health or the environment because there are no complete exposure pathways. Numerous metals were	3

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			detected, but at concentrations below the regulatory cleanup levels. The concentrations of arsenic and chromium detected exceeded the regulatory cleanup level, but were below the site-specific background concentrations.	
Above Ground Storage Tank Sites **Building T-1932**	7 (2) PS	This site includes the entire Property. There are twenty-six 275-gal. diesel ASTs in the two cantonment areas (Bonneville and Killpack). The ASTs were used for heating buildings. All buildings are reported to have been converted to electrical heat.	All ASTs were visually inspected for evidence of a release. Stained soil, odors, and/or elevated PID readings were observed at eight AST locations. In 1998, soil samples were collected from the eight AST locations and tested for TPH. Test results indicate that seven samples had concentrations above the MTCA for TPH (2,000mg/kg). In 1998, soil excavations began at the seven AST locations. Confirmatory samples were collected and tested for TPH. Three AST locations had confirmatory sample test results that exceeded the MTCA for TPH. Additional excavations took place at two of these locations followed by another round of confirmatory sampling, which showed no results above the MTCA for TPH. Additional excavations could not be done at Building 1932 (third location) because the excavation could have undermined the building. The maximum TPH concentration detected in the confirmatory sample from this building was 2,690 mg/kg. It is assumed that there could be as much as 33 cys of TPH contaminated soil remaining beneath this building. The WDOE concurred that leaving the TPH contaminated soil in place was acceptable. All contaminated soil, except as noted above, was disposed of at an off-site facility. All excavations were backfilled to grade. No further removal actions are required at this time. If the building is demolished in the future, additional soil sampling and removal may be required.	2
Burned Buildings 1962 & 1983 Building 1962	8 (7) HR(P)	Former Building 1962 was located near the southeast corner of Camp Bonneville cantonment area. The building was burned in place at an unknown date. The debris	A geophysical survey of the area detected building materials at a specific location, which was assumed to be the footprint of former Building 1962. Surface soil samples were collected from within the assumed building footprint and immediately adjacent to the footprint. All test results were below the	3

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		was removed to an unknown location, leaving no visible trace of the building.	regulatory cleanup level.	
Building 1983	8 (7) HR(P)	Former Building 1983 was located near the southeast corner of Camp Bonneville cantonment area. The building was burned in place at an unknown date. The debris was removed to an unknown location, leaving no visible trace of the building.	A geophysical survey of the area detected building materials at a specific location, which was assumed to be the footprint of former Building 1983. Surface soil samples were collected from within the assumed building footprint and immediately adjacent to the footprint. All test results were below the regulatory cleanup level.	3
Pesticide Storage/Mixing Building 1964	9 (7) HR(P)	This wood-framed building was originally constructed in 1955 as a fire station and later used to store and mix pesticides. Pesticides including 2,4,5-T, 2,4-D, and DDT were reportedly stored in this building. More recently, the building was used as the grounds shop where equipment, vehicles, small gasoline containers and car batteries are stored. A sink inside the building drained to a dry well.	Surface, subsurface, and groundwater samples were collected at the site and tested for TPH, VOCs, (subsurface samples only) SVOCs, chlorinated pesticides, PCBs, organophosphorus pesticides, chlorinated herbicides, and PL metals. Test results indicate that surface and sub-surface soil samples had concentrations of various metals (cadmium, chromium and lead) above regulatory cleanup levels. The concentrations of cadmium and lead exceeded background levels. Groundwater samples collected from the two monitoring wells installed at the site contained no analytes above regulatory criteria. Remediations began in June 2000 that included soil excavations to an average depth of 0.8 feet bgs. Confirmatory samples were collected from the excavation, and the test results indicated that the concentration of TPH (diesel and heavy oil range) and lead exceeded cleanup criteria. Based on that data, the excavation was extended to 2.7 feet bgs (average). Confirmatory samples were collected, and all test results showed target analyte concentrations to be below their respective cleanup criteria. The contaminated soil excavation was competed in 2000, and all contaminated soil was disposed of at an off-site facility. The excavation was backfilled to grade.	4

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Table 1

DESCRIPTION OF PROPERTY

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CS Gas Training Building 1834 (Building 1834 CS Gas Chamber)	10 (1)	This building was used for chemical warfare training, but records indicate that only CS was used. This is a wood frame one-story post-on-pier converted barracks. This facility was used for gas mask training for an unknown period of time.	In preparation for demolishing Building 1834, a survey was conducted that included testing soil samples for CS gas and its breakdown products, field screening surface soil samples for lead, and screening the building for asbestos. A surface soil sample was collected from beneath the building and another sample was collected from 10 feet (approximately) in the prevailing downwind direction from the building. No CS gas or its breakdown products, lead, or asbestos were detected in the soil or building components above regulatory cleanup criteria. The building was demolished and the debris was disposed of off-site at a municipal landfill.	3
Grease Pit - Killpack (Grease Pit)	11 (7) HR(P)	This grease pit is located on the east side of the former mess hall (Building 4389). The grease pit consists of two corrugated metal pipes that extend into an underground pit filled with gravel. The pit was built to accept grease from the mess hall and is reported to have been used from the mid-1930s to the 1990s.	Two soil borings were advanced immediately adjacent to the grease pit. Two soil samples were collected from each boring and tested for TPH, VOCs, SVOCs, PCBs, pesticides, and PPL metals. VOCs and PCBs were not detected. No organic compounds were detected in the two soil samples collected at this pit. Numerous metals were detected. Chromium, lead, and thallium were detected above regulatory cleanup levels, but below site-specific concentrations. Arsenic was detected above its regulatory cleanup and site-specific background levels. Arsenic does not pose an unacceptable risk to human health or the environment because there are no complete exposure pathways.	3
Maintenance Pit (Building 4475)	12 (7) PR(P)HR(P)	Building 4475 had a maintenance pit that reportedly received waste oil and antifreeze associated with vehicle maintenance activities. The concrete floor of the building currently covers the pit. Small-scale pesticide mixing and loading occurred in the building.	Six soil samples were collected from two borings advanced at the Maintenance pit. The soil samples collected at the drainage pit were tested, and the results showed unidentified hydrocarbons, VOCs, SVOCs and chlorinated pesticides at concentrations below regulatory criteria. No PCBs were detected in any of the samples. Several metals were detected above the regulatory cleanup concentration (arsenic, chromium, and lead) but below site-specific background concentrations with the exception of one sample, which had a lead concentration above background. In June 2000, all accessible lead-contaminated	4

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			soils were excavated and disposed of at an off-site facility. The excavation was stopped to avoid undermining the building. Contaminated soil may be present beneath the building. Potential contaminants may include petroleum hydrocarbons, VOCs, SVOCs, metals. The excavation was backfilled to grade. No further removal actions are required at this time. If the building is demolished in the future, additional soil sampling may be required.	
Hazardous Materials Accumulation Point (Buildings 4475B and 4476A)	13 (7) PR(P)/HR(P)	The January 1997 *Environmental Baseline Survey Report for Camp Bonneville, Washington* indicates that Buildings 4475B and 4476A stored hazardous substances. The *July 2004 Final Cleanup Action Plan, Remedial Unit 1, Camp Bonneville, Vancouver, Washington* identified Building 4475a, in addition to Buildings 4475B and 4476, as storing hazardous materials (antifreeze and POLs). Building 4476 consists of three masonry block walls on a concrete slab floor. The open front of the structure is secured with locking metal gates. Building 4475B is used to store POLs associated with vehicle maintenance, and Building 4476A is a storage shed that contains a 1,000-gal. diesel AST with secondary containment. The site is also referred to as the Covered Vehicle Maintenance Storage building. Drums of antifreeze and waste oil, as well as the temporary storage of hazardous	Two soil samples were collected from directly in front of the site and tested for TPH, SVOCs, PCBs, Pesticides, and PPL metals. Pesticides and PCBs were not detected at concentrations above the testing instrument's reporting limits. Test results show hydrocarbon compounds and metals at concentrations below the regulatory cleanup or background concentrations. The contents of a sump located in Building 4475B were tested, and the results showed unknown hydrocarbons. The contents were removed from the sump and disposed of at an off-site facility. Visual inspection of the sump found no crack or outlets, and the concrete was observed to be in good condition.	3

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		material have been stored in this building. The building currently contains empty drums.		
Wash Rack 1 (Former Vehicle Maintenance Rack and UST)	14 (7) PR(P)	This wash rack is located near Building 4476. The wash rack was constructed of timbers and demolished in the early 1980s. Wastewater from washing operations discharged directly onto the ground. A UST was reportedly located adjacent to the wash rack, and was removed in 1978.	Two surface and two subsurface soil samples were collected from this site. Test results indicate that all analyte concentrations were below regulatory cleanup criteria. Petroleum hydrocarbons were detected in all samples but at concentrations below the MTCA Method A cleanup criteria. Metals were detected above regulatory cleanup criteria, but below background levels.	2
Pesticide Storage Building 4126 (Building 4126)	16 (7) HR(P)	This building was used to store 55-gal. drums of the pesticides 2,4,5-T, 2,4-D, and DDT until 1977. The building was constructed of wood and included skids on the bottom of the building. It is reported that the building was moved to various locations at Camp Bonneville.	Soil samples and an indoor floor sample were collected and tested for chlorinated pesticides and herbicides, PCBs, PPL metals (plus barium) and TPH (gasoline and diesel ranges). Test results on these samples indicate that pesticides (4,4-DDT, 4,4-DDD, 4,4-DDE, beta-BHC, lindane, 2,4-D, 2,4-DB, 2,4,5-T, and MCPP), petroleum hydrocarbons, and several metals were detected but at concentrations below regulatory cleanup and background concentrations. Polychlorinated biphenyls were not detected at concentrations exceeding the laboratory reporting limit. Petroleum hydrocarbons were detected in floor samples above regulatory cleanup standards. Lead was detected in a surface soil sample above regulatory cleanup and background concentrations. Based on the floor and soil sample results, the building was dismantled and soil was excavated under the building footprint to a depth of one foot. Confirmatory samples were collected and test results show no analyte concentration above regulatory cleanup criteria. The building debris and excavated soils were disposed of at an off-site facility. The excavation was backfilled to grade.	4
Former Sewage Pond	17 (7) HR(P)	The former sewage pond is located in the Camp Bonneville cantonment area, although the exact location and dimensions are unknown. The pond is	A UXO avoidance/screening and electromagnetic survey identified fence posts; no UXO debris was observed. No organic compounds were detected in the soil or groundwater samples collected at the pond. Antimony, cadmium, copper, chromium, and thallium were detected, but at concentrations	3

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Table 1

DESCRIPTION OF PROPERTY*

[illegible]	[illegible] Parcel Designation	[illegible]	[illegible]	[illegible]
		reported to have been unlined and used for a short period of time ending in 1978.	below regulatory concentrations. One of 17 soil samples had arsenic concentrations above the regulatory and site-specific background concentrations.	
Drum Disposal Area (Suspect Drum Burial Site)	18 (7) HR(P)	This area is reported to contain an unknown number of buried drums. There is no information on the contents of the drums.	An electromagnetic survey of the area identified anomalies. Soil borings were advanced in this area and samples collected. No SVOCs, PCBs, pesticides, or explosive compounds were detected in the samples, and there was no evidence of the presence of explosives. Petroleum hydrocarbons, certain VOCs, and metals were detected, but at concentrations below regulatory cleanup criteria and/or background concentrations. In 2000, the area was excavated to remove buried drums and debris (paint cans, corrugated metal, scrap metal and barbed wire). Twenty-six test pits were excavated to assess the area of drum disposal. Soil samples collected from the tests pits, and samples of rainwater that had accumulated in the pits were tested. The soil sample test results indicated that toluene, arsenic, barium, chromium and methoxychlor exceeded regulatory cleanup criteria. The rainwater sample test results indicate that naphthalene, ethyl benzene, toluene, and lead were present above cleanup levels. A second EM survey was conducted to determine if buried objects could have caused or contributed to the contamination. Thirteen additional anomalies were identified and investigated by trenching. One excavation contained among other things paint cans and paint. The other trenches contained scrap metal, reinforcement bars, barbed wire and firing point survey markers. Cleanup activities were initially conducted to address the debris, but later to address the organic compounds and metal detected in the test pits. Approximately 110 tons of soil and debris were excavated and disposed of at an off-site facility. Confirmatory sample results indicate all target analyte concentrations were either not detected or below regulatory cleanup criteria. The excavation was backfilled to grade.	4
Paint and Solvent Disposal Area	19 (7) HR(P)	This area is reported to contain waste paints and	An electromagnetic survey of the area was conducted in July 1998. The survey identified	2

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(Suspect Disposal Site)		solvents.	two anomalies suspected of being disposal areas. Two soil borings were advanced at each of these locations, and soil samples were collected. Test results of these samples showed that the concentrations of VOCs, SVOCs, PCBs, pesticides, and explosives compounds were below the testing instrument's detection limits. Petroleum hydrocarbons and metals were detected, but at concentrations below regulatory cleanup criteria. Arsenic and chromium were detected at concentrations above regulatory cleanup criteria, but below background concentrations. In June 2000, cleanup activities were conducted to remove the debris, which included a paint can, paint chips, pipes, and wires. Confirmatory samples were not collected because the soil sample test results did not identify analyte concentrations above regulatory cleanup of background criteria. The excavation was backfilled to grade and the debris was disposed of at an off-site facility. A notification of hazardous substance, storage, release, or disposal is not required because this cleanup was not a result of a CERCLA listed hazardous substance.	
Wash Rack 2 (Wash Point)	20 (7) PR(P)/HR(P)	This area is associated with a former vehicle washing point south of Building 4475, and consists of a gravel pullout on the side of the road, and a water hose. The water hose was used to rinse dirt and mud off vehicles returning from training exercises. There is no oil-water separator at this wash point.	The January 1997 *Environmental Baseline Survey Camp Bonneville, Washington* (EBS) states that there were no obvious indications of potential environmental impacts at the wash point or the areas where wash water would drain. The EBS also indicates that there is a low probability of being a potential source of contamination.	1
Former CS Gas Training Building	25 (7) HR(P)	This site is located in the central part of the installation north of Firing Range 7. The exact location of the building and the period of time it was in use are not known. The site is the location of a	Five soil borings were advanced in the area and soil samples were collected. Test results indicate that CS gas and cyanide were not detected. Semi-volatile organic compounds were detected but at concentrations below regulatory criteria. Lead was detected above regulatory cleanup and background criteria.	4

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		former building used for tear gas training. Records suggest that the building was destroyed by fire in the late 1970s. The building number is not known.	In June 2000, contaminated soil excavation activities commenced. The excavation extended to 3-feet below grade. Confirmatory sample test results indicate that all analyte concentrations were below MTCA cleanup criteria. The excavation was backfilled to grade and all contaminated soil was disposed of at an off-site facility.	
Ammunitions Storage Bunkers (Facility Nos. 2950, 2951, and 2953)	NA	These bunkers were constructed in 1976 to store various munitions. They range in size from 4 sq. ft. to 100 sq. ft. The magazines are fenced.	In 1998, fifteen sampling locations (nine at the largest bunker and three each at the two smaller bunkers) were selected for the collection of surface and subsurface soil samples. A soil boring was also advanced at each bunker based on the results of the surface soil tests from soil samples collected from inside the bunkers. Wipe samples were collected from the floors in each magazine. The soil samples collected from inside the bunker and the wipe sample tests results show RDX (below reporting levels) and all the PPL metals except selenium and thallium in Facility 2950. Arsenic, beryllium, cadmium, chromium, lead, and mercury were detected in the soil samples collected from inside the bunker at concentrations that exceed the MTCA cleanup criteria. Arsenic, beryllium, and cadmium concentrations were also above background levels. PETN was detected in one bunker; however, there is no established cleanup concentration for PETN. No organic compounds were detected above reporting limits in the surface soil samples collected outside the bunker. Arsenic, cadmium, chromium, and lead were detected at concentrations above MTCA cleanup criteria and background levels in the surface soil samples collected outside the bunker. In 2001, surface and subsurface soil samples were collected from Facility 2953. PETN, picric acid, and 2,4-dinitrotoulene were detected in the surface soil samples at concentrations below MTCA cleanup criteria. No ordnance compounds or propellants were detected in the subsurface soil samples. Metals were detected in the surface soil samples. Arsenic and chromium were detected above MTCA cleanup criteria. Lead was detected above the MTCA cleanup criteria and background levels. In May 2001, contaminated soils at the three	4

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Table 1 DESCRIPTION OF PROPERTY				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
			bunker were excavated to 1-foot below grade. *Confirmatory* samples were collected and the test results indicated no residual contaminants above regulatory criteria or background levels. The excavations were backfilled and the contaminated soil and wood from pallets inside the bunker were disposed of at an off-site facility. The interior surfaces of the bunker were cleaned.	

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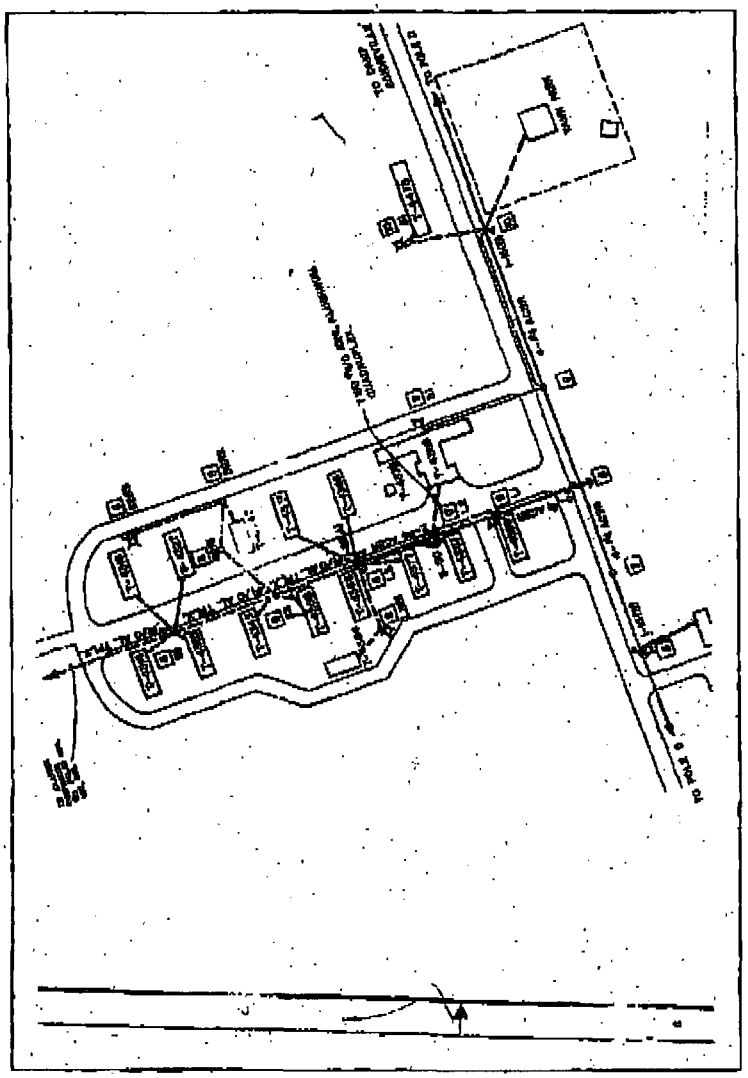
EXHIBIT B To Restrictive Covenant



Camp Bonneville Reuse Plan, Appendix A, Killpack Cantonment

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EXHIBIT C to Restrictive Covenant

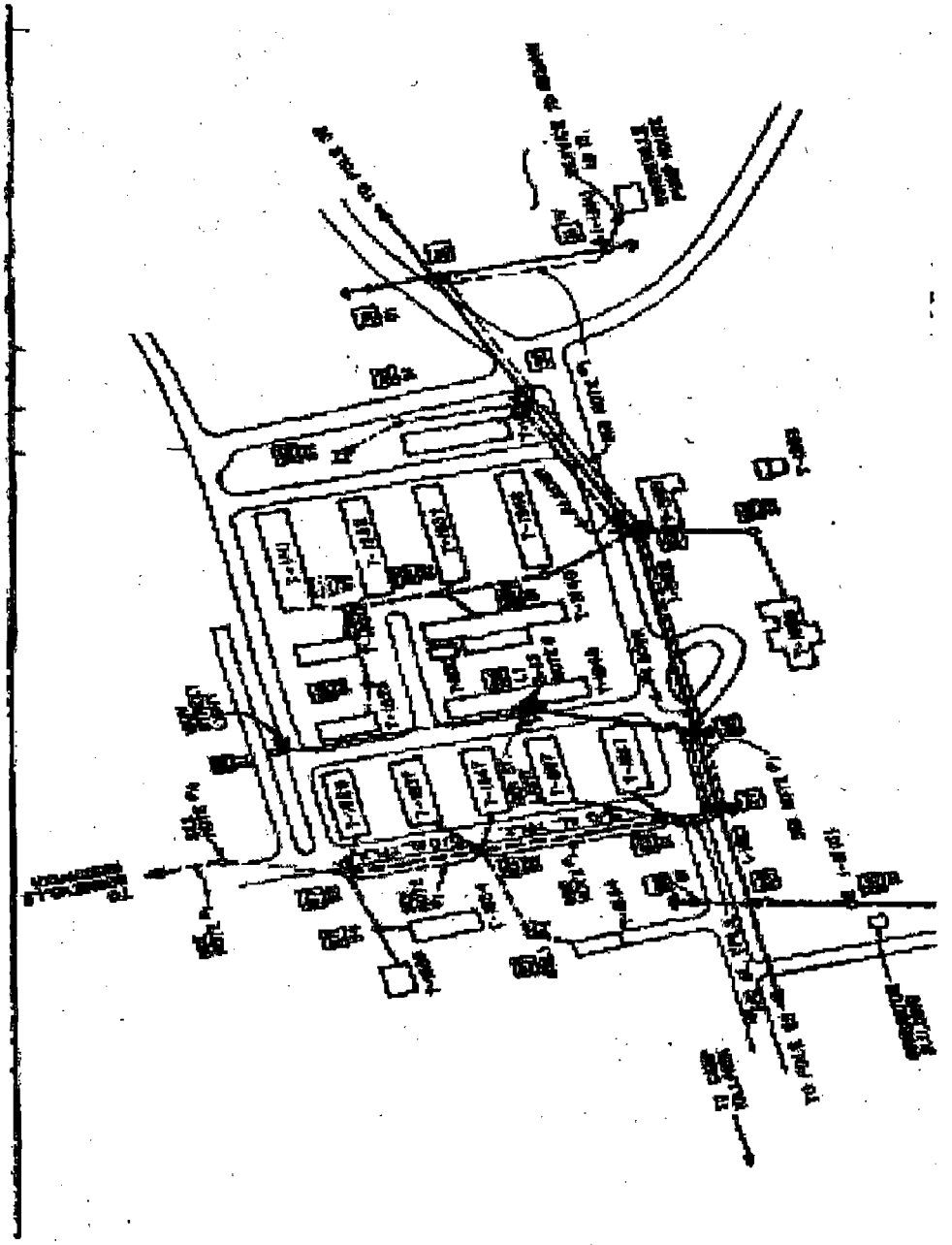

EXHIBIT D

LEGAL DESCRIPTION

A parcel of land located in Sections 34 and 35 of Township 3 North, Range 3 East of the Willamette Meridian, and in Sections 1, 2, 3, and 10 of Township 2 North, Range 3 East of the Willamette Meridian, all in Clark County, Washington, more particularly described as follows:

BEGINNING at a 3 inch aluminum cap marking the southwest corner of Section 34 Township 3 North, Range 3 East, Willamette Meridian; thence South 88° 25' 57' East, 2,635.07 feet along the south line of the southwest quarter (SW¼) of said Section 34 to a 3¼ inch aluminum cap marking the south quarter corner of said Section 34; thence North 02° 00' 17" East, 2,648.35 feet along the west line of the southeast quarter (SE¼) of said Section 34 to a ½ inch iron rod with yellow plastic cap marked "Hart 12974" marking the center of said Section 34 per that record of survey recorded in book 39 of Surveys at page 34, Records of Clark County, Washington; thence South 88° 11' 19" East, 2,643.06 feet along the north line of the southeast quarter (SE¼) of said Section 34 to the east quarter corner of said Section 34, as calculated per that Record of Survey recorded in Book 21 of Surveys, at Page 132, Records of Clark County, Washington; thence North 02° 11' 12" East, 2,637.25 feet along the west line of the northwest quarter (NW¼) of Section 35 to a 3 inch brass cap marking the northwest corner of said Section 34, being also the northeast corner of Section 35, Township 3 North, Range 3 East; thence South 88° 07' 36" East, 2,644.51 feet along the north line of the northwest quarter (NW¼) of said Section 35 to a 3¼ inch aluminum cap marking the north quarter corner of said Section 35; thence South 88° 07' 57" East, 2,644.52 feet to the northeast corner of said Section 35, said corner having a witness corner marked by a 3 inch brass cap bearing North 02° 13' 29" East, 5.00 feet, as set per that Record of Survey recorded in Book 21 of Surveys, at Page 132, Records of Clark County, Washington; thence South 02° 13' 29" West, 5,196.56 feet along the east line of said Section 35, to a 3 inch brass cap marking the southeast corner of said Section 35, being also the southwest corner of Section 36, Township 3 North, Range 3 East, as calculated per that Record of Survey recorded in Book 21 of Surveys, at page 132, records of Clark County, Washington; thence South 89° 00' 11" East, 5,286.83 feet along the south line of said Section 36, to a 3 inch brass cap marking the southeast corner of said Section 36, being also the northeast corner of Section 1, Township 2 North, Range 3 East; thence South 01° 10' 01" West, 5,302.22 feet along the east line of said Section 1, to a 3 inch brass cap marking the southeast corner of said Section 1; thence North 88° 46' 24" West, 5,266.51 feet along the south line of said Section 1, to a ½ inch iron rod with yellow plastic cap marked "TBH PLS 10920" marking the southwest corner of said Section 1, per that Record of Survey recorded in Book 21 of Surveys, at Page 95, Records of Clark County, Washington, being also the southeast corner of Section 2, Township 2 North, Range 3 East; thence North 88° 31' 25" West, 2,637.03 feet along the south line of the southeast quarter (SE¼) of said Section 2, to a ⅞ inch drill shaft marking the south quarter corner of said Section 2; thence North 88° 40' 34" West, 2,621.18 feet to a 3¼ inch aluminum cap marking the southwest corner of said Section 2, being also the northeast corner of Section 10, Township 2 North, Range 3 East; thence South 01° 25' 00" West, 2.640.69 feet to a 3¼ inch aluminum cap marking the east quarter corner of said Section 10; thence North 89° 15' 33" West, 5,294.16 feet along the south line of the North half (N½) of said Section 10 to a 3½ inch brass cap marking the west quarter corner of said Section 10; thence North 01° 27' 42" East, 2.641.85 feet along the west line of the northwest quarter (NW¼) of said Section 10 to a 1¼ inch iron pipe marking the northwest corner of said Section 10, being also the southwest corner of Section 3, Township 2

PAGE 20/21 * RCVD AT 10/2/2007 11:43:11 AM [Pacific Daylight Time] * SVR:NT23/22 * DNIS:7595284 * CSID:360 694 4734 * DURATION (mm-ss):05-38

North, Range 3 East, per that Record of Survey recorded in Book 17 of Surveys, at Page 87, Records of Clark County, Washington;. thence North 00° 52' 55" East, 2650.31 feet along the west line of the southwest quarter (SW¼) of said Section 3, to a ¾ inch iron pipe marking the west quarter corner of said Section 3, per said Record of Survey in Book 17 of Surveys, at Page 87; thence North 00° 52' 57" East, 2,671.49 feet to the northwest corner of said Section 3, being also the southwest corner of Section 34, Township 3 North, Range 3 East and the **POINT OF BEGINNING.**

EXCEPT the north half of the southwest quarter of the southwest quarter (N½SW¼SW¼) of Section 3, Township 3 North, Range 3 East, Willamette Meridian, per that Record of Survey recorded in Book 23 of Surveys, at Page 91, Records of Clark County, Washington.

ALSO EXCEPT that tract of land conveyed to the Public, by Quit Claim Deed recorded under Auditor's File Book 24, Page 223 on August 29, 1894, in Clark County, Washington, being a portion of the southwest quarter of the northwest quarter (SW¼NW¼) of Section 3, Township 2 North, Range 3 East, of the Willamette Meridian, described as follows:

BEGINNING at the southwest corner of the northwest quarter (NW¼) of said Section 3; thence east along the south line or said northwest quarter (NW¼), 330 feet (20 rods); thence north parallel with the west line of said northwest quarter (NW¼), 264 feet (16 rods); thence west parallel with the south line of said northwest quarter (NW¼), 330 feet (20 rods), to the west line of northwest quarter (NW¼) of Section 3; thence south along said west line 264 feet (16 rods), to the **POINT OF BEGINNING.**

ALSO EXCEPT any portion lying within the right of way of Northeast 232nd Avenue, and

ALSO EXCEPTING any portion lying within the right of way of Northeast 68th Street.

This description contains 3,013 acres, more or less.

This description based on survey preformed by Clark County, Washington 15 May 2006 as recorded in Book 56 of Surveys, at page 007, Records of Clark County, Washington. The Basis of Bearing is the south line of the southwest quarter of Section 34, Township 3 North, Range 3 East, Willamette Meridian, being held as South 88° 25' 57" East and distances are based on grid distances with a combined factor of 1.0000365 to obtain ground distances. Survey is based on the Washington State Plane Coordinate System, South Zone, NAD83/91 Adjustment.

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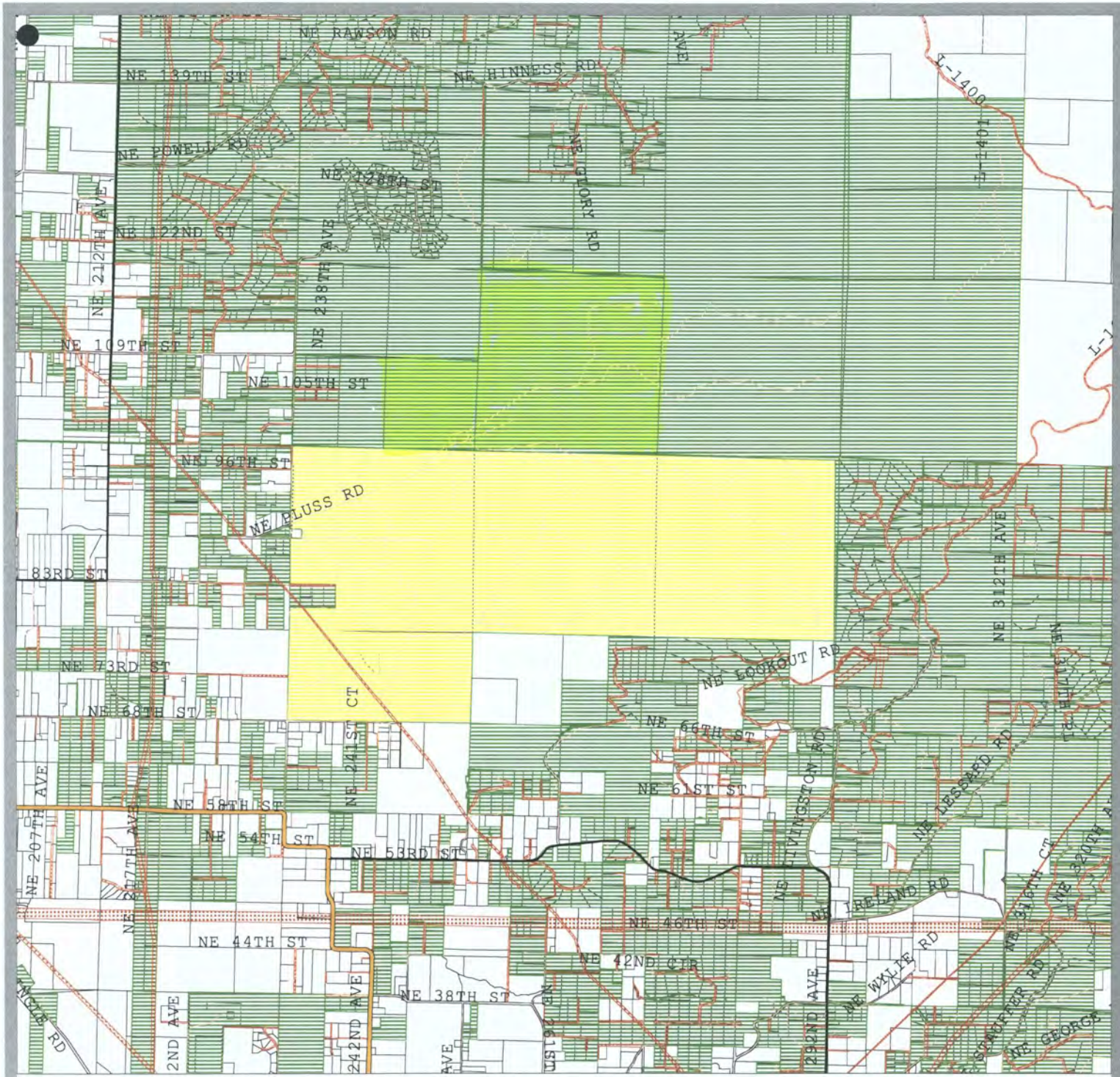


(Scale 1:49217.8) 2000 0 2000 4000 6000 8000 Feet

SE 1/4 of Section 02 T2R3E WM

Serial Number: 170186-000
Owner: BONNEVILLE CONSERVATION R&R
Address: 0

Major Roads
- State
- State On-Ramp
- Interstate
- Interstate On-Ramp
- Primary Arterial
- Arterial
- Roads
- Easmnts
- Surveys

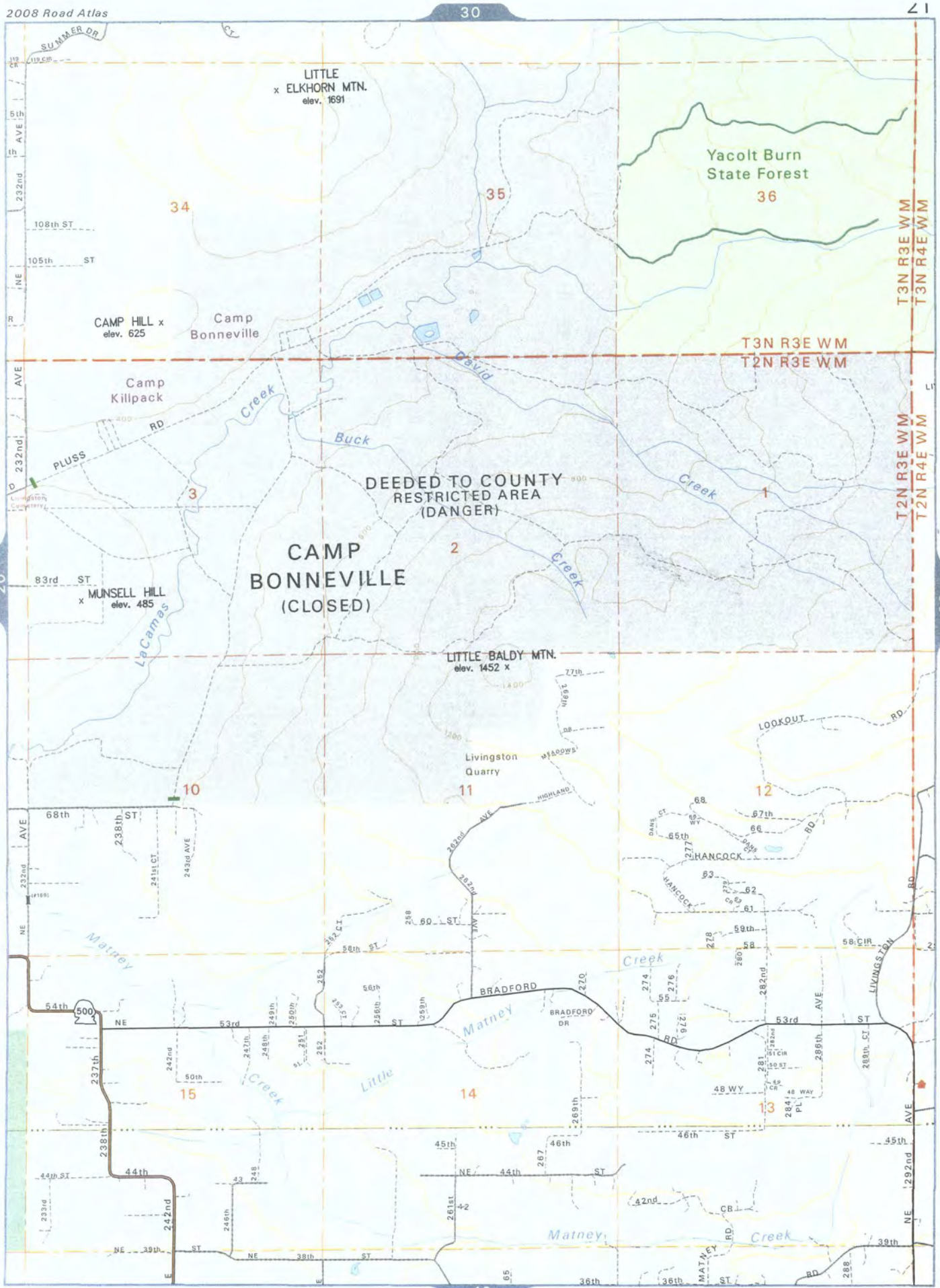
Real Property Services

CLARK COUNTY
WASHINGTON
proud past, promising future

Plot Date: Oct 1, 2008
Map produced by:

Information shown on this map was collected from several sources. Neither Clark County or the agency producing this document accept responsibility for any inaccuracies that may be present.

N


LITTLE
x ELKHORN MTN.
elev. 1691
Yacolt Burn
State Forest
36
35
34
T3N R3E WM
T3N R4E WM
T3N R3E WM
T2N R3E WM
CAMP HILL x
elev. 625
Camp
Bonneville
Camp
Killpack
Creek
David
Buck
Creek
DEEDED TO COUNTY
RESTRICTED AREA
(DANGER)
CAMP
BONNEVILLE
(CLOSED)
MUNSELL HILL
elev. 485
LaCamas
LITTLE BALDY MTN.
elev. 1452 x
Livingston
Quarry
LOOKOUT RD
HANCOCK
BRADFORD
BRADFORD DR
LIVINGSTON
Matney
Creek
Little
Matney
Creek
Matney
Creek
MATNEY RD
SUMMER DR
108th ST
105th ST
83rd ST
68th ST
54th ST
53rd ST
50th
46th ST
45th
44th ST
39th ST
36th ST
232nd AVE
238th AVE
242nd AVE
282nd AVE
292nd AVE
PLUSS RD
HIGHLAND
10
11
12
13
14
15
2
3
1
20
22
12
500

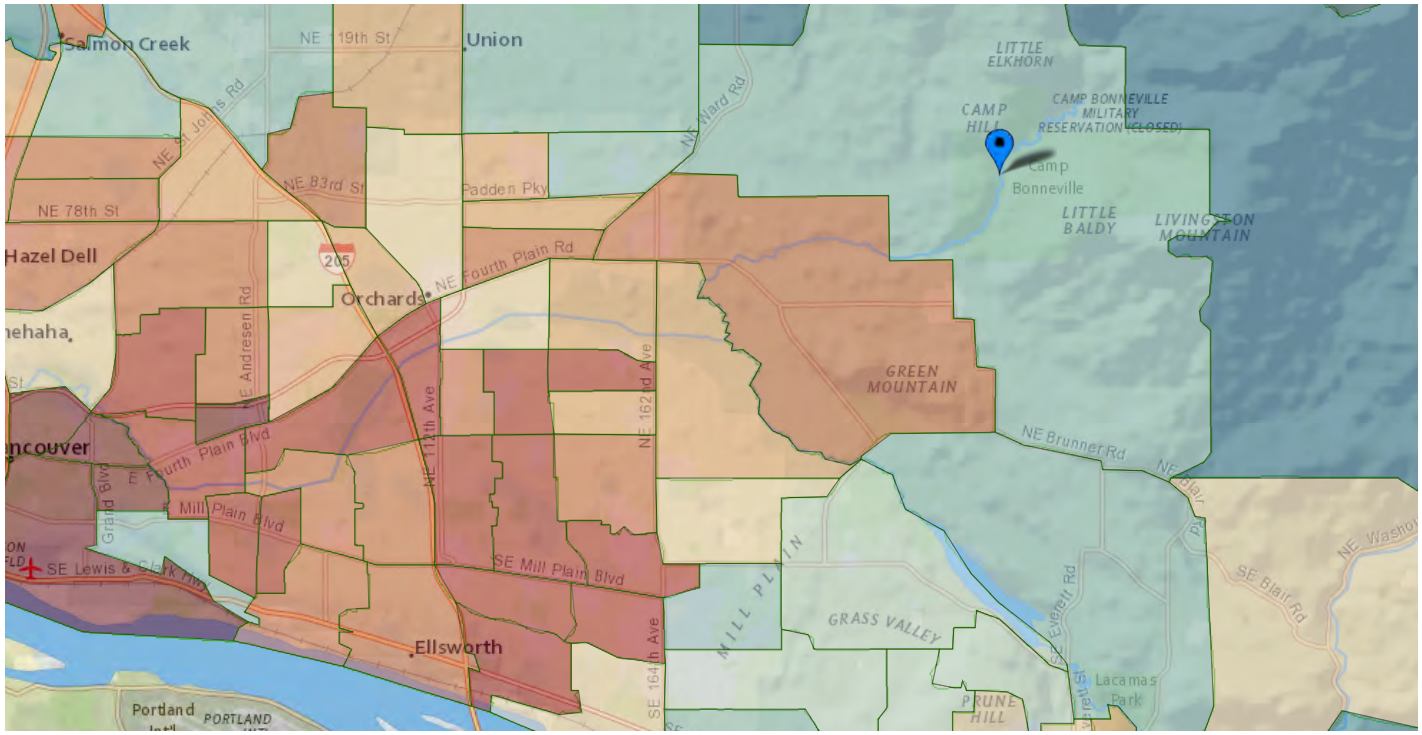
Appendix D. Vulnerable Population Data

Washington State Department of Health

Selection:

Date: 07/16/2025 at 3:42 PM

Legend: (High) 10 9 8 7 6 5 4 3 2 1 **(Low)**



2mi

Legend

- Airport Runways
- Care Facilities - Adult Family Homes
- Care Facilities - Nursing Homes
- City Limits
- Climate Projections ~2050
- County Boundaries
- DCYF Licensed Childcare Centers

Dry Cleaners (Current and Former)
Electric Utilities - Investor
Electric Utilities - Public
Farmworkers Housing
Former Orchard Lands
Hazardous Waste Facilities

Historical Redlining (HOLC)
Hospitals
Legislative Districts
Mortgage Discrimination
National Flood Hazard Layer
Prisons
Railroads
Rural-Urban Classification
Superfund Sites

Tacoma Smelter Plume
Top Student Home Languages
Tribal Boundaries
Tribal Census Tracts
Tribal Health Services

WA Ecology Cleanup Sites
Watershed Boundaries

Wildfire Smoke Cumulative Score (2016-2022)

Appendix E. Site Hazard Assessment and Ranking Process

US ARMY CAMP BONNEVILLE MILITARY RESERVATION

SHARP Report — Part 1 of 2

Go to site contamination history

• SHARP first SHARP		v2024.04.29	Ecology Info	
• SHARP rating	Low		ERTS	None
• SHARP date	08/04/2025		CSID	11670
• EJFlagged?	SHARP it		FSID	69965472
• LD confidence level	low		VCP	None
• Cleanup milestone	periodic review		UST ID	None
• SHARPster	Michael Cronin		LUST ID	None

This section is blank if this is the first SHARP

SHARP Media	Scores	Confidence	Additional Factors	
Indoor air	B4	low	multiple chemical types	⊘
Groundwater	C3	high	risk to off-site people	⊘
Surface water	D4	high	climate change impacts	✔
Sediment	D4	medium	plant/animal tissue data	⊘
Soil	B2	medium		

Location and land use info

23201 NE Pluss Rd, Vancouver, Clark County, 98682

Primary parcel	SHARP it
Land use	recreational
Responsible unit	HQ

Sources reviewed

See overflow

Primary census tract	Associated census tracts
40603	

Local demographics comments

EJScreen removed by EPA in 2025 using only DOH data for assessment.

Source/source area description

Former Military use; Landfills and munitions demolition areas, maintenance areas, pesticide mixing and storage, small arms ranges, use of military munitions, drum disposal, paint and solvent use, ammunition storage

Soil comments

Answers based on current site uses by Clark County Public Works. Future use plan as a Regional Park will require new SHARP. SHARP does not include the dangerous wastes Munitions of Explosive Concern (MEC) / Unexploded ordnance (UXO) in evaluation. MEC and UXO are potentially present at site below clearance depths or in areas where clearance has not occured. PFAS are in early stages of investigations. Fencing and Security features in place to restrict access to property. High confidence in MEC and RAU 2C data. RAU 2A, RAU 2B, and RAU 1 data is robust but old data lowering confidence level.

Groundwater comments

PFAS preliminary investigations ongoing. No evidence of major release but single groundwater sample exceeding MCLs for PFOS.

Surface water comments

no comments

Sediment comments

High confidence for RAU 2C cleanup. Preliminary PFAS investigations ongoing.

Indoor air comments

VI was not evaluated as part of the RAU 1 Cleanup. Petroleum hydrocarbons left in place or suspected at two locations.

Additional factors comments

Historic Landslides mapped in area; Wildfire risk 1-in-10,000 to 1-in-4,643.

Site history

Go to top

The Site is an approximately 3,840-acre former military training facility located near Proebstel in Clark County, Washington, about 12 miles northeast of Vancouver. The U.S. Army established the installation as a field and rifle range in in 1909 . Over time, the site grew to include rifle, machine gun, grenade, and artillery ranges, as well as barracks and support buildings at Camp Bonneville and Camp Killpack cantonments . It was used by multiple military branches; including the Reserve Officer Training Corps (ROTC), National Guard, and Marine Corps until 1995, when it was closed under the Department of Defense's (DoD) Base Realignment and Closure (BRAC) program (URS Greiner Woodward Clyde 1999). The property was subsequently transferred in 2006 to Clark County for eventual reuse as a regional park. Clark County Public Works currently oversees and maintains the Site.

Overflow - Site contamination and cleanup history

Atlanta Environmental Management, Inc. (AEM). 2003. Draft Final Site Investigation Report Small Arms Ranges and Demolition Areas 2 and 3 Camp Bonneville Vancouver, Washington. September
Bay West. 2011. Final After Action Report, Inspection and Disposal of Material Potentially Presenting an Explosive Hazard, Remedial Action Unit 3. July
Bonneville Conservation Restoration and Renewal Team, LLC (BCRRT). 2007a. Emergency Actions - Emergency Action Report, Remedial Action Unit 3. February
BCRRT. 2007b. Addendum 1 Emergency Actions - Emergency Action Report, February 2007 Fence Replacement and Repair, and Signs Replacement. June
BCRRT. 2007c. Emergency Actions - Emergency Action Report, Addendum 2, Remedial Action Unit 3. July
BCRRT. 2007d. Final Remedial Investigation/Feasibility Study Report, Small Arms Ranges (RAU 2A), Camp Bonneville Military Reservation . August
BCRRT. 2007e. Final Remedial Investigation Report Demolition Areas 2 & 3 (RAU 2B) Camp Bonneville Military Reservation . June
BCRRT. 2008a. 2.36-Inch Rocket Range – After Action Report. April.
BCRRT. 2008b. Interim Action Work Plan for Remedial Action Unit 2A and 3 – Central Valley Floor - Addendum 3. April
BCRRT. 2008c. Interim Action Work Plan for Remedial Action Unit 2A and 3 – Dense Vegetation/Moderate Slope - Addendum 4. June
BCRRT. 2008d. Final Cleanup Action Plan, Small Arms Ranges (RAU 2A), Camp Bonneville Military Reservation . January
BCRRT. 2008e. Operations Plan for HTW Remediation, Remedial Action Unit 2A - Small Arms Firing Ranges, Camp Bonneville Military Reservation. August
BCRRT 2008f. Draft Final Remediation Investigation/ Feasibility Study for RAU 3 Revision 1. February
BCRRT. 2009a. After Action Report, Roads and Trails. April
BCRRT. 2009b. Environmental Study Area, After Action Report. March
BCRRT. 2009c. Interim Action Work Plan for Remedial Action Unit 3, Addendum 5, Central Impact Target Area. March
Bertz JH. 1925. The Spokane Flood Beyond the Channeled Scablands. Journal of Geology. Volume 33 No. 2.
Clark County Public Works (CCPW). 2022. County approves DNR helicopter operations at Camp Bonneville to support wildfire suppression efforts . April 13, 2022.
Clark County Auditors Office (CCAO) 2006. Quit Claim Deed. October 4
Washington State Department of Ecology (Ecology). 1994. Natural background soil metals concentrations in Washington State: Olympia, Washington, Ecology publication no. 94-115, October.
Ecology. 2003. ENFORCEMENT ORDER No. 03TCPHQ-5286 . February
Ecology. 2004. Re: Camp Bonneville Military Reservation Enforcement Order No. 03TCPHQ-5286 . June
Ecology. 2006. Prospective Purchaser Consent Decree . October
Ecology. 2008. Re: No Further Action Determination under WAC 173-340-515(5) for the Remedial Action Unit 1 (RAU 1), Camp Bonneville Military Reservation, 23201 Northeast Pluss Road, Vancouver Washington . January
Ecology. 2009. Re: No Further Action Determination for Remedial Action Unit 2B (RAU-2B) of the Camp Bonneville Army Reservation Facility . March
Ecology 2010. Camp Bonneville Final Cleanup Action Plan RAU-3 . August

US ARMY CAMP BONNEVILLE MILITARY RESERVATION

SHARP Report — Part 2 of 2

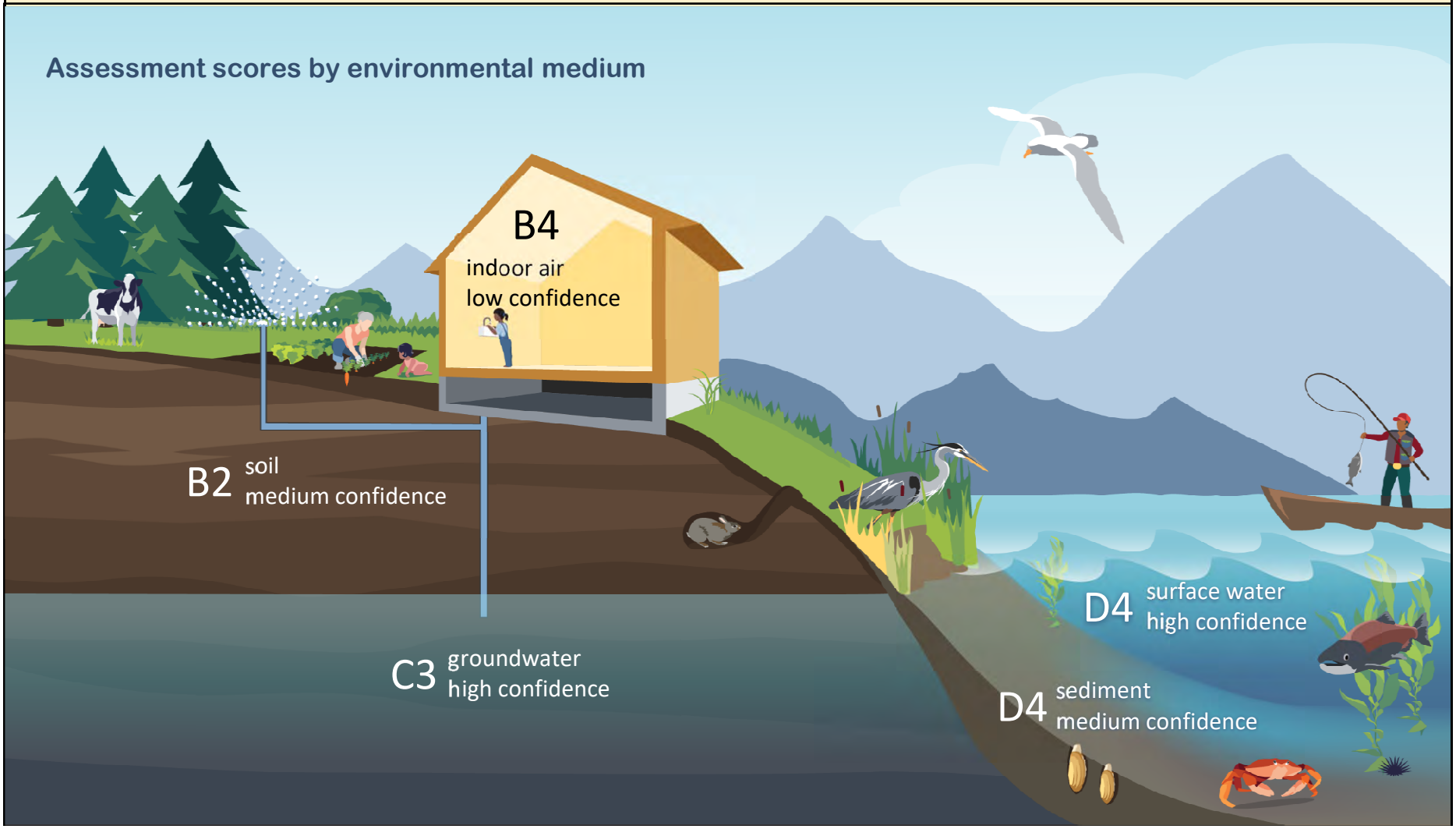
11670 US ARMY CAMP BONNEVILLE MILITARY RESERVATION 20250804

First SHARP

SHARP rating — Low

Conceptual site model

08/04/2025



Appendix F. Clark County Draft Periodic Review Support Report

To: Kevin Tyler (Clark County)
Betsy Wing (Clark County)
CC: Amy Hargrove (Ecology)
Forrest Malone (Ecology)

Date: May 2, 2025

Subject: Ecology comments on Periodic Review Submission

On January 21, 2025, the Department of Ecology (Ecology) received the submission "Periodic Review" (Report) for the Camp Bonneville Cleanup Site (Site), submitted by Clark County Public Works (County) and prepared by PBS (an Apex Company).

Ecology has reviewed the Report and identified substantial issues in the presentation and accuracy of the information and findings contained within. By submitting the Report, the County has fulfilled its obligation under paragraph 150 of the Amended Prospective Purchaser Consent Decree for this past five-year period. However, Ecology does not consider the County's Report to be the periodic review, as a periodic review is an Ecology conducted review of post-cleanup site conditions and monitoring data to assure that human health and the environment are being protected. *See* WAC 173-340-420(1). Ecology will prepare the Periodic Review for the Site as required by WAC 173-340-420.

Ecology has prepared comments on the Report for the record and for the County, should the County choose to have the Report revised. Considering the substantial effort that has gone into reviewing the Report and Ecology's need to prepare the Periodic Review for the Site, Ecology will not conduct another review of the Report.

Ecology is requesting a meeting with Clark County to discuss these comments and the following additional information that Ecology requires to complete its periodic review:

- The individual tables from historic reports used to prepare tables in the Report
- Any spreadsheets and notes used to prepare and compile the tables for the Report.

Ecology would like to discuss modifying the figures presented in the Report for use in Ecology's periodic review.

Ecology intends to include this response and the Report as an appendix to Ecology's Periodic Review.

If you have any questions or concerns regarding these comments, please contact me by telephone at 564-233-9482 or email at Michael.Cronin@ecy.wa.gov.

SN	Sec./Pg.#	Comments
		The Report is not the Periodic Review for the Site. Ecology's comments to the Report are included for the agency's record for the Site.
1.	General	Should the Report be revised and resubmitted by the County, Ecology requests the Report be titles as "Periodic Review Support Report" and include these comments in that Report's appendices.
2.	General	Several findings of this Report make recommendations based on historical Site investigations without reference or inclusion in evaluations of the decisions made under the MTCA Cleanup Process. This includes evaluations of known exceedances identified as "data gaps" that were considered at the time of remedy selection and implementation. By making evaluations without regard to the decision-making process under MTCA this in effect bypasses those cleanup decisions. Ecology has provided individual comments where this occurs in the Report. Generally, a periodic review would not reevaluate those conditions unless one of the criteria set out in WAC 173-340-420(4) is triggered.
3.	General Section 6 & Section 7	Provide Ecology with the qualifications of PBS staff to make professional recommendations and evaluations regarding MEC remediation and MEC risk assessments. The findings of the Report recommend additional cleanup of RAU-3 based on an arbitrary definition of "use intensity". Use intensity and risk analysis for site activities was developed in the RAU-3 RI/FS (BCRRT February 2008 Section 4.4.3) and RAU-3 Supplemental RI/FS (BCRRT May 2009) which factored in accessibility, future land reuse (high, medium and low intensity), and depth of activity/reuse. Ecology concurs that additional UXO investigations and/or UXO remediation may be necessary given the projected site use based on the current reuse plan dated 2005 given changes to the Cleanup Actions at the Site. The County's determination, however, needs to be supported with a well-founded rationale and a clear, expert-supported analysis.
4.	General	Reporting fails to consistently provide citations throughout the document (e.g. comments 29 and comment 57), several critical documents of record are omitted from the record (e.g. comment 36, Comment 74), or are not the final report of record (e.g. comment 76). It is not clear if the authors have compiled from individual reports of record or are summarizing from later documents. These comments will be addressed in their relevant sections. Ecology would recommend, in addition to updating citations, that the authors clarify when the information is derived from summary reports rather than primary documents and provide references to the specific sections of reports where information can be found.

5.	General	The Report correctly identifies that the Long-Term Operations and Maintenance Plan (O&M Plan) a major requirement of the APPCD and Cleanup Action Plans (CAPs) for the site has not been developed. It is true that several institutional controls for the site require further development in this document and this document is intended to add additional institutional controls based on the completed cleanup. The lack of development of the Long-Term O&M Plan, however, does not excuse the County's lack of recording restrictive covenants and implementation of institutional controls called for in the cleanup action plans for the remedial action units. Findings of the Report should list and evaluate compliance with all institutional controls.
6.	General	A review of the Clark County Auditor's Office records indicates that the Restrictive Covenant for Remedial Action Unit 1 (attached) while signed on 11/21/2006 had not been recorded with the County Auditor's office. Ecology is requesting Clark County Public Works confirm that the Restrictive Covenant was not mis-recorded or misfiled. If the Restrictive Covenant has not been recorded against the property, the Restrictive Covenant should be recorded immediately with the County's Auditor's Office. The recording of this Covenant is necessary to preserve the integrity of remedial actions implemented at the Site and to ensure that human health and the environment are being protected.
7.	General	Ecology's review of the APPCD documents filed with the Clark County Superior Court demonstrate that that the following Cleanup Action Plan Amendments were not filed with the court: • Washington State Department of Ecology. August 2017. Memorandum from Ben Amoah-Forson of Washington State Department of Ecology Toxic Cleanup Program to Camp Bonneville RAU 3 File. "Subject: Proposed Changes to the 2010 Cleanup Action Plan for Remedial Action Unit 3, Site Wide Munitions Contamination." • WESTON. June 2017. Addendum to the Cleanup Action Plan, Small Arms Ranges, RAU 2A-l 6 and RAU 2A-21, Former Camp Bonneville Military Reservation, Vancouver, Washington. • Washington State Department of Ecology November 2018. Memorandum from Ben Amoah-Forson of Washington State Department of Ecology Toxic Cleanup Program to Camp Bonneville RAU 3 File. "Subject: Proposed Changes to the 2010 Cleanup Action Plan for Remedial Action Unit 3, Site-Wide Munitions Contamination" These amendments need to be filed with the court. Ecology considers the cleanup actions and institutional controls outlined in the amendments as site requirements for the periodic review period. The Report should explain that these amendments need to be filed by Ecology and Clark County as a joint motion with the Clark County Superior Court and included in the Report's discussion. See Ecology August 2017 and Ecology November 2018 Memorandum from Ben Amoah-Forson of Washington State Department of Ecology Toxic Cleanup Program to Camp Bonneville RAU 3 File (See comment 74).

8.	General	Include as an appendix the quitclaim deeds and environmental covenants for the property. Include the environmental covenant for RAU 1 (See Ecology Comment 6).
9.	General Figures and Tables	Figures presented in the Report contain numerous issues and inaccuracies that are detrimental to the project record. For example, Figure 7 "RAU 3 Areas" does not include all the RAU 3 areas and Figure 9 "Institutional and Engineering Control Plan" is not an IC/EC plan. This is not a comprehensive list.
10.	General RAU 2C Section 3 & 4	The Report includes extensive discussion of RAU 2C. This includes findings which have not been formally established including an updated conceptual site model, contaminate pathways, and COPCs and COCs (i.e. indicator hazardous substances). Discussions of RAU 2C appear to include findings and analysis from the draft remedial investigation / feasibility study (RI/FS) submitted by PBS/Apex in December 2024 to Ecology. The RAU 2C draft RI/S is subject to a public comment period (required by MTCA) and approval by Ecology before findings can be incorporated into other reports. It is inappropriate to include findings from an unapproved draft in the Report. Presenting those findings in this Report effectively bypasses the process for RI/FS review and approval. Physical data collected in support of the RAU 2C RI/FS can be included if needed for discussion, but analysis and conclusions drawn from that data in a RI/FS, such as indicator hazardous substances (i.e. COCs) and new conclusions to the conceptual site model should not be included. Remove discussion of the conceptual site model, pathways for receptors, types of receptors, indicator hazardous substances made conclusions in the Draft RI/FS from the Report.
11.	Title Page	The Ecology FSID #475000 is the FSID for RAU 2C. The periodic review is for the entire Site. Use master site FSID and CSID: Facility Site ID: 69965472 Cleanup Site ID: 11670
12.	Abbreviations and Acronyms pg. vi	Review and revise the abbreviations and acronyms. Add the following abbreviations and acronyms that are missing from the list: Amsl - above mean sea level Building 4389 - former mess hall building Building 4476 - Hazardous Materials Accumulation Point Building 1864 - Pesticide Storage/Mixing Building CS – tear gas AA – Anti-aircraft

		DA1 – Demolition Area 1 HE – High Explosive PPL – Priority Pollutant CVFAW – Central Valley Floor and Associated Wetlands DGM – Digital Geophysical Mapping MD – Munitions Debris MC – Munitions Constituents SWAT – Special Weapons and Tactics LAMBDIS – Laser Multi-Beam Differential Interferometric Sensor RDX – Royal Demolition Explosive (1,3,5-Trinitro-1,3,5-triazinane)
13.	Abbreviations and Acronyms pg. vi	Review and revise the abbreviations and acronyms. The following abbreviations and acronyms are not used in the Report text, remove them if not used: NT – non-target Zone PM – Particulate Matter Pt – Troutdale formation SSRP – Site-Specific Remediation Plan
14.	Abbreviations and Acronyms pg. vi	Review and revise the abbreviations and acronyms. Several instances of first use cases do not have an abbreviation or definition Ecology has noted: Pg. 10 section 3.2 Cleanup Action Plan - add (CAP) Pg. 12 Section 3.4 Site investigation - add (si) Pg. 16 Section 4.1.1.2 Priority Pollutant – add (PP) This is not an exhaustive list.

15.	Introduction pg. 1	The Report states the "The key components of the Periodic Review report include: 1. Summary of site history, contamination sources, and site conditions 2. Summary of cleanup actions completed at each of the five remedial action units (RAUs) 3. Summary of additional information gathering and site inspections 4. Technical review of the effectiveness of remedial actions with consideration of the following: a. New scientific information for hazardous substances b. New state or federal laws c. Current site and resource uses d. Availability and practicability of more permanent remedies e. Availability and improved analytical techniques 5. Technical assessment summary 6. Recommendations and follow-up actions" Ecology requests the opening sentence be change to state "The key components of this report include:" as items such as a technical assessment summary and recommendations and follow up actions, while valuable, are not required components of a periodic review under MTCA (WAC 173-340-420(§4 & §6).
16.	2.2 Site Chronology pg. 2	Include the date of the first enforcement order under MTCA for the site (February 4, 2003) and the EO number 03TCPHQ-5286 and either include this enforcement order as a citation in the references or include a link to the document as a footnote https://apps.ecology.wa.gov/cleanupsearch/document/441
17.	2.2 Site Chronology pg. 2	The chronology should include that EO 03TCPHQ-5286 was amended in June 2004 https://apps.ecology.wa.gov/cleanupsearch/document/3021
18.	2.2 Site Chronology pg. 2-3	Include the dates NFAs were issued & citation for each statement in the RAU status bullet points.
19.	2.2 Site Chronology Pg. 3	For accuracy of reporting consider including discussion of timber management and sales which was discussed as part of the reuse plans designated at the outset of the Findings of Suitability for Early Transfer (FOSET). The Statement "with no financial gain to the County" could be interpreted as prohibiting any revenue-generating activities. However, from the outset of the early transfer process, the operational costs of the park property were expected to include revenue from timber harvests and sales. Ecology would recommend removing no financial gain and quoting Section 5.2.1 of the 2005 Reuse Plan which states, "Timber revenues will be used to leverage matching grants that together will provide the ongoing revenues needed for both capital and operational costs "

20.	2.2 Site Chronology pg. 3 & 8 References	Include as a reference the 2006 Prospective Purchasers Consent Decree.
21.	2.2 Site Chronology Pg. 3	The chronology should include discussion of the restrictive covenants including the quitclaim deed for the property. This includes the restrictive covenant for RAU-1 and its administrative status.
22.	2.2 Site Chronology Pg. 3	The statement "Ownership was transferred from BCRRT back to the County in 2010…" is not accurate. The departure of BCRRT from the cleanup and transference to Clark County began during that period, but the quitclaim deed transferring ownership of property from BCRRT to Clark County was issued in December 2011.
23.	2.3.3 Hydrogeology Pg. 4 & 5	Provide citations for detailed descriptions of the site within its geologic/hydrogeologic context and all geologic unit descriptions.
24.	2.3.3 Hydrogeology Pg. 4 & 8.0 references	This section cites BCRRT 2009 – Interim Action Clearance Camp Bonneville Military Reservation. Ecology requested and received clarification on this reference in email correspondence dated February 21, 2025. This Citation is incorrect and should be BCRRT, 2009. Draft Supplemental RI/FS, RAU 3, May 2009.
25.	2.3.3 Hydrogeologic Pg. 5	Editorial comment: The citation, "(2006)", on the last sentence is incomplete and needs to be revised.
26.	Section 3 General	Some locations mentioned in this section are still in use (e.g. ammunition storage magazines, maintenance facilities, FBI range), or may have projected future uses. It would be beneficial to include a statement that the Report describes current and future uses in Section 6.4.
27.	Section 3 General	Ammunition storage magazines are occasionally referred to as bunkers elsewhere in the Report, these should be described as magazines for consistency with the project record.
28.	Section 3 Background General	This section does not define what the class of COPCs are for each RAU. Instead the reader is left to infer from the text and tables alone. Ecology requests when introducing each RAU (section 3.1, 3.2, etc.) the Report states the general class of contaminate associated with the RAU (e.g. VOCs, petroleum hydrocarbons, explosive chemicals, etc.). A table identifying the general COPCs for reference may be beneficial.

		This section introduces the reader to the site locations and backgrounds which involve references to many past investigations. Citations are missing throughout this section. Several sections and subsections have no references. The following are examples, but not a comprehensive list, of subsections with no references: 3.1.6, 3.1.8, 3.1.9, 3.1.10, 3.3, 3.5.2. Add citations for the information presented in the Report. When discussing specific investigations or cleanup actions, include the date of the action and add the citation at the end of the statement. Alternatively, clearly state when a group of statements is based on a single source and identify when a source is providing a summary of past work (e.g. RI/FS or CAP). Using 3.1.1 Landfill 1 descriptions as an example, recommended changes are shown in **Bold**: "…In the 1980 archaeological survey, the site was described as a small (approximately 12 by 15 feet) shallow depression. **(Larson 1980)** In 1997, a field reconnaissance and geophysical survey were completed **(Woodward-Clyde 1997)**. The exact location of the landfill could not be determined (**are you referencing a finding in the 1997 EBS or URS 2004 RAU1 CAP or Shannon and Wilson 1999?).** No evidence of a landfill, either in the way of a depression or of debris, was identified (**Which report was used for reference)**. It was determined the site may instead have been a former homestead (URS, 2004). " Using 3.5.2 Central Impact Target Area as an example with comments in **bold**: "The CITA is shown in Figure 7 and includes multiple artillery and mortar practice targets. This area was initially determined by the Army to be roughly 465 acres **(State the date of this initial determination and what document shows this is it USACE 1997)** and now also includes 107 acres in the CITA North Expansion Area **(ideally state the date the CITA North Expansion was established and include the relevant citation)**. The CITA includes multiple target areas and surrounded by non-target areas. While the target areas received the bulk of the munitions, the non-target areas were within the range fans of the artillery and mortar rounds. The entire CITA (both target and non-target areas) is designated as No-Reuse Access Restricted **(Citation)**.
29.	Section 3 Background General	
30.	3.1.1 landfill 1 pg. 6	Editorial: the citation to Larson 1980 should be moved from the middle to the end of the sentence for consistency.
31.	3.1.1 landfill 1 pg. 6	The discussion beginning with "Former homestead (URS 2004)" and continuing to the end of the section is about Landfill 2, not Landfill 1. This appears to be an editing error. Move this information to 3.1.2, Landfill 2.

32.	3.1.15 Aboveground storage tanks Pg. 9	State where the remedial actions for the aboveground storage tanks (ASTs) took place or specify the buildings involved. Simply stating that releases occurred at several ASTs does not indicate their locations.
33.	3.2 & 4.2 Remedial Action Unit 2A	The discussion of the number of ranges in RAU 2A is not consistent between Section 3.2 & Section 4.2. The Archives Search Report (ASR), the 2002 Small Arms Ranges Reconnaissance Report, and the RAU 2A RI/FS reference 24 or 25 ranges, later confirmed in the RAU 2A CAP to be 17 due to misidentification, overlap, or other factors (BCRRT. 2008, January Final Cleanup Action Plan Small Arms Ranges (RAU 2A)).
34.	3.2 Remedial Action Unit 2A pg. 11	Where applicable, list the RAU 2A designation for ranges which moved to remediation (e.g. RAU 2A-16)
35.	3.2 Remedial Action Unit 2A pg. 11	Ecology requested a citation for the statement "Additional ranges including the 500-inch Anti-Aircraft (AA) and an Anti-Aircraft Range are identified in later documents." In email correspondence dated February 21, 2025. PBS/APEX identified the source as the amended PPCD (Ecology, 2012) with a suggested revision of "*Additional ranges including the 500-inch Anti-Aircraft (AA) and an Anti-Aircraft Range are identified in the amended PPCD (Ecology, 2012).*" The statement in the Report and this revision is slightly misleading. These ranges are not being identified in these later documents. Rather, the PPCD and APPCD included the initial number of 21 ranges description in the first enforcement order (No 03TCPHQ-5286) including Exhibit C RAU 2A. This figure was generated in January 2003 and is based on the ranges identified in USACE 1997. The RAU 2A CAP in section 3.1 identifies that up to 25 ranges were originally identified in historic records but several ranges had name changes and were in fact the same range and a total of 17 ranges had been identified (BRCCT January 2008). No evidence of the 500-inch Anti-Aircraft (AA) and an Anti-Aircraft Range were identified as documented in Parsons Environmental, Draft Reconnaissance Results, Small Arms Ranges, Camp Bonneville, Vancouver, WA, Contract No. DACA87-95-D-0018, January 2002 (Parson January 2002).
36.	3.2 Remedial Action Unit 2A pg. 11	Include the reference to the RAU 2A CAP Amendment (Weston June 2017) when discussing 2A-16 and 2A-21 as the exception to the 2008 RAU 2A CAP.

37.	3.3 Remedial Action Unit 2B Pg. 11	This section is written in a way which is inconsistent with other discussions in the section and lacks references to support the history of RAU 2B. Ecology has the following comments: 1. The section should include how and when were these areas identified a. demo area 2 was suspected through photograph, oral history, and finding of debris in the general area, observation of a crater depression for Demo area 3 b. DA2's investigations were focused on impacts downgradient as the suspected DA was not physically found. 2. Why is this discussion including the hydrogeology of DA3 in this section? 3. How was the determination of COPCs developed? Several important documents are not referenced in the Report including BCRRT June 2007 – *Final Remedial Investigation Report Demolition Areas 2 and 3 (RAU 2B)*, CALIBRE March 2005 – *Final Site investigation Report for Demolition Area 2 and 3*, and Atlanta Environmental Management, Inc September 2003 – *Final Site Investigation Report Small Arms Ranges and Demolition Areas 2 and 3*.
38.	3.4 Remedial Action Unit 2C General	The discussion of RAU 2C contains far greater level of details than the rest of the discussions presented in this report. This level of detail is not necessary for the purpose of the Report. Ecology would recommend focusing the discussion of RAU 2C and citing the documents where findings are established or discussed at length. As an example, discussion of the hydrogeologic conditions at RAU 2C could be incorporated into section 2.3.3 “Hydrogeology” or key findings of fact from previous investigations such as the aquifer underlying RAU 2C is isolated from the Troutdale Sole-Source Aquifer System can be stated with appropriate references.
39.	3.4 Remedial Action Unit 2C pg. 12	Ecology requests the Report clarify RAU 2C’s definition as Landfill 4/Demo Area 1. The requirements for sitewide groundwater monitoring have evolved over time starting with the original enforcement orders and monitoring of sentinel wells at the base boundary have been incorporated into ongoing monitoring of RAU 2C (See section IX.G of the APPCD).

40.	3.4 Remedial Action Unit 2C pg. 12	The Report states "The RI/FS is currently being prepared for the RAU 2C to inform the selection of remedy alternative to address the COPCs located at the LF4/RA1." The purpose of a RI/FS is more than a document to inform the selection of the remedy, and this definition presented in this section dismisses the remedial investigation portion of a RI/FS. The purpose of a RI is to present and evaluate information to adequately characterize a contaminated site, while the FS is to develop and evaluate cleanup action alternatives to enable the selection of a cleanup action that meets the requirements of MTCA. (See WAC 173-340-350 & WAC 173-340-351) Ecology requests this statement be modified.
41.	3.4 Remedial Action Unit 2C pg. 12	The statement, "These potential seeps have routinely been field inspected and have not been observed since at least 2017," is technically accurate, but is misleading as it indicates ongoing observations since 2017. The 2017 investigation for RAU 2C attempted to observe seeps and did not. Since that investigation observations were not part of the routine groundwater monitoring activities. Seep observations were added as part of the routine groundwater monitoring program for RAU 2C following Ecology comments on the Draft RAU 2C RI/FS on September 18, 2023 and no seeps have been observed. Update the statement to accurately reflect the timeline of events.
42.	3.5 Remedial Action Unit 3 pg. 13	The introduction to this section could benefit from a brief statement that the remediation actions for MEC as discussed in section 4 was broken into phases.
43.	3.5 Remedial Action Unit 3 pg. 13	Clarify the first statement to indicate that the site inspection, review of historical records, and interviews of former CBMR personnel are components of the Archive Search Report (ASR), rather than being separate items in addition to the ASR. Alternatively, simply stating "The USACE-developed Archives Search Report (ASR) (July 1997) concluded that the…" is equally effective.
44.	3.5 Remedial Action Unit 3 pg. 13	The third sentence "The types of MEC range from small arms ammunition to 155-millimeter (mm) artillery rounds, up to 4.2-inch mortars, 2.36-inch and 3.5-inch rockets, and hand and rifle grenades." This sentence is unclear with how it's designating the various munitions present at the installation. Would suggest referencing the ASR: The ASR concluded that most of the installation has the potential for MEC, which includes small arms ammunition, as well as larger munitions such as artillery rounds, mortars, rockets, and grenades.
45.	3.5 Remedial Action Unit 3 pg. 13	Editorial – Second paragraph the "central impact target area" is referenced as "central impact area".

46.	3.5.1 Target areas pg. 13	Clarification requested, is the lead contamination discussed in this section a part of RAU 1 or RAU 2A investigations. Provide the relevant citation.
47.	3.5.2 Central Impact Target Area pg. 14	Editorial: add the acronym (CITA) to the heading
48.	3.5.2 Central Impact Target Area pg. 14	State when the Northern CITA Expansion was established or recommended. It was in the 2010 RAU-3 CAP & RAU-3 Supplemental RI/FS.
49.	3.5.3 Open Burn/Open Demolition Areas pg. 14 & Section 8.0 references	The reference to Tetra Tech November 2005 – *Final Interim Removal Action Report, Landfill 4/Demolition Area 1 for Camp Bonneville, Washington* is not the final report of record for that interim Action. The final report was issued in February 2006 (https://apps.ecology.wa.gov/cleanupsearch/document/144628), the citation in the PPCD and APPCD of November 2005 contains a clerical error. Ecology requests the reference in the Report be updated to February 2006.
50.	3.5.5 roads and trails pg. 14	The reference used in this section for the roads and trails is a document for RAU 2A, use a RAU 3 document for reference (e.g. Roads and Trails after action report (BCRRT April 2009).
51.	3.5.5 roads and trails pg. 14	Add clarification, the roads and trails include maneuver areas, but not all roads and trails were in maneuver areas (e.g. CITA roads).
52.	3.5.5 roads and trails pg. 14	State that generally a 20-foot buffer on either side of Roads and Trails Area were surface cleared. The Roads and Trails Area adjacent to the site boundary had a 30-foot buffer. Generally, the roads and trails themselves were not surfaced cleared. Exceptions include the CITA road and some target access roads within the CITA which were cleared to 14” during the Weston Phase 3 work.
53.	3.5.6 Wildlife Management Area pg. 14	The CITA is within the boundary of the Wildlife Management Area (WMA), but it has undergone its own remediation work and is designated as no-reuse area with access restrictions. For clarity, it would be more accurate to state that this section discusses the WMA, excluding the CITA.
54.	3.5.7 Central Valley Floor and Associated Wetlands pg. 14	The description is incorrect, limited MEC clearance did occur in sensitive areas. See Weston Central Valley Floor and Associated Wetlands Final Reports, limited work included in wetlands with hand tools during dry seasons and limited anomaly locations occurring in cultural resource areas. Final delineation of the inaccessible portions remains undetermined.
55.	4.0 Remedial Actions General	See Ecology Comment 28 regarding COPCs, but this introductory section should list all the COPCs identified at the site rather than sitewide and site specific COPCs. The distinction in the Report between sitewide COPCs and site specific COPCs appears to be arbitrary.
56.	4.0 Remedial Actions General	The section lacks critical citations throughout. Each bullet point in the individual RAU subsections should contain a citation. If summarizing findings from a single

		document rather than compiled reports (i.e. CAP or RIFS) then provide that specific reference.
57.	4.0 Remedial Actions General	This section identifies “Key Documents” for each RAU. The rationale for why these are “Key Documents” is unclear especially as important records including pilot studies, emergency and interim actions, and work plans are not referenced. Remove reference to documents as Key Documents and provide clear citations for individual statements made in this section.
58.	4.0 Remedial Actions General	The section contains multiple references to whether additional work was required under the 2012 APPCD. This is a sitewide review and the 2012 APPCD does not negate work or requirements done prior to signing of the current iteration of the consent decree. Remove these statements.
59.	4.0 Remedial Actions General	Provide dates for significant items, or at least the date of the report, in the section. For example, in section 4.1.1.2 Cleanup Actions at Landfill 2, bullet point 2 states, “One undetonated 2.76-inch light anti-tank weapon was identified and later removed and disposed of by the Fort Lewis Explosive Ordnance [Disposal] Detachment.” When did this action occur, and could a citation be provided? Without a citation, the reader may need to determine which of the 5 key documents includes this information or if it comes from another report of record.
60.	4.1.1.4 Cleanup Actions at Former Burn Area pg. 17	Bullet point 1: If possible, please clarify what is meant by “surface debris.” Was this munitions debris, range-related debris, cultural debris, or something else?
61.	4.1.1.8 Cleanup Actions at Former Sewage Pond pg. 19	A typo is present in this section. A soil investigation was completed in 1998 not 1988.
62.	4.1.1.9 Cleanup Actions at Hazardous Materials Accumulation Point pg. 19	Bldg. 4476 should be stated as associated with this location.
63.	4.1.1.20 Cleanup Actions at ammunition Storage Bunkers Pg. 24	The header is not consistent with Section 3.1.19 discussion and site documents. Call these the Ammunition Storage Magazines (#2950, #2951, #2953)

64.	4.1.3 Remedial Action Unit 1 Operation, maintenance, and monitoring pg. 25	State what institutional controls are required for the maintenance Pit beneath building 4475 and soils at building T-1932 are.
65.	4.1.3 Remedial Action Unit 1 Operation, maintenance, and monitoring pg. 25	Ecology 2008 makes no specific statement either way regarding engineering controls, O&M or environmental monitoring requirements for RAU 1. The citation to Ecology. (2008, January) is misleading as it implies these items are stated in that document. Remove this citation and reference the RAU 1 CAP and note reporting on the condition of signage at RAU 1 is required per the restrictive covenant, which needs to be recorded, and CAP.
66.	4.2 Remedial Action Unit 2A pg. 25	The first sentence is incorrect, 21 ranges were identified in the PPCD, 17 range areas were confirmed, cleanup action was required at 9 of those ranges.
67.	4.2 Remedial Action Unit 2A pg. 25 & General	This section includes the first statement of several in the Report: "Restrictive Covenants are in place for RAU 2A-16 and RAU 2A-21 and require CAP Inspections". Ecology requested the restrictive covenants and received the following response in email correspondence dated February 21, 2025: "*Restrictive covenants are required for RAU 2A-16 and RAU 2A-2 but appear not to have been filed yet. Please see clarifying edit recommended for the report:* *"Restrictive covenants are required for RAU 2A-16 and RAU 2A-21 to document cap inspections and maintenance.""* Several statements in this Report are made assuming Restrictive Covenants for RAU 2A are in place and this document does not exist. Reporting and evaluations made based on this statement in the Report need to be reevaluated and rewritten. The NFA for RAU 2A does reference the sitewide ground disturbance restriction in the Quitclaim deed as being protective of the soil cap, not covenants specifically recorded for 2A-16 or 2A-21. Ecology concurs restrictive covenants should be developed and recorded with the County's Auditor's Office for 2A-16 and 2A-21 as the general no ground disturbance requirements does not adequately manage a soil cap. The Draft Addendum to the RAU 2A cleanup action plan does state in section 5.1.2 Protection of Ecological Receptors "*The capped areas will require certain institutional and engineering controls as well as inspections to ensure the cap remains protective in the future*." This reference does not establish monitoring frequency or critical details needed for maintenance. This should be established in the long-term O&M plan. Future restrictive covenants should include provisions for maintenance of the soil caps, if damaged, and annual reporting requirements.

68.	4.2 Remedial Action Unit 2A pg. 25	Editorial: The second bullet point reference is missing the report author and should be (**Weston** June 2017)
69.	4.2 Remedial Action Unit 2A pg. 26	Reviewing the MKM May 28, 2008 Operations Plan for Lead Remediation of Small Arms Ranges and the RAU 2A CAP, MTCA regulated soils were defined as soils above 50 mg/kg but below 250 mg/kg with TCLP concentrations less than 5 mg/L.
70.	4.2 Remedial Action Unit 2A & 6.1.2.1 pg. 27	Special Condition areas were established in the MKM Operations Plan for lead remediation of Small Arms Ranges which should be referenced in the Report (MKM May 2008).
71.	4.2 Remedial Action Unit 2A pg. 31	The record indicates that confirmation sampling and cleanup work followed the CAP and workplan for RAU 2A as discussed and documented in a series MKM memorandums: • MKM Engineers, Inc. (MKM). 2008a. "Memorandum from Clif Gray of MKM Engineers, Inc. to Mark J. Knight of MKM Engineers, Inc. with Subject: 1000-inch Range (RAU 2A-16) – Memo for the Record #1." October 24. • MKM. 2008b. "Memorandum from Clif Gray of MKM Engineers, Inc. to Dr. Ben Amoah-Forson of Washington State Department of Ecology with Subject: HTW Lead Remediation –Memo for the Record #2." November 10. • MKM. 2009. "Memorandum from Kathleen Anthony of MKM Engineers, Inc. to Dr. Ben Amoah-Forson of Washington State Department of Ecology with Subject: HTW Activities Complete for 2008 – Memo for the Record #3." January 9. • MKM. 2010. "Memorandum from Kathleen Anthony of PIKA International, Inc. to Mark Knight of Michael Baker Jr., Inc. with Subject: Draft RAU 2A-21 Boundary Delineation After Action Report." February 25. These references are from the Weston 2018 Cleanup Action Report. However, sample data is not presented. Discussion of RAU 2A would benefit by reviewing and incorporating the details of these documents and BCRRT July 2008 "Operations Plan for HTW Remediation Remedial Action Unit 2A- Small Arms Firing Ranges".
72.	4.4 Remedial Action Unit 2C pg. 33 & pg. 34	Remove discussion of the weight of evidence on impacts to surface water, the statement "The actual contaminants of Concern (COCs) and other evaluations that are part of the draft RI/FS for RAU 2C from this section.

Section 4.5 and its subsections are missing critical references and do not present the interim actions taken as part of RAU 3 or MEC related cleanup as part of other RAUs, for example the 2004 RAU 2C interim action had a MEC clearance component.

Ecology would suggest Section 4.5.1 be titled Remedial Action Unit 3 Remedy, then have section 4.5.1.1 be Interim and Emergency Actions. A list of cleanup/removal actions omitted in this Report are as follows:

73. 4.5 Remedial Action Unit 3 General

1. Time Critical Removal Action (TCRA), M203 high explosives (HE) and practice ranges. *Final Removal Report Ordnance and Explosives Removal Action Camp Bonneville Vancouver, WA (UXB, Oct 12, 2000)*
2. Interim Action, LF4/DA1, RAU 2C. *Final Interim Removal Action Report Landfill 4/Demolition Area 1 for Camp Bonneville, Washington (Tetra Tech Feb 2006)*
3. Emergency Action, perimeter and CITA fence and sign installation/repair. *Emergency Actions – Emergency Action Report Remedial Action Unit 3 Camp Bonneville Vancouver, Washington (BCRRT, Feb 2007); Addendum 1 (BCRRT, Feb 2007); and Addendum 2 (BCRRT, July 2007)*
4. Interim Action, 2.36-inch Rocket Range. *2.36-Inch Rocket Range – After Action Report (BCRRT, April 2008)*
5. Interim Action (Addendum 1), Roads and Trails. *After Action Report Roads and Trails (BCRRT, April 2009)*
6. Interim Action (Addendum 2), Environmental Study Area (ESA). *Environmental Study Area After Action Report (BCRRT, March 2009)*
7. Interim Action (Addendum 3), Central Valley Floor
    a. Note Addendum 3 was described in "*Interim Action Work Plan for Remedial Action Unit 2A and 3 - Central Valley Floor – Addendum 3*" (BCRRT September 2008) and documented in the daily field logs at the time. However, Ecology did not receive an interim action completion report nor has evidence that one was produced.
8. Interim Action (Addendum 4), Dense Vegetation Moderate Slope (DVMS), TAs 4, 5, and 12.
    a. Note Addendum 4 was described in "*Interim Action Work Plan for Remedial Action Unit 2A and 3 - Dense Vegetation/Moderate slope/ Addendum 4*" (BCRRT June 2008) and documented in the daily field logs at the time. However, Ecology did not receive an interim action completion report nor has evidence that one was produced.
9. Interim Action (Addendum 5), CITA.
    a. Note this interim action work was describe in "Interim Action Work Plan for Remedial Action Unit 3 Addendum 5 Central Impact Target Area" (BCRRT March 2009)" and documented in the daily field logs at the time. However, Ecology did not receive an interim action completion report nor has evidence that one was produced.
10. Interim Action (Addendum 6), materials potentially presenting an explosive hazard (MPPEH) processing and final inspection. *Final After Action Report Inspection and Disposal of Material Potentially Presenting an Explosive Hazard Remedial Action Unit 3 Camp Bonneville, Washington (Bay West, July 2011)*

74.	4.5 Remedial Action Unit 3 General	The Report omits critical references for the RAU 3 Cleanup Action Plan. Specifically, the proposed amendments to the Cleanup Action Plans for RAU 3 which guided subsequent remediation work. Ecology's review of court filings, being conducted as part its Periodic Review Process, has identified that these CAP Amendments were not filed with the court. These are: • Ecology, August 2017 "Proposed Changes to the 2010 Cleanup Action Plan for Remedial Action Unit 3, Site Wide Munitions Contamination" o https://apps.ecology.wa.gov/cleanupsearch/document/65966 ▪ Change the cleanup requirements of the CITA • Ecology, October 2018 "Summary Response to Public Comments Proposed Changes to Cleanup Action Plans RAU 2A, Small Arms Ranges and RAU 3, Central Impact Target Area" o https://apps.ecology.wa.gov/cleanupsearch/document/79231 • Ecology, November 2018 "Camp Bonneville Proposed Changes to the 2010 Cleanup Action Plan for Remedial Action RAU 3 November 2018" o https://apps.ecology.wa.gov/cleanupsearch/document/78677 ▪ Change the cleanup requirements of the Western Slope Area from 25 degrees (46.6% slope) to 14 degrees (25% slope) • Ecology, April 2019 "2019 Camp Bonneville Summary Response to Public Comments RAU 3 Western Slopes Area" o https://apps.ecology.wa.gov/cleanupsearch/document/84065 Incorporate these documents into the Report and update findings as necessary.
75.	4.5 Remedial Action Unit 3 General	This section omits from discussion the Weston January 2018 "Site-Specific Final Report Munitions and Explosives of Concern Remedial Action Unit 3 Western Slopes Area Pilot Study" this report and its findings should be included in the discussion. Incorporate this document into the Report and update the findings as necessary.
76.	4.5 .1 Remedial Action Unit 3 Remedy Implementation Pg. 34	Parsons 2004 is not the RI/FS of record for RAU 3. The Parsons 2004 RI/FS underwent public comment with a response to public comment issued in February 2006. This report and the public comments were addressed and finalized in BCRRT RAU 3 RI/FS dated February 2008.
77.	4.5 .1 Remedial Action Unit 3 Remedy Implementation Pg. 34	Reference error BCRRT 2007 is for RAU 2A not the Roads and Trails for RAU 3. The correct citation should be BCRRT 2009.

78.	4.5 .1 Remedial Action Unit 3 Remedy Implementation Pg. 34 - 35	Discussion of the roads and trails clearance is not accurate in this section. Only select roads associated with the CITA were cleared to 14 inches (See Weston January 2021) and where road buffers intersected with subsurface cleanup actions (see Weston June 2018). Interim actions for the roads and trails cleared the majority of the site within 20 feet of the edge of the road/trail not the centerline as reported and with a surface clearance, not a hand clearance of MEC to the Frost-heave depth of 14-inches as reported. See *Interim Action (Addendum 1), Roads and Trails. After Action Report Roads and Trails* (BCRRT, April 2009).
79.	4.5 .1 Remedial Action Unit 3 & 4.5.1.4 Remedial action unit 3 Phase IV	When discussing slope cleanup in the Western Slope area include both degrees and slope percentage. This has been a source of confusion in the past, particularly as a change occurred from a 25 Degree (46.6%) slope to 14 Degree (25%) Slope and typos particularly between 25 degree and 25 % have occurred in past documents/figures.
80.	4.5 .1 Remedial Action Unit 3 Phase IV pg. 35	Editorial: Change usage of “base” to Site as CMBR was not a base.
81.	4.5.2 Actions Subsequent to Remedial Action Unit 3 Remedy Implementation	Rename Section 4.5.2 to “Findings Subsequent to Remedial Action Unit 3 Remedy Implementation” Findings following cleanup are not cleanup actions under MTCA.
82.	4.5.2 Actions Subsequent to Remedial Action Unit 3 Remedy Implementation	The “training fuse” discovered near landfill 4 should be described by the correct terminology the item was a “M60 time fuse igniter.” A fuze is a different item than a fuse ignitor.
83.	4.5.2 Actions Subsequent to Remedial Action Unit 3 Remedy Implementation pg. 37	The County Forester’s account of discoveries conflicts with statements made by the project UXO specialists Greg Johnson and Ronnie Johnson, who worked on the site for most of the project. When asked whether items were discovered outside of remedial activities, the forester responded: “*Yes, munitions have been found occasionally during site inspections, particularly in areas with historical military activity. These discoveries underscore the importance of UXO training and anomaly avoidance practices.* “ Ecology requests a written follow-up with the County Forester to document, to the best of their ability, when and where the referenced finds occurred, as well as how they were reported and/or documented. The phrase “site inspections” suggest that these finds were part of the cleanup activities.

84.	4.5.3 Remedial Action Unit 3 Operation, Maintenance, and Monitoring pg. 37	Provide clarification or a direct citation for the statement, "the current monitoring and maintenance program is outlined in the RAU 3 CAP". While the CAP mentions maintenance of institutional controls, such as fencing and signage, there is no clearly defined monitoring and maintenance program outlined. The CAP, and other documents, call for a long-term O&M plan, but one does not currently exist for the site. A site-specific long-term O&M plan needs to be developed. There have been no annual inspections or monitoring following storm events, as included in the Proposed Changes to the 2010 Cleanup Action Plan for Remedial Action Unit 3, Site Wide Munitions Contamination - August 2017. Furthermore, documentation of other monitoring activities, such as fence and IC status and repairs, have been inconsistent or not documented at all.
85.	4.5.3 Remedial Action Unit 3 Operation, Maintenance, and Monitoring pg. 37	Add clarification that a Level I MEC technician is language in the CAP and the correct terminology for the certification is a UXO Technician I. Ecology will refer to this requirement as a UXO Technician I in following comments.
86.	4.6 Sitewide Institutional Control and Remedy Implementation pg. 38 & Section 7	The listed Institutional controls associated with a long-term O&M plan include restrictive covenant items that do not need further development in a long-term O&M plan, such as residential and groundwater use restrictions. Ecology requests a complete list of the restrictions and required institutional controls, even if further development is needed, to be documented in this section. Ecology provided Clark County a list of these items, including citations and multiple ICs, at the start of the periodic review, but they are not presented in the Report (attached). Recommendations made in Section 7 include items such as inspection following rainstorms, which would be considered an Institutional Control for the site (See Ecology August 2017 Memorandum from Ben Amoah-Forson of Washington State Department of Ecology Toxic Cleanup Program to Camp Bonneville RAU 3 File).
87.	4.6 Sitewide Institutional Control and Remedy Implementation Pg. 38	Editorial: The first bullet point has a typo, and two separate items are combined residential use restrictions and forest maintenance provisions.

88.	4.6 Sitewide Institutional Control and Remedy Implementation pg. 38	Editorial: Delete “either” and change “or” to “and” in bullet point two. The fencing and signage program provides both physical access restriction and information in the form of signage.
89.	4.6 Sitewide Institutional Control and Remedy Implementation pg. 38	Bullet point 2 – Grammatically this is confusing, Ecology would state that Fencing is required along the perimeter of the site and the CITA with signage placed at 50-foot intervals. Example would be, “Maintain the perimeter fence and ensure signage is affixed at 50-foot intervals.”
90.	4.7 Sitewide Actions Not Included in the APPCD pg. 39	Rename this section, the APPCD is not the starting point for a periodic review, Ecology would suggest “Additional Actions”
91.	5.1 Additional Information Gathering and Site inspections pg. 41	Remove Section 5.1 Community Notification and involvement to clarify the process under the WAC. Public involvement in the periodic review report preparation of the public draft is not part of the process for MTCA and therefore not part of the additional information gathering process. The solicitation of public feedback and notice to the tribe occurs after the draft final document is prepared for the public notice. Comments from the public and tribe will be responded to in the final document.
92.	5.2 interviews pg. 41	Update the interviews to include the MEDU response received by the County after the Report had been submitted.
93.	5.3 Site Inspection pg. 41	Provide clarification: Ecology was conducting its own site inspection separately but concurrently with the County/PBS inspection. Provide the inspection records in addition to the photograph logs in Appendix B. While the photos are valuable, they do not indicate where they were taken, or which areas were inspected. For example, Ecology staff were not present for the inspection of the sewage lagoon. If PBS did not produce a report or written record at the time of inspection, Ecology will only utilize its own inspection report for the Periodic Review.
94.	5.3.1 Remedial action unit 1 pg. 41	Provide clarification: The ECCR reports documenting compliance are submitted annually, however the RAU 1 restrictive covenant requires reporting on the status and signage at the two building locations. This restrictive covenant, though signed, does not appear to have been recorded with the County’s Auditor’s Office. Although the signage has been maintained as required, this covenant is not referenced in the ECCR reports.

95.	5.3.2 Remedial action unit 2A pg. 42	Editorial – a typo is present, the statement regarding ground disturbance is being made for RAU 2A-16, NOT RAU 2A-21. Confirm that this statement is correct and fix the typo.
96.	5.3.2 Remedial action unit 2A pg. 42	For the RAU 2A-21 soil cap, were fallen trees with exposed root balls observed by PBS?
97.	5.3.3 Remedial action unit 2B pg. 42	Editorial – Disturbance is misspelt in this section.
98.	5.3.3 Remedial action unit 2B pg. 42	Would clarify that observations were made for site wide restrictive covenants as there are no engineering controls, institutional controls, or restrictive covenants for RAU 2B.
99.	5.3.5 Remedial action unit 3 pg. 42	This section does not identify or discuss the results of the site inspection performed on December 5th and 6th for all RAU 3 ICs. State whether the site inspection was comprehensive for all ICs and list the observations made.
100	5.3.5 Remedial action unit 3 pg. 42	Where on the CITA fence was damage observed from tree falls? Maintenance and inspection records were not available for the entirety of the Site.
101	5.3.6 Sitewide Controls pg. 43	The first bullet points states, “O&M plans related to UXO and forestry practices were available.” Ecology requested the referenced O&M plans supporting this statement and was provided a scanned printout of a UXO safety briefing dated April 10, 2023, prepared by Eric Harrison, along with “Appendix 4: Camp Bonneville Wildfire Suppression Plan, updated 2/23/2024” via email correspondence on February 21, 2025. The documents provided to Ecology are not site-specific O&M plans. Revise the statement to reflect no O&M plans related to UXO and forestry practices are currently available or provide actual records which support the statement. It is inaccurate to state health and safety documents have been prepared. As of 2025, Clark County is developing site-specific health and safety documents.
102	5.3.6 Sitewide Controls pg. 43	During the site inspection, Ecology observed the perimeter fencing was missing in some locations. Maintenance teams were not present at the time of the site inspection, but Ecology inspectors were informed the work was being performed. Ecology has been informed that ongoing maintenance work is being performed on the Site.
103	5.3.6 Sitewide Controls pg. 43	Ecology recommends a separate bullet point to address factors that have compromised the fencing, treefall affects more than just areas with hurricane fencing. Additionally, recurring issues such as biological activity (elk) and historical trespassing/vandalism have also caused damage.

104	5.3.6 Sitewide Controls pg. 43	Clarify that not all areas with sinks were inspected.
105	5.3.6 Sitewide Controls pg. 43	State whether road and trail signs were observed and in place.
106	5.3.6 Sitewide Controls pg. 43	Clark County has never employed two UXO Level I technicians since the RAU 3 CAP was developed in 2010. It would be more accurate to state: • From 2010 to 2021, Clark County employed a UXO Technician III. • During all remedial activities, multiple UXO technicians were contracted by Clark County and were on site and available for support. • In 2024, Clark County provided for the training of a staff member as a UXO Technician I; however, this individual has since departed the County in February 2025, after this report was submitted. • In April 2025, after this report was submitted, the County hired a UXO technician on a part-time basis for support.
107	6 Technical Assessment General	The technical assessment section demonstrates compliance with the review criteria outlined in WAC 173-340-420; however, several statements regarding exceedances and their inclusion in the evaluations need to be clarified in the section. Decisions where COPC concentrations exceeded applicable cleanup levels at the time of decision do not need to be reassessed, provided none of the other periodic review criteria (i.e. new scientific information, revised cleanup levels, decisions based on availability of a permanent remedy, or improved analytical techniques) apply. The cleanup decisions were made based on the information available at the time, and therefore, there has been no change to the effectiveness of the cleanup action.
108	6 Technical assessment pg. 44	Editorial: Assessment in the header is misspelled as “ASSESSMMENT” which is carried into the index and bookmarks.
109	6 Technical assessment pg. 44 & Tables	Arsenic MTCA level B Cleanup level for direct contact was lowered to 0.31 mg/kg with the latest CLARC updated in February 2025 *“(1) Toxicity Value Updates. Added newly published IRIS toxicity values for arsenic (RfDo and CPFo) and PFHxS (RfDo) released by EPA on 1/13/25. Updates have been made to the noncancer effects table for these chemicals*.” Revise the text and tables as necessary, though the natural background concentrations for the site have not changed and were used for multiple decision points at the site.
110	6 .1.1.1 Remedial action performance 44 & Tables	State which grease pit is being referenced in bullet point one – there are multiple locations.
111	6 .1.1.1 Remedial action performance pg. 44	Editorial: In bullet point two, the last sentence should read “…does **not** reduce the effectiveness…” instead of the current phrasing.

112	6 .1.1.1 Remedial action performance pg. 45	Typo: The AST is located at Building 1932, not Building 1092.
113	6 .1.1.1 Remedial action performance pg. 45	Clarification: The statement that this detection is within the area of an associated Institution Control could use clarification. This location specifically has an IC in place due specifically to the petroleum hydrocarbons contamination in the discussion.
114	6 .1.1.1 Remedial action performance pg. 45	Remove the discussion of accumulated rainwater samples. These samples were collected during remediation efforts for the drum disposal area as rainwater had ponded in exposed contamination soil test pits. These samples did not reflect post remediation site conditions.
115	6.1.1.2 Implementation of institutional and engineering controls pg. 45	Are the annual reports the ECCR reports? Be consistent with language used in other sections of the Report.
116	6.1.1.2 Implementation of institutional and engineering controls pg. 45	That statement that disruption of remedy was not reported is misleading. Disruption of remedies and actions taken to address those disruptions are clearly documented in multiple ECCR reports. Maintenance and repairs required for the perimeter fencing for instance.
117	6.1.1.2 Implementation of institutional and engineering controls pg. 45	Would clarify, reporting requirements for the RAU 1 Restrictive covenant have not been documented though the engineering controls (required signage) has been in place.
118	6.1.1.2 Implementation of institutional and engineering controls pg. 46	The final paragraph of the section appears to be out of place in the context of the Report. Ecology would note for RAU 1 additional institutional controls may be required with the development of the long-term O&M plan but would not state that they are likely to be required.
119	6.1.2.1 Effectiveness of Remedy for Remedial Action Unit 2A pg. 46	The soil range concentration referenced as 423 mg/kg was identified at machine gun range south site not the machine gun range north site (sample number S18630318E).

120	6.1.2.1 Effectiveness of Remedy for Remedial Action Unit 2A Pg. 46 - 47	Ecology disagrees with the evaluation and analysis presented on the soil caps at RAU 2A-16 and RAU 2A-21 particularly in the determinations of remedy effectiveness for ecological receptors. The Weston 2017, June Draft Addendum to the Cleanup Action Plan Small Arms Ranges RAU 2A-16 and RAU 2A-21 includes statements on protectiveness of this remedy for ecological receptors (Section 5.1.2). Most importantly the entire analysis presented ignores the placement the geotextile layer (Mirafi® N-Series Nonwoven Polypropylene Geotextile) and treats the remedy as only a 1-foot cover of clean soil. Ecology concurs with recommendations made regarding tree falls and protection from erosion.
121	6.1.2.2 RAU 2A Implementation of institutional and engineering controls Pg. 47	The first sentence "*In addition to the sitewide ICs and ECs (overall access restrictions and signage), specific ICs and ECs for RAU 2A include requirements for the cap inspection and maintenance.*" appears to be partly based on a conclusion that restrictive covenants are in place for RAU 2A-16 and RAU 2A-21 and indicates that inspections have been regularly occurring when they have not. The only acknowledgement that institutional and engineering controls and inspections are needed is in the 2017 Addendum to the Cleanup Action Plan in section 5.1.2. "*The capped areas will require certain institutional and engineering controls as well as inspections to ensure the cap remains protective in the future*." This statement does not provide specific or necessary details for these requirements at RAU 2A-21 and RAU 2A-16, nor did the addendum apply directly to the sewage lagoon. Ecology would request that the section state specific ICs and ECs for the soil covers have not been developed and need to be established for RAU 2A-21 and RAU 2A-16 along with the former sewage lagoon.
122	6.1.2.2 RAU 2A Implementation of institutional and engineering controls Pg. 47	Ecology concurs with Bullet points 1, 3, 4, 6. Bullet point 2: Reassess recommendation based on inclusion of the Geosynthetic liner in evaluation of protectiveness for plant-based receptors. Bullet Point 5: Reassess as cleanup implementation, though not fully documented with supporting confirmation samples, appears protective of ecological receptors (50mg/kg) (see comment 120 & comment 153)

123	6.1.3.1 RAU 2B Pg. 47	This section needs a substantial revision for clarity. Statements appear to be incomplete and paragraph structure lacks internal logic. 1. The statements regarding the explosive compounds in soil indicate that they were below the CULs at the time of assessment; however, this statement is not expounded upon. Did the CULs change and are there exceedances present for those compounds? 2. What explosive compounds were detected in soils? (a reference to a table or other section would be appropriate if that information is presented) 3. Internal consistency, the Report states that several samples for metal were detected but not the media they were detected in. This is in the paragraph discussing soil samples; however, the previous sentence discussing explosive compounds had a clarification that it was soil samples. Using this logic on this statement, this sentence should also contain that clarification. 4. Soil metal detections were above laboratory detection limits but were considered within the range of naturally occurring background concentrations. This appears to tie in with the next sentence potentially out of order. Did the natural background concentrations change? 5. "*Several detected concentrations from DA 2 were detected above historical and current MTCA Method A CULs.*" Again, this follows the discussion of metal detections, but it is not clear that this is a statement regarding metal detections and if the previous statement regarding natural background concentrations would be relevant. 6. What metals were detected in soils, which had exceedances, which CULs change? (a reference to a table or other section would be appropriate if that information is presented) 7. The final four sentences in the first paragraph are discussing arsenic detections without clarification that the topic of discussion is arsenic. A general statement about metals is followed by "*The Method A CUL (20 mg/kg) has remained consistent (Sic) over time*".
124	6.1.5.1 RAU 3 pg. 48	The Report calls out 515 items identified as MEC or MPPEH during Phase I clearance activities and states risk for these items have been effectively addressed. This statement and the focus on one part of the RAU 3 cleanup is not an accurate reflection of the entirety of RAU 3. Later discussion does not go into the same level of detail for the other RAU 3 Phases, nor does the section identify the interim and emergency actions for RAU 3. Ecology requests this section be revised to accurate reflect the work completed for the entire RAU.
125	6.1.5.1 RAU 3 pg. 48	The statement roads and trails have been reported to be clear to depths of 14-inches is incorrect see comment 78

126	6.1.5.1 RAU 3 pg. 48	Provide documentation for “some roads were not shown to be cleared” and identify if these roads/trails still exist. A review of the Roads and Trails Interim Action cleanup records (BCRRT, 2009) indicates that several sections of roads and trails, identified in early investigations, could not be located as depicted by the project GIS data available at the time. During anomaly avoidance and vegetation removal operations, discrepancies were observed due to factors such as changes in alignment and position, hazardous work conditions caused by extreme terrain, and physical inaccessibility of certain sections.
127	6.1.5.1 RAU 3 pg. 49	Clarify that documented number of suspect materials at depths greater than 14 inches is based on Westons field work and not a sum of all prior investigations.
128	6.1.5.1 RAU 3 pg. 49	List all the institutional and Engineering Controls required for RAU 3.
129	6.2.1 Site Applicability—New Information for COCs pg. 50	Change section title from COCs to COPCs
130	6.2.1 Site Applicability—New Information for COCs pg. 50	See comment 109 regarding Arsenic
131	6.3.2 New regulations or laws – Heal Act	Consider adding statement that EJScreen has been disabled and the website removed by the EPA in February 2025. Replacement methodology for HEAL ACT compliance is being developed by Ecology.
132	6.4.1 LEO training pg. 52-53	The statement regarding the Clark County Sherrif Office (CCSO) operating at an adjacent gun range is incorrect. There is only one active range at the Site (FBI range) which the CCSO uses along with other law enforcement agencies.
133	6.4.1 LEO training pg. 52-53	State where close quarter and SWAT activities are conducted (Bonneville Cantonment)
134	6.4.1 LEO training pg. 52-53	Provide clarification on the use and storage of munitions. The FBI and CCSO stores ammunition in secured areas at the FBI Range. The ATF uses the former magazines for storage of explosives and evidence and does not use explosives on the Site.
135	6.4.1 LEO training pg. 52-53	Identify that the ATF and MEDU use the property.

136	6.4.3 Forest operations pg. 53	Provide Ecology with the contract language communicating ground disturbance protocols. Clarify that MEC training refers specifically to MEC safety training conducted through the County's UXO Awareness Briefing. Additionally, confirm whether contractors receiving this training have been documented as having completed it.
137	6.4.3 Forrest operations pg. 53	Remove the statement that Work Areas are also "cleared" by the Level I MEC technician employed by the County or provide documentation to support this statement. Currently this statement is incorrect, not supported by any documentation, and directly contradicted by the administrative record. Additionally, the term for construction/forestry support should be anomaly avoidance not clearance. A UXO technician I is not a UXO-Qualified Personnel (UXOQP) for the purpose of construction support and Clark County Public Works did not employ a UXO technician I until May 2024. For the period from January 2021 to May 2024 Clark County did not have a UXO technician on staff. From 2010 – 2021 a UXOQP was employed by the County and multiple UXOQPs were working on the site; however, Ecology has not been provided direct documentation that UXO construction support was provided for forestry activities.
138	6.5.1 RAU 1 Permanent Remedies Pg 53	Clarify that further remediation is required by the institutional controls and restrictive covenant for RAU 1. This section is focusing on the practicality of more permanent remedies under the conditions which are already accounted for (e.g. construction or building demolition). Are new or more permanent remedies available which do not require demolition or modification not the structures at the existing locations?
139	6.5.2 RAU 2A Permanent Remedies Pg 54	The RAU 2A CAP was amended as removal of the underlying contaminated soil at RAU 2A-21 and RAU 2A-16 was not practical due to the nature and extent of contamination. Removal of contaminated material via dig and haul was the remedy of the choice from outset of the RAU 2A CAP. The evaluation of this remedy in this Report is unnecessary and ignores the decisions and evaluations made through the cleanup process.
140	6.5.3 RAU 2B Permanent Remedies Pg 54	It would be more appropriate to state rather than no further remedy is needed that there is no more practical or permanent remedy for RAU 2B given the Report section.
141	6.5.5 RAU 3 Permanent Remedies	Provide citations for technology developments referenced
142	6.5.5 RAU 3 Permanent Remedies Pg 54	Consider stating the exact number of unidentified discrete items rather than "hundreds of"

143	6.5.5 RAU 3 Permanent Remedies Pg 54	Statements regarding drone mounted GPR units may not be entirely accurate and may be misleading regarding industry preferred technology. GPR is available for MMRP; however, it is not considered the most advance detection technology. Ecology recommends evaluation of advance geophysical classification (AGC). Drone technology may not be practical for the conditions at the site given forest density and vegetation.
144	6.5.5 RAU 3 Permanent Remedies Pg 54	The Report states "*Additional methods for clearance should be undertaken for certain areas of the park where intensive use will occur, such as campgrounds, picnic areas, recreation areas, and playgrounds*". This statement is made without any supporting justification or tie into the RI/FS and CAP for RAU 3. Intensive use is not defined and ignores classification of use intensity in the RI/FS and supplemental RI/FS specifically for the land uses referenced. How was this conclusion reached and why is it more practical than the decisions made in the RI/FS, CAP, and CAP amendments? Additional site investigation and possible remedial activities for UXO may be required in areas where the projected site use (i.e. 2005 reuse plan) and the cleanup undertaken do not align. Examples include plans requiring constructions activities that require subsurface disturbance greater than 14 inches or a forestry camp that partially overlaps the CITA exclusion zone. The County intends to develop a master park plan. Ecology recommends that the master park plan should accurately reflect and consider cleanup that has been completed.
145	6.6 Improved analytical Techniques	Provide citations for statements in this section
146	6.7.2 RAU 2A Summary Pg. 56	State that Machine Gun Range South was Identified in the RAU 2A CAP and not selected for remedy.
147	6.7.2 RAU 2A Summary Pg. 56	Separate the sewage lagoon from the soil cap discussion as this is a separate item to the soil caps. Ecology concurs mitigations of the conditions at the sewage lagoon need to be prioritized.
148	6.7.4 RAU 2C Summary Pg. 56	State that RAU 2C is still undergoing cleanup and quarterly monitoring continues.
149	6.7.5 RAU 3 Summary Pg. 56	State that other residual items may remain in other areas where clearance/cleanup was not performed.
150	6.7.5 RAU 3 Summary Pg. 56	Add clarification (edit in bold) "… are also expected to be below **Area specific** clearance depths across the rest of RAU 3,…" It is important to note that clearance depth varied with area.
151	6.7.5 RAU 3 Summary Pg. 56	See comment 144 regarding recommendation of further clearance

152	6.7.5 RAU 3 Summary Pg. 56	Provide the Ecology citation including section number for the statement it is not practical to remove all MEC from the CITA.
		Ecology disagrees with the statement that the RAU 2A cleanup did not take into account ecological risk. While confirmation sampling data is not available at this time, multiple sources indicate the workplans and CAP for RAU 2A were followed during cleanup. The RAU 2A CAP and RI/FS discusses and evaluates Ecological Risk. Cleanup goals for RAU 2A were 50/mg cleanup and documented in the following sources: "Final Cleanup Action Plan Small Arms Ranges" RAU 2A CAP (BCRRT 1/2008), appendix B - Joint Aquatic Resources Permit Application Form (JARPA) was submitted to USACE. In the scenarios presented, the applicant would consider excavated soil "clean" if it was below 50 mg/kg using XRF analysis. Excavation was to continue until no bullet fragments were observed and XRF results were below 50 mg/kg.
153	6.7.6 Sitewide Considerations Summary Pg. 57	"Operations Plan for HTW Remediation Remedial Action Unit 2A- Small Arms Firing Ranges" (BCRRT 7/2008) specifies that soil exceeding total lead concentration of 50 mg/kg will be managed following Appendix B of the Final Cap and Appendix D of the Operations Plan. The Appendix E of "Operations Plan for HTW Remedial Action Unit 2A Small Arms Firing Ranges (BCRRT 7/2008)" pages 69- of the PDF file. Describes sidewall and floor sample collection procedures, as well as step out requirements when results exceed the CUL. The sampling plan calls for submission of samples to TestAmerica for laboratory analysis by EPA 6010. Memos from MKM/PIKA indicate at the time work was proceeding with confirmation sampling occurring and step outs occurring as needed. If historic confirmation sampling data cannot be located, Ecology would require confirmation sampling be conducted at RAU 2A.
154	6.7.6 Sitewide Considerations Summary Pg. 57	The PFAS preliminary assessment identified and evaluated the drum disposal area, paint and solvent disposal area, and the sewage lagoon in detail. These do not represent data gaps where no evaluation was made. If the Report author disputes the findings of those reports more site specific rational and evidence is needed than presented in this section. The Report is correct the SI utilized a shorter compound list than EPA method 1633 but omits that EPA method 1633 was not established at the time of the PFAS preliminary site investigation. Ecology has requested and received confirmation that the sewage lagoons did not receive discharge from the former fire stations or wash racks.

155	7.0 Conclusions pg. 58	Ecology disputes the finding that Key institutional controls have been implemented. It would be accurate to state several institutional controls have been implemented or partially implemented but multiple institutional controls for the site are not in place and/or require further development.
156	7.0 Conclusions pg. 58	RAU 1 is substantially in compliance but reporting requirements have not been fulfilled. Recommend that reporting requirements be incorporated into the annual ECCR.
157	7.0 Conclusions pg. 58	RAU 2A data was identified above the CUL for Machine gun range South Site, not the North Site. This location and other locations were identified in the RAU 2A RI-FS and RAU 2A CAP but not chosen for remediation in the RAU 2A CAP.
158	7.0 Conclusions pg. 58	RAU 2A - recommend filing restrictive covenants for RAU 2A-16 and RAU 2A-21.
159	7.0 Conclusions pg. 58	RAU 2B - a known detection is not a data gap nor are identifying data gaps part of a Periodic Review. This exceedance of CULs was known and evaluated at the time of decision.
160	7.0 Conclusions pg. 59	RAU 3 – Ecology disagrees that CBMR is in full compliance with the requirements for MEC awareness training for contractors and visitors. Partial compliance has been demonstrated; however, there is no written record demonstrating that staff, visitors, and contractors have received this training in this past. Clark County Public Works has stated this training has been conducted for staff and visitors is actively implementing a formal MEC awareness program with clear documentation requirements.
161	7.0 Conclusions pg. 59	RAU 3 – While Ecology concurs with the implementation of a robust inspection program and recommends development of long term O&M plan, annual surface MEC inspections and surface MEC inspections following heavy rainstorms were already proposed for the CITA in the August 2017 CAP Amendment.
162	7.0 Conclusions pg. 59	RAU 3 – Based on the 2005 Reuse Plan, Ecology concurs that additional site investigation and possible remedial action may be needed to support the projected Site use. The statements of use intensity and rationale for this assessment need to be evaluated with the planned future use (see comment 3 and comment 144).
163	7.0 Conclusions pg. 59	Sitewide Considerations – The site is not incompliance with multiple institutional controls along with the requirement for long-term O&M plans. Additional Restrictive Covenants need to be recorded.

164	7.0 Conclusions pg. 59	Sitewide Considerations – Ecology disagrees that institutional controls required for the Site are fully implemented. The site is currently not in compliance with the requirements of the APPCD and institutional controls outlined in the cleanup action plans. Several key requirements such as access restriction are in place but require further development with long term O&M Plans to clearly document activities such as inspection frequency and reporting requirements. Ecology acknowledges that operations and maintenance of the existing engineering/institutional controls is ongoing, and Clark County Public Works is demonstrating material progress and commitment towards bringing the site into compliance.
165	Figures general	Due to the number of issues identified and the visual nature of figures, Ecology requests a meeting with the County to discuss figures. In general: • Sources the figure data should be included • Buildings and non-point reference areas should be outlined • Figure 9 is not an institutional and engineering control plan
166	Tables General	To complete a comprehensive review Ecology is requesting the individual tables from historic reports used for reference in this section along with any notes used to prepare and compile the tables for the Report.
167	Tables General	Would add asterisk and note to tables for historical MTCA values to document when in the cleanup process value was established and is being used for in this context.
168	Tables General	Add CAS numbers for COPCs as several compounds have other names
169	Tables general	For consistency either use non-detect values (<#.##) or use ND. Both identifiers are used in the tables.
170	Table 1	isopropyltoluene;p has a Soil method B - Direct Contact Noncancer 320 mg/kg
171	Table 1	p-Cumene is this a typo for Isopropyltoluene; p- aka p-Cymene?
172	Appendix B	Include the field log if generated for the field inspection and indicate where photos were taken on a site map.
173	Appendix B	Photo-1 &2 these documents are general H&S documents and not O&M manuals
174	Appendix B	Photo 16 – confirm if this is a photo of 2A-16 or the M203 range

Attachments

1. Periodic Review Draft Table
2. RAU 1 Restrictive Covenant

Periodic Review

Camp Bonneville Military Reservation
Vancouver, Washington
Ecology FSID #475000

Prepared for:
Clark County Public Works
Vancouver, Washington

January 2025
PBS Project 24011091

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Abbreviations and Acronyms

2,4,5-T	2,4,5-trichlorophenoxy acetic acid
2,4-D	2,4-dicholorophenoxy acetic acid
ACM	asbestos-containing material
AFFF	aqueous firefighting foam
AOPI	area of potential interest
APPCD	amended prospective purchaser consent decree
ARAR	Applicable or Relevant and Appropriate Requirement
Army	United States Army
ASR	archive search report
AST	aboveground storage tank
BCRRT	Bonneville Conservation Restoration and Renewal Team
bgs	below ground surface
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	cleanup action plan
CBMR	Camp Bonneville Military Reservation
CITA	Central Impact Target Area
COC	contaminant of concern
COPC	chemical of potential concern
County	Clark County
CSM	conceptual site model
CUL	cleanup level
CVF	Central Valley Floor
cy	cubic yard
DA2	Demolition Area 2
DA3	Demolition Area 3
DDT	dichloro-diphenyl-trichloroethane
DNR	Washington State Department of Natural Resources
DoD	United States Department of Defense
DOH	Washington State Department of Health
EBS	Environmental Baseline Survey
EC	engineering control
ECCR	Environmental Covenants, Conditions, and Restrictions
Ecology	Washington State Department of Ecology
EHD	Washington State Environmental Health Disparity
EJ	environmental justice
EM	electromagnetic
EO	Enforcement Order
EPA	Environmental Protection Agency
ESCA	Environmental Services Cooperative Agreement
FBI	Federal Bureau of Investigation
GPR	ground-penetrating radar
HEAL	Healthy Environment for All
HFPO-DA	hexafluoropropylene oxide dimer acid
HI	Hazard Index
HMX	High Melting Explosive
IC	institutional control

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LF4/DA1	Landfill 4/Demolition Area 1
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
Ma	million years ago
MCL	maximum contaminant level
MCLG	maximum contaminant level doal
MDAS	Material Documented as Safe
MDL	laboratory method detection limit
MEC	munitions and explosives of concern
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mm	millimeter
MPPEH	material potentially presenting an explosive hazard
MRL	laboratory method reporting limit
MTCA	Model Toxics Control Act
NFA	No Further Action
NFLC	North Fork Lacamas Creek
NPDWR	National Primary Drinking Water Regulation
NT	non-target zone
O&M	Operation and Maintenance
OB	open burning
OD	open detonation
OTM	other test method
PA	picric acid
PBS	PBS Engineering and Environmental LLC
PCB	polychlorinated biphenyl
PETN	pentaerythritol tetranitrate
PFAS	per- and polyfluoroalkyl substances
PFBA	perfluorobutanoic acid
PFBS	perfluorobutane sulfonate
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexane sulfonate
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PM	particulate matter
PPCD	Prospective Purchaser Consent Decree
PRG	preliminary remediation goal
Pt	Troutdale Formation
Qa	quaternary floodplain and stream channel alluvium and lacustrine deposits
Qfg	quaternary cataclysmic flood deposits
Qls	quaternary landslide deposit
Qtc	quaternary unnamed conglomerate
RAU	remedial action unit
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
RSL	regional screening level
SAL	Washington State Action Level

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SERS	surface-enhanced Raman scattering
SHPO	Washington State Historic Preservation Office
SI	site investigation
SSRP	Site-Specific Remediation Plan
State	State of Washington
SVOC	semi-volatile organic compound
Tbem	Basaltic Andesite of the Elkhorn Mountain
TCLP	Toxicity Characteristic Leaching Procedure
TNT	trinitrotoluene
TOC	total organic carbon
TPH	total petroleum hydrocarbons
Tsr	Sandy River Mudstone
TSRS	Technical Specifications and Requirements Statement
Ttfc	Troutdale Formation Conglomerate
Ttfh	Troutdale Formation Lower Member
Tv	Oligocene Volcanic Bedrock
USACE	United States Army Corps of Engineers
UST	underground storage tank
UXO	unexploded ordnance
VOC	volatile organic compound
WAC	Washington Administrative Code
WMA	Wildlife Management Area
WSA	Western Slopes Area
WWTP	wastewater treatment plant
XRF	x-ray fluorescence

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1 INTRODUCTION

PBS Engineering and Environmental LLC (PBS) has prepared this Periodic Review report for the Camp Bonneville Military Reservation (CBMR) located at 23201 NE Pluss Road in Vancouver, Washington (Figure 1).

Clark County (County) is the current owner of the property. The United States Army (Army) was the prior owner and operator of CBMR. In May 2012, the County entered an amended prospective purchaser consent decree (APPCD) number 06-2-05340-4 with the State of Washington (State) to address contamination at CBMR. This distinction is important as it explains the roles of each party in the management and remediation of the CBMR site. The Army was responsible for historical activities that led to the contamination, while Clark County is now managing the cleanup and environmental restoration efforts.

This Periodic Review report was prepared for the County in cooperation with the Army. The report follows the requirements of the Model Toxics Control Act (MTCA) Cleanup Regulation, specifically Chapter 173-340-420 of the Washington Administrative Code (WAC).

The key components of the Periodic Review report include:

1. Summary of site history, contamination sources, and site conditions
2. Summary of cleanup actions completed at each of the five remedial action units (RAUs)
3. Summary of additional information gathering and site inspections
4. Technical review of the effectiveness of remedial actions with consideration of the following:
    a. New scientific information for hazardous substances
    b. New state or federal laws
    c. Current site and resource uses
    d. Availability and practicability of more permanent remedies
    e. Availability and improved analytical techniques
5. Technical assessment summary
6. Recommendations and follow-up actions

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2 SITE DESCRIPTION AND CHRONOLOGY

The following section provides an overview of CBMR's physical setting, usage, and infrastructure, as well as an overview of the site's chronology.

2.1 Site Description

CBMR occupies approximately 3,840 acres in Clark County, Washington, approximately 5 miles northeast of Vancouver, Washington, and 7 miles north of the Columbia River (Figure 1). It is located along the western foothills of the Cascade Mountain Range, with Camp Hill and Little Elkhorn Mountain to the northwest, Munsell Hill to the west, and Little Baldy Mountain to the south. Lacamas Creek, a tributary of the Columbia River, bisects the site. CBMR is composed of mostly undeveloped, forested hillsides, and creek side drainages. Former military barracks and training facilities are concentrated at the Killpack and Bonneville cantonments. Other developed areas include firing ranges, a paved two-lane road connecting the main gate with the two cantonment areas, and a network of unpaved roads (Figure 2).

2.2 Site Chronology

CBMR historically was used by the United States Department of Defense (DoD) to provide training for active Army, Army Reserve, National Guard, Marine Corps Reserve, Navy Reserve, Coast Guard Reserve units, and other DoD personnel. The installation included the Bonneville cantonment and Killpack cantonment, 25 firing ranges, sewage lagoons, and 4 historical landfills.

Between 1910 and 1995, the DoD used CBMR for live fire of small arms, assault weapons, artillery, and field and air defense artillery. In the early 1950s, the DoD arranged to lease an additional 840 acres from the State to expand training possibilities. DoD operations at the facility ceased in 1995 when CBMR was selected for closure under the 1995 Base Realignment and Closure (BRAC) process.

Since CBMR was officially closed, investigations were conducted by the DoD and its consultants to characterize the nature and extent of contamination at the site and to develop a plan for potentially transferring ownership to the County, which expressed interest in the site. Investigations began in 1997 in response to the BRAC process and have occurred every year to date on the numerous investigation areas identified at the site. During this time, the County prepared an initial Reuse Plan for the property (Otak, 2005).

CBMR was divided into RAUs in a 2003 Enforcement Order (EO) issued by the Washington State Department of Ecology (Ecology). RAUs were based on the nature of contaminants, not by physical location. Figures 3 through 7 show each RAU's location. The five RAUs, and their status post-remedy, are as follows:

- RAU 1—hazardous substance, other than military munitions, storage areas, no further action necessary under MTCA
- RAU 2A—small arms ranges, no further action necessary under MTCA
- RAU 2B—former open burning/demolition areas excluding Demolition Area 1, no further action necessary under MTCA
- RAU 2C—sitewide groundwater with emphasis on Landfill 4/Demolition Area 1 (LF4/DA1) area, still active under MTCA
- RAU 3 (Phases 1 through 4)—sitewide locations where munitions and explosives of concern (MEC) may be located:
    - Phase 1—Central Valley Floor (CVF) and Associated Wetlands, no further action necessary under MTCA

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- Phase 2—Central Impact Target Area (CITA)/Northern CITA expansion, no further action necessary under MTCA
- Phase 3—Open Burning (OB)/Open Demolition (OD) Areas, no further action necessary under MTCA.
- Phase 4 –Western Slopes Area, no further action necessary under MTCA

The Reuse Plan called for the majority of CBMR to be transferred to the County for the public benefit, education, law enforcement, and parks, with no financial gain to the County. Several unsuccessful attempts to transfer CBMR from the DoD to the County were made prior to a successful transfer of ownership in 2006 under a prospective purchaser consent decree (PPCD).

In October 2006, the Army transferred ownership of the property to the County, which immediately transferred the land to the Bonneville Conservation Restoration and Renewal Team (BCRRT). The transfer was a conservation conveyance that followed 10 U.S.C. 2694(a). A conservation conveyance limits use of the property to conservation purposes. Ownership was transferred from BCRRT back to the County in 2010, and cleanup activities have continued according to the Reuse Plan. In 2012, the PPCD was superseded with the APPCD, and work has continued under the APPCD from 2012 to present.

2.3 Physiography and Regional Setting

2.3.1 Regional Geology

The Cascade Mountain Range divides Washington into two distinct physiographic areas, the western side with moderate temperatures and abundant rainfall, and a semi-arid eastern side that experiences greater temperature extremes. The peaks and ridges of the range vary from 6,000 to 8,000 feet above mean sea level (amsl) with some volcanic peaks over 10,000 feet amsl. The Cascade Range borders the site to the east, consisting of Tertiary to Quaternary volcanic and sedimentary rocks. CBMR is situated between the western foothills of the Cascade Range and Portland Basin physiographic provinces.

The Portland Basin and surrounding area is characterized by low topographic relief with exposures of Oligocene volcanic basalt flows of the Elkhorn Mountain (approximately 26.5 million years ago [Ma]) at the eastern edges. Volcanism and uplift of the younger Cascade Range in the east caused the basin to fill with low-energy sediments, such as the Sandy River Mudstone, via the ancestral Columbia River. In the Miocene, more abrupt changes in relief resulted in higher energy sediments of the Troutdale Formation accumulating in the basin from eastern sources. An abrupt lifting of the Cascade Range in the late Miocene to early Pliocene (approximately 5 Ma) resulted in further sedimentation in the Columbia Valley, which caused much of the previously existing Troutdale Formation in the Portland Basin to erode. These events left Troutdale Formation remnants on the western foothills of the Cascades.

The geology of the Lacamas Creek 7.5-minute quadrangle is presented on a map published by the US Geological Survey (Evarts, 2006). The quadrangle is located south of the limits of Pleistocene glaciers emanating from the Cascade Range in Washington (Mundorff, 1984; Evarts, 2006). However, elevations below approximately 400 feet were periodically inundated by Pleistocene glacier-outburst floods from Glacial Lake Missoula (Mundorff, 1984; Evarts, 2006).

2.3.2 Local Geology

According to nomenclature found in the Lacamas Creek quadrangle (Evarts, 2006), five geologic formations are present at CBMR (Figure 8) and, from oldest to youngest, are the following:

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- Quaternary floodplain and stream channel alluvium and lacustrine deposits (Qa), which mantle the Lacamas Creek valley floor.
- A Quaternary landslide deposit (Qls) of surface soils and bedrock displaced from the steep slope along David Creek
- Sandy River Mudstone (Tsr) is a fine-grained, low-permeability siltstone deposit that only occurs between the Bonneville and Killpack cantonments in the small valley between Camp Hill/Munsell Hill along the north side of Lacamas Creek as it exits CBMR in the southwest.
- A thick sequence of Quaternary to Pliocene gravel, fine-grained sand, and cobbly and bouldery sand known as the Troutdale formation (Pt), which underlies areas to the west of the Bonneville cantonment. Lower Member (conglomerate) of the Troutdale Formation (Ttfc, Ttfh)
- Oligocene volcanic bedrock (Tv), which is exposed at the surface in the eastern part of CBMR as identified as the Basaltic Andesite of the Elkhorn Mountain (Tbem).

These units are presented in the Lacamas Creek quadrangle geologic map (Evarts, 2006).

2.3.3 Hydrogeology

CBMR lies within the Portland Basin portion of the Willamette Lowland Aquifer System. The Portland Basin is bounded to the east by the Cascade Mountains, to the north by the Lewis River, and to the west by the Coast Range. Groundwater flow in the uppermost alluvium aquifer within CBMR follows topography. Precipitation that recharges groundwater in the uplands flows downhill through the shallow, weathered zones of bedrock into the alluvium of the Lacamas Creek floodplain. Topographic contours and inferred groundwater flow direction at CBMR is shown on Figure 7.

The Tbem unit has little capacity to store or transmit water. Where water is present, it is located at the soil/rock interface or in fractured zones within the rock (McFarland and Morgan, 1996). At CBMR, this unit is not considered to be a productive aquifer, with some exceptions where potable water has been encountered in fracture zones.

Three wells at CBMR have been used for water supply since their installation (Figure 2). These wells are in the Central Valley and were installed between 350 and 600 feet below ground surface (bgs). According to well logs, competent bedrock was not reached until approximately 200 feet bgs. Estimates of the hydraulic conductivity of the bedrock indicated it is a low-yield aquifer (BCRRT, 2009).

The Sandy River Mudstone is a low-permeability unit. This unit is only present in a small valley that extends between the Killpack and Bonneville cantonments.

The Troutdale Conglomerates are considered excellent water-bearing units and commonly serve as water sources for municipal, industrial, and irrigation supplies (McFarland and Morgan, 1996). In 2006, the Environmental Protection Agency (EPA) designated the Troutdale aquifer a sole-source aquifer in the County. This aquifer system provides approximately 99% of the available drinking water to the residents living over it. There are no other available drinking water sources that would be economically feasible to supply these residents (EPA, 2006). The Troutdale Sole-Source Aquifer System is a highly productive aquifer and includes not only the Troutdale Formation, but all productive, hydraulically interconnected overlying water-bearing sedimentary units within the entire Portland Basin, including unnamed conglomerate (Qtc), cataclysmic flood deposits (Qfg), and alluvium (Qa) (EPA, 2006, using the nomenclature of Evarts, 2006).

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At CBMR, the Conglomerate Member of the Troutdale Formation is present along the west-southwest portion (Evarts, 2006). In addition, a remnant of the formation is present at LF4/DA1. The remnant is disconnected/isolated from the Troutdale Formation located at the west-southwest property line of CBMR. The remnant was isolated from the rest of the unit to the west-southwest by the downcutting of Lacamas Creek. The Troutdale Aquifer, a major source of potable water in the area, is found within the Troutdale Formation.

CBMR lies within the Streamflow Source Area of the Troutdale Aquifer. The Streamflow Source Area is defined by EPA as "the upstream headwaters area of streams that flow into the recharge area of the aquifer" (2006).

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3 BACKGROUND

The following subsections describe the RAUs with respect to their location and historical site uses.

3.1 Remedial Action Unit 1

The RAU 1 area consists of 20 discrete sites, where previous investigations and remedial activities found that chemicals of potential concern (COPCs) were either not detected or were below regulatory cleanup levels. Brief descriptions of the sites included in RAU 1 are provided below, including their location within CBMR. Most of the sites were largely identified during the Environmental Baseline Survey (EBS) (Woodward-Clyde, 1997) conducted after the installation was selected for closure by the BRAC Commission.

3.1.1 Landfill 1

Landfill 1 was reportedly located east of the Bonneville cantonment area and just north of the existing sewage lagoon (Figure 3). It was identified as having potential historic significance based on a 1980 cultural resources survey (Larson, 1980), which stated that bottle fragments dating from the early 1900s were found in the area. There is no record of when the site was used or what other types of materials it may contain. In the 1980 archaeological survey, the site was described as a small (approximately 12 by 15 feet) shallow depression.

In 1997, a field reconnaissance and geophysical survey were completed. The exact location of the landfill could not be determined. No evidence of a landfill, either in the way of a depression or of debris, was identified. It was determined the site may instead have been a former homestead (URS, 2004). Landfill 2 was discovered during excavation for construction of the current sewage lagoon circa 1978. The general Landfill 2 area is bounded by the existing sewage lagoon to the west and north and wooded areas to the south and east (Figure 3). The landfill area slopes gently southward toward Lacamas Creek.

According to an interview performed during the EBS, landfill material was unearthed at the eastern and northern borders of the sewage lagoon (Woodward-Clyde, 1997). No description of the materials encountered during construction of the sewage lagoon was found. No additional records of the type or quantity of material that was placed in this landfill were located, and the exact dates of use are unknown. Although the EBS suggested that the landfill may have been operated from 1940 to 1950, its use apparently preceded the mid-1970s.

3.1.2 Landfill 2

Landfill 2 was discovered in approximately 1978 during excavation for the sewage lagoon. Landfill material was unearthed at the eastern and northern borders of the sewage lagoon. Description of the materials encountered during construction or records of the type or quantity of material that was placed in this landfill were not available. The EBS suggested that the landfill may have operated from 1940 to 1950 and that its use apparently preceded the mid-1970s (Woodward-Clyde, 1997).

The general Landfill 2 area is bounded by the existing sewage lagoon to the west and north and wooded areas to the south and east. The landfill area slopes gently southward toward Lacamas Creek. Although most of the site area is fairly flat, portions of the area are bumpy and uneven.

3.1.3 Landfill 3

Landfill 3 is located southeast of the existing sewage lagoon, near Lacamas Creek, and approximately 300 feet southeast of Landfill 2 (Figure 3). The location of Landfill 3 is an obvious mound of soil in an otherwise flat area on the Lacamas Creek floodplain. Lacamas Creek flows along the eastern and southern sides of Landfill 3. At its closest point, Lacamas Creek is approximately 20 feet east of the landfill area. The creek banks are nearly vertical with the top of the bank about 4 feet above stream level.

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According to the EBS, this area was described by the previous CBMR Facility Manager as having been dug out as a trench and then used as a trash burial area from the mid to late-1970s to the early to mid-1980s (Woodward-Clyde, 1997). Objects such as a refrigerator, a locker, wallboard, and paint cans were reportedly buried here. Soil was scraped from nearby and pushed onto the landfill, creating a broad mound.

3.1.4 Former Burn Area

The Former Burn Area is located immediately north of Landfill 3, to the southeast of the existing sewage lagoon (Figure 3). The area reportedly was used infrequently to burn wood and debris, although there is no record of the length of use or list of materials burned (Woodward-Clyde, 1997). This area has apparently not been used for burning material since the mid-1980s. According to the CBMR Facility Manager, debris had been piled on the site for three to four years before its removal in June 1997.

3.1.5 Buildings 1962 and 1983

Buildings 1962 and 1983 were located near the southeastern corner of the Bonneville cantonment area (Figure 3). The buildings were burned in place, and the burned debris was removed to an unknown location, leaving no visible trace of the footprints of the buildings. Based on their age and wood-frame type of construction, lead-based paint may have been used in the buildings. Lead from the paint could have been released to the soils over the life of the buildings and when they were burned. Asbestos and semi-volatile organic compounds (SVOCs) may also have been present in the composition roofing materials and other building materials.

3.1.6 Grease Pits

Three grease pits were identified at CBMR: two were located in the Bonneville cantonment north of Building 1828 (Figure 3), and one was located in the Killpack cantonment east of Building 4389 (Figure 3). Each of the grease pits consists of a gravel-filled excavation with a corrugated metal pipe extending vertically down into the gravel. The grease pits were used for disposal of waste cooking greases and oils from nearby mess halls. Use of the pits reportedly began around 1935. During an interview performed as part of the EBS, the potential for the disposal of unauthorized materials in the pits was suggested.

The two reported grease pits in the Bonneville cantonment are located north of the mess hall and associated structures. Each of the grease pits consists of a single corrugated metal pipe approximately 18 inches in diameter and are approximately 1.5 feet apart. There were no reported caps, and municipal waste was observed in both.

The grease pit at the Killpack cantonment is located approximately 10 feet east of the gravel road that runs north to south on the east side of the former mess hall building (Building 4389). The grease pit is located just inside a heavily wooded area; access is somewhat limited by the trees. The visible portion of the grease pit consists of two corrugated metal pipes, one inside the other. The outer pipe is approximately 16 inches in diameter, and the inner pipe is approximately 10 inches in diameter. The pipes are covered with a metal cap.

3.1.7 Former Sewage Pond

The Former Sewage Pond site is located south of the Bonneville cantonment area. The exact location and dimensions of the pond were not documented in the records reviewed for the EBS; however, the general area is indicated on Figure 3. According to the former facility caretaker, the pond was an unlined lagoon that, when abandoned, was pumped out and filled with clean soil derived from a local source. The pond reportedly was used for sewage disposal until 1978, when the existing sewage lagoon was constructed. The years of pond usage are not known; however, according to the facility caretaker, it may have been used for only a short period of time (Woodward-Clyde, 1997).

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Although there are no records of hazardous materials disposal in the sewage pond and no evidence of contamination has been observed in the area, the potential for contamination could not be discounted given the nature and purpose of the facility. There was also the potential for unexploded ordnance (UXO) at the site because of munitions misfires impacting outside of established range fans, unauthorized munitions disposal, or other activities. Water tends to pond in much of this area during the wet season. Lacamas Creek is approximately 200 feet southeast of the site at the closest point.

3.1.8 Hazardous Materials Accumulation Point

The Hazardous Materials Accumulation Point (Building 4476) is in the northeastern corner of the shop area in the Killpack cantonment (Figure 3). The building is a three-walled structure, built in 1990, with concrete masonry block walls and a concrete slab floor. The open front of the structure is secured with locking metal gates. The structure, also referred to as the Covered Vehicle Maintenance Storage, has been used for the storage of drums of liquids such as antifreeze and used oil and may have been used for temporary accumulation of drums for other hazardous materials. The concrete floor of the building includes a blind sump that measures approximately 2 feet square and is approximately 2 feet deep. The sump is a blind sump; no drains are present in the sump. Evidence or reports of spills were identified.

A vehicle fuel aboveground storage tank (AST), covered and within a concrete secondary containment structure, is immediately west of the building.

3.1.9 Drum Disposal Area

An anonymous former CBMR employee reported the existence of an area of buried drums located south of the Killpack cantonment and east of a gravel road south of the current storage area (Figure 3). The caller reported that pesticides, paints, and solvents were disposed of at this location. As a result of the call, a program was established to characterize the area. Drums were identified during a geophysical survey and were ultimately removed from the site.

3.1.10 Paint and Solvent Disposal Area

The existence of the Paint and Solvent Disposal Area was reported by the same anonymous former CBMR employee who reported on the Drum Disposal Area. The Paint and Solvent Disposal Area was reported to be south of the Killpack cantonment, in an open area where a tractor shed currently exists (Figure 3). The caller stated that paints, solvents, and pesticides were disposed of in this location. As a result of the call, a program was established to characterize the area. An electromagnetic (EM) survey was conducted, and several subsurface items were identified. Confirmation samples indicated COPCs were detected below cleanup levels (CULs); however, paint chips were found that were considered a characteristic hazardous waste.

3.1.11 Washrack 1

Located immediately west of the shop office (Building 4475) in the Killpack cantonment (Figure 3), Washrack 1 was used to clean vehicles from approximately 1978 to 1994. Wastewater from the washing operations was reportedly discharged directly to ground via overland flow to a nearby ditch. Potential contaminants include vehicle fluids such as gasoline, used oil, lubricants, antifreeze, and solvents used for cleaning. Soil exceeding CULs was removed from CBMR. Confirmation samples indicated the remaining COPC concentrations were below CULs.

3.1.12 Washrack 2

The Washrack 2 site (former maintenance rack site) is located in the Killpack cantonment at the northeastern corner of the shop office area, near Building 4476, on the hillside in a small, relatively level clearing (Figure 3).

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The washrack was used for vehicle cleaning, and a rack for performing vehicle maintenance, including the draining of engine fluids, was present. The rack was originally constructed of two parallel timber ramps with gravel in between. If vehicles were washed at this location, wash water would have discharged, by uncontrolled overland flow, onto the surrounding area. According to the EBS, the washrack was demolished in the early 1980s and an adjacent 275-gallon gasoline underground storage tank (UST) was removed in 1978. Interviews at the time of the EBS disclosed that evidence of a release was not observed during decommissioning (Woodward-Clyde, 1997).

3.1.13 Maintenance Pit

A maintenance pit is located underneath a concrete slab within the west end of Building 4475 in the Killpack cantonment (Figure 3). It was formerly an area where mechanics repaired and maintained vehicles. Vehicle related fluids such as fuel, used oil, lubricants, and antifreeze were potentially released to the ground. The pit was reported to be an unlined excavation, and no documentation exists concerning its depth or how long the pit was used. Soil excavation was completed at exterior areas; however, residual contamination remains beneath the building.

3.1.14 Pesticide Storage/Mixing Building (Building 1864)

Built in 1955, the Pesticide Storage/Mixing Building (Building 1864) was originally used as a fire station. Much later (1977 through 1980), it was used as an area where pesticides were stored and mixed. Fifty-five-gallon drums of 2,4,5-trichlorophenoxy acetic acid (2,4,5-T); 2,4-dicholorophenoxy acetic acid (2,4-D); and dichloro-diphenyl-trichloroethane (DDT) were reportedly stored here. A sink was used for pesticide mixing and pesticide container and applicator cleaning. This sink was discovered to discharge via a pipe to a dry well containing large drain rock to a depth of 3 feet. More recently, the building has been used as the grounds shop where equipment, vehicles, small gasoline containers, and car batteries are stored. The location of Building 1864 is indicated in Figure 3. Soil excavation was completed to remove contaminated soil in this area.

3.1.15 Aboveground Storage Tanks

Of the 26 ASTs currently at CBMR, 23 are located in the Bonneville cantonment and the remaining 3 are in the Killpack cantonment. Each of these ASTs has a 275-gallon capacity and was used since the 1920s and 1930s to store diesel fuel for heating. In July 1999, ASTs were reportedly still being used at the Camp Killpack shop office, the fire station, and the laundry. Surface sampling indicated releases from several ASTs. Soil was removed to the maximum extent practicable and confirmation sampling indicated residual contamination was below CULs, except at building T-1932. The contamination extended beneath this building foundation and additional excavation was not possible without compromising foundation integrity. Institutional controls (ICs) were put in place if future site activities included demolition of building T-1932.

3.1.16 Former CS Gas Training Building Site

The former CS Gas Training Building was located south of the Bonneville cantonment next to Range Road, between Lacamas Creek to the north and the 50-caliber firing range (Firing Range 7) to the south. This former structure was used to train troops in the use of protective equipment for chemical warfare. The primary substance reported to have been released during training exercises was CS gas (tear gas). CS is the common name for 2-chlorobenzalmalononitrile and is a military or police riot-control agent. The dates of use for the building are not documented, but the building is observed in aerial photographs from 1950, 1960, and 1970. The building was destroyed by fire in the late 1970s. The general location of the building is indicated in Figure 3.

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3.1.17 CS Gas Chamber Building (Building 1834)

A second CS Gas Building (Building 1834) is located within the Bonneville cantonment and was also used historically to train troops in chemical warfare agents (Figure 3). The chemical warfare training conducted in this building was restricted to CS gas.

3.1.18 Pesticide Storage Building (Building 4126)

Building 4126, the Pesticide Storage Building, was located on the edge of a small, flat, grassy field approximately 75 feet south of the gravel road adjacent to the Killpack cantonment (Figure 3). This building was a skid mounted shed used to store 55-gallon drums of 2,4,5-T; 2,4-D; and an unknown amount of DDT until 1977.

According to the United States Army Corps of Engineers (USACE) and CBMR personnel (Woodward-Clyde, 1997), previous uses of the Pesticide Storage Building included towing it to various locations throughout the cantonment. Wooden skids attached to the underside of the floor further suggest this type of use. Following a cleanup interim action, final confirmation samples indicated remaining COPCs were below CULs.

3.1.19 Ammunition Storage Magazines (#2950, #2951, #2953)

Ammunition Storage Magazines #2950, #2951, and #2953 are located approximately 2,000 feet northeast of the Pesticide Storage Area on the south side of the road leading into the facility from the Killpack cantonment (Figure 3). They were constructed in 1976 and used to store munitions of various types that were brought to CBMR for training purposes.

3.1.20 Underground Storage Tank (Associated with Building 4475)

A UST was formerly located approximately 10 feet east of Building 4475 (Figure 3). This UST was part of a refueling system connecting one 275-gallon diesel AST with the 300-gallon diesel UST. The UST was thought to be leaking because the fuel consumption and tank filling records did not coincide. Additionally, petroleum stains were prevalent on the ground surface around the fueling site. As a result, the 300-gallon diesel UST was removed in 1995. Contaminated soil was discovered during the UST removal.

3.2 Remedial Action Unit 2A

RAU 2A consists of 17 small arms ranges that were previously identified within the boundaries of CBMR from maps dating back to 1958 during the remedial investigation and feasibility study (RI/FS) of the small arms ranges (BCRRT, 2007) and the Cleanup Action Plan (BCRRT, 2008). A small arms range used by the Federal Bureau of Investigation (FBI) was not included in cleanup actions because it remains active. This range will be remediated by the FBI once abandoned. The 17 original small arms range designations are as follows:

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- 1,000 Foot Range, 1,000 Foot Machine Gun and Moving Target Range (1,000 foot ranges)
- 25 Meter M60 Range/Pistol Range
- 25 Meter M60 Range, Machine Gun Range
- 25 Meter M60 Range/Pistol Range
- 25 Meter Record Fire Range
- Close Combat Range
- Combat Pistol Range
- Field Fire Rifle Ranges 1 and 2
- Field Firing Range & Piston Range
- Infiltration Course (North)
- Infiltration Course (South)
- Machine Gun Range – North
- Machine Gun Range – South
- Pistol Range
- Rifle Ranges 1 & 2
- TF Range
- Undocumented Pistol Range

Additional ranges including the 500-inch Anti-Aircraft (AA)_ and an Anti-Aircraft Range are identified in later documents. Figure 4 shows the location of the firing ranges.

Lead and explosive residue, such as nitroglycerine and nitrocellulose, are the COPCs in soil in these areas from the use of lead bullets and fragments. The 17 ranges were remediated according to the RAU 2A cleanup action plan (CAP), except for RAU 2A-16 and RAU 2A-21, which correspond to the 1,000-foot ranges and field fire ranges 1 and 2, respectively. A soil cap was installed at these two locations. Figure 4 shows the location of the firing ranges. Soil cap construction details are summarized in Section 4.2.

3.3 Remedial Action Unit 2B

RAU 2B consists of two demolition areas, Demolition Area 2 (DA2) and Demolition Area 3 (DA3), shown on Figure 5.

3.3.1 Demolition Area 2

The exact location of historical activities at DA2 is unknown and site walks/field inspections have not resulted in the identification of specific suspect areas. It was reported by site workers that DA2 was historically used for destruction of unwanted ordnance. The general suspect area was identified through interpretation of historical aerial photographs and is located on the southwest-facing side slope at the head of Lacamas Creek Valley (Figure 5). The DA2 area is approximately 60 feet in diameter and forested with dense understory vegetation on mostly steep slopes. COPCs exceeding CULs were not identified at DA2.

3.3.2 Demolition Area 3

DA3 is a location where a surficial depression exists that may be an excavation or detonation crater. The location is approximately 2,000 feet upstream of the Base Boundary area in Lacamas Creek Valley where Lacamas Creek exits the site (Figure 5). The crater is approximately 20 feet in diameter and 10 feet deep. DA3 may have been used for detonation of unwanted ordnance. The crater fills with water as the water table rises throughout the winter and becomes dry in the summer as the water table drops. COPCs exceeding CULs were not identified at DA3.

3.4 Remedial Action Unit 2C

RAU 2C encompasses sitewide groundwater with an emphasis on the LF4/DA1 area. Sentinel wells installed where Lacamas Creek exits the site (Base Boundary at Lacamas Creek) are included in the analysis of sitewide groundwater to ensure COPCs are not exiting the site. Monitoring wells associated with LF4/DA1 and the Base

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Boundary are indicated on Figure 6. The RI/FS is currently being prepared for the RAU 2C to inform the selection of remedy alternatives to address the COPCs located at the LF4/RA1.

Groundwater samples collected at RAU 1, 2A, and 2B did not identify detections of COPCs; therefore, RAU 2C focuses on groundwater at LF4/DA1. Quarter annual groundwater sampling at the Base Boundary at Lacamas Creek (Base Boundary) wells related to RAU 2C are used to verify COCs identified at LF4/DA1 remain localized to the LF4/DA1 area,

LF4/DA1 consists of approximately 1.82 acres located approximately 1,800 feet north of the CVF and 2.5 miles northeast of where Lacamas Creek exits Camp Bonneville. LF4/DA1 is located approximately 1 mile northeast of the Camp Bonneville cantonment (Figure 2).

The geology beneath LF4/DA1 consists of 45 to 65 feet of alluvial soils and weathered bedrock zone, underlain by competent andesitic bedrock. The alluvial and weathered bedrock soils consist of silty clay to clayey silt. The alluvium and weathered bedrock have relativley low permeabilty that influence the hydraulic conductity and groundwater movement. Groundwater in the alluvium flows radially at LF4/DA1 toward the west, northwest, and southwest following topographic contours. The hydraulic gradient values collected at the site indicate a vertical component to groundwater flow at the eastern boundary of the LF4/DA1 location as upland precipitation enters the alluvium aquifer. The predominant component of groundwater flow away from LF4/DA1 is lateral with potential surface discharge to North Fork Lacamas Creek (NFLC). The andesitic bedrock acts as a semi-confining layer with limited groundwater infiltration and movement.

A series of site investigations, interim soil removal action, and groundwater monitoring was completed at CBMR with a focus on LF4/DA1 from 1998 to 2024. The initial SI was conducted in 1998 and a subsequent investigation in 2001 to evaluate the potential for contamination resulting from past uses of RAU 2C. The investigations were directed primarily at evaluating potential environmental impacts from waste disposal within the landfill, but also considered potential impacts from activities related to use of the site as an OB/OD ordnance demolition area. The LF4/DA1 SI consisted of UXO avoidance, geophysical surveying, surface soil sampling, drilling, and subsurface soil sampling, monitoring well installation and development, and groundwater sampling (URS, 2003). The area of buried debris disposal was identified to be approximately 120 by 200 feet during the geophysical survey. Groundwater levels during the July 2001 sampling event ranged from 14 to 22 feet bgs.

Groundwater has been sampled from multiple wells at Camp Bonneville from 1998 to 2024. Two areas associated with the RAU 2C sitewide groundwater are currently being monitored, which include LF4/DA1 and Base Boundary. Wells have been installed in these areas to monitor shallow and deeper groundwater zones to maximum depths of approximately 75 feet bgs. While COPCs (RDX, perchlorate, and 1,1-dichloroethene) have been detected at LF4/DA1, their levels have decreased significantly. The COPCs above cleanup criteria in groundwater are localized to the area near the former LF4/DA1 excavation area. Groundwater flow to potential receptors is also monitored in the three on-site drinking water wells. No COPCs have been detected in drinking water wells above laboratory reporting limits (MRLs). The impact of the COPCs on groundwater is geographically constrained to the LF4/DA1 area. This localization influences potential cleanup strategies, focusing remediation efforts directly at or near the former LF4/DA1 site.

The potential for groundwater discharge to surface water through seeps at North Fork Lacamas Creek adjacent to the LF4/DA1 area has been inspected as a potential pathway. These potential seeps have routinely been field inspected and have not been observed since at least 2017. Surface water samples are collected from NFLC on an annual basis at designated locations, with the third quarter 2024 sample event being the

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most recent. There have been no detections of COPCs above the MRL in the surface water samples since periodic sampling started in 2013.

The conceptual site model (CSM) for RAU 2C indicates that potential human receptors include current and future on-site and off-site workers, as well as future recreational users of the site. Although localized groundwater contamination exists, the pathway for exposure through groundwater use by current on-site receptors is considered incomplete. This is because the groundwater currently accessed for drinking on-site comes from three wells drilled to depths of 364, 105, and 516 feet bgs. These wells, located in a deeper, hydrogeological separate aquifer, show no detectable contaminants and are isolated from the shallow and deep monitoring wells at LF4/DA1.

Given the low groundwater recharge rate in the alluvial formations, shallow groundwater is not anticipated to be a viable drinking water source in the future. Therefore, the alluvial groundwater pathway remains incomplete for both current and future drinking water use scenarios (URS, 2003)

Since the groundwater beneath LF4/DA1 may discharge to NFLC, the CSM considers surface water use a potentially complete exposure pathway for future on-site recreational users and workers. Additionally, while ingestion of fish exposed to site contaminants is a potential pathway, it is deemed negligible because the contaminants present in LF4/DA1 groundwater do not significantly bioaccumulate in fish tissue (URS, 2003). Furthermore, there have been no recent detections of COPCs in surface water samples since 2011; therefore, the exposure pathway to surface water is not deemed complete.

Potential primary ecological receptors at CBMR include terrestrial animals that may be exposed to COPCs in undisturbed surface soil and surface water. Terrestrial plants and waterfowl could also be exposed to COPCs in surface soil and surface water. Terrestrial animals and plants, benthic invertebrates, aquatic plants, and fish could be exposed to COPCs in surface water. The COPCs at the site do not appreciably bioaccumulate in terrestrial or aquatic biota and have little potential to biomagnify through a food web via consumption of contaminated prey (URS, 2003). The impacted soil is defined to be below 15 feet bgs at LF4/DA1, which further reduces potential exposure to ecological receptors.

3.5 Remedial Action Unit 3

The USACE completed site inspection, review of historical records, and interviews of former CBMR personnel and generated a final archives search report (ASR) dated July 1997. The ASR concluded that the potential for MEC exists throughout a majority of the CBMR installation. The types of MEC range from small arms ammunition to 155-millimeter (mm) artillery rounds, up to 4.2-inch mortars, 2.36-inch and 3.5-inch rockets, and hand and rifle grenades. RAU 3 is not associated with COPCs; rather, it involves identification and removal of MEC.

The areas recommended by the ASR for further assessment included the identified ranges and safety fans, mortar positions, artillery firing points, demolition areas, and the central impact area (USACE, 1997). These areas are described below. Firing points and target area are shown in Figure 7.

3.5.1 Target Areas

Three former training range/target areas were located in the southeast area of the site, east of the CVF. The areas were composed of a hand grenade range, a rifle grenade range and target area, and a 3.5-inch rocket range and target area, with a total combined area of approximately 7.6 acres (Weston, 2015). Lead contamination from use as a rifle range was previously discussed and is associated with RAU 1; the purpose

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here is the use of the area for MEC. These areas included target area features, such as automobile/appliance targets, engineered wooden structures, and expended MEC items located downrange.

3.5.2 Central Impact Target Area

The CITA is shown in Figure 7 and includes multiple artillery and mortar practice targets. This area was initially determined by the Army to be roughly 465 acres and now also includes 107 acres in the CITA North Expansion Area. The CITA includes multiple target areas and surrounded by non-target areas. While the target areas received the bulk of the munitions, the non-target areas were within the range fans of the artillery and mortar rounds. The entire CITA (both target and non-target areas) is designated as No-Reuse Access Restricted.

3.5.3 Open Burn/Open Demolition Areas

The OB/OD MEC sites consist of three locations at CBMR, known as Demolition Areas 1, 2 and 3 (DA1 through DA3). DA1 is in the northwest quadrant of the site, east of Little Elkhorn Mountain; DA2 is located adjacent to and west of the CITA; while DA3 is in the southwest quadrant of the CBMR, adjacent to Lacamas Creek and the natural gas pipeline.

In 2004, the USACE physically removed the contents and associated contaminated soils at DA1, as part of the Landfill 4 Interim Removal Action (Tetra Tech, 2005). MEC at DA2 and DA3 were address as part of the RAU1 cleanup activities for these areas.

3.5.4 Firing Points

The Firing Points at CBMR consist of six mortar firing positions, nine artillery firing positions, one rifle grenade range firing point, one 3.5-inch rocket range firing point, and one M203 40-mm HE Grenade Range (Range 4). Firing Points are located near the apex of each range.

3.5.5 Roads and Trails

There are approximately 46 miles of roads and trails throughout CBMR (BCRRT, 2007). The roads and trails have the same munitions related historical use and characteristics as the Maneuver Areas. Roads and trails are shown on Figure 7. These areas have been cleared of MEC with a 20 foot buffer on either side.

3.5.6 Wildlife Management Area

The Wildlife Management Area (WMA) is composed of approximately 2,188 acres and includes the former Washington State Department of Natural Resources (DNR) leased lands. The WMA does not include the CITA. Most of the WMA overlies one or more Range Safety Fans.

3.5.7 Central Valley Floor and Associated Wetlands

The CVF and associated wetlands (adjacent to Lacamas Creek) have a gentle topographic slope, and low vegetative cover. These areas cover approximately 445 acres along the Lacamas Creek valley floor.

Wetlands extend throughout the CVF along the Lacamas Creek basin and total roughly 110 acres. These wetlands contain sensitive ecological habitats, easily disturbed soils, and flora and fauna that require additional regulatory management. MEC clearance did not occur in sensitive areas (wetlands or cultural resource locations) to prevent damage to these resources.

4 REMEDIAL ACTIONS

The following sections describe the cleanup actions completed at each RAU or the basis for No Further Action (NFA) finding if cleanup actions were not required. Engineering controls (EC) or ICs, and associated operations and maintenance requirements, are summarized when applicable.

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COPCs were identified sitewide and include the following:

- Lead
- Total petroleum hydrocarbons (TPH)
- Volatile organic compounds (VOCs)
- SVOCs
- Polychlorinated biphenyls (PCBs)
- Nitroaromatic and nitramine explosives, inclusive of pentaerythritol tetranitrate (PETN) and picric acid (PA)

Additional COPCs are listed at specific areas, such as pesticides and herbicides. Tables 1 through 5 list the maximum concentration of COPCs detected in soil and/or groundwater at RAU 1, 2A, and 2B. Where applicable, COPC concentrations remaining following remedial action are also included. CULs at the time of implementation of the RAU's CAP and current CULs for individual analytes are listed.

4.1 Remedial Action Unit 1

RAU 1 included 20 sites that were primarily identified during the 1997 EBS (Woodward-Clyde, 1997). Independent investigation and remediation actions were undertaken between 1997 and 2003. Site investigation data demonstrated that the concentrations of target analytes in 10 of the sites within RAU 1 did not exceed applicable CULs and did not require further investigation or remedial action. The locations of the 20 sites included in RAU 1 are shown in (Figure 3).

The remaining 10 sites, including the Drum Disposal area, the Paint and Solvent Disposal area, Washrack 1, the Maintenance Pit, the Pesticide Storage and Mixing area, the Aboveground Fuel Storage Tank areas, the CS Gas Training Building, Pesticide Storage Building 4126, the Ammunition Storage Bunkers and the UST associated with Building 4475 required remedial action through excavation and removal of debris and contaminated media. A 2004 CAP (URS, 2004) summarized each of the cleanups that were completed and identified two sites where cleanup activities were completed but CULs could not be achieved. A brief description of the remedial actions and rationale for NFA are listed below in Section 4.1.1.

In 2008, Ecology determined that the independent remedial actions conducted at, and restrictive covenants implemented at RAU 1 where necessary, were sufficient to meet the substantive requirements in MTCA and that NFA was necessary (Ecology, 2008). Additional cleanup work was not required under the 2012 APPCD.

Key documents include:

- *Final Cleanup Action Plan - Remedial Action Unit1* (URS, 2004)
- *No Further Action Determination for RAU 1* (Ecology, 2008)
- *Final Closure Report, Environmental Restoration, Pesticide Building #4126 and Ammunition Bunkers #2953, #2951, and #2950* (Gary Struthers Associates, 2001)
- *Environmental Restoration Multi-Sites Camp Bonneville, Washington* (Struthers, 2000)
- *Multi-Site Investigation Report Camp Bonneville, Washington* (Shannon and Wilson Team, 1999)

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4.1.1 Remedial Action Unit 1 Remedy Implementation

A brief summary of investigative and remedial actions for each of the 20 RAU 1 sites is below. Site investigation was primarily completed between 1997 and 2000. Cleanup and remediation at areas selected for further action was primarily completed in 2000 and 2001.

4.1.1.1 Cleanup Actions at Landfill 1

- UXO avoidance/screening surveys were completed in December 1997 north and northwest of the sewage lagoon, where the historic landfill was reportedly located. A second search of the area was completed using metal-detecting equipment.
- No evidence of the landfill was identified in either search, and it was determined that the reported landfill was likely to be a small debris pile associated with a former residence was observed in the area (URS, 2004).
- Cleanup actions were not required for Landfill 1.

4.1.1.2 Cleanup Actions at Landfill 2

- The landfill was located using UXO, EM, and ground-penetrating radar (GPR) surveys in 1997.
- One undetonated 2.76-inch light anti-tank weapon was identified and later removed and disposed of by the Fort Lewis Explosive Ordinance Detachment.
- A soil gas survey consisting of 64 sample locations within the landfill area was completed in 1997. Soil gas samples were analyzed for concentrations of halogenated hydrocarbons and benzene, toluene, ethylbenzene, and total xylenes (BTEX) compounds as a screening tool to determine whether VOCs may be present and emanating from the landfill. No target analytes were detected above laboratory reporting limits, except chloroform in two samples, which appeared to have been due to laboratory contamination (URS, 2004).
- Three soil borings were drilled outside the estimated perimeter of Landfill 2 in July 1998 and were converted to temporary monitoring wells. Groundwater was encountered at depths of 2.6 and 2.9 feet in the downgradient monitoring wells. The upgradient monitoring well was dry; however, evidence of shallow seasonal groundwater was observed.
- One soil sample collected from each boring was analyzed for TPH, VOCs, SVOCs, PCBs/pesticides, nitroaromatic and nitramine explosives, PETN, PA, cyanide, total organic carbon (TOC), and priority pollutant metals. With the exception of metals, no target analytes were detected in any of the soil samples. Eleven of the PPL metals were detected in all soil samples collected at Landfill 2, but at concentrations below CULs. Selenium and mercury were not detected above laboratory reporting limits. Arsenic and chromium concentrations in all samples exceeded the regulatory CULs; however, the concentrations did not exceed expected regional background levels.
- Groundwater samples were collected from both downgradient monitoring wells; however, the upgradient monitoring well was dry. Groundwater samples were analyzed for TPH, VOCs, SVOCs, PCBs/pesticides, nitroaromatic and nitramine explosives, PETN, PA, cyanide, TOC, and priority pollutant metals. One VOC, naphthalene, was detected in one groundwater sample at a concentration below CULs. Nine PPL metals were detected in one or both groundwater sample; however, all concentrations were below CULs.
- Cleanup actions were not required for Landfill 2.

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4.1.1.3 Cleanup Actions at Landfill 3

- Landfill 3 was identified in the area of a dirt mound approximately 50 feet in width and 70 feet in length. UXO and EM surveys performed in 1997 confirmed that the landfill area coincided with the mound. Non-UXO metallic debris was found at and near the landfill surface.
- A December 1997 soil gas survey included 11 soil gas samples collected in the landfill area. Soil gas samples were analyzed for concentrations of halogenated hydrocarbons and BTEX compounds as a screening tool to determine whether VOCs may be present and emanating from the landfill. No target analytes were detected above laboratory reporting limits.
- Five soil borings were drilled outside the estimated perimeter of Landfill 3 in July 1998 and four of the borings were converted to temporary monitoring wells. Three of the monitoring wells were placed downgradient of Landfill 3 and the remaining well was placed upgradient (URS, 2004).
- One soil sample collected from the capillary fringe in each boring was analyzed for TPH, VOCs, SVOCs, PCBs/pesticides, nitroaromatic and nitramine explosives, PETN, PA, cyanide, TOC, and priority pollutant metals. With the exception of PPL metals, no target analytes were detected in any of the soil samples. Twelve of the PPL metals were detected in some or all soil samples collected at Landfill 3, but at concentrations below CULs. Mercury was not detected above laboratory reporting limits. Arsenic and chromium concentrations in all samples exceeded the regulatory CULs; however, the concentrations did not exceed expected regional background levels.
- Groundwater samples were collected from each of the four monitoring wells. Groundwater samples were analyzed for TPH, VOCs, SVOCs, PCBs/pesticides, nitroaromatic and nitramine explosives, PETN, PA, cyanide, TOC, and priority pollutant metals. One VOC, naphthalene, was detected in one groundwater sample, at a concentration below CULs. Ten PPL metals were detected in one or both groundwater samples; however, all concentrations were below regulatory CULs.
- Cleanup actions were not required for Landfill 3.

4.1.1.4 Cleanup Actions at Former Burn Area

- The former burn area contained surface debris, which was removed prior to a 1997 site investigation to assess potential impacts to surface and near surface soils.
- Three sampling locations were placed within the perimeter of the former burn area, and one sample each placed upgradient and downgradient of the area. Two soil samples were collected from each sampling location to assess surface soil conditions (at a depth of 0 to 1 foot) and near-surface soil conditions (at a depth of 1 to 2 feet). The upgradient sample was saturated at a depth of 1.2 feet (URS, 2004).
- Each of the soil samples were analyzed for TPH, VOCs, SVOCs, PCBs/pesticides, nitroaromatic and nitramine explosives, PETN, PA, cyanide, TOC, and priority pollutant metals. Except for VOCs and PPL metals, no target analytes were detected in any of the soil samples. VOC detections included xylenes, toluene and acetone, but all concentrations were below regulatory CULs. Ten of the PPL metals were detected at concentrations below CULs. Of these 10, thallium and zinc exceeded expected background levels. Arsenic and chromium concentrations in all samples exceeded the regulatory CULs; however, the concentrations did not exceed expected regional background levels.
- Cleanup actions were not required for the former burn area.

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4.1.1.5 Cleanup Actions at Burned Buildings 1962 and 1983

- Approximate former building footprints were located using a magnetometer and aerial map survey.
- A soil survey completed in February 1998 included 15 surface and near surface soil samples in and around the estimated building footprints. Ten of the soil samples were collected from five sampling locations within the former building footprints. The remaining five samples were collected from locations approximately 50 feet from the estimated former building locations (URS, 2004).
- Each of the soil samples was analyzed for SVOCs, asbestos, and lead. SVOCs and asbestos were not detected in any of the 15 samples collected. Lead was detected in all the soil samples; however, none of the concentrations exceeded regulatory CULs.
- Cleanup actions were not required for burned buildings 1962 and 1983.

4.1.1.6 Cleanup Actions at Camp Bonneville Grease Pits

- A July 1998 soil investigation was completed to assess potential subsurface impact from the grease pits. The pits were lined with large drain rock and contained debris, which prevented drilling directly through the grease pits; therefore, two soil borings were placed adjacent to the grease pits. Groundwater was not encountered in the borings; however, soil staining indicated that seasonal high groundwater may be as shallow as 3.5 feet in the grease pit area.
- Two soil samples were collected from each boring at depth intervals of 3 to 5 feet and 5 to 7 feet. The four soil samples were analyzed for TPH, SVOCs, PCB/pesticides, VOCs, and PPL metals. TPH, VOCs and PCBs were not detected at concentrations above laboratory reporting limits. Eight of the PPL metals were detected in some or all soil samples at concentrations below regulatory cleanup limits, including copper and barium in one soil sample that exceeded expected background levels.
- Lindane, a pesticide, was detected in soil at concentrations above CULs in one location in the grease pits. Lindane is not associated with cooking greases and was detected in only one of five samples (GP-SB02-02) at a concentration of 2.0 milligrams per kilogram (mg/kg), which is below the historical MTCA Method A concentration and minimally exceeds the historical Method B cleanup level. The source of Lindane was not identified (Shannon and Wilson, 1999).
- Cleanup actions were not required for the Camp Bonneville grease pits.

4.1.1.7 Cleanup Actions at Camp Killpack Grease Pit

- An August 1998 soil investigation was completed to assess potential subsurface impact from the grease pit. The pit was lined with large drain rock and contained debris, which prevented drilling directly through the grease pits. One soil boring was placed adjacent to the grease pits. Groundwater was not encountered in the boring; however, soil coloration indicated that seasonal high groundwater may be as shallow as 3.5 feet in the grease pit area (URS, 2004).
- Two soil samples were collected from the boring at depth intervals of 3 to 5 feet and 5 to 7 feet. The soil samples were analyzed for TPH, SVOCs, PCB/pesticides, VOCs, and PPL metals. VOCs and PCBs were not detected at concentrations above laboratory reporting limits. TPH was detected in one soil sample; however, the chromatographic profile was not consistent with fuel standards. Eight of the PPL metals were detected in some or all soil samples at concentrations below regulatory cleanup limits, including barium in one soil sample that exceeded expected background levels. Chromium was detected at a concentration exceeding CULs but below expected background levels.

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- Arsenic was detected in one soil sample at a concentration above CULs; however, the sample concentration was close to the background values (7.9 mg/kg versus 7 mg/kg). The remaining samples contained concentrations of arsenic below background values. Although the arsenic concentration slightly exceeded CULs in the one soil sample, the concentration at the Camp Killpack grease pit is extremely localized and because of incomplete exposure pathways, the concentrations were considered to not pose a risk to human health or the environment.
- Cleanup actions were not required for the Camp Kilpatrick grease pit.

4.1.1.8 Cleanup Actions at Former Sewage Pond

- The approximate limits of the former sewage pond were located using UXO avoidance screening and EM surveys. GPR was not used due to uneven terrain (URS, 2004).
- A soil investigation completed in July 1988 included five soil borings to characterize soil conditions in and around the former sewage pond area. Three sample borings were placed within the former pond area and drilled into volcanic bedrock. One soil boring each was placed upgradient and downgradient of the Former Sewage Pond and converted into temporary monitoring wells. Groundwater was encountered in the monitoring wells at depths of 4 to 5.5 feet.
- Three soil samples were collected from each boring, with the uppermost sample collected at the shallower of either 4 to 5 feet in depth or at the capillary fringe. The soil samples were analyzed for TPH, SVOCs, PCB/pesticides, VOCs, and PPL metals. Two VOCs, acetone and carbon disulfide, were detected at concentrations below regulatory limits and were believed to be caused by laboratory cross-contamination. Seven of the PPL metals, including arsenic and lead, were detected in one or both groundwater soil samples at concentrations below regulatory cleanup limits. Chromium was detected at a concentration exceeding CULs but below expected background levels. Arsenic was detected at a concentration exceeding CULs but similar to expected background levels. No other target analytes were detected above laboratory reporting limits.
- Groundwater samples were collected from each of the two monitoring wells at depths of 4 to 5.5 feet. Groundwater samples were analyzed for TPH, VOCs, SVOCs, PPL metals, and water quality parameters. TPH, VOCs, and SVOCs were not detected above laboratory reporting limits in either sample. Ten PPL metals were detected in one or both groundwater samples; however, all concentrations were below regulatory CULs. Water quality parameters were similar between the two wells; cyanide, nitrates and orthophosphates were not detected in either groundwater sample.
- Cleanup actions were not required for the former sewage pond.

4.1.1.9 Cleanup Actions at Hazardous Materials Accumulation Point

- A February 1990 soil investigation included collection of one surface soil sample at each of two locations directly in front of the Hazardous Building Materials Accumulation Building.
- The soil samples were analyzed for TPH, SVOCs, PCB/pesticides, and PPL metals. Pesticides and PCBs were not detected above laboratory reporting limits. TPH was detected at concentrations below regulatory CULs. One SVOC was detected, likely due to laboratory contamination. Nine PPL metals were detected at concentrations less than CULs and expected background levels. Cadmium was detected at a concentration that exceeded background levels but was below regulatory CULs. Arsenic was detected a concentration exceeding regulatory CULs but below expected background levels.
- The concrete sump was pumped and cleaned for further inspection. The sump contents were pumped into a 55-gallon drum. A waste characterization sample of the sump contents was collected and analyzed for

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TPH, SVOCs, VOCs, PCBs/pesticides, and metals. The substance appeared to be a mixture of weathered hydrocarbons. The contents of the drum were disposed of as non-RCRA waste. Following cleaning, the concrete sump was inspected and determined to be in good condition (URS, 2004).

- Cleanup actions were not required for the hazardous materials accumulation point.

4.1.1.10 Cleanup Actions at Drum Disposal Area

- An EM study and limited subsurface investigation were conducted in 1998 to delineate the extent of the buried drums and potentially contaminated surrounding soils. Drum contents were unknown; therefore, surrounding soils were analyzed for a wide range of analytes.
- Site investigation soil samples contained petroleum hydrocarbon concentrations less than CULs. Detected VOC concentrations were below CULs, and no SVOCs, PCBs, pesticides, or explosive compounds were detected in soil samples. Except for antimony, detected metals concentrations were less than background concentrations. The antimony concentration was below CULs.
- Excavation of surface and subsurface debris was conducted in June 2000. During excavation, contaminated soil was encountered, and a solvent-like odor was observed. Fieldwork was discontinued to allow for additional site investigation and excavation of test pits to determine the source and extent of the solvent-like odor.
- In June 2000, the area of the solvent-like odor was investigated by excavation of 26 test pits. In addition, rainwater flowed into the excavations from the surrounding area. The test pits had concentrations of toluene, methoxychlor, and metals exceeding CULs in soil samples. Naphthalene, ethylbenzene, toluene, and lead exceeded CULs in samples of rainwater in the excavation.
- An additional EM survey completed in June 2000 revealed 13 anomalies, each of which was evaluated by trenching with a backhoe. One of the excavations contained paint cans, paint, and miscellaneous debris. The other evaluated anomalies appeared to be the result of pipes, reinforcement bar, barbed wire, and scrap metal.
- Following excavation of the test pits and waste characterization in 2000, approximately 110 tons of soil and metallic and nonmetallic debris were removed from the former drum storage area and transported to a Subtitle D landfill for disposal. Post-excavation soil samples indicated that the concentrations of target analytes were either not detected or were below CULs (URS, 2004).
- Following site remediation, additional cleanup actions were not required for the drum disposal area.

4.1.1.11 Cleanup Actions at Paint and Solvent Disposal Area

- An EM study and limited subsurface investigation were conducted in 1998 to delineate the extent of the buried drums and metal debris. Two disposal areas were identified (URS, 2004).
- A soil investigation completed in 1998 included two borings next to each of the two disposal areas. One soil sample was collected from each of the four borings at a depth estimated to be below the base of the debris. Laboratory analysis of each soil sample included TPH, VOCs, SVOCs, PCBs/pesticides, explosive compounds, and PPL metals. TPH was detected at concentrations less than the regulatory CULs. PPL metals were detected in all samples at concentrations less than regulatory CULs, except for arsenic and chromium; however, their concentrations were below expected regional background levels. No other target analytes were detected above laboratory reporting limits.
- Site cleanup was conducted in June 2000 and consisted of removing wiring, paint debris, and paint chips found in near surface soils. The soil contaminated with paint chips was determined to be

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hazardous waste and was transported to the Chemical Waste Management facility in Arlington, Oregon, for proper disposal. Remaining soil and debris were designated nonhazardous and were transported to the Hillsboro Landfill for disposal.

- Post-excavation soil characterization was determined to be unnecessary since pre-excavation soil sampling indicated that concentrations of target analytes were below CULs.
- Following site cleanup, no further cleanup action was required for the paint and solvent disposal area.

4.1.1.12 Cleanup Actions at Washrack 1

- A 1998 soil investigation included the collection of two surface soil samples and three subsurface samples from a boring placed in the Washrack 1 area to a depth of 11.5 feet.
- The two surface soil samples were analyzed for TPH, SVOCs, PCBs/pesticides, and PPL metals. The three subsurface samples were analyzed for TPH, VOCs, SVOCs, and PPL metals. TPH was detected in four of the five soil samples, including a surface sample concentration that exceeded regulatory CULs. PPL metals were detected in all samples, including lead concentrations in one surface soil sample that exceeded both background level and regulatory CULs. Arsenic and chromium concentrations exceeded regulatory CULs but were below expected background levels in all samples. No other metals were detected at concentrations above both CULs and expected regional background levels. No other target analytes were detected at concentrations above laboratory reporting limits.
- Site cleanup commenced in June 2000 and included removal of washrack timbers and soil excavation to a depth of 3.5 feet over the footprint of the building. Post-excavation soil samples collected from the excavation cavity revealed concentrations of TPH and lead exceeding regulatory CULs. An additional 3 feet of soil was removed from the excavation sidewalls and floor. Subsequent soil confirmation sampling indicated that TPH and lead levels were below regulatory cleanup levels (URS, 2004).
- Following remediation, additional cleanup actions were not required for Washrack 1.

4.1.1.13 Cleanup Actions at Washrack 2

- A 1998 soil investigation included the collection of two surface (at a depth of 0 to 1 foot) and two near-surface (at a depth of 1 to 2 feet) soil samples in the Washrack 2 area (URS, 2004).
- The four soil samples were analyzed for TPH, SVOCs, and PPL metals. TPH was detected above laboratory detection limits in all four samples, but concentrations were below regulatory CULs. PPL metals were detected in all samples, but none were detected both above regulatory CULs and expected background levels.
- Cleanup actions were not required for Washrack 2.

4.1.1.14 Cleanup Actions at Building 4775 Maintenance Pit

- A 1998 soil investigation completed adjacent to the former Maintenance Pit in Building 4775 included the collection of six soil samples from two soil borings.
- Soil samples were analyzed for TPH, VOCs, SVOCs, chlorinated pesticides, and PPL metals. TPH, VOCs, SVOCs, and chlorinated pesticides were detected at concentrations below CULs. PCBs were not detected. PPL metals were detected in some or all samples, but concentrations were below regulatory CULs, with the exception of arsenic, chromium, and lead. Arsenic and chromium concentrations were

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below expected regional background levels but lead concentrations in one sample exceeded both CULs and background levels.

- In June 2000, shallow soils were excavated to a depth of 0.8 feet along the northern border of Building 4775 (URS, 2004). Post-excavation soil samples revealed elevated concentrations of diesel and heavy-range petroleum and lead exceeded regulatory CULs. Additional soil removal to a depth of 2.7 feet was completed and post-excavation soil samples indicated that concentrations of target analytes were below regulatory CULs. All excavated soil was characterized as nonregulated waste and disposed of at the Hillsboro landfill.
- Assessment of soil conditions directly beneath the maintenance pit was not possible due to continued use of Building 4775. Target contaminants are suspected to be present directly below the existing Maintenance Pit Building, although this could not be confirmed without demolishing the building.
- Due to uncertainty about soil conditions beneath Building 4775, ICs were implemented for this building requiring additional investigation and remediation of petroleum-contaminated soils in the event of redevelopment (Ecology, 2008).
- Following site remediation and implementation of ICs, no additional cleanup actions were required for the former Maintenance Pit at Building 4475.

4.1.1.15 Cleanup Actions at Pesticide Storage and Mixing Building 1864

- Investigation of surface soil, subsurface soil, and groundwater was completed to assess potential impacts from spillage during mixing and use of pesticides. Surface soil samples were collected from two locations, and subsurface samples were collected at three depth intervals in each of three borings in the vicinity of Building 1864. Monitoring wells were installed upgradient and downgradient of the site.
- Surface and sub-surface soil samples collected were analyzed for TPH, VOCs, SVOCs, chlorinated pesticides, chlorinated herbicides, PCBs, organophosphorus pesticides, and PPL metals. TPH was detected in all soil samples at concentrations below regulatory CULs. With the exception of lead, cadmium, and chromium, all target analytes were either not detected above laboratory reporting limits or were detected at concentrations below regulatory CULs. In surface samples, lead concentrations exceeded CULs. Cadmium and chromium were detected in subsurface samples at concentrations exceeding CULs; however, only the cadmium concentration also exceeded expected regional background levels.
- One groundwater sample was collected from each monitoring well and was analyzed for TPH, VOCs, SVOCs, chlorinated pesticides, chlorinated herbicides, PCBs, organophosphorus pesticides, and PPL metals. No target analytes were detected at concentrations exceeding regulatory CULs.
- Soil excavation was conducted to remove contaminated soils in June 2000. All soils were characterized as nonregulated waste and were transported to the Hillsboro Landfill for disposal. Initially, soil excavation to a depth of 2.5 feet was completed; however, confirmation soil sampling revealed remaining concentrations of lead exceeded the regulatory CULs. Additional excavation was completed in August 2000 (URS, 2004). Post-excavation confirmation soil samples indicated that remaining lead concentrations were below CULs.
- Additional cleanup actions were not required at the Pesticide Storage and Mixing Building.

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4.1.1.16 Cleanup Actions at Aboveground Storage Tank Areas

- Visual inspections of twenty-three 275-gallon heating oil ASTs located in the Bonneville cantonment and three 275-gallon heating oil ASTs in the Camp Kilpatrick cantonment were completed to identify evidence of leaks and spills. The visual inspections indicated possible localized impacts to surface soils beneath eight of the ASTs (URS, 2004).
- The eight ASTs identified for additional assessment were associated with Buildings T-1833, T-1837, T-1828, T-1940 (Day Room), T-1942, and T-1980, and two ASTs at Building T-1922 (Struthers, 2000).
- In March 1998, one surface soil sample was collected beneath each of the eight ASTs identified during the visual inspection. Soil samples were analyzed for TPH and concentrations of diesel and high-weathered diesel exceeding regulatory CULs were identified in seven of the eight samples collected.
- Petroleum-contaminated soil beneath the ASTs was excavated at depths ranging from 2 to 5 feet based on field indicators. One composite sample was collected from each excavation cavity and submitted for TPH analysis. Elevated TPH concentrations were identified in three of the excavation cavities. Additional soil excavation was completed in only two of the three excavation cavities due to structural concerns associated with continued excavation at Building T-1932. Following additional excavation, laboratory analysis indicated that TPH concentrations were below regulatory CULs. All heating oil-contaminated soil was characterized as nonregulated waste and disposed at the Hillsboro landfill.
- Petroleum-contaminated soil remains in place beneath Building T-1932. Excavation of this soil would have required demolition or relocation of the building. The maximum residual concentration identified was a diesel-range organic concentration of 2,690 mg/kg adjacent to Building T-1932. Soil conditions beneath Building T-1932 have not been characterized, but there is likely to be a small pocket of heating oil-contaminated soil present. Previous reports conservatively estimate a maximum of 33 cubic yards (cy) of petroleum-contaminated soil may be encountered during future redevelopment.
- ICs were implemented for this building and future redevelopment will require additional investigation and remediation of petroleum-contaminated soils. Following site remediation and implementation of ICs at Building T-1932, further cleanup actions were not required for the AST areas at the Camp Bonneville and Camp Kilpatrick cantonments (Ecology, 2008).

4.1.1.17 Cleanup Actions at CS Gas Training Building

- A soil investigation at the CS Gas Training Building included five soil borings. One surface sample and one subsurface sample were collected from each boring.
- All soil samples collected were analyzed for CS gas and cyanide. Additionally, four surface samples and one subsurface sample were analyzed for SVOCs and lead. CS gas and cyanide were not detected above laboratory reporting limits in any of the samples analyzed. SVOCs were detected, but at concentrations below regulatory CULs. Lead was detected in two samples exceeding both the regulatory CUL and expected regional background levels.
- In June 2000, lead-contaminated soil was excavated across the CS Gas Training Building site to a depth of 2 feet bgs. Post-excavation soil sampling indicated concentrations of lead exceeding CULs. The excavation was extended to 3 feet in depth; one post-excavation soil sample indicated that remaining lead concentrations were below regulatory CULs (URS, 2004). Excavated soil was classified as nonregulated waste and was transported to the Hillsboro Landfill for disposal.
- Following remediation, additional cleanup actions were not required at the CS Gas Training Building.

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4.1.1.18 Cleanup Actions at CS Gas Chamber Building 1834

- In 1997, a pre-demolition survey was conducted at Building 1834, including investigation of near-surface soil conditions.
- One surface sample was collected beneath the foundation of Building 1834 and one surface sample was collected approximately 10 feet downwind of the building. Both samples were analyzed for the presence of CS gas and associated breakdown products, which were not detected at concentrations above laboratory reporting limits in either sample. Lead concentrations were screened in the field using an x-ray fluorescence (XRF), and one soil sample was sent for laboratory analysis. All XRF readings showed concentrations below the equipment detection limit of 93 mg/kg (URS, 2004). One soil sample was sent for laboratory analysis for lead and was determined to have a concentration of 17 mg/kg, below regulatory CULs.
- Building materials were tested for lead and asbestos. No asbestos-containing material (ACM) was discovered. Lead concentrations were below CULs in soil samples and below Washington Dangerous Waste levels in building materials. Building 1834 was demolished and the debris was disposed of in a municipal landfill.
- Cleanup actions were not required at the former CS Gas Chamber Building 1834.

4.1.1.19 Cleanup Actions at the former Pesticide Storage Building 4126

- In June 2000, a supplemental site investigation was conducted. The building contents were transferred to Pesticide Building 1864, Building 4126 was demolished, and 1 foot of soil was removed. Two soil samples and one flooring sample were collected and analyzed for chlorinated pesticides and herbicides, PCBs, petroleum hydrocarbons (gasoline- and diesel-range), and metals.
- Pesticides and herbicides were detected in some or all soil samples at concentrations below CULs. PCBs were not detected at concentrations above laboratory reporting limits. Gasoline-range TPH was not detected in any samples collected; diesel-range TPH was detected at concentrations below CULs in soil samples, and above CULs in flooring material. Lead was detected in soil concentrations that exceeded both CULs and background levels. Other detected metals were either below background values or CULs.
- Building 4126 was demolished in May 2001 and soil was over-excavated to a depth of 1 foot across the former building footprint (URS, 2004). Post-excavation soil sampling revealed that remaining concentrations of target analytes were below regulatory CULs. Excavated soil was managed as Discarded Chemical Products (U060, U061) and wood removed from the building was managed as listed waste (D008). All waste generated from the demolition and remediation of Building 4126 was transported to the Chemical Waste Management facility in Arlington, Oregon, for proper disposal.
- Following demolition and excavation, additional cleanup actions were not required at the former Pesticide Storage Building 4126.

4.1.1.20 Cleanup Actions at Ammunition Storage Bunkers

- A 1998 soil investigation included the collection of surface and subsurface soil samples, along with wipe samples at three ammunition storage bunkers.
- All soil samples were analyzed for PPL metals. Additionally, samples collected from Storage Bunker #2953 were analyzed for 2,4-dinitrotoluene, PETN, and PA, and samples collected from Storage Bunker #2950 were analyzed for RDX, 2,4-dinitrotoluene, PETN, and PA. In 2000, a

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supplemental site investigation was completed to evaluate potential soil contamination associated with the recent removal of black powder from the building. Concentrations of PPL metals, explosives, and propellants exceeded CULs in surface soil samples. Groundwater was not encountered.

- In May 2001, ammunition magazines were disinfected and contaminated soil was excavated to a depth of 1 foot at each of the three ammunition storage bunkers. Post-excavation soil sampling indicated that concentrations of target analytes were all either below regulatory CULs or expected regional background levels. Excavated soil was characterized as nonhazardous and disposed of at a Subtitle D landfill. Wood from pallets in the bunkers was characterized as listed waste and disposed of at a Subtitle C landfill (URS, 2004).
- Following disinfection and soil excavation, additional cleanup actions were not required at the ammunition storage bunkers.

4.1.1.21 Cleanup Actions at Underground Storage Tank (associated with Building 4475)

- A 300-gallon diesel UST was removed from the east side of Building 4475 in 1995. Soil sampling conducted at the time of the UST removal indicated diesel concentrations exceeding CULs. Later investigations in 1996 and 1997 revealed petroleum-contaminated soil in the UST area and an adjacent drainage area.
- Remediation activities completed between November 1996 and October 1997 included excavation of approximately 375 cy of petroleum-contaminated soil. Excavated soil was transported to TPST Soil Recyclers in Portland, Oregon, for thermal desorption treatment. 250 gallons of petroleum-contaminated water was transported to Enviroservice, Inc. in Seattle, Washington, for disposal (URS, 2004).
- Post-excavation soil sampling indicated that petroleum-contaminated soil from the UST and adjacent areas was removed. However, residual concentrations of TPH remained at the site beside the adjacent roadway. The maximum remaining concentration of 860 mg/kg was below the MTCA Method A cleanup level for diesel fuel of 2,000 mg/kg.
- Following UST removal and petroleum-contaminated soil excavation, additional cleanup actions were not required for the UST site associated with Building 4475.

4.1.2 Actions Subsequent to Closure

Following review of independent site investigation and cleanup activities undertaken by the Army, the RAU 1 sites were conferred NFA status by Ecology in 2008. No subsequent investigative or remediation activities have been completed for RAU 1 (Ecology, 2008).

4.1.3 Remedial Action Unit 1 Operation, Maintenance, and Monitoring

ICs are in place for the maintenance pit beneath Building 4475 and the sub-surface soils associated with the former AST at Building T-1932. ICs are required to be maintained, inspected, and reported on annually. There are no ECs requiring operations and maintenance (O&M) or environmental media monitoring requirements within RAU 1 (Ecology, 2008).

4.2 Remedial Action Unit 2A

An RI/FS was completed on 20 firing ranges and cleanup was required at 8 of those ranges. Cleanup at the 8 RAU 2A small arms ranges began in October 2007 and continued in 2008 and 2009, with some work continuing into 2010. Because confirmatory sampling and visual observations indicated lead-impacted soil remains at portions of ranges RAU 2A-16 and RAU 2A-21, additional cleanup actions were required. The 2012 APPCD describes that the County was to submit an amended CAP for RAU 2A-16 and RAU 2A-21, which was

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submitted in June 2017. Soil with residual lead contamination at RAU 2A-16 and RAU 2A-21 was capped with clean fill. The capping project was completed in 2017. The active firing range that is currently used by the FBI was excluded from RAU 2A and will undergo the cleanup process upon its closure.

Ecology reviewed the independent cleanup action in 2019 and determined the remedial actions conducted at RAU 2A are sufficient to meet the substantive requirements in MTCA and that NFA was necessary. Restrictive covenants are in place for RAU 2A-16 and RAU 2A-21 and require cap inspections.

Primary documents included:

- *Cleanup Action Plan, Small Arms Ranges (RAU2A)* (BCRRT, 2008)
- *DRAFT Addendum to the Cleanup Action Plan Small Arms Ranges RAU 2A-16 and RAU 2A-21 (June 2017*)
- *Cleanup Action Report, Remedial Action Unit2A Small Arms Firing Ranges* (Weston, 2018)
- *No Further Action Determination for RAU 2A* (Ecology, 2019)

4.2.1 Remedial Action Unit 2A Remedy Implementation

The RAU 2A remedy included excavation of lead-contaminated soils and sifting to remove lead fragments at the following ranges:

- RAU 2A-4, Combat Pistol Range
- RAU 2A-15, Undocumented Pistol Range
- RAU 2A-16, 1,000-Foot Rifle Range and Machine Gun Range
- RAU 2A-17, 25-Meter M60 and Pistol Range
- RAU 2A-18, 25-Meter Machine Gun Range
- RAU 2A-19, 25-Meter Record Firing Range and Field Firing Range
- RAU 2A-20, Field Firing Ranges
- RAU 2A-21, Rifle Ranges/Field Fire Ranges No. 1 and No. 2
- RAU 2A-22, Rifle Ranges/Field Fire Ranges No. 1 and No. 2

These ranges are shown in Figure 5.

The remedy included specific soil handling procedures for Resouce Conservation and Recovery Act (RCRA) soils. At RAU 2A, RCRA soils were designated based on the leachability characteristic and testing using the Toxicity Characteristic Leaching Procedure (TCLP) for lead. These analytical results were used to determine the final categorization, treatment, and disposition of the excavated soils.

MTCA-regulated soils, defined as having a total lead concentration less than 250 mg/kg and TCLP concentration less than 5 milligrams per liter (mg/L), were transported to an on-site containment facility. The MTCA-regulated soils were transported to the sewage lagoon ponds located at CBMR for disposal (Figure 3). Prior to soil placement, a 6-mil reinforced liner was placed at the bottom and along the northern walls of the lagoon prior to adding soil in the disposal area.

RCRA-regulated soils were sifted using a vibrating multi-stage screening system and treated using a proprietary stabilization process. Removed bullets and bullet fragments were staged securely in a designated location and recycled when economically feasible. The treated soil piles were sampled and analyzed for TCLP lead at the rate of 1 composite sample for every 500 cy of soil being disposed of off site. Following treatment

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confirmation sampling, the characteristic RCRA designation was removed, and the soils were disposed of at a Subtitle D landfill.

Excavation at the ranges was completed until an average concentration of 118 mg/kg was attained within a given grid square. Specific excavation approaches were adopted for the range berms, pop-up target areas, and the range floors. Excavation was sequentially completed along the face of the berms, in the following order of operation:

- Upper 12 inches of soil were excavated and presumed to be RCRA soil;
- Next 12 inches of soil excavated and presumed to be MTCA soil; and
- Additional soils were removed in 6-inch increments until visual observations (i.e., lead bullets or bullet fragments seen on the surface of the excavation) and confirmation sampling confirmed concentrations were below CULs.

For ranges with pop-up targets, a 15-foot radius area around each pop-up target base was excavated to a depth of 6 inches bgs.

Cleanup of the range floor was based on the results of the RI grid sampling program completed across each range (BCRRT, 2007). The following lead concentrations in the RI sampling grids were used to determine the area of excavation:

- Category 1—average and individual lead sample concentrations less than 50 mg/kg; no excavation required
- Category 2—average lead sample concentration less than 50 mg/kg and no individual sample concentration greater than 118 mg/kg; no excavation required
- Category 3—average lead sample concentration greater than 50 mg/kg but less than 118 mg/kg and no individual sample concentration greater than 250 mg/kg; focused excavation required in a 29-foot by 29-foot area surrounding locations where concentrations exceed 50 mg/kg to a depth of 6 inches bgs
- Category 4—average lead sample concentration greater than 118 mg/kg but less than 250 mg/kg; focused excavation required in a 58-foot by 58-foot area surrounding locations where lead concentrations exceed 50 mg/kg to a depth of 6 inches bgs
- Category 5—average lead sample concentration is greater than 250 mg/kg; excavation required at the entire grid to a depth of 6 inches bgs

Areas referred to as "Special Conditions" were identified after the final RAU 2A CAP was generated and were not included in that document. Special Condition areas included areas where remedial actions (comprising excavation, sifting, stabilization, confirmatory sampling, and disposal) were not viable due to one or several of the following conditions:

- Standing water, presence of a creek, stream, or similar water body running through the range;
- Within an area of potential cultural significance; and
- Location outside of the firing line and/or the historical boundary of the range.

Soil sampling frequency was reduced in Special Condition areas to a rate of 5 discrete soil samples per 29-foot by 29-foot area. Sampling in areas of wetlands, creeks, and streams were coordinated with Ecology and other stakeholders.

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4.2.1.1 Cleanup Actions at Remedial Action Unit 2A-4

RAU 2A-4 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—Soil was excavated along the natural slopes of the hillside berm. Additional excavation was required behind targets on the berm due to deeper penetration of lead slugs.
- Concrete Pop-Up Targets—Soil was excavated around 42 concrete pop-up target bases. The concrete bases were dismantled, cleaned of native soils, and disposed of at a local crushing plant. The outer boundaries of all pop-ups that were situated along the periphery of the range floor were used to establish the extent of excavation. Excavation was completed to a depth of 6 inches bgs.
- Range Floor—Soil excavation was completed to depths of 6 inches where Category 3 through 5 soils were encountered. Three 29-foot by 29-foot square areas on the range floor, which had been identified for excavation, were classified as Special Conditions since these areas were located outside the firing range boundary and within the buffer zone for cultural concerns. The areas were re-sampled and analyzed for total lead. Lead concentrations ranged from 58.5 to 165 mg/kg.
- Estimated volume of soil excavated, based upon truckloads, was 750 cy of RCRA soils and 105 cy of MTCA soils.

4.2.1.2 Cleanup Actions at Remedial Action Unit 2A-15

RAU 2A-15 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—Soil was excavated along the natural slopes of the hillside berm. Based on the results of confirmation samples, additional excavation was required on the front side of the berm (an area 6 feet wide by 70 feet long).
- Range Floor—Two 29-foot by 29-foot square areas on the range floor, which had been identified for excavation, were initially classified as Special Conditions since these areas were located outside the firing range boundary. The areas were sampled and analyzed for total lead. One of these grids, the grid surrounding 2A-15-1-E, showed levels of lead requiring excavation. Confirmation samples identified step-out excavation required to the southwest of the grid surrounding 2A-15-1-E. Step-out confirmatory sample results were less than 118 mg/kg.
- Estimated volume of soil excavated, based upon truckloads, was 45 cy of RCRA soils and 60 cy of MTCA soils.

4.2.1.3 Cleanup Actions at Remedial Action Unit 2A-16

RAU 2A-16 cleanup activities were completed between 2007 and 2017 and included the following:

- Berm—Soil was excavated along the natural slopes of the hillside berm. Additional excavation was required for the berm due to deeper penetration of visible lead slugs.
- Range Floor—A total of twenty 58-foot by 58-foot square areas and five 29-foot by 29-foot square areas on the range floor were identified for remedial actions. Most of these locations were close to each other and overlapped. Some of these 58-foot by 58-foot square areas were identified as Special Conditions because they were located outside the firing range boundary. One of the 58-foot by 58-foot square areas was identified as a Special Condition because it included a portion of the adjoining creek bed. Special Condition areas were sampled. Results confirmed elevated levels of lead reported by previous sampling efforts. No excavation was performed within the creek bed.
- Confirmatory sampling results showed elevated levels of lead on the range floor and berm.

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- A total of 23 munitions and explosives of concern (MEC) and 20 munitions debris items were identified in the berm and on the range floor during excavation. Findings required subsurface clearance of the areas to be excavated.
- Estimated volume of soil excavated, based upon truckloads, was 510 cy of RCRA soils and 995 cy of MTCA soils.

The County and Ecology concurred that additional cleanup activities were required for RAU 2A-16 as documented in the APPCD (Ecology, 2012). Confirmatory soil sampling revealed that lead concentrations were increasing with depth in portions of RAU 2A-16, which was contrary to expectations and observations at the other small arms ranges. It was later determined that RAU 2A-16 was constructed over lead-impacted fill soil, which had apparently been brought to the range from another portion of the site and used to raise the elevation of the range floor and adjacent area above the flood level of Lacamas Creek (Michael Baker Jr., Inc., 2010). The lead-impacted fill soil area is approximately 1.76 acres.

Additional investigation and installation of a soil cap was completed in 2017. In accordance with the Addendum to the RAU 2A CAP (Weston, 2017b), the 1.76 acres of lead-impacted soil at RAU 2A-16 were capped with geotextile and 1 foot of clean fill. The lateral extent of the soil cap areas for RAU 2A-16 was marked and grade stakes were installed to mark areas requiring vegetation removal and placement of the one-foot thickness soil cap. Deadfall was removed and vegetation cut in the lead-contaminated areas before covering with geotextile and import soil.

4.2.1.4 Cleanup Actions at Remedial Action Unit 2A-17

RAU 2A-17 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—Soil was excavated along the natural slopes of the hillside berm. Deep penetration of bullets was identified during excavation. The penetration depth was 6 feet into the face of the berm. Confirmatory sampling results required step-out excavation of the berm.
- Range Floor—One 29-foot by 29-foot square area of the range floor was excavated.
- Step-out confirmatory sample results were less than 118 mg/kg.
- All excavated materials were sifted for the removal of lead slugs.
- Estimated volume of soil excavated, based upon truckloads, was 345 cy of RCRA soils and 705 cy of MTCA soils.

4.2.1.5 Cleanup Actions at Remedial Action Unit 2A-18

RAU 2A-18 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—Soil was excavated along the slopes of both the front and back faces of the freestanding berm. Results from 27 of the 36 berm confirmatory samples were greater than the 118 mg/kg cleanup level, which were excavated and resampled. Eight panels showed lead levels greater than 118 mg/kg and were excavated and resampled. Of these, five panels showed lead levels greater than 118 mg/kg and were excavated and resampled. Two of the five panels required additional excavation.
- Range Floor—The Operations Plan (BCRRT, 2008b) identified one 130-foot by 130-foot square area, four 58-foot by 58-foot square areas, and ten 29-foot by 29-foot square areas on the range floor that were excavated. Some of these areas were overlapping and some were located underneath the berm. Vertical and lateral step-outs were performed based on confirmation sampling results. Confirmation samples could not be collected from the floor of the grid surrounding RAU 2A-18-11-W due to the presence of bedrock.

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- In early 2009, RAU 2A-18 was used as a staging site for waste from other ranges. Some excavation was delayed by the presence of stockpiles.
- A total of 15 items, presumed to be MEC items (3.5-inch rockets and 37-mm frag subsurface), were reportedly identified in locations east of the berm within the 3.5-inch rocket target area (MKM, 2010).
- All excavated materials were sifted for the removal of lead slugs.
- Estimated volume of soil excavated, based upon truckloads, was 225 cy of RCRA soils and 60 cy of MTCA soils.

4.2.1.6 Cleanup Actions at Remedial Action Unit 2A-19

RAU 2A-19 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—No berms are associated with this firing range.
- Range Floor—Two 130-foot by 130-foot square areas and six 29-foot by 29-foot square areas on the range floor were excavated. Vertical and lateral step-outs were performed based on confirmation sampling results.
- One confirmation sample collected from the southern sidewall step-out of the grid surrounding RAU 2A-19-34-C had a result of 156 mg/kg and was not further excavated.
- All excavated materials were sifted for the removal of lead slugs.
- Estimated volume of soil excavated, based upon truckloads, was 360 cy of RCRA soils and 170 cy of MTCA soils.

4.2.1.7 Cleanup Actions at Remedial Action Unit 2A-20

RAU 2A-20 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—Soil was excavated along the front face of a U-shaped berm. Additional areas behind targets on the berm were removed.
- Range Floor—One 130-foot by 130-foot grid, one 58-foot by 58-foot grid, and one 29-foot by 29-foot grid were excavated.
- Two additional 58-foot by 58-foot range floor grids were identified as Special Conditions.
- All excavated materials were sifted for the removal of lead slugs.
- Estimated volume excavated, based upon truckloads, was 480 cy of RCRA soils and 175 cy of MTCA soils.

4.2.1.8 Cleanup Actions at Remedial Action Unit 2A-21 and Remedial Action Unit 2A-22

RAU 2A-21 and RAU 2A-22 cleanup activities were completed between 2007 and 2017 and included the following:

- Berm—Soil was excavated along the front face of two berms. One panel on the RAU 2A-21 berm required additional excavation, which was completed, and confirmation results showed lead levels at 119 mg/kg. Ecology approved no further excavation.
- Concrete Pop-Up Targets—Soil was excavated from a 15-foot radius around each of 42 concrete pop-up target bases: 14 targets associated with RAU 2A-21 and 28 targets associated with RAU 2A-22.
- Range Floor—Two 130-foot by 130-foot grids, five 58-foot by 58-foot grids, and nine 29-foot by 29-foot grids were excavated. Vertical and lateral step-outs were performed based on confirmation

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sampling results. Lateral step-outs expanded the excavation as shown in Figure 10. The northern portion of the 130-foot by 130-foot grid surrounding RAU 2A-21-30-C was not excavated due to the presence of standing water. Two additional 130-foot by 130-foot grids (surrounding RAU 2A-21-31-C and RAU 2A-21-32-C) were considered Special Conditions and were not excavated due to the presence of standing water. A 58-foot by 58-foot grid surrounding RAU 2A-21-25-C was not sampled or excavated since it was located within a gravel road. The grid surrounding RAU 2A-21-15-N was bounded to the north by a road.

- Estimated volume excavated, based upon truckloads, was 2,610 cy of RCRA soils and 1,450 cy of MTCA soils.

The Cleanup Action Report included discussion of procedures for confirmation sampling (Weston, 2018). However, specific results were only provided for RAU-2A-16 and RAU-2A-21. Weston reports that additional excavation was completed as vertical or lateral step-outs until the contamination had been delineated and removed. Confirmation sampling would have been completed during this process and corresponding results are not reported in Weston (2018).

In January 2010, a boundary delineation investigation of the RAU 2A-21 overshoot area identified lead slugs and blank cartridges at the surface and at depths up to 18 inches bgs. The lead-impacted soil area was estimated to be 4.25 acres in size (MKM, 2010). The County and Ecology concurred that additional cleanup activities were required for the overshoot area associated with RAU 2A-21 as documented in the APPCD (Ecology, 2012).

Additional investigation of the RAU 2A-21 overshoot area and installation of a soil cap was completed in 2017. In accordance with the Addendum to the RAU 2A CAP (Weston, 2017b), the area of lead-impacted soil at RAU 2A-21, found to be 6.21 acres, was covered with geotextile and 1 foot of clean fill. The lateral extent of the soil cap areas for RAU 2A-21 was marked and grade stakes were installed to mark areas requiring vegetation removal and placement of the 1-foot thick soil cap. Deadfall was removed and vegetation cut in the lead-contaminated areas before covering with geotextile and import soil. Trees greater than 6 inches in diameter were not removed. The deadfall was placed in nearby areas.

4.2.2 Actions Subsequent to Remedial Action Unit 2A Remedy Implementation

Cleanup actions have not been undertaken since the soil cap was completed in 2017.

4.2.3 Remedial Action Unit 2A Operation, Maintenance, and Monitoring

A restrictive covenant referenced in the RAU 2A NFA letter references that intrusive activities are prohibited in the area of the soil caps at RAU-2A-16 and RAU-2A-21 (Ecology, 2019).

4.3 Remedial Action Unit 2B

RAU 2B consists of DA2 and DA3, and a RI was completed in 2003 that culminated in a site closure report. Site Investigation (SI) was completed in 2003 to characterize soil and groundwater conditions at the two demolition areas in order to determine if further actions were required. The groundwater monitoring program was finished in 2005 with no detected COPCs exceeding CULs. DA2 and DA3 are described as follows:

- DA2 consists of an approximately 10-acre wooded area. The specific area of DA2 was interpreted to be approximately 60 square feet located within a steep forested slope. The investigative approach was to install and monitor groundwater downgradient of the DA2 area to determine if groundwater contamination is present and to sample surface and subsurface soil in the suspect area. Three shallow wells were used for this characterization.

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- DA3 consists of a detonation crater approximately 20 feet in diameter and 10 feet deep. The investigative approach at DA3 was to monitor groundwater surrounding the crater and sample soils in and around the crater. Four shallow wells and one deep well were used for this characterization.

NFA status was provided in 2009 by Ecology. Therefore, the APPCD did not include cleanup requirements at RAU 2B.

4.3.1 Primary Documents

- *Final Site Investigation Report, Demolition Areas 2 and 3, Camp Bonneville, Vancouver, Washington*. Calibre, March 14, 2005.
- *No Further Action Determination for Remedial Action Unit2B (RAU 2B) of the Camp Bonneville Army Reservation Facility*. Ecology, March 23, 2009.
- *Focused Groundwater Assessment for Perchlorate and Explosives Lacamas Creek and Demolition Area 3 Wells Camp Bonneville, Clark County, Washington*. PBS, March 3, 2014.
- *Focused Groundwater Assessment for Perchlorate and Explosive Compounds Lacamas Creek and Demolition Area 3 Wells*. PBS, May 30, 2014.

4.3.2 Remedial Action Unit 2B Remedy Implementation

Additional remedial actions were not required in the APPCD. The basis for the 2009 NFA status for DA2 and DA3 is summarized below.

4.3.2.1 Demolition Area 2

Soils samples were collected across DA2 and from a berm next to a road on the south side of the demolition area. Soil samples were analyzed for explosives, perchlorate, and metals. Soil sampling and laboratory analyses conducted at DA2 did not detect explosives or perchlorate residues above reporting limits. Concentrations of metals were not detected above regional background concentrations and corresponding CULs (Ecology, 1994).

Groundwater was monitored for explosives, perchlorate, total and dissolved metals, and water quality parameters from the three shallow wells at DA2. The results did not detect explosives, perchlorate, or total and dissolved metals at concentrations at or above CULs.

4.3.2.2 Demolition Area 3

Soil samples were collected during drilling of the DA3 monitoring wells from the surface to depths of 15 feet bgs. Additional surface and near-surface soil samples were collected across DA3. Concentrations of four explosives were detected in surface and subsurface soil samples. The concentrations detected were significantly below 1 mg/kg and below any corresponding EPA Region 9 Preliminary Remediation Goals (PRGs). Two explosive compounds, 2-Am 4,6-DNT and 4-Am 2,6-DNT, were detected at 0.22 mg/kg and 0.14 mg/kg, respectively. PRGs were not available for these compounds. Detected concentrations were below the relevant EPA Region 3 Residential risk-based concentration of 4.7 mg/kg available for both these compounds. These concentrations were attributed to outdoor storage of spent shells.

Groundwater monitoring results at DA3 did not detect explosives, perchlorate, or total and dissolved metals at concentrations above CULs.

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4.3.3 Actions Subsequent to Remedial Action Unit 2B Remedy Implementation

Groundwater monitoring was conducted in 2013 in response to a low-level detection of the High Melting Explosive (HMX) in groundwater from monitoring well LC-MW01D, which is included in the "Base Boundary" well grouping within the Lacamas Creek area. The sample collected from the well had a detection of HMX at 0.22 micrograms per liter (µg/L). Another well (LC-MW02D) had a detection of HMX between the method reporting limit (MRL) and the method detection limit (MDL). The appearance of HMX at the downgradient Base Boundary location was unexpected, and it was decided that additional groundwater assessment was warranted in the DA3 area. Because the Base Boundary area is downgradient of the five existing Demolition Area 3 wells, the five DA3 monitoring wells were redeveloped and sampled in May and March 2013.

Samples were analyzed for perchlorate, HMX, and RDX. Perchlorate, HMX, and RDX were not detected in the DA3 monitoring wells in the March or May 2013 monitoring events. Following DA3 well sampling efforts, it was determined that laboratory quality control was a probable cause of the HMX detections. There have been no subsequent detections in seven years following changing the analytical laboratory.

4.3.4 Remedial Action Unit 2B Operation, Maintenance, and Monitoring

Operations, maintenance, and monitoring requirements are not included in the APPCD for RAU 2B.

4.4 Remedial Action Unit 2C

RAU 2C has not yet received an NFA determination and a final remedy is in process. A draft RI/FS document has been submitted to Ecology for consideration with four alternatives. Additional information can be found in the draft documents.

An interim remedial action was completed in December 2004 and included removal and disposal of OB/OD ordnance and landfill materials and associated contaminated soils. Soil was removed until confirmation samples indicated that perchlorate was at concentrations below MTCA Method B soil CULs for protection of groundwater of 0.5 mg/kg or 500 micrograms per kilogram (µg/kg). In one area, on the western boundary of the landfill, excavation continued to approximately 27 feet bgs where saturated soils were encountered, and sample results indicated that perchlorate levels continued to exceed CULs. Excavation at this location ceased due to safety concerns. Ecology determined that residual contamination remaining at this depth would be remediated during a groundwater remediation phase of work. It was estimated that 13,300 cy of impacted material were removed from the landfill, and that approximately 900 cy of potential impacted soil remains in place at depths greater than 27 feet bgs (Tetra Tech, 2005). The interim soil removal was reported to have removed approximately 93% of the impacted soil.

The COPCs have impacted both soil and groundwater, with the primary source materials removed in 2004 from the LF4/DA1 location. Given the physicochemical properties of the primary COPCs, perchlorate and RDX, these contaminants are expected to continue leaching to groundwater from soil until the source is depleted.

COPCs were detected during one surface water sampling event in NFLC, which is adjacent to LF4/DA1, in 2011 but have not been detected in subsequent monitoring periods. The lack of being able to confirm the 2011 detections suggests that the migration of COPCs from the LF4/DA1 area into the surface water has diminished, potentially due to the depletion of the contamination source or the success of earlier remediation efforts. The absence of recent detections provides evidence that the contaminants' impact on surface water has lessened over time, reducing potential risks to the surrounding environment and human health. This trend may also influence future remediation and monitoring plans, focusing on continued observation to ensure that COPC levels remain non-detectable.

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The actual contaminants of concern (COCs) for RAU 2C were determined through evaluation of the COPCs for complete exposure pathways and the levels of the COPCs in the media as described in the CSM. Perchlorate and RDX in groundwater meet the threshold as COCs for the site. Due to residual COC levels in groundwater at LF4/DA1 above long-term risk-based levels, various cleanup alternatives were developed and examined. The evaluation was based on established screening criteria, which included factors such as effectiveness, applicability, permanence, and the potential for disproportionate costs.

4.5 Remedial Action Unit 3

RAU 3 includes the entire site where UXO and munitions are located. Cleanup work was conducted in phases throughout the site, as required by the APPCD. The APPCD stipulated that remediation of RAU 3 was to be conducted in the following four phases:

- Phase I (Central Valley Floor; CVFAW)—subsurface MEC clearance of the CVF and associated wetlands.
- Phase II (CITA and Firing Points)—MEC surface and subsurface clearance of the CITA and Firing Points as required in the final CAP for RAU 3.
- Phase III (Demolition Areas 1 and 2)—The County shall conduct MEC surface clearance of DA1 and DA2 as required in the final CAP for RAU 3.
- Phase IV (Western Slopes)—The County shall conduct surface clearance of the western slopes as required in the final CAP for RAU 3.

The APPCD noted that the order and numbering of the final phases may change. Cleanup activities were completed for all phases by 2021. Ecology issued NFA determination between 2017 and 2021.

Primary documents include the following:

- *Site Specific Final Report, Munitions and Explosives of Concern, Remedial Action Unit 3, CVF and Associated Wetlands* (Weston, 2018).
- *Site Specific Final Report, Munitions and Explosives of Concern, Remedial Action Unit 3, Central Impact Target Area and Northern CITA Expansion, Former Camp Bonneville Army Reservation, Vancouver, Washington* (Weston, 2021).
- *Site Specific Final Report, Munitions and Explosives of Concern Phase 3, Demolition Areas 1 and 2* (Weston, 2020).
- *Site Specific Final Report, Munitions and Explosives of Concern, Remedial Action Unit 3, Phase 4 (RAU 3-4)* (Weston, 2020).
- *No Further Action Determination for RAU 3, CVF and Associated Wetlands* (Ecology, May 18, 2021)
- *No Further Action Determination for RAU 3, Central Impact Target Area* (Ecology, May 5, 2021)
- *No Further Action Determination for RAU 3, Phase 3* (Ecology, June 25, 2020)
- *No Further Action Determination for RAU 3, Phase 4* (Ecology, March 10, 2021)
- *Amended Prospective Purchaser Consent Decree* (May 2, 2012)

4.5.1 Remedial Action Unit 3 Remedy Implementation

Interim actions for RAU 3 were completed between 2007 and 2009 that included surface clearance of roads and trails (BCRRT, 2007). The RI/FS for RAU 3 (Parsons, 2004) reported the clearance depth for roads was

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based on a conservative estimate of frost heave at CBMR (14 inches bgs). There are approximately 46 miles of roads and trails throughout CBMR, of which 25 miles are located within the proposed regional park. Work commenced in 2007 in an emergency action focused on the base and CITA perimeter roads. Later interim actions focused on additional roads and trails at CBMR. The scope included brush clearance of 20 feet from the centerline of the road/trail, followed by hand clearance of MEC to the frost-heave depth of 14 inches bgs.

RAU 3 Phases I through IV were subsequently completed between 2012 and 2020.

4.5.1.1 Remedial Action Unit 3, Phase I

The CVFAW is composed of 329 acres in the CVF and 120 acres in the Associated Wetlands, totaling 449 acres. Phase I remediation was completed between 2012 and 2017 and included the removal of surface and subsurface MECs, material potentially presenting an explosive hazard (MPPEH), munitions debris, and other materials documented as safe items, small arms, and all other metallic items to clear anomaly locations to a depth of 14 inches bgs within the Phase I area. The remedial action is documented in *Site Specific Final Report, Munitions and Explosives of Concern, Remedial Action Unit 3, Central Valley Floor and Associated Wetlands* (Weston, 2018).

The CVFAW was partitioned into a total of 2,241 one-hundred-foot grids (including partial boundary grids). A total of 43 full grids were cleared using DGM survey techniques, 118 full grids were cleared using a mechanized excavation and screening process, and 2,066 grids cleared using analog "mag and dig" methods. The remaining 14 grids consisting of approximately 2 acres were not cleared; three grids were inaccessible due to steep terrain, and 11 grids are part of an active training range currently used by the FBI.

A total of 515 MEC and MPPEH items were recovered within the CVFAW boundary during the clearance activities, to include artillery projectiles, rockets, mortars, grenades, pyrotechnics, training devices, and fuses. Munitions constituents including 1 pound of trinitrotoluene (TNT), 1 pound of 2.75-inch rocket propellant, and 7 pounds of bulk high explosives were recovered. All recovered munitions debris was 100% inspected by UXO personnel and classified as material documented as safe (MDAS) or non-munitions scrap. MDAS was shipped off site for demilitarization and scrap metal was recycled off site.

4.5.1.2 Remedial Action Unit 3, Phase II

RAU 3 Phase II included munitions cleanup at 58.84 acres outside the Central Valley Floor between 2018 and 2019. The munitions cleanup included removal of MEC, MPPEH, MDAS, MD, and other metallic items. Munitions cleanup was completed at the following areas of RAU 3, Phase II:

- Demolition Areas 1 and 2 (0 to 3 inches bgs clearance)
- Range Target Areas—Hand Grenade Range; Rifle Grenade Range; and 3.5-inch Rocket Range (0 to 3 inches bgs clearance)
- Firing Positions and Points—Artillery Positions 1, 2, 3, 4 and 7; Mortar Positions 1, 2, 5 and 6; Rifle Grenade Firing Point; and 3.5-inch Rocket Range Firing Point (0 to 14 inches bgs clearance)
- Road and Trail Stepout Areas (0 to 3 inches bgs clearance)

A total of 86 MEC and MPPEH items were recovered during the Phase II munitions cleanup, including four MEC items recovered during stepout activities performed in 2018 and 2019. MCs, including 1 pound of 2.75-inch rocket propellant and 2 pounds of cartridge propellant, were recovered and recorded as MPPEH. The MEC/MPPEH items were recovered from Demolition Area 1, the 3.5-inch Rocket Range Target Area (and

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associated stepout area), the 3.5-inch Rocket Range Firing Point, and Mortar Position 5. There were no MEC or MPPEH items recovered from the other Phase II munitions cleanup areas.

4.5.1.3 Remedial Action Unit 3, Phase III

The CITA is composed of approximately 465 acres and the Northern CITA Expansion includes 107 acres adjacent to the Northern CITA boundary. Together, the CITA and Northern CITA Expansion are classified as a No-Reuse Restricted Access Area with no designated reuse or facilities planned.

Phase II remediation was completed between 2017 and 2020 and included the removal of MEC/MPPEH items within specific areas. The remedial action is documented in *Site Specific Final Report, Munitions and Explosives of Concern, Remedial Action Unit 3, Central Impact Target Area and Northern CITA Expansion, Former Camp Bonneville Army Reservation, Vancouver, Washington* (Weston, 2021).

The CITA clearance area is a 100-acre polygon that is composed of 15 documented target areas, and the locations of previously removed MEC items within the CITA Expansion (BCRRT, 2009). Stepouts were implemented for 17 acres composed of ninety-four 100-foot by 100-foot grids after the identification of MEC/MPPEH items in the primary search area boundary subgrids using the stepout criteria.

- CITA Target Areas Polygon—surface clearance (0 inches) consisting of a 100-acre polygon encompassing 15 identified target areas and previous MEC findings locations
- CITA Road Alignment—subsurface clearance to 14 inches bgs within the 10-foot wide road alignment within the CITA boundary (approximately 6,800 linear feet of roadway)
- Northern CITA Expansion Perimeter Fence/Road Easement, 40 feet wide and approximately 9,050 linear feet in length (see Figures 3 and 5):
    - A 10-foot wide area inside the fence alignment (surface clearance to 0 inches bgs)
    - A 10-foot wide roadway alignment located just outside the fence line (surface and subsurface clearance to 14 inches bgs)
    - A 20-foot wide area outside the roadway alignment (surface clearance to 0 inches bgs)
- CITA Stepout Grids (when required based on identification of MEC/MPPEH items in primary search areas)

A total of 96 MEC and MPPEH items were recovered within the CITA Target Areas (87 in the 100-acre polygon and 9 in stepout areas), including artillery projectiles, 40-mm projectiles, mortar rounds, grenades, pyrotechnics, training devices, and fuzes. All encountered MEC and MPPEH items were blown in place or consolidated on site and then later disposed. All other recovered material was 100% inspected by UXO personnel and classified as MDAS or non-munitions scrap. MDAS items were shipped off site for demilitarization and recycling. Scrap metal was also shipped off site for recycling.

MEC and MPPEH items were not recovered within the CITA Road Alignment. Material recovered was 100% inspected by UXO personnel and classified as MDAS or non-munitions scrap and managed as described above.

One MPPEH item (an unfuzed artillery projectile) was recovered within the Northern CITA Expansion Perimeter Fence/Road Easement in February 2019 during surface sweep prior to removal of vegetation. The MPPEH item was destroyed during a consolidated disposal and reclassified as MEC. No MEC items were recovered during subsequent construction of the Northern CITA Expansion Perimeter Fence/Road. All other recovered material

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was 100% inspected by UXO personnel and classified as MDAS or non-munitions scrap. MDAS and scrap metal were managed as described above.

Because the CITA was designated as restricted access, a fence consisting of 5-strand barbed wire was constructed around the CITA. Warning signs were installed every 50 feet.

4.5.1.4 Remedial Action Unit 3, Phase IV

Phase IV consists of the Western Slopes Area (WSA) that includes 194 acres where an analog surface clearance was conducted to remove MEC and MPPEH in accessible portions of the site (slopes less than 25% grade and not restricted accessibility) between 2019 and 2020. The objective was to ensure that all MEC, MPPEH, MD, and other metallic debris were removed from ground surface to 3 inches bgs. The remedial action was documented in *Site Specific Final Report, Munitions and Explosives of Concern, Remedial Action Unit 3, Phase 4 (RAU 3-4)* (Weston, 2020).

- Twenty-four MEC and MPPEH items were recovered during the WSA analog clearance. Seventeen of these items were determined to be MDAS following demolition and seven were confirmed to be MEC.
- MD (164 items weighing approximately 302.65 pounds) were recovered during clearance activities. This includes 17 items weighing 115.5 pounds that were initially identified as MEC/MPPEH and later determined to be MDAS and recovered small arms, 18.35 pounds, also classified as MDAS.
- During the MEC clearance activities, cultural debris items such as, wire, nails, cable, horseshoe, rebar, pipe, barbed wire, bolt, can, chain, fencing, fence post, vehicle parts, and other metal debris that were possible to remove were contained in roll-off bins. Scrap metal from the WSA surface clearance was not segregated from scrap metal recovered during other MEC clearance activities conducted concurrently at CBMR.
- A total of 89 historic-period items were identified for collection as a result of the surface clearance activities.

4.5.2 Actions Subsequent to Remedial Action Unit 3 Remedy Implementation

Additional remedial actions have not been taken following the remedy implementation. Interviews conducted for this periodic review indicated that a training fuse had been discovered near Landfill # 4. The training fuse was disposed by Clark County Sheriff's Office bomb technicians. Additionally, the FBI indicated that a mortar round was identified near the barracks in 2019. The FBI indicated the area was marked with a safety flag and the "remediation crew" was notified. The County Forester indicated that unexploded artillery shells and small ordnance have been occasionally discovered and were disposed by certified technicians.

4.5.3 Remedial Action Unit 3 Operation, Maintenance, and Monitoring

The current monitoring and maintenance program is outlined in the RAU 3 CAP (BCRRT, 2010) and includes:

- Fencing and signage program to either restrict access or to increase public awareness of past military activities conducted at the site including the following:
    - Fencing and signage along the perimeter of the facility
    - Ground-disturbance permit notification program and standard operating procedures for ground-disturbing activities.
    - Maintenance of the existing fence and signage surrounding the CITA
- Level I MEC technician certification for two Clark County Park Employees

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Sitewide requirements for monitoring and maintenance also apply. These are described in Section 4.6.

4.6 Sitewide Institutional Control and Remedy Implementation

Cleanup action has concluded at four of the five RAUs, with RAU 2C in the final stages of the RI/FS process. Following initial investigations beginning when CBMR was identified for closure in the BRAC process, a quitclaim deed was issued in September 2006 transferring ownership of the site from the DoD to the County. The original PPCD was referenced in the quitclaim deed, later revised with the APPCD, and included reference to each CAP from the five RAUs, with their associated remedies including ICs and ECs.

Section 2.1.3(6) of Attachment E.1 – Technical Specifications and Requirements Statement (TSRS) of Environmental Services Cooperative Agreement (ESCA) Number W8128F-06-2-0160 between the Army and the County includes requirements to document annual compliance with the Environmental Covenants, Conditions, and Restrictions (ECCR). These ECCRs were incorporated into and made enforceable parts of the quitclaim deed from the Army to the County as Exhibit C to that deed.

ICs have been recorded on the deed for RAU-1 and the quitclaim deed. ICs for RAU-2A and RAU-3 are discussed in their corresponding cleanup plans; however, they have not been recorded. A long-term O&M plan that formally documents the ICs and actions necessary to ensure the long-term effectiveness of the cleanup is required under the APPCD. Sitewide ICs were also assigned to CBMR as described in the quitclaim deed. Areas requiring ICs and ECs are illustrated in Figure 9. At a minimum, the long-term O&M plan will summarize and document procedures for the following activities:

- Residential Use Restriction: forest maintenance is permitted at areas outside the CITA.
- Fencing and signage program to either restrict access or to increase public awareness of past military activities conducted at the site including the following:
    - Fencing and signage along the perimeter of the facility located every 50 feet
    - Signage every 50 feet and maintenance of the existing fence surrounding the CITA
    - Signage at select target areas and each firing point
    - Signs along roads and trails at appropriate intervals
- Sitewide groundwater use restriction
- Public Information Program:
    - Permit Notification program for permits for construction or installations of building foundations, aboveground/underground utility lines, roads, and other paved or graded gravel areas, land surveying, timber management, and other tasks which will or may involve land disturbance activities.
    - Construction support activities for forest management and fire suppression logging work.
    - Standard Operating Procedures for construction and maintenance related activities and other potential land disturbing tasks
    - Printed media program and on-site information kiosk
    - Public access restriction to the CITA

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  - Preservation covenant to notify the Washington State Historic Preservation Officer (SHPO) to maintain previously identified archaeological sites and all other as yet undiscovered archaeological sites.

- Level I MEC technician certification for two Clark County park service employees

The APPCD and the RAU 3 NFA letter indicate that institutional controls that result from the long-term O&M plan must be recorded on the property deed.

4.7 Sitewide Actions Not Included in the APPCD

Subsequent to the APPCD, per- and polyfluoroalkyl substances (PFAS) compounds were identified as an emerging contaminant and subsequently identified as a source of human health risks. PFAS are associated with a wide range of commercial and industrial uses including paints, varnishes, sealants, hydraulic fluid, surfactants, and firefighting foams. In 2023, the Army conducted a preliminary assessment (PA; Leidos, 2023a) and SI (Leidos, 2023b) to characterize the usage, storage, disposal, or release of PFAS at Camp Bonneville.

The PA for Camp Bonneville focused on ascertaining and documenting the following information regarding PFAS history and use, storage, or disposal at Camp Bonneville:

- On-post fire training activities
- Use of PFAS-based aqueous firefighting foam (AFFF) in fire suppression systems or other systems
- AFFF stored, used, and/or disposed of at buildings and crash sites
- Activities or use of materials that are likely to contain PFAS, such as metal plating operations
- Wastewater treatment plants (WWTPs) and landfills that may have received PFAS-containing materials
- Studies conducted to assess environmental impacts at the facility
- Potential PFAS use at parcels post transfer
- Potential off-post sources that may impact Camp Bonneville

Areas of potential interest (AOPIs) were identified based on records review, aerial photographic analysis, site reconnaissance, and interviews. The scope of the PA activities is summarized as follows.

- **Records Review.** Records reviewed for the PA are discussed in Section 3.1 of the PA. These records included consultant, DoD, and Army reports related to BRAC programs. Information gathered during the record reviews helped identify data gaps and enabled elimination of several areas based on their historical use. Data gaps associated with facility operations; PFAS-containing material use, storage or disposal; and current exposure receptors at Camp Bonneville were used to identify potential AOPIs. Areas with little potential to result in a PFAS release, such as residential buildings, hospitals, cafeterias, and recreational areas, were eliminated from further evaluation.
- **Aerial Photograph Analysis.** Aerial photograph review is described in Section 3.2 of the PA and were used to identify potential activities or developments that may suggest the potential use, storage, or disposal of PFAS-containing materials, including AFFF (e.g., evidence of fire training activities, such as fire pits or burn scars). No conclusions on AFFF use or storage were drawn from the aerial photograph review.
- **Site Reconnaissance.** The PA site visit is summarized in Section 3.3 of the PA and included a site walk and visual inspection of all readily accessible areas at Camp Bonneville to identify potential sources of PFAS and gather information for developing conceptual site models at AOPIs.
- **Interviews.** Interviews were conducted and are summarized in Section 3.4 of the PA. Interviews included the Vancouver Fire Department, Clark County Fire District 3, and other regional fire

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department personnel regarding historical fires, historical fire response procedures, and AFFF use. The parties interviewed were not aware of usage or training with AFFF foams at the property. Between 1989 and base closure, 20 gallons of AFFF, stored in 5-gallon pails, were kept on the fire truck staged at the fire station building (No. 4483) by the City of Vancouver Fire Department. Each pail included a lockout tag. The AFFF was never reported to be used. AFFF was not otherwise stored on the property.

Sections 4 and 5 of the PA summarize and evaluate the data and identified three AOPIs, as follows.

- **Building 1864 Fire Station.** Building 1864 in the Bonneville cantonment operated as a fire house, fire equipment shed, and fire truck storage area from the late 1940s until the late 1970s. Based on historical uses, AFFF storage or use is possible.
- **Building 4483 Fire Station.** Building 4483 in the Killpack cantonment operated as a fire station from the late 1980s until approximately 2007. AFFF was historically stored on the fire truck inside the fire station.
- **Washracks 1 and 2.** Washrack 1 consisted of a wooden two track vehicle ramp and was used for vehicle washing between 1978 and approximately 1994. Washrack 2, also referred to as the vehicle maintenance rack, was constructed with two parallel wooden timbers with gravel in between and was used until the 1980s. Both washracks were in the shop office area at the Killpack cantonment, in the vicinity of the Building 4483 Fire Station. Fire truck washing could have resulted in release of PFAS compounds through the washrack.

The three AOPIs at the property were investigated during the SI. Soil, groundwater, sediment, and/or surface water samples were collected. PFAS compounds that were analyzed included: perfluorooctane sulfonate (PFOS); perfluorooctanoic acid (PFOA); perfluorobutanoic acid (PFBA); perfluorobutane sulfonate (PFBS); perfluorononanoic acid (PFNA); perfluorohexanoic acid (PFHxA); perfluorohexane sulfonate (PFHxS); and hexafluoropropylene oxide dimer acid (HFPO-DA; also known as GenX).

Samples collected during this SI were compared to EPA regional screening levels (RSL) for a residential scenario, calculated using the EPA RSL calculator. In summary, concentrations of PFAS were detected:

- In 3 of 29 soil samples at concentrations below RSLs. When detected, concentrations were minimally above MRLs or estimated concentrations between the MRL and the MDL.
- In 4 of 4 groundwater samples at concentrations below the RSLs. The highest detections of PFAS were detected in groundwater sample CBV-1864-2 from the Building 1864 Fire Station AOPI.
- In 1 of 3 surface water samples at concentrations below the groundwater RSLs. Surface water RSLs were not available for PFAS compounds.
- In 2 of 4 sediment samples, PFOS was detected at estimated concentrations between the MRL and MDL. Sediment RSLs were not available for PFAS compounds.

Target PFAS concentrations did not exceed RSLs in samples from any media.

Based on these results, further investigation was not recommended by the Army.

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5 ADDITIONAL INFORMATION GATHERING AND SITE INSPECTIONS

The purpose of this Periodic Review is to evaluate the implementation and performance of the implemented remedies at CBMR in order to determine human health and the environment are being protected. In order to collect information on site operations since the remdies were implemented, interviews and inspections were completed.

5.1 Community Notification and Involvement

As part of this process, Ecology will complete project specific outreach to Native nations and the general public.

5.2 Interviews

Interview questionnaires were developed and disributed to property users and manager, as follows:

- Clark County Land Management Division
- Clark County Parks Division
- Bureau of Alchohol, Tobacco, Firearms, and Explosives
- Department of Natural Resources helicopter tactical team (Heli-tact)
- Ecology former site managers

The completed interview questionnaires are included in Appendix A. Information from the interiview questionnaires was incorporated into Section 6.

5.3 Site Inspections

A site inspection was completed on December 5 and 6, 2024. The purpose of the site inspection was to inspect the ECs and ICs in place at the site. The inspection was completed by personnel from Ecology, the County, and PBS. The results of the inspection are summarized below. Representative photographs summarizing the inspection activities are included in Appendix B.

5.3.1 Remedial Action Unit 1

RAU 1 includes 20 hazardous subsurface sites located across the Property. ICs are required at Building 4475 and Building T-1932 within RAU 1 to notify of the presence of contaminated soil and instruct that excavation is not permissable without approval.

Signage was present at both Building 4475 and Building T-1932. Evidence of ground disturbance at either location was not observed.

Maintenance and annual inspection records were not available. ECCR reports documenting compliance with ICs established in the quitclaim deed were submitted annually.

5.3.2 Remedial Action Unit 2A

RAU 2A includes lead contamination at firing ranges. ECs are in place at two locations within RAU 2A where lead-contaminated soils were capped, RAU-2A-16 and RAU-2A-21.

RAU-2A-16 Soil Cap:

- Boundary markers were not observed. The general soil cap area was identified based on the area of reworked soil and extent of a silt fence along the north side.
- Signage indicating the presence of a soil cap was not observed.

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- Tire tracks were observed along south side of the capped area. The tire tracks traversed the cap and exited across the area north of cap. The tire tracks left an approximately 6-inch indentation along their track.
- An area of streambank erosion was observed along the northeastern edge of the cap. The shortest separation distance was 4.5 feet from thr edge of the soil cap to the stream.

Evidence of ground disturbance at the RAU-2A-21 soil cap was not observed, with the exception of the tire tracks.

RAU-2A-21 Soil Cap:

- Boundary markers were not observed. The soil cap area was identified based on visual observation of mounded soil.
- Signage indicating the presence of a soil cap was not observed.
- Indications of a breach of the cap were not identified.
- Mature trees across the soil cap were observed to be dead (likely as a result of the cap installation burying the tree bases) and several trees had been cut down.

Evidence of ground disturbance at the RAU-2A-21 soil cap was not observed.

Maintenance and inspection records were not available for the two RAU 2A soil caps.

5.3.3 Remedial Action Unit 2B

RAU 2B includes the former demolition areas DA 2 and DA 3. Remedial actions were not required at these two areas. DA 3 was accessed for inspection to confirm there was no ground disturbacne. DA2 could not be accessed.

5.3.4 Remedial Action Unit 2C

The RI/FS for RAU 2C is underway. Inspection activities related to RAU 2C did not identify any evidence of ground disturbance, and no seeps were observed along the adjacent streambank. Monitoring wells were observed to be in good condition.

5.3.5 Remedial Action Unit 3

RAU 3 includes munitions cleanup and removal of MEC and other metallic items. Munitions cleanup of RAU3 was completed in phases. ECs in effect for RAU 3 include fencing the entire area of the CITA and restricting access. ICs in effect for the CITA include requirements for signage at 50-foot intervals along the CITA boundary fence.

- Barbed wire fencing was present surrounding the entire CITA. In several areas, treefall had compromised the fence.
- Warning signs were present; however, the signs were not present uniformly at the required distances (1 every 50 feet).
- The gate to the access road bisecting the CITA was open at the time of inspection.

Maintenance and inspection records were not available for the CITA or CITA boundary fence. ECCR reports documenting compliance with ICs established in the quitclaim deed were submitted annually.

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5.3.6 Sitewide Controls

Sitewide ICs were also assigned to CBMR as described in the APPCD. Future long-term O&M requirements were to be documented in an O&M plan. In summary:

- A long-term O&M plan was not available for review. O&M plans related to UXO and forestry practices were available.
- Fencing and signage program to restrict access was present around the perimeter of the facility, but signage was not present uniformly at the required distances (1 sign every 50 feet) around the full perimeter.
- Hurricane fencing was present near areas of higher population density, near the west and south fence line. Barbed wire fencing was present in the other areas. Treefall had compromised the fence in multiple areas, particularly in the northwest quadrant of the perimeter. County workers were noted as being in the process of repairing the fence.
- Signage highlighting former military operations was largely not present. One kiosk with some information was present at the main gate.
- Signage indicating water was non-potable was observed in areas where sinks were present. Bottled water was available at these locations.
- The Public Information Program was not in place. Ground-disturbing activities are coordinated through the Clark County Land Management Division. Active construction or indications of recent construction were not observed.
- Documentation that two County employees had received the Level I MEC technician certification was not available. The County reports that it currently employs one Level I MEC technician.

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6 TECHNICAL ASSESSMMENT

This section evaluates the status of each of the RAUs according to the factors presented in WAC 173-340-420 (4).

6.1 Effectiveness of Cleanup Actions

This section describes the effectiveness of the remedies in place for each of the RAUs, including how the completed remedies have performed relative to their design intent as per WAC 173-340-420 (4)(a). Each of these remedies includes RAU-specific or sitewide institutional and engineering controls and rely on the maintenance of those controls to remain protective.

Remedial effectiveness of the cleanup decision or the completed cleanup action was evaluated by identifying the maximum concentration of individual constituents detected at each RAU and comparing them to CULs in effect at the time of the cleanup decision or cleanup action, as well as current CULs that would be applicable. This screening is summarized in Table 1 to Table 5 and is described in the sections below. Screening is completed to each RAU, and individual cleanup sites within an RAU, except RAU-2C.

6.1.1 Effectiveness of Remedy for Remedial Action Unit 1

6.1.1.1 Remedial Action Performance

The 20 discrete sites that comprise RAU 1 have been defined as areas where previous investigations and remedial activities found that COPCs were either not detected or were below regulatory cleanup levels (either during the individual site assessments or following a focused cleanup action). For sites that had exceedances of the CULs, the removal of soil and debris was completed to permanently reduce the potential for human or ecological exposure to the contamination as the wastes were either placed in an on-site containment facility or were taken of fsite for disposal at a permitted landfill. The associated institutional and engineering controls maintain the remedy protectiveness by ensuring that the site conditions remain consistent with the exposure assumptions (such as by preventing residential land uses).

A total of 193 site assessment soil samples were collected across 19 of the RAU 1 sites. Soil samples were not collected at Landfill 1 because the location could not be confirmed (URS, 2004). Investigation data demonstrated that the concentrations of target analytes in 10 of the sites within RAU 1 did not exceed applicable CULs and did not require further investigation or remedial action. Based on the screening in Table 1, exceptions are noted below where concentrations used for cleanup decisions exceeded applicable cleanup levels or were revised downward. These included:

- Maximum arsenic concentrations at the grease pit (7.2 mg/kg) and former sewage pond (7.9 mg/kg) exceeded background concentrations and the current Method B CUL. Cleanup decisions were made with Method A concentration limits (which are 20 mg/kg). While the detected concentrations exceed the Method B CUL, because they only minimally exceed the published background concentration (7.0 mg/kg), and are well below the Method A CUL, the detected arsenic concentrations do not reduce the effectiveness of the cleanup action.
- The maximum Lindane concentration at the grease pits was detected in only one of five samples (GP-SB02-02) at a concentration of 2.0 milligrams per kilogram (mg/kg), which is below the historical MTCA Method A concentration and minimally exceeds the historical Method B cleanup level. The Method B cleanup level has decreased since the cleanup. The current cleanup level is 0.91 mg/kg. Based on the frequency of detection and exceedance factor compared to the revised cleanup level (approximately 2), the detected concentrations of lindane does nor reduce the effectiveness of the cleanup action.

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Remediation was completed at nine sites. Each of these cleanup actions involved excavation and disposal of contaminated soil and debris. A total of 145 post-remediation soil samples were collected to characterize remaining concentrations of COCs at each site. Based on the screening in Table 1, COPCs were below CULs in all post-excavation soil samples, with one exception for the following:

- At one of the AST locations (building T-1092) concentrations of diesel-range hydrocarbons (2,690 mg/kg) exceeded applicable CULs at the time of remediation. This is within the area of the associated IC.

Water was sampled as groundwater and accumulated rainwater. A total of 15 water samples (11 groundwater, 1 sump water, and 3 excavation rainwater samples) were collected from 7 RAU 1 sites.

- In groundwater samples collected from monitoring wells at Landfills 2 and 3, concentrations of arsenic minimally exceeded historical Method B CULs, but do not exceed current Method B CULs. The detected arsenic concentrations are attributed to natural background concentrations and do not reduce the effectiveness of the cleanup action.
- At the hazardous materials accumulation point, concentrations of several metals (arsenic, lead, and zinc) exceeded groundwater cleanup levels. This sample was collected from a sump and is not indicative of groundwater conditions. The detected metals concentrations do not reduce the effectiveness of the cleanup action.
- At the drum disposal area, concentrations of lead, naphthalene, ethylbenzene, and xylenes were detected in a rainwater sample during the test pit investigation completed in 2000. A rainwater sample is not representative of groundwater conditions. The detected concentrations therefore do not reduce the effectiveness of the cleanup action.

Site uses within RAU 1 have not changed; however, some of the Method B CULs have been adjusted since the time of assessment and remediation. A review of the historical data against current CULs demonstrates that the revised CULs did not change the effectiveness of the RAU 1 soil remedies. Because there are no changes to the current or proposed land use, and the changes to the cleanup goals do not fundamentally affect the assessment of protectiveness, the RAU 1 remedial action is considered effective (pending the resolution of residual contamination beneath two buildings, as discussed in Section 6.1.1.2).

RAU 1 cleanup was primarily based on soil results. When sampled, concentrations of COPCs in groundwater were mostly below historical groundwater cleanup levels. CULs for petroleum-related VOCs have decreased since remedial actions were implemented.

6.1.1.2 Implementation of Institutional and Engineering Controls

Annual reports were consistently prepared by the County and submitted to the Army on an annual basis. Records of Annual reports from 2009 to 2023 were reviewed for this Periodic Review. The annual reports documented compliance with restrictions associated with residential land use, groundwater use, excavation and land disturbance, public access, archeological preservation, munitions, and asbestos in building materials. Disruption of remedies was not reported in any of the annual reports that were reviewed.

Property inspection in December 2024 (Section 5.4) identified deficiencies related to public information; boundary fencing and signage; and inspections and associated recordkeeping. The inspection identified that the property was in general complaince with requirements related to land use, water use, public access, and signage at Building 4715 and Building T-1932.

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The long-term O&M plan has not been prepared. The annual ECCR reports to the Army document compliance with an comprehensive list of restrictions, but not all the restrictions contemplated or proposed in associated cleanup plans. Additional institutional controls are likely to be required once the O&M plan is complete.

6.1.2 Effectiveness of Remedy for Remedial Action Unit 2A

6.1.2.1 Remedial Action Performance

A total of 17 sites were included in RAU 2A and were assessed for potential elevated concentrations of lead associated with historical use as firing ranges. A total of 1,535 site assessment soil samples were collected across RAU 2A. Lead concentrations at seven of the sites were below applicable human health CULs and no remediation was completed. Concentrations at three of the sites (Infiltration Course South, Machine Gun Range South, and M31 Sub-Caliber Ranges 1 and 2) exceed CULs for ecological receptors. Elevated concentrations of lead (423 mg/kg) were identified at at the Machine Gun Range North Site, but records of remediation were not identified. Remediation occurred at 9 of the 17 sites and included excavation and/or ECs as described below.

Elevated concentrations of lead identified at sites selected for remediation ranged from 219 mg/kg at the 25-meter M60 range to as high as 10,200 mg/kg at the 1,000 Foot Ranges. The remedy for RAU 2A included excavation across 9 sites and disposal of 9,045 cy of soil with lead-contaminated soil. Soils with lead concentrations in excess of the leachability characteristic were treated, stabilized, and transported off site for disposal as a nonhazardous waste. The remaining volume was placed in the east side of the former Sewage Lagoon (as noted below).

Confirmation sampling would have been completed during this process to confirm remedial effectiveness, but are not reported in Weston (2018). Specific results were only provided for RAU-2A-16 and RAU-2A-21. Confirmation sampling would have been completed to confirm remediation effectiveness.

Following the excavation and disposal, the remaining lead concentrations were reported as below the human health based CUL of 250 mg/kg, with the exception of two sites, RAU-2A-16 and RAU-2A-21, where remaining elevated lead concentrations range from 660 mg/kg to 5,400 mg/kg and extend beyond the surface soil interval. Remediation at these sites included the placement of a demarcation geotextile and 1-foot soil cap over the residual wastes. The soil remedies permanently reduced the potential for human exposure to the contamination by either placing the waste in a managed facility, or through the installation of the cap as long as that structure remains intact. The emplaced ICs will likewise maintain the remedy protectiveness by ensuring that the site conditions remain consistent with the remedy's design assumptions.

The Eastern Lagoon Pond was used as an on-site disposal location for soil with concentrations of lead less than 250 mg/kg, which corresponds to the human health based cleanup level, but greater than ecological based cleanup levels for plants and wildlife (50 mg/kg and 118 mg/kg, respectively). Information describing a cap or other containment mechanism for the pond were not described in *Cleanup Action Report, Remedial Action Unit 2A Small Arms Firing Ranges* (Weston, 2018). The soils placed at the Eastern Lagoon Pond are not protective of ecological receptors. The surface of the former lagoon sits below grade and contains standing water. During the inspection completed for this review, the lagoon was breached and water flowed from the lagoon to the nearby surface road. Evidence of burrowing wildlife was also identified. A cap or similar EC should be considered that contains the contaminated soil, removes ponding, and repairs the breach in the former lagoon perimeter.

While the caps currently remain in reasonably good physical condition, (and so the remedy for RAU 2A is currently effective for human health protection), the soil cap is not designed to be protective of ecological

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risks and is too thin to meet engineering standards for a protective cap. The thin profile section (1 foot) is susceptible to erosion, particularly along the northern edge of the RAU-2A-16 cover where stream erosion has been noted in close proximity to the cover. The covers are also susceptible to damage from rutting (noted across the RAU-2A-16 cover) and from the toppling of trees (particularly the RAU-2A-21 cover). The thin section of the covers also provide an opportunity for plant roots to reach contaminated soil and potentially bring lead contamination to the surface through root uptake and leaf/stem deposition.

As noted below, continued inspection and maintenance of the covers will be needed to continue their effectiveness, but improvements to the covers should be considered (e.g., removal of deep-rooted plants, thickening of the cover soil, and engineered protections against erosion). Capping or similar containment of the former sewage lagoon should be considered.

6.1.2.2 Implementation of Institutional and Engineering Controls

In addition to the sitewide ICs and ECs (overall access restrictions and signage), specific ICs and ECs for RAU-2A include requirements for the cap inspection and maintenance. Routine inspection of the two capped areas is necessary to maintain the protectiveness of the remedy followed by the repair of any observed deficiencies. Additional maintenance considerations needed to maintain the effectiveness of the soil covers include the following:

- Removal of the trees that are located on the RAU-2A-21 soil cover area to prevent windthrow (or similar toppling of trees) and the associated potential for the raising of lead-impacted soil in the tree root ball (alternatively this protection could be accomplished by routine inspection of the capped area and removal of any fallen trees along with repair of the soil cover).
- Routine inspection of the caps for non-grassy plants (such as shrubs or saplings) followed by their removal to prevent uptake of lead in the deeper-rooted plant species (lead uptake could eventually result in the emergence of surficial lead through the deposition of lead-impacted leaf or stem detritus).
- Demarcation of the boundary of the soil covers (such as through simple fencing or other permanent control) and installation of signage to provide notice of the restricted land use.
- Physical maintenance of the soil covers, such as repair of the rutted tire tracks on RAU-2A-16 and installation of a barrier and signage across the road frontage of the capped area.
- The RAU-2A remedy involved on-site containment of lead-contaminated soils below MTCA Method A CULs, but in excess of ecological based CULs. It would be appropriate to include inspection of this area and follow up action (as needed) to document vegetative cover and that ground disturbance and evidence of burrowing wildlife are not present.
- An official schedule and documentation of inspections should be developed.

6.1.3 Effectiveness Remedy for Remedial Action Unit 2B

6.1.3.1 Remedial Action Performance

COPCs were not identified at RAU 2B during the site investigation at concentrations above the CULs at the time and no remedial action was performed. A total of 68 soil samples were collected across RAU 2B. Four explosive compounds were detected in soil at concentrations above laboratory detection limits; however, the concentrations were well below CULs at the time of the assessment. Several metals were detected at concentrations exceeding laboratory detection limits; however, at the time of the assessment, the detected concentrations were considered within the range of naturally ocurring background concentrations. Several detected concentrations from DA 2 were detected above historical and current MTCA Method A CULs. The Method A CUL (20 mg/kg) has remained consistend over time. A Method B CULs is available that is

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significantly lower than the Method A CUL. The Method B CUL is 0.67 mg/kg. Maximum arsenic concentrations were measured at 30.1 mg/kg.

A total of nine groundwater samples were collected during initial site assessment from borings placed in RAU-2B. Slightly elevated concentrations of nitrate/nitrite and perchlorate were identified in some samples. An additional nine groundwater samples were collected from Base Boundary wells. Nitrate/nitrite concentrations were similar to initial assessment samples indicating that the RAU 2B sites were not likely the source of the detections in groundwater. The maximum perchlorate concentration detected in the boundary wells was 0.72 µg/L, an order of magnitude below the sample collected in demolition area 3 and the current CUL of 12 µg/L.

There are no changes to the site condition or use and changes to the CULs, when promulgated, do not affect the cleanup decision. Therefore, there are no changes to the cleanup goals that would affect the assessment of effectivness.

6.1.3.2 Implementation of Institutional and Engineering Controls

The sitewide institutional and engineering controls apply to each of the sites within RAU 2B (DA2 and DA3).

6.1.4 Effectiveness Remedy for Remedial Action Unit 2C

6.1.4.1 Remedial Action Performance

The remedy for RAU 2C has not yet been implemented. A draft RI/FS document has been submitted to Ecology for review.

6.1.4.2 Implementation of Institutional and Engineering Controls

There are existing restrictions that prohibit groundwater use underlying LF4/DA1 and requiring that the development of groundwater use elsewhere within RAU 2C be reviewed and approved by Ecology and USACE. These restrictions, together with the sitewide ICs and ECs, are protective by not allowing contact with impacted groundwater, but require maintenance and enforcement until the final remedy is selected and implemeted.

6.1.5 Effectiveness of Remedy for Remedial Action Unit 3

6.1.5.1 Remedial Action Performance

During the implementation of the RAU 3 remedial action, a total of 515 items itentified as MEC or MPPEH were removed and disposed of during the Phase I clearance activities; therefore, the potential risk presented by these specific items has been effectively addressed. However, as per the CAP, the clearance of area within RAU 3 varied.

Most roads and trails have been reported to be cleared to depths of 14 inches. Some roads shown in Figure 7 were not shown to be cleared.

Across the Central Vallety Floor, clearance was completed to the frost depth. This was reported to be a depth of 14 inches at CBMR, which is reasonably consistent with the relatively higher elevation of the site compared to much of the County and the associated 12-inch frost depth defined by the local building code.

At areas outside of the Central Valley Floor, clearance depths consisted of:

- Demolition Areas 1 and 2 (0 to 3 inches bgs clearance)

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- Range Target Areas—Hand Grenade Range; Rifle Grenade Range; and 3.5-inch Rocket Range (0 to 3 inches bgs clearance)
- Firing Positions and Points—Artillery Positions 1, 2, 3, 4 and 7; Mortar Positions 1, 2, 5 and 6; Rifle Grenade Firing Point; and 3.5-inch Rocket Range Firing Point (0 to 14 inches bgs clearance)
- Road and Trail Stepout Areas (0 to 3 inches bgs clearance)

Areas associated with the CITA were cleared as follows:

- CITA Target Areas Polygon—surface clearance (0 inches) consisting of a 100-acre polygon encompassing 15 identified target areas and the locations of previous MEC findings locations.
- CITA Road Alignment—subsurface clearance to 14 inches bgs within the 10-foot-wide road alignment within the CITA boundary (approximately 6,800 linear feet of roadway).
- Northern CITA Expansion Perimeter Fence/Road Easement, 40 feet wide and approximately 9,050 linear feet in length:
  - A 10-foot-wide area inside the fence alignment (surface clearance to 0 inches bgs).
  - A 10-foot-wide roadway alignment located just outside the fence line (surface and subsurface clearance to 14 inches bgs).
  - A 20-foot-wide area outside the roadway alignment (surface clearance to 0 inches bgs).

For areas within the western slopes, surface clearance was completed for areas with slopes less than 25%. Clearance was not completed when slopes exceeded 25%.

There are also documented suspect materials at depths of greater than 14 inches (a total of 722 locations were reported) across RAU 3, and there were several areas where clearance was not possible due to accessibility issues (0.65 acres that are considered too steep to be accessible and 2.5 acres that are currently being used by the FBI for ongoing training). Therefore, the potential exists for MEC/MPPEH to remain in these areas. Maintenance of the ICs and ECs is necessary to be protective of human health.

6.1.5.2 Implementation of Institutional and Engineering Controls

Institutional and engineering controls at RAU 3 were proposed for RAU 3 following MEC clearance actions, including:

- Property perimeter fence line.
- CITA fencing and signage.
- Signage to be maintained on roads and trails
- Provision for two County employees to be certified as Level I MEC technicians
- Additional signage at target areas and firing points, along roads and trails, and around the CITA perimeter fence to provide information about the site's military history, and on-site information kiosks with available media for additional information
- Current maintenance of ECs, primarily restricted area fencing at the CITA, requires improvement

Collectively, these ICs and ECs would be effective at providing information and reducing the risks to human health. These controls would not be effective at addressing risks to ecological receptors. An inspection in December 2024 identified that, while maintenance of fencing is ongoing, multiple fencing breaches are

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present due to downed trees and limbs. The fencing requires regular maintenance and enforcement to remain effective. Trespasser access has ocurred on occasion at CBMR during periods that the fence is down or trespassers have caused the fence to be down. With some maintenance, the RAU-3 boundary and CITA fence effectiveness can be restored.

6.2 WAC 173-340-420 (4)(b) Is New Scientific Information Available for Hazardous Substances at the Site

This section summarizes new scientific information that may be available for COCs at CBMR.

6.2.1 Site Applicability—New Information for COCs

New information was not identified for the TPH and lead.

Toxicological information for RDX was last updated in 2018 to revise slope factors for carcinogenic risk (suggestive evidence exists of carcinogenic potential of RDX) and the reference dose for oral exposurce (based on nervouse system disruptions). Toxicological information for perchlorate was last revised in 2005. RDX and perchlorate are COPCs for RAU-2B. These changes are reflected in the preliminary cleanup levels for this site. Additionally, case studies that support the effective use of enhanced bioremediation to address RDX and perchlorate in groundwater, as also included in the draft RI/FS for RAU-2C. New methods for the discovery of explosive materials is discussed below in Section 6.6.

Updated cleanup levels based on revised toxicological information for RDX are reflected in the preliminary cleanup levels for this site.

6.2.2 Site Applicability—PFAS

Information regarding human health risks for PFAS, and their application to cleanup projects, has been consistently evolving since its identification as an emerging contaminant.

In April 2024, EPA finalized a National Primary Drinking Water Regulation (NPDWR) for the following six PFAS: PFOA, PFOS, HFPO-DA, PFBS, PFHxS, and PFNA. EPA established the following MCLs:

PFOA	4 nanograms per Liter (ng/L)
PFOS	4 ng/L
PFHxS	10 ng/L
PFNA	10 ng/L
HFPO-DA	10 ng/L

In addition, EPA set an MCLG and MCL based on a hazard index (HI) of 1 for mixtures of two or more of the following PFAS: PFHxS, PFNA, HFPO-DA, and PFBS. That is, the sum of the individual hazard quotients for these PFAS in a water sample cannot exceed an HI of 1.

Both MCLs (for carcinogens and noncarcinogens) and MCLGs (for noncarcinogens) are identified as Applicable or Relevant and Appropriate Requirements (ARARs) under MTCA. The State has adopted these MCLs as its Method B cleanup levels.

In September 2024, EPA published final science-based water quality concentrations for 10 PFAS that will help protect fish and other aquatic life from these chemicals. The levels, referred to as water quality criteria and benchmarks, are not regulatory and are not required. States and Tribes can consider using them to develop

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water quality standards, which inform the implementation of other Clean Water Act programs, like wastewater discharge permits.

Tables 6 and 7 screen the 2023 SI data consistent with current EPA and Ecology methodology. The maximum detected PFOA concentration in sample CB186402-GW-01, 4.9 ng/L, exceeds the MTCA Method B screening level that is based on the MCL. This is the only PFAS compound that exceeds a current criterion. Soil and surface water concentrations were below cleanup levels. An HI was calculated using the maximum concentration in groundwater samples. The resulting HI was 0.4, below the criterion of 1.

6.3 WAC 173-340-420 (4)(c) Are New State or Federal Laws for Hazardous Substances at the Site Applicable?

New state or federal laws specific to TPH, lead, RDX, and perchlorate were not identified. New regulations or laws are available relating to PFAS and State requirements for consideration of environmental justice (EJ) in state actions.

6.3.1 New Regulations or Laws—PFAS

In 2021, Ecology concluded PFAS compounds are a Dangerous Waste and meet the definition of a hazardous substance under MTCA. Also, the Washington State Department of Health (DOH) issued final groundwater State Action Levels (SALs) for the following PFAS compounds: PFOA, PFOS, PFNA, PFHxS, and PFBS.

In April 2024, EPA finalized a critical rule to designate two widely used PFAS, PFOA and PFOS, as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act.

In April 2024, EPA issued the first-ever national, legally enforceable drinking water standard to protect communities from exposure to PFAS. EPA established legally enforceable levels, called MCLs, for six PFAS in drinking water: PFOA, PFOS, PFHxS, PFNA, and HFPO-DA as contaminants with individual MCLs, and PFAS mixtures containing at least two or more of PFHxS, PFNA, HFPO-DA, and PFBS using an HI MCL to account for the combined and co-occurring levels of these PFAS in drinking water. EPA also finalized health-based, non-enforceable Maximum Contaminant Level Goals (MCLGs) for these PFAS. As part of the rule, public drinking water systems are required to comply with a PFAS monitoring and reduction program, summarized below:

- Public water systems must monitor for these PFAS and have three years to complete initial monitoring (by 2027), followed by ongoing compliance monitoring. Water systems must also provide the public with information on the levels of these PFAS in their drinking water beginning in 2027.
- Public water systems have five years (by 2029) to implement solutions that reduce these PFAS if monitoring shows that drinking water levels exceed these MCLs.
- Beginning in five years (2029), public water systems that have PFAS in drinking water which violates one or more of these MCLs must take action to reduce levels of these PFAS in their drinking water and must provide notification to the public of the violation.

The Dangerous Waste listing for PFAS compounds is a relevant future consideration. Designation of PFAS as hazardous substances make them subject to cleanup under Ecology's MTCA rules. If future PFAS cleanup is required, compliance with the Dangerous Waste regulations will be required.

A public water system is defined by EPA as a public or private water system that provides water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year. The water system at the property has the capacity to be a public system but does not currently meet that definition. The on-site wells are for non-potable purposes

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only because of contamination from other hazardous substances. PFAS sampling of the on-site water wells has not been conducted.

6.3.2 New Regulations or Laws—HEAL Act

The Healthy Environment for All Act (also known as the HEAL Act) was enacted in 2021 to create a coordinated and collaborative approach to EJ, making it a priority and part of the mission of key state agencies. State actions, in this case the CBMR cleanup, are required to consider possible impacts to vulnerable populations and overburdened communities, as required under WAC 173-340-350(6)(h)(iii). This review was prepared following the guidance in Section 4.0 of Implementation Memo No. 25, Identifying Likely Vulnerable Populations and Overburdened Communities under the Cleanup Regulations (Ecology, 2024). The table below summarizes the review. Supporting information is included in Appendix C.

Criteria	Test	Result
Washington State Environmental Health Disparities (EHD) Index	Ranking on EHD Map	EHD Map Result: 4
EJ Screen Demographic Index	80th percentile or greater	Limited English speaking (Spanish, Indo-European Languages, Asian Pacific Island, other): 56% Over the age of 65: 73%
EJ Screen Environmental Burden Indicator	80th percentile or greater	Particulate Matter 2.5: 96%
EJ Screen Supplemental Demographic Index	80th percentile or greater	Supplemental Indexes: all less than 80%

Environmental Health Disparities were not identified (EHD Index Map result = 4).

The EJ demographic index indicates vulnerable populations are not present. All percentile markers came in at less than 80%. The most notable environmental burden indicator was for particulate matter 2.5 (PM2.5) at 96%. The Supplemental Demographic Index values also reflected a percentile of less than 80%. Common sources of PM2.5 include wood smoke, wildfires, vehicles, industry, power plants, construction and agriculture, and ships and trains. Cleanup activities that generate PM2.5 are not ongoing. Episodic PM2.5 generation related to trucking and equipment use for remediation is possible. Future operation as a regional park could result in excess PM2.5 generation.

6.4 WAC 173-340-420 (4)(d) Current and Projected Site and Resource Uses

As summarized in the APPCD, the projected end use of the property is a regional park. The County's reuse plan is summarized in the Camp Bonneville Reuse Plan (Otak, 2005). A timeline for development of this property has not be approved by County Council yet. Current interim uses are limited and consist of law enforcement training, seasonal use by DNR helicopter tactical team (Heli-Tact), and some logging.

6.4.1 Law Enforcement Training

The FBI currently operates a training facility that they constructed at Camp Bonneville in 1995. Local law enformcement, primarily the Clark County Sheriff, also conduct training at an adjacent range. Both facilitities

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are shown in Figure 10. Mobile response, patrol, close quarter, and SWAT training activities are also conductedby the law enforcement orgnaizations. Ammunition is stored at the FBI range and temporarily at two magazines in the Central Valley Floor during active use.

Interviews conducted for this Periodic Review identiifed that the FBI includes quarterly firearms training for its law enforcement officials and monthly training for it's SWAT operators. Quarterly firearms training is four sessions per quarter and involves pistol and rifle qualifications and marksmanship skill building. It also involves medical training and search/arrest procedures. SWAT trains four times per month and conducts firearms drills and close quarter clearing/arrest techniques.

Interviews conducted for this Periodic Review identiifed that the Clark County Sheriff uses the range twice a month for a firearms open range day for deputies to practice and qualify. In addition, the Sheriff's Office reserves up to 14 days a year to potentially use for patrol training days, though its actual use may be less. The Mobile Response Team infrequently uses the range for training. A few additional days a year are sometimes used for the citizens academy and new hire firearms orientation.

6.4.2 DNR Heli-Tact Operations

The County has an interlocal, short-term lease agreement with DNR, which establishes a forward operating base for helicopter operations. DNR's helicopter operations at Camp Bonneville assist its efforts to mitigate and improve response times for wildfires in the area. DNR has been using Camp Bonneville to conduct these operations since 2019 (CCPW, 2022). The agreement includes adequate space for a helicopter, fuel truck, and Building T-1980 to house crew members and limits WDNR's access of Camp Bonneville to only the barracks, parking area, and airfield near the main camp entrance.

6.4.3 Forestry Operations

Logging to promote forest health is periodically completed. Logging is completed by outside contractors and consists of thinning/dead limb removal from below and removing smaller trees. Logging is only completed in areas outside of the CITA or critical areas (wetlands, etc.). Ground disturbance protocols are communicated in the contract documents and logging contractors receive MEC training. Work areas are also cleared by the Level I MEC technician employed by the County. Logging is completed under permit from DNR. DNR notifies Ecology of logging activities. Table 8 summarizes the forestry practices at CBMR since 2012. As shown on the table, all activities were related to thinning, hazard removal and replanding to promote forest health.

6.4.4 Projected Site Uses

Projected site uses include the regional park plan. The County's reuse plan has nine specific components: regional park, law enforcement training center, rustic retreat center/outdoor school, Native American culture center, Clark College environmental education, trails and nature area, FBI firing range, timber resource management area, and habitat restoration (Otak, 1998). The concept for the park redevelopment is shown in Figure 10.

6.5 WAC 173-340-420 (4)(e) Availability and Practicability of More Permanent Remedies

6.5.1 Remedial Action Unit 1

Further remedy needed for RAU-1 is required to address the residual contamination beneath Building 4475 and Building T-1932 in the event that the buildings are removed (or the contaminated soil becomes otherwise accessible). Future work in these areas would provide the opportunity to implement more permanent remedies for the residual contamination. As the residual contamination is limited to petroleum hydrocarbons, permanent remedies are readily available and would be selected based on the future site conditions and scope of the proposed future work.

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6.5.2 Remedial Action Unit 2A

The remedies completed at RAU-2A have successfully addressed potential risks to human health and it was determined that no further remedy is needed. However, the two soil covers (RAU-2A-16 and RAU-2A-21) are susceptible to damage and will require perpetual inspection and maintenance to remain effective. Further removal of the underlying contaminated soil could be considered to be a more permanent remedy, but it would not be considered practicable as it would require removal of the existing clean overburden as well as an undefined extent of underlying contaminated soil over a large area. Improvements to the existing soil covers (as outlined in Section 6.1) could be reasonably practicable and could address concerns about erosion and re-emergence of underlying contamination, but would still require inspection and maintenance. Improvement, inspection and maintenance of the containment at the former sewage lagoon should be implemented.

6.5.3 Remedial Action Unit 2B

There is no further remedy needed for RAU-2B.

6.5.4 Remedial Action Unit 2C

The remedy for RAU 2C has not yet been implemented. The draft RI/FS includes consideration of permanent remedies (including the permanent destruction of COPCs).

6.5.5 Remedial Action Unit 3

The cleanup action for RAU-3 has included the permanent removal of MEC/MPPEH items from the Site, but it is likely that additional MEC items exist in areas that were either not cleared or at depths below the clearance depth (prior reporting documented hundreds of unidentified discrete items below the screening depth). The potential for MEC to remain on site is highest within the CITA. Physical removal would be the only practicable remedy for the MEC/MPPEH, but is only effective when the discrete items are located with detection equipment prior to removal.

The predominant method that has previously been used at the Site for location of subsurface items was analog detectors (F1 Minelab all-metals detectors; Weston, 2018). Other technologies exist for locating subsurface items, including the recent development of drone-mounted GPR units. Drone-mounted GPR units have been used successfully for the discovery of buried MEC at other sites and is uniquely suitable to difficult terrain and dangerous sites. However, the minimum size that can be resolved with currently available airborne GPR equipment is greater than 5 centimeters (about 2 inches), which is larger than several of the items known to present a potential explosive hazard (such as the 37-mm projectile fuze and 14.5-mm subcaliber projectile; Weston, 2018) Therefore, this method has similar issues as were encountered with the digital geophysical mapping methods previously used. The aerial GPR may be suitable for identifying larger MEC items in the areas identified as being inaccessible (such as on slopes that were greater than 14%) but could not be relied on to identify all MEC/MPPEH items.

The available documentation does not address how additional clearance will be completed when the regional park is developed. Additional methods for clearance should be undertaken for certain areas of the park where intensive use will occur, such as campgrounds, picnic areas, recreation areas, and playgrounds.

6.6 WAC 173-340-420 (4)(e) Availability and Improved Analytical Techniques

Since the completion of the cleanup actions at the site and associated reporting, significant developments have been made in the detection of trace explosives, but the majority of these developments require a material sample or contact with the material (including spectrometry, biosensors, and surface-enhanced

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Raman scattering [SERS]), which would not be suitable for the discovery of MEC at the Site. Other methods are reportedly being developed that use non-contact methods, such as monitoring for trace quantities of vapors from explosive materials or using laser-acoustic technology (LAMBDIS), but these methods are not currently available for commercial use and are unlikely to be suitable to CBMR due to the heterogeneity of the ground, the abundance of organic material and plants, and the depth of the potential MEC.

6.6.1 Availability and Improved Analytical Techniques: PFAS

Until recently, PFAS was primarily analyzed using EPA 537, which is a drinking water method modified for environmental media. In January 2024, the EPA released three methods to better measure PFAS in the environment:

- Final EPA Method 1633, a method to test for 40 PFAS compounds in wastewater, surface water, groundwater, soil, biosolids, sediment, landfill leachate, and fish tissue
- Final EPA Method 1621, which can broadly screen for the presence of chemical substances that contain carbon-fluorine bonds, including PFAS, in wastewater
- Other Test Method (OTM)-50, which measures 30 volatile fluorinated compounds in air

6.6.1.1 Site Applicability

The SI analyzed samples using an equivalent method to EPA 537, which includes analysis for eight compounds (PFOS, PFOA, PFBA, PFBS, PFNA, PFHxA, PFHxS, and HFPO-DA/GenX). Method EPA 1633, released in 2024, provides for analysis of 40 PFAS related compounds. Future sampling of environmental media at the site should utilize EPA 1633.

EPA 1633 has MRLs that are approximately 3 and 10 times lower than the modified 537 method that were used in the SI. As summarized in Tables 6 and 7, the higher MRLs that were used during the SI did not result in MRLs that were above the RSLs used in the SI.

6.7 Technical Assessment Summary

In general, the technical review of the CBMR cleanup actions identified the need to complete planned tasks (such as the site O&M Plan, record applicable restrictive covenants for RAU 2A and RAU 3), implement a defined inspection program, and intensify sitewide fence maintenance. Specifics for each remedial action unit are described below.

6.7.1 Remedial Action Unit 1

Previous actions across RAU-1 have addressed exceedances of the reported CULs. The institutional controls associated with the residual contamination beneath Building 4475 and Building T-1932 are in place and effective for the current use. Maintenance of these controls will be necessary until that contamination is addressed (such as through a cleanup action following a future change in site use that includes the removal of the buildings).

6.7.2 Remedial Action Unit 2A

Significant waste removal actions have permanently improved the condition of RAU-2A. Two minor exceptions were identified:

- Elevated concentrations of lead (423 mg/kg) above applicable CULs were identified at at the Machine Gun Range South Site, but records of remediation were not identified.
- Confirmation sample results are not reported in the 2018 Cleanup Action Report for RAU-2A.

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These conditions are considered data gaps.

Further improvements to the two soil caps (RAU-2A-16 and RAU-2A-21) are recommended to improve effectiveness and reduce the potential for future releases, including:

- Signage at both areas alerting to the presence of the soil cap and prohibiting vehicular access
- Removal of the trees within the RAU-2A-21 soil cover and filling any related voids in the cover
- Physical maintenance of the caps to include fill of tracked area and protection against further erosion at RAU-2A-20
- Demarcation of the boundary of both soil covers and installation of signage
- Annual inspection program, including monitoring erosion distance to RAU-2A-16 streambank
- Removal of non-grassy plants (such as shrubs or saplings) across both soil cover areas
- Incorporation of soil placed in the Eastern Sewage Lagoon into the institutional controls and a routine inspection program

Mitigation of conditions at the Eastern Sewage Lagoon should be prioritized, including repair of the breach or installation of runoff controls should be prioritized. Capping of the soils in the Eastern Sewage Lagoon that are present above cleanup levels for ecological risk should be evaluated.

6.7.3 Remedial Action Unit 2B

Data for the cleanup decision for RAU-2B largely did not identify exceedances of CULs in soil and groundwater, the exception of detected arsenic concentrations at DA 2 being present above naturally occurring background concentrations and cleanup levels. The precise location of DA 2 is not known. Groundwater assessment of DA 2 concluded impacts to groundwater have not occurred.

6.7.4 Remedial Action Unit 2C

Implementation of the RI/FS that is currently being reviewed by Ecology will address the remaining contamination associated with RAU-2C.

6.7.5 Remedial Action Unit 3

While significant amounts of MEC/MPPEH have been removed from RAU-3, it is expected that residual items remain, particularly with the CITA. Numerous unidentified items were mapped at depths below the clearance depth of 14 inches across the Central Valley Floor and are also expected to be present below the clearance depths across the rest of RAU-3, some fraction of which are likely to be MEC. Further clearance (to depths of greater than 14 inches) may be appropriate in areas that are planned for future public use. Additional methods for clearance should be undertaken for certain areas of the park where intensive use will occur, such as campgrounds, picnic areas, recreation areas, and playgrounds.

Institutional controls require that the CITA be maintained as an access restricted area because it is not practicable to remove all MEC from the CITA. Improvements to the institutional and engineering controls are recommended, specifically development of the long-term O&M plan and an inspection program, and fence maintenance.

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6.7.6 Sitewide Considerations

The long-term O&M plan has not been prepared. While the annual ECCR reports to the Army document compliance with a comprehensive list of restrictions and some plans are in place, O&M requirements are not documented in a comprehensive plan as required by the APPCD. The long-term O&M plan should include provisions for routine inspections, maintenance of records and other requirements under the APPCD. Institutional or engineering controls developed based on the long-term O&M plan must be recorded on the property deed.

The boundary fence is damaged in multiple places, and improvements for timely repair are needed to maintain effectiveness.

Cleanup activities did not account for ecological risk in consistent with MTCA requirements, particularly the cleanup activities for RAU 2A. Ecological risk is a sitewide consideration that should be evaluated consistent with MTCA.

The 2023 PFAS PA and SI identified minimal potential for PFAS sources at the site. A single PFAS compound in groundwater was detected in excess of cleanup levels. The HI calculated using maximum groundwater concentrations was acceptable. Two data gaps were identified in association with the PFAS PA and SI:

- The Drum Disposal Area, Paint and Solvent Disposal Area, and the Sewage Lagoon were excluded from sampling during the PFAS PA. Paints, solvents, and municipal wastewater can be sources of PFAS. Sampling of these areas should be considered if PFAS is evaluated further.

The SI utilized a shorter compound list and did not use EPA Method 1633, which is industry-wide practice for PFAS analysis because it tests for 40 PFAS compounds.

If the sitewide groundwater use restriction is modified to allow drinking water use, PFAS sampling should be completed as required for public water systems.

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7 CONCLUSIONS

The Periodic Review conducted for the CBMR included a summary of the basis of each cleanup action, a summary of the cleanup actions completed, inspections, interviews with key personnel, and evaluated the cleanup actions following WAC 173-340-420 (4). Based on the evaluation of the cleanup actions, data gaps or deficiencies related to the effectiveness and protectiveness of the remedial actions or implementation of institutional contols were identified. Key institutional controls including land use restrictions, public access, and groundwater use restrictions have been implemented. Unacceptable risks or exposures under the current land uses as a facility closed to the public were not identified. Each of the considerations related to the effectiveness and protectiveness of the remedial actions, as summarized below, can be readily corrected prior to park development.

RAU 1. Information compiled for the Periodic Review indicates RAU 1 is in compliance. Additional actions are not recommended for RAU 1. Established institutional controls should remain in place.

RAU 2A. Information compiled for the Periodic Review indicates RAU 2A is in general compliance, with several data gaps and areas for improvement identified:

- Data gaps related to elevated concentrations of lead (423 mg/kg) above applicable CULs were identified at at the Machine Gun Range North Site, but records of remediation were not identified.
- Remediation was completed across RAU-2A. However, confirmation sampling results from areas other than RAU-2A-16 and RAU-2A-21 were not included in the Cleanup Action Report for RAU-2A Small Arms Ranges (Weston, 2018).

Each of these data gaps should be resolved through by locating applicable resources that resolve the data gaps or environmental sampling.

Improvements to the soil covers at RAU-2A-16 and RAU-2A-21 are recommended to improve effectiveness and reduce the potential for future releases, including:

- Demarcation of the boundary and installation of signage at both areas alerting to the presence of the CAP and prohibiting vehicular access
- Removal of the trees within the RAU-2A-21 soil cover and filling trunk scars
- Physical maintenance of the caps to include fill of tracked area at RAU-2A-20
- Routine inspection program, including monitoring erosion distance to RAU-2A-16 streambank
- Removal of non-grassy plants (such as shrubs or saplings) across both soil cover areas

Mitigation of conditions at the Eastern Sewage Lagoon should be prioritized. Repair of the breach or installation of runoff controls should be prioritized. Capping of the soils in the Eastern Sewage Lagoon that are present above CULs for ecological risk should be evaluated. Incorporation of soil placed in the Eastern Sewage Lagoon into the institutional controls and a routine inspection program should be considered.

RAU 2B. RAU 2B is generally in compliance, with one data gap noted.

- Detected arsenic concentrations at DA 2 are present above naturally occurring background concentrations and cleanup levels. DA 2 is in a remote location and the physical location cannot be determined.

Based on the inaccessible location, this data gap is low priority for resolution.

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RAU 2C. Remedial Investigation is ongoing at this RAU. No recommendations are offered for this RAU.

RAU 3. CBMR is in compliance with requirements for MEC awareness training for contractors and visitors. Elements of the awareness program could be improved as part of long-term O&M plan development. The boundary fence and the CITA fence are down at multiple locations. Fence maintenance requires ongoing efforts to maintain compliance. While significant amounts of MEC have been removed from RAU-3, residual items remain, particularly with the CITA. Numerous unidentified items were mapped at depths below the clearance depth of 14 inches across the Central Valley Floor. Recommended improvements to management procedures related to RAU 3 include:

- Implementation of a robust inspection program, to be completed following intense rain fall or in roads that have become rutted from vehicular traffic.
- Additional methods for clearance should be undertaken for certain areas of the proposed park where intensive use will occur, such as campgrounds, picnic areas, recreation areas, and playgrounds

Maintenance of the boundary fence and CITA fence should be prioritized.

Sitewide Considerations. The site is not in compliance with requirements to prepare a long-term O&M plan summarizing and documenting procedures for complying with engineering and institutional controls. Land use and access restrictions, as well as MEC awareness training implemented by the County, have been effective on an interim basis at protecting contractors and visitors. Priority should be assigned to completing the long-term O&M plan.

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Figures

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Figure 7. RAU 3 Areas
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Figure 9. Institutional and Engineering Control Plan
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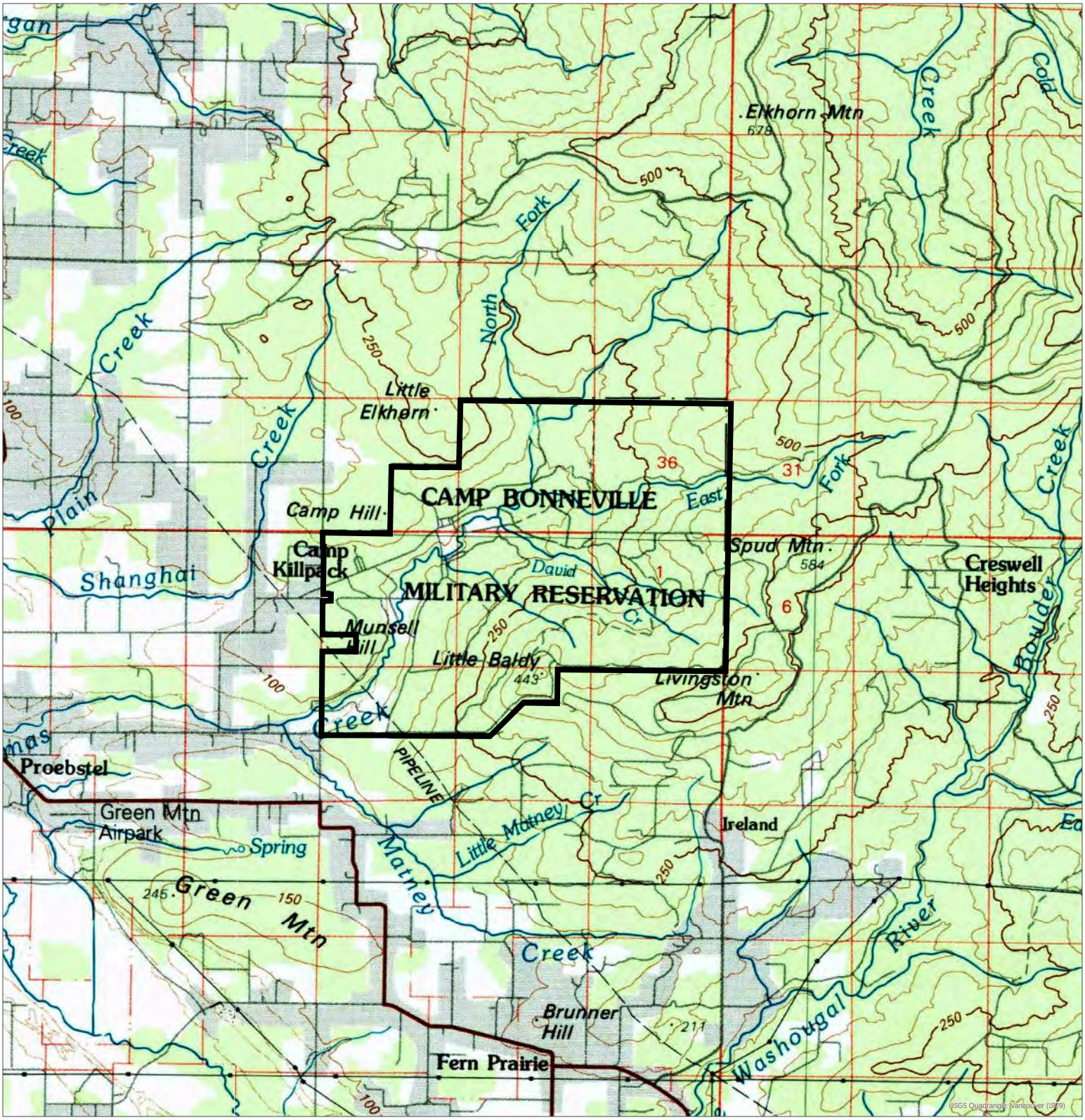

Site Vicinity

23201 NE Pluss Road, Vancouver, Washington

Date: January 2025 | Project: CLA061-0314013-24011091

Figure: 1

Site Boundary

N

1 INCH = 1 MILE

0 ½ 1 Miles

PBS

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Site Plan

23201 NE Pluss Road
Vancouver, Washington

Date: January 2025

Project: CLA061-0314013-24011091

Figure: 2

- Water Supply Well
- General Groundwater Flow Direction
- Road/Trail
- Waterway
- Central Valley
- Camp Bonneville Area
- Site Boundary
- Elevation Contour (20' Interval, via Clark County)

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

PBS

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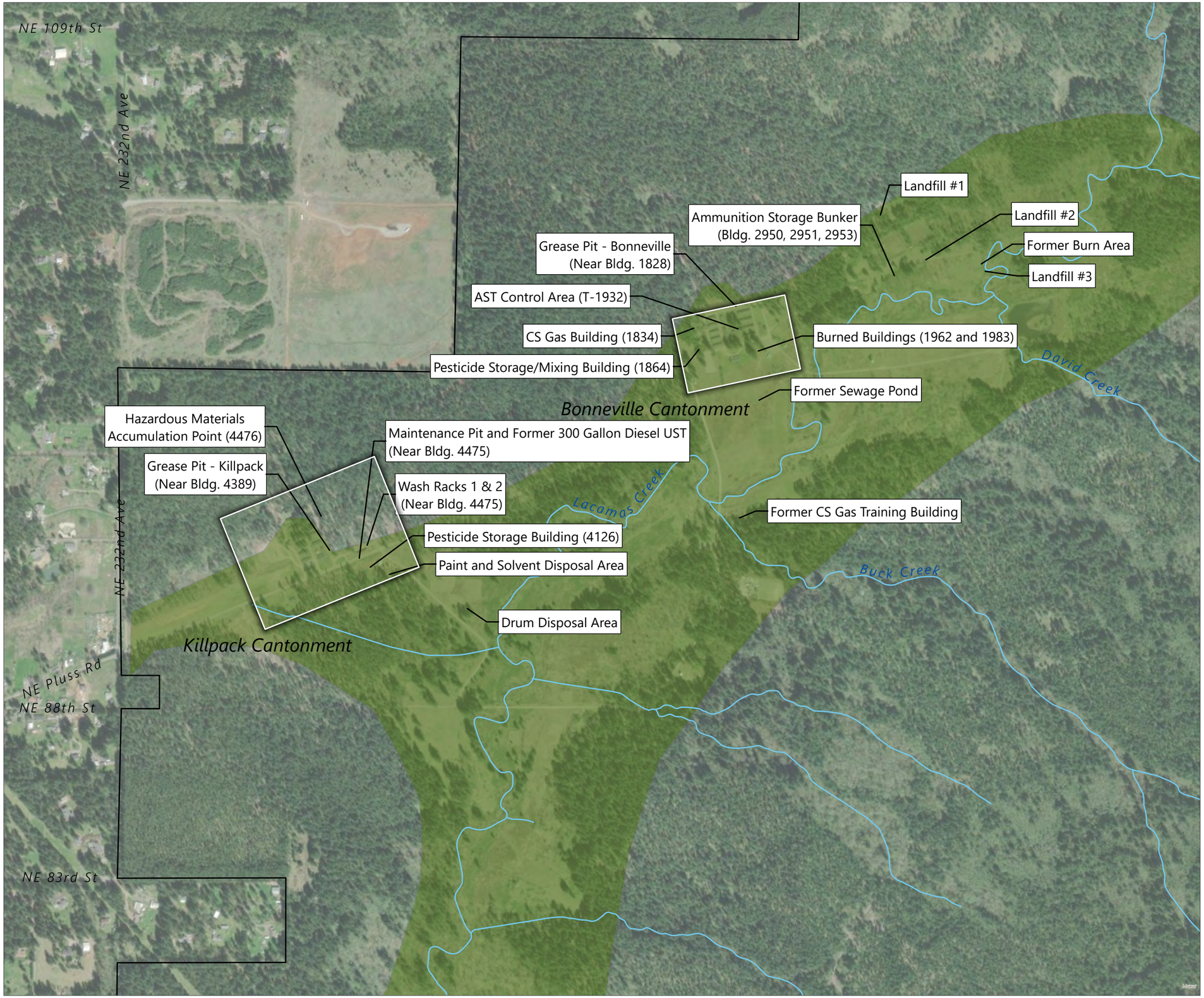

Remedial Action Unit #1

23201 NE Pluss Road
Vancouver, Washington

Date: January 2025

Project: CLA061-0314013-24011091

Figure: 3

- Waterway
- Base Boundary
- Central Valley

N

1 INCH = 750 FEET

0 750 1,500 Feet

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NAD 1983 StatePlane Washington South FIPS 4602 Feet | L:\Projects\76000\76100-76199\76151_Camp Bonneville, Vancouver\DWG\GIS\FiveYearReview\CampB5Year\CampB5Year.aprx | 1/17/2025 9:49 AM

Remedial Action Unit #2A

23201 NE Pluss Road
Vancouver, Washington

Date: January 2025

Project: CLA061-0314013-24011091

Figure: 4

Ranges

- 1000 Foot Range/1000 Foot Range Gun & Moving Target Range
- 1952-TEC-22 Boundary
- 25M M60 Range/Pistol Range
- 25M Machine Gun Range
- 25M Record Fire Field Range
- 500-Inch A-A Range (1943)
- Anti-Aircraft Range
- Close Combat Range
- Combat Pistol Range
- Field Firing Ranges 1 & 2
- Infiltration Course (North)
- Infiltration Course (South)
- Machine Gun Range (North)
- Machine Gun Range (South)
- Pistol Range
- Rifle Ranges 1 & 2/Field Fire Rifle Ranges 1 & 2
- Sub-Caliber Range 1
- Sub-Caliber Range 2
- Sub-Machine Gun Range
- TF Range
- Undocumented Pistol Range
- Waterway
- Road/Trail
- Central Valley
- Base Boundary

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

PBS

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Remedial Action Unit #2B

23201 NE Pluss Road
Vancouver, Washington

Date: January 2025

Project: CLA061-0314013-24011091

Figure: 5

- Waterway
- Road/Trail
- Gas Pipeline
- Central Valley
- Base Boundary

1 INCH = 1,500 FEET

N

0 1,000 2,000 Feet

PBS

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RAU-2C Well Locations

23201 NE Pluss Road
Vancouver, Washington

Date: January 2025

Project: CLA061-0314013-24011091

Figure: 6

- Monitoring Well
- Road/Trail
- Waterway
- Landfill 4/Demolition Area 1 (Tetra Tech, 2004)
- Central Valley
- Base Boundary
- Elevation Contour (20' Interval, via Clark County)

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

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RAU 3 Areas

23201 NE Pluss Road
Vancouver, Washington

Date: January 2025
Project: CLA061-0314013-24011091

Figure: 7

RAU 3 Phase 2
- RAU 3 Phase 2 Boundary
- RAU 3 Phase 2 Stepout

Western Slopes
- Greater than 25% Slope
- Less than 25% Slope

Road/Trail
- Cleared of MEC
- Not Cleared of MEC (Controls Recommended)

- Central Valley
- Demolition Area
- Central Impact Target Area
- Waterway
- Wetland (via Clark County)
- Base Boundary

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

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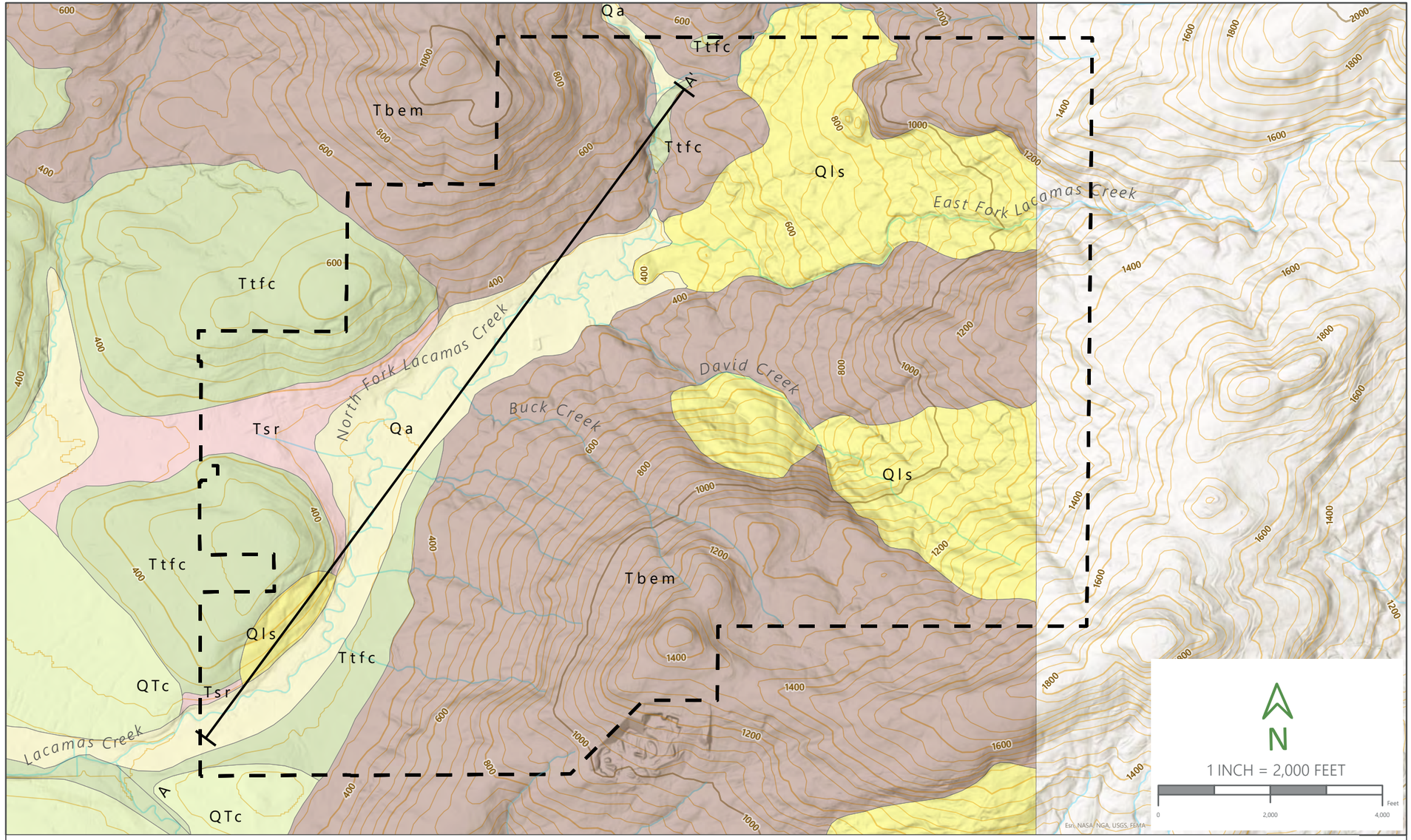
Esri Community Maps Contributors, County of Clark, WA, Oregon Metro, Oregon State Parks, State of Oregon GEO, WA State Parks GIS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS

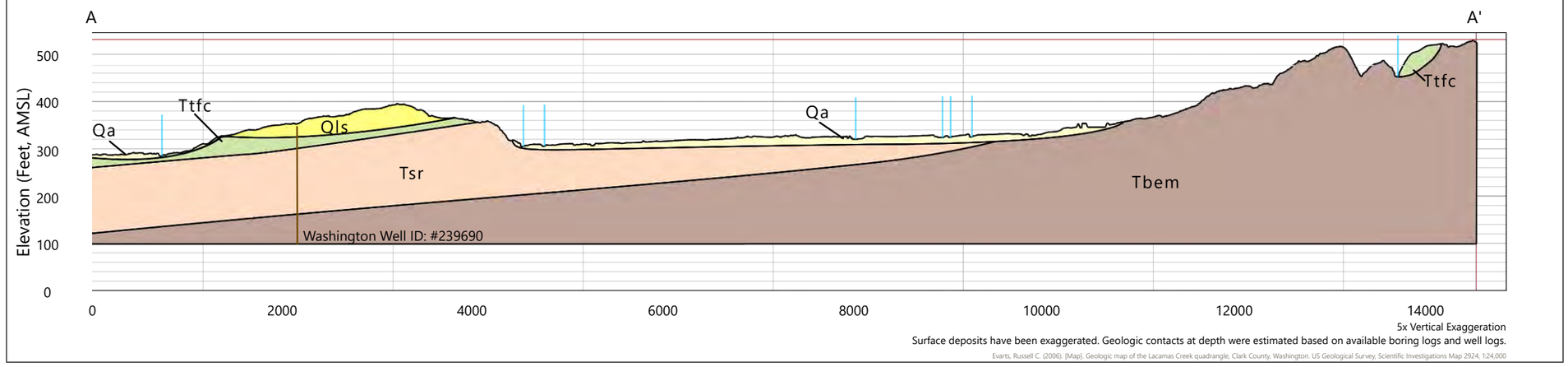
Camp Bonneville Sitewide Geologic Map

23201 NE Pluss Road
Vancouver, Washington

Date: January 2025
Project: CLA061-0314013-24011091

Figure: 8





Surface deposits have been exaggerated. Geologic contacts at depth were estimated based on available boring logs and well logs.

Evarts, Russell C. (2006). [Map]. Geologic map of the Lacamas Creek quadrangle, Clark County, Washington. US Geological Survey, Scientific Investigations Map 2924, 1:24,000

- Waterway
- Topographic Contour (40 Foot Interval)
- Site Boundary

Geologic Unit

- Alluvial Sediments (Qa)
- Landslide Deposits (Qls)
- Lower Troutdale Member (Ttfc)
- Sandy River Mudstone (Tsr)
- Basaltic Andesite of Elkhorn Mountains (Tbem)

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Institutional and Engineering Control Plan

23201 NE Pluss Road
Vancouver, Washington

Date: January 2025

Project: CLA061-0314013-24011091

Figure: 9

- Water Supply Well

Road/Trail

- Cleared of MEC
- Not Cleared of MEC (Controls Recommended)
- Waterway
- Soil Cap
- Demolition Area 1 Groundwater Restriction
- Sewage Lagoon (Controls Recommended)
- Central Impact Target Area Fence - Restricted Area
- Boundary Fence
- Elevation Contour (20' Interval, via Clark County)

Note: This plan does not show the location of cultural resource sites 45-CL-318 in Quitclaim Deed and others identified during RAU3 remediation.

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

PBS

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Camp Bonneville Reuse Plan

23201 NE Pluss Road
Vancouver, Washington

Date: January 2025

Project: CLA061-0314013-24011091

Figure: 10

- Central Impact Target Area
- Regional Park
- Wildlife Management Area
- Road/Trail
- Waterway
- Base Boundary
- Elevation Contour (20' Interval, via Clark County)

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

PBS

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NAD 1983 StatePlane Washington South FIPS 4602 Feet | Z:\PBS\Projects\76000\76100-76199\76151_Camp Bonneville, Vancouver\DWG\GIS\FiveYearReview\CampB5Year\CampB5Year.aprx | 1/17/2025 9:49 AM

Tables

Table 1. Effectiveness Screening RAU 1 Soil
Table 2. Effectiveness Screening RAU 1 Water
Table 3. Effectiveness Screening RAU 2A Soil
Table 4. Effectiveness Screening RAU 2B Soil
Table 5. Effectiveness Screening RAU 2B Groundwater
Table 6. SI Soil Boring Results: PFAS
Table 7. SI Drinking Water Results: PFAS
Table 8. Forestry Activity Summary

Table 1. Effectiveness Screening RAU 1 Soil
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Metal Background	Current MTCA B*	Landfill 2 & 3		Burn Area		Former Building (1962-1983)	Grease Pits (Near Building 1828)		Former Sewage Pond	Hazardous Material Accumulation Point (Building 4476)	Drum Disposal Area		Paint And Sulvant Disposal	Washrack 1 (Near Building 4475)		Washrack 2 (Near Building 4475)	Maintenance Pit (Near Building 4475)		Pesticide Mixing Building 1864		Aboveground Tank (Building T-1932)		Former Training Building		CS Gas Chamber Building 1834	Pesticide Storage Building 4126		Ammunition Sotrage (Buildings 2950, 2951, 2953)		Underground Storage Tank (Near Building 4475)	
		Pre/Post Remedial Action				NA		NA		NA	NA		NA	NA	Pre	Post	NA	Pre	Post	NA	Pre	Post	Pre	Post	Pre	Post	Pre	Post	NA	Pre	Post	Pre	Post	Pre	Post
Total Number Samples Collected						17		22		15	5		17	3	5	6	4	5	8	5	6	24	11	5	9	49	11	10	2	4	6	30	17	9	18
METALS—MAXIMUM CONCENTRATION																																				
Antimony	mg/kg	NS	32	0.12	32	0.079		0.1		--	0.088		0.24	0.062	0.65	--	0.088	0.26	--	0.088	0.28	--	0.54	--	--	--	--	--	--	7	0.407	20	2.5	--	--
Arsenic	mg/kg	20	0.667	7	0.67	4.5		3.4		--	**7.9**		**7.2**	0.96	2.5	7	3.9	4.1	--	3.9	3.8	--	**10.1**	2.13	--	--	--	--	--	1.8	--	**15.5**	5.36	--	--
Barium	mg/kg	NS	5,600	257	16,000	255		--		--	374		--	91.8	388	230	143	244	--	143	176	--	242	--	--	--	--	--	--	7.2	--	2,590	208	--	--
Beryllium	mg/kg	NS	160	2	160	1.3		1.3		--	1.2		1.1	0.36	1.3	--	0.87	1.3	--	0.87	1.3	--	1	--	--	--	--	--	--	1	--	5.6	0.824	--	--
Cadmium	mg/kg	2	NS	1	80	0.13		0.19		--	0.055		1.5	1.3	1.45	0.71	0.68	1.8	0.997	0.68	1.2	--	**2.7**	1.14	--	--	--	--	--	1	--	**18.3**	1.21	--	--
Chromium	mg/kg	2,000	120,000	42	120,000	29.3		33.8		--	24.2		31.4	6.1	1,240	56.3	22.6	31.6	--	22.6	37.8	--	28.9	--	--	--	--	--	--	30.2	--	114	43.4	--	--
Copper	mg/kg	NS	2,960	114	3,200	134		104		--	133		123	48.5	125	125	125	125	125	125	125	125	166	--	125	125	125	125	125	125	125	125	125	125	--
Lead	mg/kg	250	NS	17	250	13.1		17.9		149	24.4		13.2	12.4	**5,610**	15.3	12.8	**766**	88.7	12.8	**4,120**	20.6	**295**	46.3	--	--	**674**	24.4	17	**970**	221	**1,170**	38.2	--	--
Mercury	mg/kg	2	24	0.07	2	ND		0.07		--	ND		0.038	ND	0.271	ND	0.03	0.042	--	0.03	0.054	--	0.044	--	--	--	--	--	--	0.46	--	**4.2**	--	--	--
Nickel	mg/kg	NS	1,600	38	880	12.7		15.1		--	19.9		23.3	13.7	14.4	--	9.7	9.9	--	9.7	9.5	--	14.8	--	--	--	--	--	--	18	--	117	20.9	--	--
Selenium	mg/kg	NS	400	NS	400	0.1		0.23		--	0.34		0.13	ND	ND	0.608	ND	0.62	--	ND	0.37	--	ND	--	--	--	--	--	--	--	--	<0.6	--	--	--
Silver	mg/kg	NS	400	NS	400	0.24		0.26		--	0.24		0.32	0.21	0.2	ND	0.13	0.22	--	0.13	0.24	--	0.18	--	--	--	--	--	--	0.7	--	2.9	--	--	--
Thallium	mg/kg	NS	56	0.27	0.8	0.16		0.29		--	0.28		0.36	ND	ND	--	ND	ND	--	ND	0.26	--	0.24	--	--	--	--	--	--	--	--	0.49	<0.347	--	--
Zinc	mg/kg	NS	24,000	86	24,000	92.3		182		--	78.1		80.2	51.5	74.7	--	66.5	158	--	66.5	364	--	350	--	--	--	--	--	--	330	--	525	84.4	--	--
VOLATILE ORGANIC COMPOUNDS—MAXIMUM CONCENTRATION																																				
Acetone	mg/kg	NS	8,000	NS	72,000	--		0.013		--	--		0.0037	--	0.24	--	--	0.083	--	--	0.052	--	0.026	--	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/kg	NS	800	NS	160	--		--		--	--		--	--	--	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Butanone (MEK)	mg/kg	NS	48,000	NS	48,000	--		--		--	--		--	--	0.05	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1 -Dichloroethene	mg/kg	NS	1.67	NS	4,000	--		--		--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/kg	6	8,000	NS	8,000	--		--		--	--		--	--	**2,670**	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.4	--
Isopropylbenzene	mg/kg	NS	8,000	NS	8,000	--		--		--	--		--	--	149	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Propylbenzene	mg/kg	NS	NS	NS	8,000	--		--		--	--		--	--	178	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
p-isopropyltoluene	mg/kg	NS	NS	NS	NS	--		--		--	--		--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	mg/kg	NS	NS	NS	800	--		--		--	--		--	--	738	ND	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	mg/kg	NS	NS	NS	800	--		--		--	--		--	--	1,770	ND	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
tert-Butylbenzene	mg/kg	NS	NS	NS	8,000	--		--		--	--		--	--	0.006	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
sec-Butylbenzene	mg/kg	NS	NS	NS	8,000	--		--		--	--		--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
p-Cumene	mg/kg	NS	NS	NS	NS	--		--		--	--		--	--	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Hexanone	mg/kg	NS	NS	NS	400	--		--		--	--		--	--	--	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbon disulfide	mg/kg	NS	8,000	NS	8,000	--		--		--	--		0.0052	--	--	--	--	--	--	--	0.003	--	0.013	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/kg	7	16,000	NS	6,400	--		0.002		--	--		--	--	**973**	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	mg/kg	0.1	1,600	NS	1,600	--		--		--	--		--	--	**118**	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
m- & p-Xylenes	mg/kg	9	160,000	NS	16,000	--		0.0025		--	--		--	--	23,400	ND	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--

Table 1. Effectiveness Screening RAU 1 Soil
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Metal Background	Current MTCA B*	Landfill 2 & 3		Burn Area		Former Building (1962-1983)	Grease Pits (Near Building 1828)	Former Sewage Pond	Hazardous Material Accumulation Point (Building 4476)	Drum Disposal Area		Paint And Sulvant Disposal	Washrack 1 (Near Building 4475)		Washrack 2 (Near Building 4475)	Maintenance Pit (Near Building 4475)		Pesticide Mixing Building 1864		Aboveground Tank (Building T-1932)		Former Training Building		CS Gas Chamber Building 1834	Pesticide Storage Building 4126		Ammunition Sotrage (Buildings 2950, 2951, 2953)		Underground Storage Tank (Near Building 4475)	
		Pre/Post Remedial Action				NA		NA		NA	NA	NA	NA	Pre	Post	NA	Pre	Post	NA	Pre	Post	Pre	Post	Pre	Post	Pre	Post	NA	Pre	Post	Pre	Post	Pre	Post
Total Number Samples Collected						17		22		15	5	17	3	5	6	4	5	8	5	6	24	11	5	9	49	11	10	2	4	6	30	17	9	18
o-Xylene	mg/kg	9	160,000	NS	16,000	--		0.0026		--	--	--	--	4,330	ND	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Vinly Chloride	mg/kg	NS	0.667	NS	0.67	--		--		--	--	--	--	--	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Remaining VOCs	mg/kg	Varies	Varies	NS	Varies	ND		--		--	ND	--	ND	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--
SEMI-VOLATILE ORGANIC COMPOUNDS—MAXIMUM CONCENTRATION																																		
Bis(2-ethylhexyl)phthalate	mg/kg	NS	71.4	NS	71	--		--		--	--	--	0.033	--	--	--	0.19	--	--	ND	--	0.18	--	--	--	0.063	--	--	--	--	0.38	--	--	--
Butyl benzyl phthalate	mg/kg	NS	16,000	NS	530	--		--		--	--	--	--	20.5	--	--	--	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/kg	1	0.137	NS	1.9	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.055	--	--	--	--	--	--	--	--
Benzoic Acid	mg/kg	NS	320,000	NS	320,000	--		--		--	--	--	--	4.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diethyl phthalate	mg/kg	NS	64,000	NS	64,000	--		--		--	0.081	--	--	--	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/kg	NS	160	NS	3.2	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.7	--	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/kg	NS	80	NS	0.67	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.051	--	--	--	--	--	--	--	--
Di-n-butyl phthalate	mg/kg	NS	8,000	NS	8,000	--		--		--	--	--	--	--	--	--	0.075	--	--	--	--	0.19	--	--	--	0.17	--	--	--	--	--	--	--	--
N-nitrosodiphenylamine	mg/kg	NS	204	NS	200	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5	--	--	--	--	--	--	--	--
Hexachlorobenzene	mg/kg	NS	0.625	NS	0.63	--		--		--	--	--	--	--	--	--	--	--	--	--	--	0.19	<0.10	--	--	--	--	--	--	--	--	--	--	--
Pyrene	mg/kg	NS	2,400	NS	2,400	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.066	--	--	--	--	--	--	--	--
Remaining SVOCs		Varies	Varies	NS	Varies	ND		ND		ND	--	ND	--	ND	ND	ND	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	--
EXPLOSIVES—MAXIMUM CONCENTRATION																																		
2,4,6-trinitrotoluene	mg/kg	NS	33.3	NS	33	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.12	--	--	--
2,4-dinitrotoluene	mg/kg	NS	160	NS	3.2	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.2	<0.057	--	--
2-amino-4,6-dinitrotoluene	mg/kg	NS	NS	NS	8	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.28	--	--	--
4-amino-2,6-dinitrotoluene	mg/kg	NS	NS	NS	8	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.53	--	--	--
RDX	mg/kg	NS	9.09	NS	13	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**410**	<0.059	--	--
HMX	mg/kg	NS	4,000	NS	4,000	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.18	--	--	--
PETN	mg/kg	NS	NS	NS	230	0.22		ND		--	--	--	--	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.4	<0.11	--	--
Picric Acid	mg/kg	NS	NS	NS	NS	ND		ND		--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1	<0.11	--	--
Remaining Explosives		Varies	Varies	NS	Varies	--		--		--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCBs—MAXIMUM CONCENTRATION																																		
Arochlor 1260	mg/kg	NS	NS	NS	0.5	ND		ND		--	ND	ND	ND	0.0286	ND	--	ND	--	--	--	--	ND	ND	--	--	--	--	--	--	--	--	--	ND	--
PESTICIDES—MAXIMUM CONCENTRATION																																		
4,4'-DDD	mg/kg	NS	4.17	NS	4.2	--		--		--	--	--	--	--	ND	--	--	--	--	0.14	0.119	0.022	0.00172	--	--	--	--	--	0.076	0.201	--	--	--	--
4,4'-DDE	mg/kg	NS	2.94	NS	2.9	--		--		--	--	--	--	--	ND	--	--	--	--	0.091	0.102	0.044	<0.001	--	--	--	--	--	0.23	0.0342	--	--	--	--
4,4'-DDT	mg/kg	3	2.94	NS	2.9	--		--		--	--	--	--	--	ND	--	0.013	--	--	1	0.719	0.077	<0.001	--	--	--	--	--	2.7	0.108	--	--	--	--
Beta-BHC	mg/kg	NS	NS	NS	0.56	--		--		--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0042	--	--	--	--	--
Endrin	mg/kg	NS	24	NS	24	--		--		--	--	--	--	--	ND	--	--	--	--	0.013	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 1. Effectiveness Screening RAU 1 Soil
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Metal Background	Current MTCA B*	Landfill 2 & 3		Burn Area		Former Building (1962-1983)	Grease Pits (Near Building 1828)	Former Sewage Pond	Hazardous Material Accumulation Point (Building 4476)	Drum Disposal Area		Paint And Sulvant Disposal	Washrack 1 (Near Building 4475)		Washrack 2 (Near Building 4475)	Maintenance Pit (Near Building 4475)		Pesticide Mixing Building 1864		Aboveground Tank (Building T-1932)		Former Training Building		CS Gas Chamber Building 1834	Pesticide Storage Building 4126		Ammunition Sotrage (Buildings 2950, 2951, 2953)		Underground Storage Tank (Near Building 4475)	
		Pre/Post Remedial Action				NA		NA		NA	NA	NA	NA	Pre	Post	NA	Pre	Post	NA	Pre	Post	Pre	Post	Pre	Post	Pre	Post	NA	Pre	Post	Pre	Post	Pre	Post
Total Number Samples Collected						17		22		15	5	17	3	5	6	4	5	8	5	6	24	11	5	9	49	11	10	2	4	6	30	17	9	18
Endosulfan Sulfate	mg/kg	NS	NS	NS	480	--		--		--	--	--	--	--	ND	--	--	--	--	0.015	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Alpha Chlordane	mg/kg	NS	NS	NS	40	--		--		--	--	--	--	--	ND	--	0.0022	--	--	0.069	0.0508	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gamma Chlordane	mg/kg	NS	NS	NS	40	--		--		--	--	--	--	--	ND	--	0.0013	--	--	0.065	34.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gamma-BHC (Lindane)	mg/kg	20	1.67	NS	0.91	--		--		--	2	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	0.002	--	--	--	--	--	--
2,4-D	mg/kg	NS	800	NS	800	--		--		--	--	--	--	--	ND	--	--	--	--	--	--	0.081	<0.040	--	--	--	--	--	0.5	--	--	--	--	--	--
2,4,5-T	mg/kg	NS	800	NS	800	--		--		--	--	--	--	--	ND	--	--	--	--	--	--	0.026	<0.050	--	--	--	--	--	92	2.19	--	--	--	--	--
Methoxychlor	mg/kg	NS	400	NS	400	--		--		--	--	--	--	15.2	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Remaining Pesticides		Varies	Varies	NS	Varies	ND		ND		--	--	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
HERBICIDES—MAXIMUM CONCENTRATION																																			
2,4-DB	mg/kg	NS	640	NS	NS	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	ND	--	--	--	--	--
MCPP	mg/kg	NS	NS	NS	80	--		--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	42	<1.0	--	--	--	--	--
PETROLEUM HYDROCARBONS—MAXIMUM CONCENTRATION																																			
Gasoline-Range hydrocarbon	mg/kg	100	NS	NS	100	ND		ND		--	ND	ND	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	**460**	--	<20	--	--	--	--
Diesel-Range Hydrocarbon	mg/kg	2,000	NS	NS	2,000	ND		ND		--	ND	ND	--	--	ND	--	--	264	--	--	330	220	--	**37,000**	**2,690**	--	--	--	**3,900**	59	<50	--	**9,600**	850	
Motor-Oil Hydrocarbon	mg/kg	2,000	NS	NS	2,000	ND		ND		--	ND	ND	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	1,800	--	<100	--	--	--	--
Unknown hydrocarbon	mg/kg	2,000	NS	NS	2,000	--		--		--	82	--	51	160	ND	22	**2,100**	--	22	210	--	--	--	**9,000**	--	--	--	--	--	--	--	--	--	--	--

Notes

Bold exceeds historical MTCA cleanup level

Shaded exceeds current MTCA cleanup level

Bold and Shaded exceeds historical and current cleanup level

--: Not reported

*: MTCA A cleanup level used for petroleum hydrocarbons, lead, mercury

µg/kg: micrograms per kilogram

mg/kg: milligrams per kilogram

MTCA: Model Toxics Control Act

NA: not applicable

ND or <: not detected above reporting limit

NS: not set

PCB: polychlorinated biphenyl

Table 2. Effectiveness Screening RAU 1 Water
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Current MTCA B	Landfills 2 & 3	Burn Area	Former Building (1962-1983)	Grease Pits (Near Building 1828)	Former Sewage Lagoon	Hazardous Material Accumulation Point (Building 4476)	Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1 (Near Building 4475)	Washrack 2 (Near Building 4475)	Maintenance Pit (Near Building 4475)	Pesticide Mixing Building 1864	Aboveground Tank (Building T-1932)	Former Training Building	Pesticide Storage Building 4126	Ammunition Sotrage (Buildings 2950, 2951, 2953)	Underground Storage Tank (Near Building 4475)
Total # samples collected					**14**	**NA**	**NA**	**NA**	**2**	**6**	**3**	**NA**	**NA**	**NA**	**NA**	**2**	**NA**	**NA**	**NA**	**NA**	**NA**
TOTAL METALS—MAXIMUM CONCENTRATION																					
Antimony	mg/L	NS	0.0064	0.0064	ND	--	--	--	ND	0.002	--	--	--	--	--	ND	--	--	--	--	--
Arsenic	mg/L	**0.005**	**0.0000583**	0.000058	**0.00086**	--	--	--	**0.0012**	**0.01**	**0.00298**	--	--	--	--	ND	--	--	--	--	--
Barium	mg/L	NS	1.12	3.2	0.038	--	--	--	0.039	0.097	0.47	--	--	--	--	0.19	--	--	--	--	--
Beryllium	mg/L	NS	0.032	0.032	ND	--	--	--	ND	0.00027	--	--	--	--	--	ND	--	--	--	--	--
Cadmium	mg/L	0.005	0.008	0.008	ND	--	--	--	ND	0.0021	0.00153	--	--	--	--	0.00017	--	--	--	--	--
Chromium	mg/L	0.05	24	0.05	0.00074	--	--	--	0.0035	0.0096	0.00125	--	--	--	--	ND	--	--	--	--	--
Copper	mg/L	NS	0.592	0.64	0.0044	--	--	--	0.0051	0.069	--	--	--	--	--	0.0035	--	--	--	--	--
Lead	mg/L	**0.015**	NS	0.015	0.00031	--	--	--	0.00056	**0.12**	**0.0666**	--	--	--	--	0.0027	--	--	--	--	--
Nickel	mg/L	NS	0.32	0.32	0.00095	--	--	--	0.0032	0.0095	--	--	--	--	--	0.0027	--	--	--	--	--
Selenium	mg/L	NS	0.08	0.08	0.00019	--	--	--	0.00016	0.00016	0.0021	--	--	--	--	0.0002	--	--	--	--	--
Silver	mg/L	NS	0.08	0.08	ND	--	--	--	ND	0.00013	--	--	--	--	--	ND	--	--	--	--	--
Thallium	mg/L	NS	0.00112	0.00016	0.00026	--	--	--	ND	ND	--	--	--	--	--	0.00017	--	--	--	--	--
Zinc	mg/L	NS	**4.8**	4.8	0.0039	--	--	--	0.0056	**12**	--	--	--	--	--	0.029	--	--	--	--	--
Mercury	mg/L	0.002	0.0048	0.002	ND	--	--	--	ND	ND	--	--	--	--	--	ND	--	--	--	--	--
DISSOLVED METALS—MAXIMUM CONCENTRATION																					
Antimony	mg/L	NS	0.0064	0.0064	0.0002	--	--	--	0.00017	0.00017	--	--	--	--	--	0.00036	--	--	--	--	--
Arsenic	mg/L	0.005	**0.0000583**	0.000058	**0.0035**	--	--	--	**0.0017**	**0.0017**	--	--	--	--	--	**0.00042**	--	--	--	--	--
Barium	mg/L	NS	1.12	3.2	0.032	--	--	--	0.031	0.031	--	--	--	--	--	0.19	--	--	--	--	--
Beryllium	mg/L	NS	0.032	0.032	ND	--	--	--	ND	ND	--	--	--	--	--	ND	--	--	--	--	--
Cadmium	mg/L	0.005	0.008	0.008	ND	--	--	--	ND	ND	--	--	--	--	--	ND	--	--	--	--	--
Chromium	mg/L	0.05	24	0.05	0.0019	--	--	--	0.0012	0.0012	--	--	--	--	--	ND	--	--	--	--	--
Copper	mg/L	NS	0.592	0.64	0.0047	--	--	--	0.0041	0.0041	--	--	--	--	--	0.0098	--	--	--	--	--
Lead	mg/L	0.015	NS	0.015	ND	--	--	--	ND	ND	--	--	--	--	--	0.0023	--	--	--	--	--
Mercury	mg/L	0.002	0.0048	NS	ND	--	--	--	ND	ND	--	--	--	--	--	ND	--	--	--	--	--
Nickel	mg/L	NS	0.32	0.32	0.00063	--	--	--	0.003	0.003	--	--	--	--	--	0.0038	--	--	--	--	--
Selenium	mg/L	NS	0.08	0.08	ND	--	--	--	ND	ND	--	--	--	--	--	0.00015	--	--	--	--	--
Silver	mg/L	NS	0.08	0.08	ND	--	--	--	ND	ND	--	--	--	--	--	ND	--	--	--	--	--
Thallium	mg/L	NS	0.00112	0.00016	0.00015	--	--	--	ND	ND	--	--	--	--	--	0.00027	--	--	--	--	--

Table 2. Effectiveness Screening RAU 1 Water
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Current MTCA B	Landfills 2 & 3	Burn Area	Former Building (1962-1983)	Grease Pits (Near Building 1828)	Former Sewage Lagoon	Hazardous Material Accumulation Point (Building 4476)	Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1 (Near Building 4475)	Washrack 2 (Near Building 4475)	Maintenance Pit (Near Building 4475)	Pesticide Mixing Building 1864	Aboveground Tank (Building T-1932)	Former Training Building	Pesticide Storage Building 4126	Ammunition Sotrage (Buildings 2950, 2951, 2953)	Underground Storage Tank (Near Building 4475)
Total # samples collected					**14**	**NA**	**NA**	**NA**	**2**	**6**	**3**	**NA**	**NA**	**NA**	**NA**	**2**	**NA**	**NA**	**NA**	**NA**	**NA**
Zinc	mg/L	NS	4.8	4.8	0.0043	--	--	--	0.0053	0.0053	--	--	--	--	--	0.018	--	--	--	--	--
VOLATILE ORGANIC COMPOUNDS—MAXIMUM CONCENTRATION																					
Acetone	µg/L	NS	800	7,200	--	--	--	--	--	--	38.7	--	--	--	--	--	--	--	--	--	--
Benzene	µg/L	NS	**0.795**	32	--	--	--	--	--	--	**18.4**	--	--	--	--	--	--	--	--	--	--
Bromoform	µg/L	NS	5.54	5.5	--	--	--	--	ND	--	--	--	--	--	--	ND	--	--	--	--	--
2-Butanone	µg/L	NS	4,800	NS	--	--	--	--	--	--	34.2	--	--	--	--	--	--	--	--	--	--
sec-Butylbenzene	µg/L	NS	NS	800	--	--	--	--	--	--	90.7	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	µg/L	NS	0.521	0.52	--	--	--	--	ND	--	--	--	--	--	--	ND	--	--	--	--	--
Ethylbenzene	µg/L	NS	**800**	800	--	--	--	--	--	--	**2,150**	--	--	--	--	--	--	--	--	--	--
Isopropylbenzene	µg/L	NS	1,600	NS	--	--	--	--	--	--	23.2	--	--	--	--	--	--	--	--	--	--
p-Isopropylbenzene	µg/L	NS	NS	NS	--	--	--	--	--	--	17.2	--	--	--	--	--	--	--	--	--	--
Naphthalene	µg/L	NS	160	160	0.36	--	--	--	--	--	8.24	--	--	--	0.0036	--	--	--	--	--	--
n-Propylbenzene	µg/L	NS	NS	NS	--	--	--	--	--	--	22.5	--	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone	µg/L	NS	640	NS	--	--	--	--	--	--	58	--	--	--	--	--	--	--	--	--	--
m- & p-Xylenes	µg/L	NS	16,000	1,600	--	--	--	--	--	--	7,120	--	--	--	--	--	--	--	--	--	--
o-Xylene	µg/L	NS	16,000	1,600	--	--	--	--	--	--	2,940	--	--	--	--	--	--	--	--	--	--
Toluene	µg/L	NS	**1,600**	640	--	--	--	--	--	--	**3,010**	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	µg/L	NS	NS	80	--	--	--	--	--	--	29.7	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	µg/L	NS	NS	80	--	--	--	--	--	--	105	--	--	--	--	--	--	--	--	--	--
Remaining VOCs	µg/L	Varies	Varies	Varies	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--
SEMI-VOLATILE ORGANIC COMPOUNDS—MAXIMUM CONCENTRATION																					
Benzoic Acid	µg/L	NS	64,000	64,000	--	--	--	--	--	--	566	--	--	--	--	--	--	--	--	--	--
3 & 4 Methylphenol	µg/L	NS	800	NS	--	--	--	--	--	--	72.3	--	--	--	--	--	--	--	--	--	--
PCBs		NS	NS	NS	--	--	--	--	ND	ND			--	--	--	ND	--	--	--	--	--
PESTICIDES	µg/L	Varies	Varies	Varies	--	--	--	--	--	--	--	--	--	--	--	ND	--	--	--	--	--
WATER QUALITY—MAXIMUM CONCENTRATION																					
Alkalinity total	mg/L	NS	NS	NS	--	--	--	--	--	112	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Bicarbonate, as CaCO3	mg/L	NS	NS	NS	--	--	--	--	--	112	--	--	--	--	--	--	--	--	--	--	--

Table 2. Effectiveness Screening RAU 1 Water
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Current MTCA B	Landfills 2 & 3	Burn Area	Former Building (1962-1983)	Grease Pits (Near Building 1828)	Former Sewage Lagoon	Hazardous Material Accumulation Point (Building 4476)	Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1 (Near Building 4475)	Washrack 2 (Near Building 4475)	Maintenance Pit (Near Building 4475)	Pesticide Mixing Building 1864	Aboveground Tank (Building T-1932)	Former Training Building	Pesticide Storage Building 4126	Ammunition Sotrage (Buildings 2950, 2951, 2953)	Underground Storage Tank (Near Building 4475)
Total # samples collected					**14**	**NA**	**NA**	**NA**	**2**	**6**	**3**	**NA**	**NA**	**NA**	**NA**	**2**	**NA**	**NA**	**NA**	**NA**	**NA**
Alkalinity Carbonate as CaCO3	mg/L	NS	NS	NS	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--
Alkalinity Hydroxide as CaCO3	mg/L	NS	NS	NS	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--
Chloride	mg/L	NS	NS	NS	--	--	--	--	--	1.6	--	--	--	--	--	--	--	--	--	--	--
Fluoride	mg/L	NS	0.96	0.96	--	--	--	--	--	0.17	--	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/L	NS	1.6	26	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--
Orthophosphate as P	mg/L	NS	NS	NS	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/L	NS	NS	NS	--	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/L	NS	NS	NS	--	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--
Calcium	mg/L	NS	NS	NS	--	--	--	--	--	20.9	--	--	--	--	--	--	--	--	--	--	--
Iron	mg/L	NS	NS	11	--	--	--	--	--	8.1	--	--	--	--	--	--	--	--	--	--	--
Magnesium	mg/L	NS	NS	NS	--	--	--	--	--	9.5	--	--	--	--	--	--	--	--	--	--	--
Manganese	mg/L	NS	2.24	0.75	--	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/L	NS	NS	NS	--	--	--	--	--	1.5	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/L	NS	NS	NS	--	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--

Notes

Bold exceeds historical MTCA cleanup level

Shaded exceeds current MTCA cleanup level

Bold and Shaded exceeds historical and current cleanup level

--: analyte not tested

*: MTCA A cleanup level used for petroleum hydrocarbons, chromium, lead, mercury

ND: not detected above reporting limit

NS: not set

mg/L: milligrams per liter

µg/L: micrograms per liter

MTCA: Model Toxics Control Act

PCB: polychlorinated biphenyl

SVOC: semi-volatile organic compound

VOC: volatile organic compound

Table 3. Effectiveness Screening RAU 2A Soil
Camp Bonneville Periodic Review
Vancouver, Washington

RANGE	Number of Samples Collected	Soil Volume Removed (cubic yards)	Maximum Lead Concentration (mg/kg)	
			Pre-Remedial Action	Post-Remedial Action
Close Combat Range	120	--	23.9	--
25 Meter M60 Range/Pistol Range (RAU-2A-17)	20	1,050	219	NCS
Sub Machine Gun Range	35	--	18.4	--
TF Range	40	--	30.2	--
Rifle Ranges 1 & 2 (RAU-2A-21)	160	4,060	*4,330*	*5,400*
Field Firing Ranges 1 & 2 & Pistol Range (RAU-2A-22)	70		*7,150*	NCS
Field Fire Rifle Ranges 1 & 2 (RAU-2A-20)	110	655	*2,300*	NCS
Infiltration Course North	20	--	44.1	--
Undocumented Pistol Range (RAU-2A-15)	5	105	154	NCS
1,000 Foot Range, Machine Gun & Moving Target Range (RAU-2A-16)	150	1,505	*10,200*	*660*
Combat Pistol Range (RAU-2A-4)	85	855	*785*	NCS
Machine Gun Range North	165	--	*423*	NRC
Machine Gun Range South	130	--	158	--
M31 Sub-Caliber Ranges 1 & 2	125	--	51.3	--
25 Meter and Machine Gun Range (RAU-2A-18)	65	285	*26,300*	NCS
Infiltration Course South	35	--	151	--
25 M Record Fire Field/Field Firing Range (RAU-2A-19)	200	530	*8,880*	NCS
Ecological Indicator - Plants			50	
Ecological Indicator - Wildlife			118	
Ecological Indicator - Biota			500	
MTCA A-Unrestricted Land			*250*	

Notes

Bold Range indicates remedial action (excavation) occurred

Shaded Range indicates covered by a soil cap

Italics indicates MTCA Method A cleanup level exceedance

--: Not Identified

mg/kg: milligrams per kilogram

MTCA: Model Toxics Control Act

NCS = Confirmation sample not identified

NRC = Record of remediation or cleanup record identified.

Table 4. Effectiveness Screening RAU 2B Soil
Camp Bonneville Periodic Review
Vancouver, Washington

Constituent	Units	Historical MTCA Method B Cleanup Levels	Current MTCA Method B Cleanup Levels	Demolition Area 2	Demolition Area 3
TOTAL # OF SAMPLES				36	32
Perchlorate	mg/kg	0.0036	56	<0.033	<0.033
EXPLOSIVES—MAXIMUM CONCENTRATION					
Octahydro-1,3,5,7, - tetranitro-1,3,5,7 tetrazocine (HMX)	mg/kg	3,100	4,000	<2.5	<2.5
Hexahydro-1,3,5-trinitro-1,3,5-trinitro-1,3,5,-triazine (RDX)	mg/kg	4.4	13	<2.5	0.27
1,3,5-Trinitrobenzene (1,3,5-TNB)	mg/kg	1,800	2,400	<2.5	<2.4
1,3-Dinitrobenzene (1,3-DNB)	mg/kg	6.1	8	<2.5	<2.4
Methyl-2,4,6-trinitrotolunene (Tetryl)	mg/kg	610	NS	<2.5	<2.4
Nitrobenzene (NB)	mg/kg	20	160	<2.5	<2.4
2,4,6-Trinitrotoluene (2,4,6-TNT)	mg/kg	16	33	<2.5	0.51
4-Amiro-2,6-dinitrotoluene (4-Am-DNT)	mg/kg	4.7	8	<2.5	0.12
2-Amino-4,6-dinitrotolunene (2-Am-DNT)	mg/kg	4.7	8	<2.5	0.22
2,4-Dinitrotolunene (2,4-DNT)	mg/kg	NS	3.2	<2.5	<2.4
2,6-Dinitrotolunene (2,6-DNT)	mg/kg	NS	0.67	<2.5	<2.4
2- Nitrotoluene (2-NT)	mg/kg	NS	4.5	<2.5	<2.4
3-Nitrotoluene (3-NT)	mg/kg	NS	8	<2.5	<2.4
4-Nitrotoluene (4-NT)	mg/kg	NS	63	<2.5	<2.4
Picric Acid	mg/kg	NS	NS	<10	<2.4
Pentaerthritol Tetranitrate (PETN)	mg/kg	NS	230	<4	< 12
METALS—MAXIMUM CONCENTRATION					
Antimony	mg/kg	31	32	<11.9	11.7
Arsenic	mg/kg	20	0.67	30.1	10.04
Barium	mg/kg	5,400	16,000	454	221
Beryllium	mg/kg	150	160	--	0.52
Cadmium	mg/kg	2	80	<1.2	1
Chromium	mg/kg	210	120,000	43.6	24.8
Copper	mg/kg	2,900	3,200	160	363
Lead	mg/kg	250	NS	28.5	120

Table 4. Effectiveness Screening RAU 2B Soil
Camp Bonneville Periodic Review
Vancouver, Washington

Mercury	mg/kg	2	NS	--	1.19
Nickel	mg/kg	1,600	1,600	36.5	23
Selenium	mg/kg	NS	400	--	<0.2
Silver	mg/kg	NS	400	--	<0.19
Thallium	mg/kg	5.2	0.8	--	0.4
Zinc	mg/kg	23,000	24,000	101	144

Bold exceeds historical MTCA cleanup level

Shaded exceeds current MTCA cleanup level

Bold and Shaded exceeds historical and current cleanup level

--: not identified

<: not detected above reporting limit

*: MTCA A cleanup level used for petroleum hydrocarbons, lead, mercury

mg/kg: milligrams per kilogram

MTCA: Model Toxics Control Act

NS: not set

Table 5. Effectiveness Screening RAU 2B Groundwater
Camp Bonneville Periodic Review
Vancouver, Washington

CONSTITUENT	UNITS	Historical MTCA Method B Cleanup Levels	Current MTCA Method B Cleanup Level	Demolition Area 2	Demolition Area 3
Total # samples collected				**4**	**5**
Chloride	mg/L	NS	NS	1.5	780
Sulfate	mg/L	NS	NS	1.8	640
Total Alkalinity	mg/L as CaCO3	NS	NS	24	144
Dissolved Organic Carbon	mg/L	NS	NS	0.5	1.5
Nitrate/Nitrite as Nitrogen	mg/L	NS	NS	18	9.8
Total Organic Carbon	mg/L	NS	NS	5.1	1.5
Total Suspeneded Solids	mg/L	NS	NS	340	140
Explosivces/PETN/Pitric Acid	µg/L	NS	Varies	ND	ND
Perchlorate	µg/L	NS	11	0.25	12[a]
VOC's/SVOC's	µg/L	Varies	Varies	--	NA
Total Petroleum Hydrocarbon	µg/L	1,000	500	--	NA
TPH-Gasoline	µg/L	NS	1,000	--	NA
TPH-Diesel	µg/L	500	500	--	80
METALS—TOTAL					
Arsenic	µg/L	NS	0.058	ND	ND
Copper	µg/L	NS	640	11.5	5.79
Lead	µg/L	15	15	5.14	5.29
Zinc	µg/L	500	4,800	14.3	27.6
METALS—DISSOLVED					
Arsenic	µg/L	10	0.058	ND	9.86
Copper	µg/L	1,300	640	ND	ND
Lead	µg/L	NS	15	ND	ND
Zinc	µg/L	NS	4,800	ND	11.7

Notes
Bold exceeds historical MTCA cleanup level
Shaded exceeds current MTCA cleanup level
Bold and Shaded exceeds historical and current cleanup level
[a]: Sample result determined not to be valid, resample was < 2 µg/L
: MTCA A cleanup level used for petroleum hydrocarbons, lead, mercury
mg/L: milligrams per liter
µg/L: micrograms per liter
MTCA: Model Toxics Control Act
ND: not detected above reporting limit
NS: not set

Table 6. SI Soil Boring Results: PFAS
Camp Bonneville Periodic Review
Vancouver, Washington

Perfluoroalkyl and Polyfluroalkyl Substances (PFAS) in soil in µg/kg						
Compound	**Current MRLs**	**SI MRLs**	**SI Maximum Concentration**	**MTCA Method B Noncancer Cleanup Levels**	**MTCA Method B Cancer Cleanup Levels**	**SI Cleanup Level**
PFBA	0.39	0.65	**0.26**	80,000	--	7800
PFPeA	0.19		--	--	--	--
PFHxA	0.19	0.65	<0.55	40000	--	3200
PFHpA	0.19		--	--	--	--
PFOA	0.19	0.65	<0.55	2.4	0.034	19
PFNA	0.19	0.65	<0.55	200	--	19
PFDA	0.19		--	--	--	--
PFUnA	0.19		--	--	--	--
PFDoA	0.19		--	--	--	--
PFTrDA	0.19		--	--	--	--
PFTeDA	0.19		--	--	--	--
PFBS	0.19	0.65	<0.55	24,000	--	1900
PFPeS	0.19		--	--	--	--
PFHxS	0.19	0.65	<0.55	780	--	130
PFHpS	0.19		--	--	--	--
PFOS	0.19	0.65	**1**	8	25	13
PFNS	0.19		--	--	--	--
PFDS	0.19		--	--	--	--
PFDoS	0.19		--	--	--	--
4:2 FTS	0.39		--	--	--	--
6:2 FTS	0.39		--	--	--	--
8:2 FTS	0.39		--	--	--	--
PFOSA	0.19		--	--	--	--
NMeFOSA	0.19		--	--	--	--
NEtFOSA	0.19		--	--	--	--
NMeFOSAA	0.19		--	--	--	--
NEtFOSAA	0.19		--	--	--	--
NMeFOSE	0.97		--	--	--	--
NEtFOSE	0.97		--	--	--	--
HFPO-DA	0.19	2.6	<2.3	240	--	23
ADONA	0.19		--	--	--	--
PFMPA	0.19		--	--	--	--
PFMBA	0.19		--	--	--	--
NFDHA	0.19		--	--	--	--
9Cl-PF3ONS	0.19		--	--	--	--
11Cl-PF3OUdS	0.19		--	--	--	--
PFEESA	0.19		--	--	--	--
3:3 FTCA	0.39		--	--	--	--
5:3 FTCA	0.97		--	--	--	--
7:3 FTCA	0.97		--	--	--	--

Notes

Current Maximum Reporting Limit (MRLs) based on Perfluoroalkyl and Polyfluroalkyl Substances (PFAS) by EPA Method 163

SI MRLs = Method Reporting Limits from SI (2023)

SI Maxiumum Concentration based on all soil results from SI (2023)

Soil cleanup levels from the MTCA Method B 173-340 WAC (July 2024 update).

Bold indicates analyte detected

< = Analyte was not detected above the MRL

-- = not analyzed or value not available

Table 7. SI Drinking Water Results: PFAS
Camp Bonneville Periodic Review
Vancouver, Washington

Perfluoroalkyl and Polyfluroalkyl Substances (PFAS) in Water in ng/L						
Sample Location ID	**MRL**	**SI MRLs**	**SI Maximum Concentration**	**MTCA Method B Potable Groundwater Cleanup Level (MCL)**	**EPA MCL**	**RSL Calculator (2023)**
PFBA	**0.2**	**2.1**	**31**	8,000	--	1800
PFPeA	**0.2**	--	--	--	--	--
PFHxA	**0.2**	**2.1**	**8.6**	8,000	--	990
PFHpA	**0.2**	--	--	--	--	--
PFOA	**0.2**	**2.1**	**4.9**	4	4	6
PFNA	**0.2**	**2.1**	<2.1	10	10	5.9
PFDA	**0.2**	--	--	--	--	--
PFUnA	**0.2**	--	--	--	--	--
PFDoA	**0.2**	--	--	--	--	--
PFTrDA	**0.2**	--	--	--	--	--
PFTeA	**0.2**	--	--	--	--	--
PFBS	**0.2**	**2.1**	**3.3**	4,800	--	600
PFPeS	**0.2**	--	--	--	--	--
PFHxS	**0.2**	**2.1**	<2.1	10	10	39
PFHpS	**0.2**	--	--	--	--	--
PFOS	**0.2**	**2.1**	<2.1	4	4	4
NMeFOSAA	**0.2**	--	--	--	--	--
NEtFOSAA	**0.2**	--	--	--	--	--
4:2 FTS	**0.4**	--	--	--	--	--
6:2 FTS	**0.4**	--	--	--	--	--
8:2 FTS	**0.4**	--	--	--	--	--
9Cl-PF3ONS	**0.2**	--	--	--	--	--
HFPO-DA/GenX	**0.2**	**4.2**	<4.2	10	10	6
11Cl-PF3OUdS	**0.2**	--	--	--	--	--
ADONA	**0.2**	--	--	--	--	--
NFDHA	**0.2**	--	--	--	--	--
PFMBA	**0.2**	--	--	--	--	--
PFMPA	**0.2**	--	--	--	--	--
PFEESA	**0.2**	--	--	--	--	--
PFTeDA	**0.2**	--	--	--	--	--
PFNS	**0.2**	--	--	--	--	--
PFDS	**0.2**	--	--	--	--	--
PFDoS	**0.4**	--	--	--	--	--
PFOSA	**0.2**	--	--	--	--	--
NMeFOSA	**0.2**	--	--	--	--	--
NEtFOSA	**0.2**	--	--	--	--	--
NMeFOSE	**1.0**	--	--	--	--	--
NEtFOSE	**1.0**	--	--	--	--	--
3:3 FTCA	**0.4**	--	--	--	--	--
5:3 FTCA	**1.0**	--	--	--	--	--
7:3 FTCA	**1.0**	**--**	**--**	--	--	--
Hazard Index Rating			**0.4**	1		

Notes
Current Maximum Reporting Limit (MRLs) based on Perfluoroalkyl and Polyfluroalkyl Substances (PFAS) by EPA Method 1633
SI Maxiumum Concentration based on all soil results from SI (2023)
Shaded results exceed the Model Toxics Control Act (MTCA) Method A soil cleanup level for unrestricted land use
Shading indicates Screening Level exceedance
Soil cleanup levels from the MTCA Method B 173-340 WAC (July 2024 update)
Hazard Index calcualted using HFPO-DA, PFBS, PFHxS, and PFNA
Bold indicates analyte detected
< = Analyte was not detected above the MRL
-- = Not Analyzed or value not available
J = Result is estimated
J+ = Result is estimated and may be biased high.
ug/kg = Micrograms per kilogram.
SI MRLs = Method Reporting Limits from SI (2023)
UJ = The not detected result is estimated.

Table 8. Forestry Activity Summary
Camp Bonneville Periodic Review
Vancouver, Washington

Year	Acres Harvested	Volume Harvested		Primary Prescription	Priority Focus
		SAW (BF)	Pulp (tons)		
2012	50	979,800		Release thin	Dense stands near access roads
2013	200	2,750,320		Release thin	High-density Douglas-fir units
2014	101	686,020		Release thin	High-density Douglas-fir units
2015	--	--	--	--	--
2016	--	--	--	--	--
2017	79	1,360,440	2,225	Mixed thinning and replanting	Expanded thinning in Priority I areas
2018	150	966,470		Release thin—hazard removal	Expanded thinning in Priority I areas
2019	130	1,015,740	1,323	Release thin—hazard removal	Expanded thinning in Priority I areas
2020	194	925,850	3,024	Complete release thin—hazard removal	Expanded thinning in Priority I areas
2021	--	--	--	--	--
2022	46	454,380	200	Release thin—hazard removal	Expanded thinning in Priority I areas
2023	144	1,428,650	745	Complete release thin—hazard removal	Expanded thinning in Priority I areas
2024	--	--	--	--	--
Totals	1,094	10,567,670	7,517		

Appendix A
Interviews

Camp Bonneville Periodic Review
Periodic Review: ATF Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?

   The storage of explosives in approved magazines that are shared with Clark County Sheriff's Office.

2. How frequently does your agency use the property? Daily

3. At Camp Bonneville, there are two fenced areas with Type 2 portable storage magazines. One of these fenced compounds is unsecured with two empty and open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21. The other is a secured fenced yard adjacent/coinciding with Bldg 2950. In the secured yard, there are also two larger Type 2 portable storage magazines and one permanent, older magazine. These two larger magazines are closed, but with no access to the fenced yard, their usage cannot be determined.

   3.1. Which of these fenced compounds are under the supervision of the ATF? ATF uses the magazines in the secured yard where there are two larger Type 2 magazines and one permanent magazine.

   3.2. Are any of these magazines currently in use? All three are currently in use.

   3.3. Has the ATF formerly utilized any of these magazines? What was stored in them and when (how long)? Explosives evidence is stored within the magazines along with explosives. One magazine is for the storage of blasting caps, one magazine is for the storage of evidence, and one magazine is for the storage of explosives and evidence if need be. Each contains a small amount of net explosive weight.

   3.4. Does the ATF have an agreement with any other agencies for use of these magazines? If so, who maintains that documentation/inventory? ATF has an agreement with Clark County Sheriff's Office only.

   3.5. Does the ATF intend to use them in the future? Yes. We invested money into cleaning the area, brining two magazines into the location along with updating and outfitting the permanent magazine that was utilized by the military when the base was active. The site is important to our operation. It is a safe and secure location.

   3.6. If current or future use is planned, will the ATF provide appropriate signage, placarding, and maintenance to the fenced areas where the magazines are currently located. Yes, the magazines are in compliance with ATF Compliance Regulations and State of Washington Labor and Industries. The magazines are subject to inspection on an annual basis which was recently done in November 2024.

4. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?
   No. ATF does not use explosives on the base. It is only used to store explosives.

   If Yes:
   4.1. What do those activities entail?

   4.2. Where have these activities taken place?

   4.3. When or how frequently do these activities take place?

5. Are munitions, including small arms ammunition, stored by your agency on the property? No.

   If yes:
   5.1. where are munitions stored and how are they secured?

6. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property? No.

7. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property? No.

8. Has your agency performed any firefighting activities associated with your agency's use of the Property? No.

9. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities? No.

   If munitions or explosives were discovered:
   9.1. Where were these items discovered?

   9.2. What item was discovered?

   9.3. How were they reported?

   9.4. How was the item disposed of?

10. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? No.

Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Tony Schodowski	Special Agent	ATF	503-209-4499

Date Submitted: 12/16/2024

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has printed this response as a PDF.

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property? **While the site is not currently undergoing active cleanup, routine activities such as general maintenance and repair of the fence line and landscaping are performed. A formal Standard Operating Procedure (SOP) for these activities has not yet been established.**
2. What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards? **Visitors to the site are required to sign in and receive a general map orientation of the property. A safety briefing is conducted, which includes an overview of ordinance and training materials previously identified on the site. The briefing also emphasizes the "3 R's" safety protocol: Recognize, Retreat, and Report.**
3. Please describe who has access to the property and procedures for securing the property? **Access to the property is managed by the Clark County Sheriff's Office, which oversees entry and enforces security measures. Authorized vendors and contractors are granted access as needed to perform their work, following established protocols to ensure site security and safety.**
4. Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? **Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? The Central Impact Target Area (CITA) fences require ongoing maintenance on an as-needed basis. There is no set timeline for repairs. Maintenance activities for the property, including fence inspections and repairs, are managed by Clark County Public Works and recorded in the county's internal asset management system, Cartegraph.**
5. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property? **No**
6. Are chemicals or other hazardous materials stored at the Property? If yes:
    a. Please list the materials and approximate quantities. **Large Diesel above-ground storage tank, unknown quantity.**
    b. Please describe how and where these materials are stored? **Stored near an old army maintenance building.**
    c. Please describe how these materials used? **For fueling equipment.**
7. Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment? **Yes, there was an instance where the Portland Bomb Squad conducted a controlled (Training) detonation near the Camp**

Bonneville cantonment area. This activity was promptly addressed by Clark County to ensure proper procedures were followed.

8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
9. If munitions or explosives were discovered:
    a. Where were these items discovered? **Training fuse was located near landfill # 4**
    b. What item was discovered? **Training Fuse**
    c. How were they reported? **By Clark County staff**
    d. How was the item disposed of? **The item in question was properly disposed of by Clark County Sheriff's Office bomb technicians. The specific methodology used is not known to me.**
10. Are munitions stored on the property? **No**
    a. If yes, where are munitions stored and by which agency?
11. Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.
    a. What activities requiring ground disturbance are you aware of occurring? **None**
    b. Were permits issued or a similar review process followed? **Unknown to me.**
    c. Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities? **No**
12. Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review? **Sign-in and sign-out procedures are in place for the property, which is not open to the public. Visitors to the site are required to sign in and receive a general map orientation of the property. A formal safety briefing is the current procedure, which includes an overview of ordnance and training materials previously identified on the site. The briefing also emphasizes the "3 R's" safety protocol: Recognize, Retreat, and Report.**
13. Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)? **No**

LOCATION SPECIFIC QUESTIONS

1. Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.
    a. Who is responsible for maintaining this requirement? **Clark County Public Works**
    b. Has maintenance of this signage been required? If yes, how is maintenance documented? **Inspected and repaired if needed, documented in asset management system if need.**
2. At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports. **These reports are included in the monthly updates submitted to the Army, ensuring that all activities and updates are communicated regularly. Additionally, an annual report is compiled and submitted each December, providing a comprehensive summary of the year's operation**

3. Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017? **Unknown**
4. Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available? **Unknown**
5. Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? **The Central Impact Target Area (CITA) fences require ongoing maintenance on an as-needed basis. There is no set timeline for repairs. Maintenance activities for the property, including fence inspections and repairs, are managed by Clark County Public Works and recorded in the county's internal asset management system, Cartegraph.**

6. Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available? **The language regarding annual inspections in the CAP is vague and lacks measurable criteria for proper documentation. This lack of clarity makes it difficult to confirm whether the required inspections have been completed and whether the available records meet the intended requirements. Clear guidance and measurable standards are needed to ensure proper compliance and record-keeping for these annual surface inspections within the CITA for MEC.**

7. Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available? **It is unclear to Clark County what constitutes a significant rain event as outlined in the CAP. The language used in the CAP lacks clarity and measurable criteria, making it challenging to determine when such inspections should be conducted. To effectively address this requirement, clearer and more specific language would be needed to define what qualifies as a significant rain event. Without this clarification, it is difficult to confirm whether the required inspections have been completed or provide consistent inspection records.**

8. Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)? **No**
9. Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please provide details when this training will be completed. **Yes, please consult with Jacob Huston**
10. Has signage been installed at the target areas and firing points identified in the 2010 CAP? **Unknown since 2021.**

Questionnaire Documentation Form

Name	**Erik Harrison**
Title/Position	**Parks Operations Superintendent**
Department	**Parks Department**
Email Contact	**Erik.harrison1@gmail.com**
Years Affiliated	**3 years**

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has bolded the responses for clarity and removed formatting mistakes which changed the questions number and printed this response as a PDF. Note: From an Inspection of records, Email to Erik Harrison from Ronnie Johnson (Former Ecology UXO Expert) on 4/10/2023, the Training Fuse Identified in Sitewide Question Number 9, was a "M-60 time fuze igniter".

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property? **Yes- only for road and fence maintenance**
2. What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards? **Do not know**
3. Please describe who has access to the property and procedures for securing the property? **Clark County Public Works, Clark County Sheriff's Office, FBI, Dept of Ecology, and contractors**
4. Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? **Clark County Public Works inspects and maintains fence lines, Do not know the answers to other questions**
5. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property? **No**
6. Are chemicals or other hazardous materials stored at the Property? If yes **Do not know**
    a. Please list the materials and approximate quantities.
    b. Please describe how and where these materials are stored?
    c. Please describe how these materials used?
7. Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment? **No**
8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities? **No**
9. If munitions or explosives were discovered:
    a. Where were these items discovered? **Do not know**
    b. What item was discovered? **Do not know**
    c. How were they reported? **Do not know**
    d. How was the item disposed of? **Do not know**
10. Are munitions stored on the property? **Do not know**
    a. If yes, where are munitions stored and by which agency? **Do not know**

11. Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.
    a. What activities requiring ground disturbance are you aware of occurring? **Do not know**
    b. Were permits issued or a similar review process followed? **Do not know**
    c. Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities? **Do not know**
12. Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review? **There is a description of UXO's, and an explanation of the CITA, Do not know about records**
13. Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)? **Do not know**

LOCATION SPECIFIC QUESTIONS

1. Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.
    a. Who is responsible for maintaining this requirement? **Do not know**
    b. Has maintenance of this signage been required? If yes, how is maintenance documented? **Do not know**
2. At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports. **Do not know**
3. Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017? **Do not know**
4. Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available? **Do not know**
5. Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? **Clark County Public Works maintains and inspects fence lines, do not know about documentation**
6. Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available? **Do not know**
7. Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available? **Do not know**
8. Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)? **Do not know**
9. Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please

provide details when this training will be completed. **Jacob Huston has completed this training, I don't have the documentation**

10. Has signage been installed at the target areas and firing points identified in the 2010 CAP? **Do not know**

Questionnaire Documentation Form

Name	**Jeremy Stevens**
Title/Position	**Grounds Maintenance Crew Chief**
Department	**Parks**
Email Contact	**Jeremy.stevens@clark.wa.gov**
Years Affiliated	**2 with Camp Bonneville, 10 with Clark County Public Works**

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has bolded the responses for clarity and removed formatting issues with Microsoft Word which changed the question numbering and printed this response as a PDF.

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property?
    a. The Clark County Forest Stewardship Plan guides forest practices and noxious weed control work at the site.
2. What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards?
    a. It is my understanding that this process has included a UXO briefing at Range Control for all new users of the site. Public Works is working to formalize this process with a procedure, training materials, and log of completed training.
3. Please describe who has access to the property and procedures for securing the property?
    a. Clark County Public Works employees who perform work on the property have access.
    b. Clark County Sheriff's Office employees have access.
    c. FBI employees have access.
    d. ATF employee(s) have access.
    e. Other service providers including garbage, port-a-potty, drinking water, etc. gain access to provide services.
    f. The property is behind a locked gate that uses an electronic key card for access. The Sheriff's Office currently maintains the list of employees who have key card access. FBI also maintains a key code entry system and maintains the security for that system.
4. Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?
    a. Clark County Public Works, Parks Operations and Maintenance, North Parks Crew currently maintains the fence lines at Camp Bonneville.
    b. Do not know the process and timeline for completing inspections, but fences have all be inspected and the crew is working on making repairs.
    c. Maintenance records are available in the county's asset management system (Cartegraph).

5. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property?
    a. Not aware of any.
6. Are chemicals or other hazardous materials stored at the Property? If yes:
    a. Please list the materials and approximate quantities.
        i. Tree marking paint, several cases
        ii. Small amounts (1-2 gallons) of fuel for chainsaw and ATV
        iii. Diesel fuel for vehicles, many gallons
    b. Please describe how and where these materials are stored?
        i. Stored on shelves in a storage building
        ii. Stored in cabinets in a storage building
        iii. Stored in an above-ground storage tank
    c. Please describe how these materials used?
        i. For marking trees for harvesting
        ii. For fueling chainsaw and ATVs
        iii. For fueling tractor and other small equipment
7. Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment?
    a. I am aware of only on such use. There is some munitions storage in the location of former building 2950 in storage magazines managed by the ATF.
8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
    a. Yes, one item a training timing fuse was found near landfill 4 by a noxious weed management staff a few years ago. It was reported to the site manager, who coordinated with the Clark County Sheriff's Office to remove the item from the property.
9. If munitions or explosives were discovered:
    a. Where were these items discovered? See explanation above
    b. What item was discovered?
    c. How were they reported?
    d. How was the item disposed of?
10. Are munitions stored on the property?
    a. If yes, where are munitions stored and by which agency? The FBI and Sheriff's office store ammunition at the shooting range.
11. Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.
    a. What activities requiring ground disturbance are you aware of occurring? Forest practices, road maintenance, bridge repair/replacement

   b. Were permits issued or a similar review process followed? Do not know about permits; a similar review process was performed by the site manager at the time

   c. Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities? Unexploded ordinance (UXO) technician performing approved anomaly avoidance practices was not deemed necessary since areas with forest management operations were previously cleared of UXO.

12. Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review? This will be developed in preparation for the property being opened to the public. Otherwise, please refer to the answer to question 2.

13. Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)?

    Not aware of any

LOCATION SPECIFIC QUESTIONS

1. Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.

   a. Who is responsible for maintaining this requirement? The site manager.

   b. Has maintenance of this signage been required? If yes, how is maintenance documented? No, signs are in good shape.

2. At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports.
   a. I have not been a part of developing the annual reports only finalizing the most recent annual report.

3. Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017?

   a. Do not know.

4. Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available?

   a. Do not know.

5. Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?

   a. Asked and answered under question 4 of sitewide questions.

6. Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available?

   a. Do not know.

7. Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available?

   a. Do not know.

8. Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)?
    a. The county has not reached the redevelopment phase of the project, so road and trail signs have not been installed.
9. Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please provide details when this training will be completed.
    a. The county currently has one level I UXO technician on staff and will be working to get a 2nd employee trained in 2025.
10. Has signage been installed at the target areas and firing points identified in the 2010 CAP?
    a. Do not know

Questionnaire Documentation Form

Name	Kevin Tyler
Title/Position	Lands Management Division Manager
Department	Public Work
Email Contact	Kevin.tyler@clark.wa.gov
Years Affiliated	12

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has printed this response as a PDF. Note: From an Inspection of records, Email to Erik Harrison from Ronnie Johnson (Former Ecology UXO Expert) on 4/10/2023, the Training Fuse Identified in Sitewide Question Number 9, was a "M-60 time fuze igniter".

Camp Bonneville Periodic Review
Periodic Review: Former Managers Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

You have been identified as a former employee of Ecology, DoD contractor, and/or Clark County involved in the oversight of the cleanup. Ecology is requesting your input as your employment covered the time period relevant to this periodic review.

Please complete this questionnaire by December 18, 2024, if you are unable to answer a question, please state "I Do not know".

Name: **Ronnie Johnson**
Date Submitted: **December 17, 2024**

QUESTIONNAIRE

1. What was your role and former agency, and how long did you work on the Camp Bonneville Cleanup?

I worked on Camp Bonneville from approximately 2012 – 2020. I was Ecology's munitions expert.

2. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property during your period of employment?

No

3. Are you aware of any firefighting activities on the Property?

No
If Yes:
3.1. When, where, and why did firefighting activities take place?

4. Were site specific operations and maintenance plans prepared for any of the Remedial Action Units?
No, only site wide.

5. What was the process for training users of the site about the site hazards?
UXO safety briefings, covering all associated explosive hazards. Briefings conducted by Clark county munitions safety advisor or contractor safety specialist.

6. What was the protocol for discovery of potential unexploded ordnance (UXO) outside of the remedial cleanup activities?

Mark the item conspicuously, preferably with engineer tape and notify range operations of the location and description of the item.

7. Are you aware of any UXO or potential UXO identified at the property outside of remedial cleanup activities during your period of employment?

   No

   If munitions or explosives were discovered:
   7.1. Where and when were these items discovered?

   7.2. What item was discovered?

   7.3. How were they reported?

   7.4. How was the item disposed of?

8. Describe how operations and maintenance activities in support of the institutional controls were managed and documented?

   Clark County was tasked by Ecology with developing a site wide O&M plan.

9. The RAU-1 CAP requires soil excavation permits and the RAU-3 CAP requires a permit notification program for construction and maintenance related excavation activities and other potential land disturbing tasks.

   9.1. What activities requiring ground disturbance are you aware of occurring? **None**

   9.2. Were permits issued or a similar process followed?

   9.3. Were safety measures (e.g. UXO technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities?

10. RAU 1 has restrictive covenants in place with a requirement for annual reporting. During your period on the project were annual reports prepared for these restrictive covenants? **I was not employed by Ecology at the time of RAU 1.**

11. The 2017 RAU 3 CAP Amendment requires annual inspections of the central impact target area (CITA) and inspections following storm events. Were these inspections performed during your period of employment and if performed how were these inspections documented? **No**

12. Did Clark County maintain Level I UXO technician certification for two Clark County Park employees during your period of employment? **No**

13. Have munitions been stored on the property since transfer of the property to Clark County? **Yes**

    If yes:

    13.1. where are munitions stored and by which agency? **The UXO contractors had 2 explosives magazines on site.**

14. At Camp Bonneville, there are two fenced areas with Type 2 portable storage magazines. One of these fenced compounds is unsecured with two empty and open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21. The other is a secured fenced yard adjacent/coinciding with Bldg 2950. In the secured yard, there are also two larger Type 2 portable storage magazines and one permanent, older magazine. These two larger magazines are closed, but with no access to the fenced yard, their usage cannot be determined.

    14.1. Were any of these magazines being utilized during your period on the project, if so, how were they being used and by whom? **One of them was utilized by the UXO contractors. The other I was not familiar with**..

    14.2. Who was responsible for maintaining the magazines, including documentation and inventory? **UXO contractor.**

    14.3. Which of these fenced compounds and associated magazines were utilized as a part of the cleanup? **Open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21**

    14.4. If any, or all, how were they procured for the cleanup? Were they rented or purchased? **Do not know**.

    14.5. If purchased, who assumed ownership after the conclusion of the cleanup? **Do not know**.

15. Are you aware of any law enforcement training activities occurring outside of the active shooting range (FBI range)? **Yes, room clearing activity, IED and breaching training**.

16. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? Ecology is interested in which range was used, how cleanup following training was completed and reported to Project Management. **No**

Ecology – 1/9/2025 Michael Cronin: Received as a word document to Ecology on 12/17/2024 via email. Ecology has bolded the responses for clarity and printed as a PDF.

Camp Bonneville Periodic Review
Periodic Review: Former Managers Questionnaire

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You have been identified as a former employee of Ecology, DoD contractor, and/or Clark County involved in the oversight of the cleanup. Ecology is requesting your input as your employment covered the time period relevant to this periodic review.

Please complete this questionnaire by December 18, 2024, if you are unable to answer a question, please state "I Do not know".

Name: Hun S. Park
Date Submitted: 12/11/2024

QUESTIONNAIRE

1. What was your role and former agency, and how long did you work on the Camp Bonneville Cleanup?
   Site manager – mainly cleanup for 3 years
2. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property during your period of employment?
   Not that I know.
3. Are you aware of any firefighting activities on the Property?
   yes. There was a big wild-fire around the Area.

   If Yes:

   3.1. When, where, and why did firefighting activities take place?
   DNR used the property as a helicopter refueling base in 2023.
4. Were site specific operations and maintenance plans prepared for any of the Remedial Action Units?
   NO. The county was preparing/planning while I was working on 2023.
5. What was the process for training users of the site about the site hazards?
   I don't know. There must be a process between county.
6. What was the protocol for discovery of potential unexploded ordinance (UXO) outside of the remedial cleanup activities?
   I don't remember the detail.
7. Are you aware of any UXO or potential UXO identified at the property outside of remedial cleanup activities during your period of employment?
   NO. Not that I know.

   If munitions or explosives were discovered:

   7.1. Where and when were these items discovered?
   I don't know.

7.2. What item was discovered?

N/A

7.3. How were they reported?

N/A

7.4. How was the item disposed of?

N/A → See the Cleanup reports

8. Describe how operations and maintenance activities in support of the institutional controls were managed and documented?

These procedures are described in detail at First Consent decree/amended consent decree.

9. The RAU-1 CAP requires soil excavation permits and the RAU-3 CAP requires a permit notification program for construction and maintenance related excavation activities and other potential land disturbing tasks.

9.1. What activities requiring ground disturbance are you aware of occurring?

9.2. Were permits issued or a similar process followed?

9.3. Were safety measures (e.g. UXO technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities?

please refer to the clean-up report of RAU-1.

10. RAU 1 has restrictive covenants in place with a requirement for annual reporting. During your period on the project were annual reports prepared for these restrictive covenants?

NO

11. The 2017 RAU 3 CAP Amendment requires annual inspections of the central impact target area (CITA) and inspections following storm events. Were these inspections performed during your period of employment and if performed how were these inspections documented?

Annual reports including routine inspection was conducted. No report to Ecology.

12. Did Clark County maintain Level I UXO technician certification for two Clark County Park employees during your period of employment?

Please check with the County staff.

13. Have munitions been stored on the property since transfer of the property to Clark County?

If yes: I don't know.

13.1. where are munitions stored and by which agency?

14. At Camp Bonneville, there are two fenced areas with Type 2 portable storage magazines. One of these fenced compounds is unsecured with two empty and open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21. The other is a secured fenced yard adjacent/coinciding with Bldg 2950. In the secured yard, there are also two larger Type 2 portable storage magazines and one permanent, older magazine. These two larger magazines are closed, but with no access to the fenced yard, their usage cannot be determined.

I don't know anything about this stuff.

14.1. Were any of these magazines being utilized during your period on the project, if so, how were they being used and by whom?

14.2. Who was responsible for maintaining the magazines, including documentation and inventory?

14.3. Which of these fenced compounds and associated magazines were utilized as a part of the cleanup?

14.4. If any, or all, how were they procured for the cleanup? Were they rented or purchased?

14.5. If purchased, who assumed ownership after the conclusion of the cleanup?

15. Are you aware of any law enforcement training activities occurring outside of the active shooting range (FBI range)?

NO. Not that I know.

16. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? Ecology is interested in which range was used, how cleanup following training was completed and reported to Project Management.

NO.

Camp Bonneville Periodic Review
Periodic Review: < Law Enforcement AGENCY> Questionnaire

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Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?
   Our agency shoots at the range, conducts ATV driver's training on the gravel roads and occasionally the SWAT team uses wooded areas for land navigation training. We also use the encampment for entry training and building clearing training.

2. How frequently does your agency use the property?

~~2.~~ It varies depending on the month. Anywhere from four to 10 times a month depending on if we have a class scheduled at the range. The use of the encampment and roads is far less frequent.

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3. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?

~~3.~~ yes

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If Yes:

3.1. What do those activities entail?

~~3.1.~~ Details are described in question 1.

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3.2. Where have these activities taken place?

~~3.2.~~4. Gravel roads and the encampment

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4.1. When or how frequently do these activities take place?

~~3.3.~~5. It varies depending on the month but activities outside the range area may not occur at all or a couple of times per month.

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6. Are munitions, including small arms ammunition, stored by your agency on the property?

~~4.~~ yes

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If yes:

6.1. where are munitions stored and how are they secured?

~~4.1.~~ We store small arms ammunition which is secured inside a locked box, inside a locked room inside the locked building where the bathrooms are located at the range.

7. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?

~~5.~~ Yes, there are cleaning supplies for firearms and a small amount of gasoline for the power tools.

8. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?

~~6.~~ NO.

9. Has your agency performed any firefighting activities associated with your agency's use of the Property?

~~7.~~ No.

10. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?

11.

~~8.~~12. No.

If munitions or explosives were discovered:

~~8.1.~~12.1. Where were these items discovered?

~~8.2.~~12.2. What item was discovered?

~~8.3.~~12.3. How were they reported?

~~8.4.~~12.4. How was the item disposed of?

13. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training?

~~9.~~ I do not have any information regarding this training.

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Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Tom Dennison, Commander, Clark County Sheriff's Office, Enforcement Branch, 564-397-3393			

Date Submitted: 12/05/24

Camp Bonneville Periodic Review
Periodic Review: < Law Enforcement AGENCY> Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?

The Clark County Sheriff's Office conducts firearms, 40mm less lethal, and PepperBall training at the dedicated firearms range and hands-on/non-firearms training at the Barracks where one of the buildings is used for patrol tactics (building clearing, flashlight usage, movement).

2. How frequently does your agency use the property?
   The Sheriff's Office uses the range twice a month for a firearms open range day for deputies to practice and qualify. In addition, the Sheriff's Office reserves days in advance, up to fourteen days a year, to potentially use for Patrol Training Days, but those days are not always utilized. There are additional days during the year which the Mobile Response Team may use the range for training. A few additional days a year may be used for the citizens academy and new hire firearms orientation.

3. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?
   The Sheriff's Office has utilized trails on the property for our UTV (Utility Terrain Vehicle) unit to train on their equipment.

   If Yes:

   3.1. What do those activities entail?
   Training intended to familiarize deputies with safe operation of UTV in a variety of off-road environments.

   3.2. Where have these activities taken place?
   Instructors of these activities have been instructed to utilize the trails on the west and north ends of the property.

   3.3. When or how frequently do these activities take place?
   I am not certain, but I believe this was the first year and it was used for two to four days. Two of those days were the Sheriff's Office assisting the Cowlitz Tribal Police with their own UTV unit.

4. Are munitions, including small arms ammunition, stored by your agency on the property?
   Yes
   If yes:
   4.1. where are munitions stored and how are they secured?

Munitions are stored in a heavy-duty storage cabinet with a heavy-duty padlock. The cabinet is stored inside a locked room inside a locked building at the FBI Range.

5. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   There are spray paints kept inside a shed at the FBI Range that are use to mark targets and lane markings for the range. There are some firearms cleaning solvents kept in the "garage" at the FBI Range which is used for cleaning of weapons (the solvents are small bottle/spray bottle size).
6. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   I am not aware.
7. Has your agency performed any firefighting activities associated with your agency's use of the Property?
   Not that I am aware of.
8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
   I am not aware of any.
   If munitions or explosives were discovered:
   8.1. Where were these items discovered?

   8.2. What item was discovered?

   8.3. How were they reported?

   8.4. How was the item disposed of?

9. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training?
   I do not know

Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Thomas Yoder	Sergeant – Training Unit	Clark County Sheriff	Thomas.yoder@clark.wa.gov

Date Submitted: 12/10/2024

Ecology – Michael Cronin – Responses received via email 12/10/2024. Edited on 1/8/2025 to Bold answers and print Document as PDF

Camp Bonneville Periodic Review
Periodic Review: Law Enforcement Agency Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?
   The FBI conducts Quarterly Firearms Training for it's Law Enforcement Officials and monthly training for it's SWAT Operators. Quarterly Firearms Training is four sessions per quarter and involve pistol and rifle qualifications and marksmanship skill building. It also involves Medical Training and search/arrest procedures. SWAT trains four times per month and conducts firearms drills and close quarter clearing/arrest techniques.

2. How frequently does your agency use the property?
   The FBI uses Camp Bonneville between 70 and 80 days per year.

3. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?
   Yes

   If Yes:
   3.1. What do those activities entail?
   Group runs. Vehicle stop procedures

   3.2. Where have these activities taken place?
   On pre-existing roads.

   3.3. When or how frequently do these activities take place?
   Approximately 2x per year.

4. Are munitions, including small arms ammunition, stored by your agency on the property?
   Yes – The FBI stores small arms munitions in the form of 9mm, .223, and .40 cal.

   If yes:
   4.1. where are munitions stored and how are they secured?
   Munitions are stored in a double locked shed with a security gate (no windows exist on the shed)

5. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   Yes – The FBI stores small quantities of gasoline on site to operate an ATV and yard tools. Approximate amount of fuel stored on site is 2 gallons. The FBI also stores solvents on site for cleaning weapons. Approximate amount of solvent stored on site is 1 gallon.

6. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   No. The FBI is obligated to dispose and handle hazardous materials in accordance with OSHA standards.

7. Has your agency performed any firefighting activities associated with your agency's use of the Property?
   The FBI and CCSO have worked together to reduce risk of fires and increase our ability to suppress any fire should it occur, As an example, we have taken extra measures to ensure water can be delivered to all areas of the range and supplied extra fire extinguishers. No fires have ever occurred on site while the FBI was at the range.

8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
   Yes. Item was located in 2019.

   If munitions or explosives were discovered:
   8.1. Where were these items discovered?
   Near the barracks

   8.2. What item was discovered?
   A mortar round – likely inert (blue in color)

   8.3. How were they reported?
   Range Control (Greg Johnson) was notified.
   8.4. How was the item disposed of?
   Greg marked the location/item with a safety flag and notified the remediation crew.

9. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? **I do not currently have any information regarding this event; however, I can likely find out who coordinated the training.**

Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Chris Callahan	**Special Agent/Senior Team Leader**	**FBI**	**cacallahan@fbi.gov**

Date Submitted: **12/4/2024**

Note: Ecology accepted the response entries which added in Microsoft word "Track Changes" and highlighted responses in **Bold** to distinguish from questionnaire on 12/12/2024

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. **Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property?**
    - Yes. Operation and maintenance (O&M) plans are in place for activities, including site access, UXO management, CITA fence inspections, and routine maintenance of infrastructure. These plans were informed by the extensive knowledge of past site managers, particularly Greg Johnson, who was instrumental in ensuring safety protocols during his tenure.
    - O&M plans include specific procedures for anomaly avoidance during ground disturbance, proper storage and disposal of hazardous materials, and timelines for recurring inspections. While much of this is documented, there has been a knowledge gap since Greg's departure, necessitating the county's reliance on available training records and ongoing personnel development.
2. **What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards?**
    - The process includes mandatory hazard briefings for all site users. These briefings cover the location and risks associated with UXO, procedures for anomaly avoidance, and compliance with site-specific safety requirements.
    - Contractors and law enforcement undergo specific orientation on restricted areas like the CITA and its fencing. While training is conducted regularly, there has been inconsistency in record-keeping due to staff transitions.
3. **Please describe who has access to the property and procedures for securing the property?**
    - Access is strictly limited to authorized personnel, including county staff, contractors, and law enforcement agencies like the FBI, which operates the shooting range.
    - Security measures include locked gates, perimeter fencing, and posted signage warning of hazardous conditions. After Greg Johnson's departure, the county has struggled with maintaining consistent access controls due to the lack of UXO-trained staff.
4. **Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?**
    - The responsibility falls under the county's operational team, with quarterly inspections conducted by designated staff. Maintenance involves clearing vegetation, repairing damage, and ensuring signage is visible and intact. Documentation is maintained digitally but may have gaps due to prior administrative transitions.

5. **Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property?**
    - No known spills have been reported in recent years. Historical activities, particularly during Greg Johnson's tenure, included stringent checks to prevent such incidents.
6. **Are chemicals or other hazardous materials stored at the Property? If yes:**
    - **Please list the materials and approximate quantities.**
        - Limited quantities of fuels, lubricants, and cleaning agents are stored for maintenance equipment.
    - **Please describe how and where these materials are stored?**
        - Stored in a designated shed with spill containment measures in place.
    - **Please describe how these materials used?**
        - Used for routine site maintenance, including vehicles and small equipment.
7. **Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment?**
    - No unauthorized use has been observed or reported. All firearm and explosives activities are confined to designated areas.
8. **Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?**
    - Yes, munitions have been found occasionally during site inspections, particularly in areas with historical military activity. These discoveries underscore the importance of UXO training and anomaly avoidance practices.
9. **If munitions or explosives were discovered:**
    - **Where were these items discovered?**
        - Primarily within the CITA and restricted zones.
    - **What item was discovered?**
        - Items included unexploded artillery shells and small ordnance.
    - **How were they reported?**
        - Reported immediately to county officials and UXO-certified personnel for assessment.
    - **How was the item disposed of?**
        - Disposed of by certified UXO technicians following approved protocols.
10. **Are munitions stored on the property?**
    - **If yes, where are munitions stored and by which agency?**
        - No munitions are stored on-site.
11. **Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.**
    - **What activities requiring ground disturbance are you aware of occurring?**
        - Fence repairs, road grading, and trail maintenance.
    - **Were permits issued or a similar review process followed?**
        - Yes, permits were reviewed for compliance with environmental and safety requirements.

- **Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities?**
    - Yes, all activities required oversight by UXO technicians, ensuring safe practices.

12. **Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review?**
    - The program includes mandatory safety briefings, informational pamphlets, and prominently placed warning signs. Training records are maintained, though gaps exist due to staffing changes.
13. **Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)?**

    Wildfire History at Camp Bonneville

    - **1902 Yacolt Burn**:
        - Burned 238,000 acres across Clark, Cowlitz, and Skamania counties, destroying nearly all original forests and many homesteads at Camp Bonneville.
    - **1929 Dole Valley Fire**:
        - Burned 2,088 acres within Camp Bonneville.
    - **1938 1st Livingston Mountain Fire**:
        - Burned 1,220 acres.
    - **1951 2nd Livingston Mountain Fire**:
        - Burned 1,400 acres.
    - **1970 North Fork Lacamas Creek Fire**:
        - Burned 160 acres.

    Fire Management Highlights

    - Fire suppression emphasizes safety due to unexploded ordnance (UXO) risks. The Department of Natural Resources (DNR) coordinates suppression.
    - Prevention includes thinning, pruning, controlled burns, and firebreaks to reduce wildfire risks.

LOCATION SPECIFIC QUESTIONS

1. **Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.**
    a. **Who is responsible for maintaining this requirement?**
        - County maintenance personnel oversee signage maintenance.
    b. **Has maintenance of this signage been required? If yes, how is maintenance documented?**
        - Records are kept in the county's facility management system.
2. **At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports.**
    - Do not know

3. **Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017?**
    - No additional cleanup actions have been undertaken,
4. **Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available?**
    - Do not know
5. **Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?**
    - Maintenance is performed by county staff.
6. **Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available?**
    - Do not know
7. **Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available?**
    - Do not know
8. **Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)?**
    - Do not know
9. **Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please provide details when this training will be completed.**
    - Currently, one technician is in training. Plans are being developed to certify additional personnel.
10. **Has signage been installed at the target areas and firing points identified in the 2010 CAP?**
    - Do not know

Questionnaire Documentation Form

Name	Hunter Decker
Title/Position	Clark County Forester / Natural Resources Specialist III
Department	Public Works - Lands - Forestry
Email Contact	Hunter.Decker@clark.wa.gov
Years Affiliated	8

Periodic Review: DNR Heli-Tact Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for the Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Part of the Periodic Review process is to interview current users of the property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the preparer provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. Please describe your agency's use of the property, areas of use, and annual duration of use.
    a. Staging for local Wildland Fire response for quick reaction. 5 months a year
2. Which of your agency representatives has access to the property and procedures for securing the property?
    a. Local Helicopter Manager, Aircrew, and Pilots. Management
3. Does your agency have any site-specific operation and maintenance plans related to the activities you conduct or supervise at the property?
    a. Clean after self.
4. Does your agency have a process for training your personnel about site hazards?
    a. Base briefing for all crews prior to use, reviewed by the management.
5. Does your agency conduct any active fueling while using the property?
    a. Yes. If Wildfire is close may use hot refuel of helicopter. Fuel Vehicles and Drivers are HAZMAT/DOT approved with a closed circuit refuel system. Truck is equipped with spill kits and deadman shutoff when refueling. DNR SOP covers any fuel spills as reportable IAW EPA/DNR/Ecology guidelines. No open port fueling is allowed.
6. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
    a. No
7. Does your agency store fuels, chemicals, or other hazardous materials stored at the Property? If yes:
    a. Please list the materials and approximate quantities.
        i. Jet Fuel in Fuel Truck & Helicopter. Fuel Truck 1,250 gallons, Helicopter 204.5 gallons.
        ii. Spare helicopter oil in fuel truck
    b. Please describe how and where these materials are stored?
        i. On fuel truck & helicopter
    c. Please describe how these materials used.
        i. Used when needed (Oil) or refueling of helicopter
8. During your agency's use of the property, have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)?

a. No

Questionnaire Documentation Form

Name	Dave Ritchie
Title/Position	Aviation – Assistant Division Manager
Department	Wildland Fire Management WA ST DNR
Email Contact	Dave.ritchie@dnr.wa.gov
Years Affiliated	9

Appendix B
Photograph Log

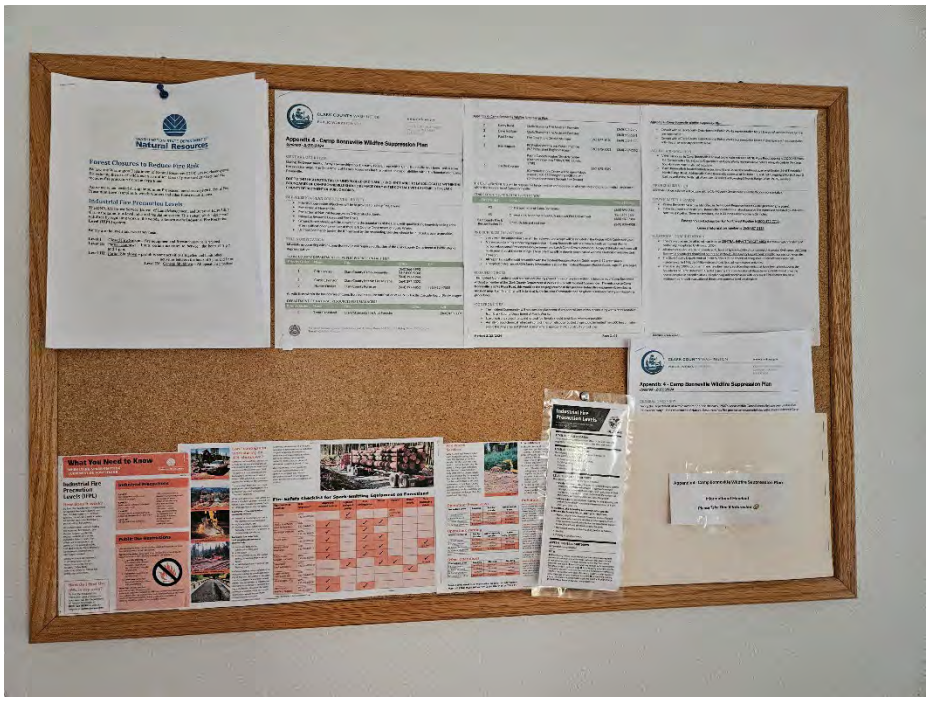


Photo 1. Bulletin board at Camp HQ with O&M manuals

Photo 2. Bulletin board at Camp HQ with O&M manuals

Photo 3. Five strand barbed wire at CITA expansion

Photo 4. Five strand barbed wire at CITA expansion

Photo 5. Typical downed tree impact

Photo 6. CITA entrance

Photo 7. Typical downed tree impact

Photo 8. Four strand barbed wire at northwest area of property

Photo 9. Fence maintenance underway

Photo 10. Building 4475 maintenance pit area signage

Photo 11. Building 4475 maintenance pit area signage

Photo 12. Building 4475 maintenance pit area signage

Photo 13. Building T-1932 AST signage

Photo 14. Building T-1932 AST signage

Photo 15. Building T-1932 AST signage

Photo 16. RAU-2A-16 soil cap area

Photo 17. RAU-2A-16 soil cap area: tire ruts observed

Photo 18. RAU-2A-16 soil cap area: bank erosion 4.5 feet from soil cap

Photo 19. RAU-2A-16 soil cap area: bank erosion 4.5 feet from soil cap

Photo 20. RAU-2A-21 soil cap area

Photo 21. RAU-2A-21 soil cap area

Photo 22. Sewage lagoon

Photo 23. Sewage lagoon

Photo 24. Evidence of burrowing mammal in lagoon

Photo 25. Breach in lagoon

Photo 26. Drainage from lagoon breach

Photo 27. Drainage from lagoon breach

Photo 28. Drainage from lagoon breach reaches access road

Photo 29. Drainage from lagoon breach reaches access road

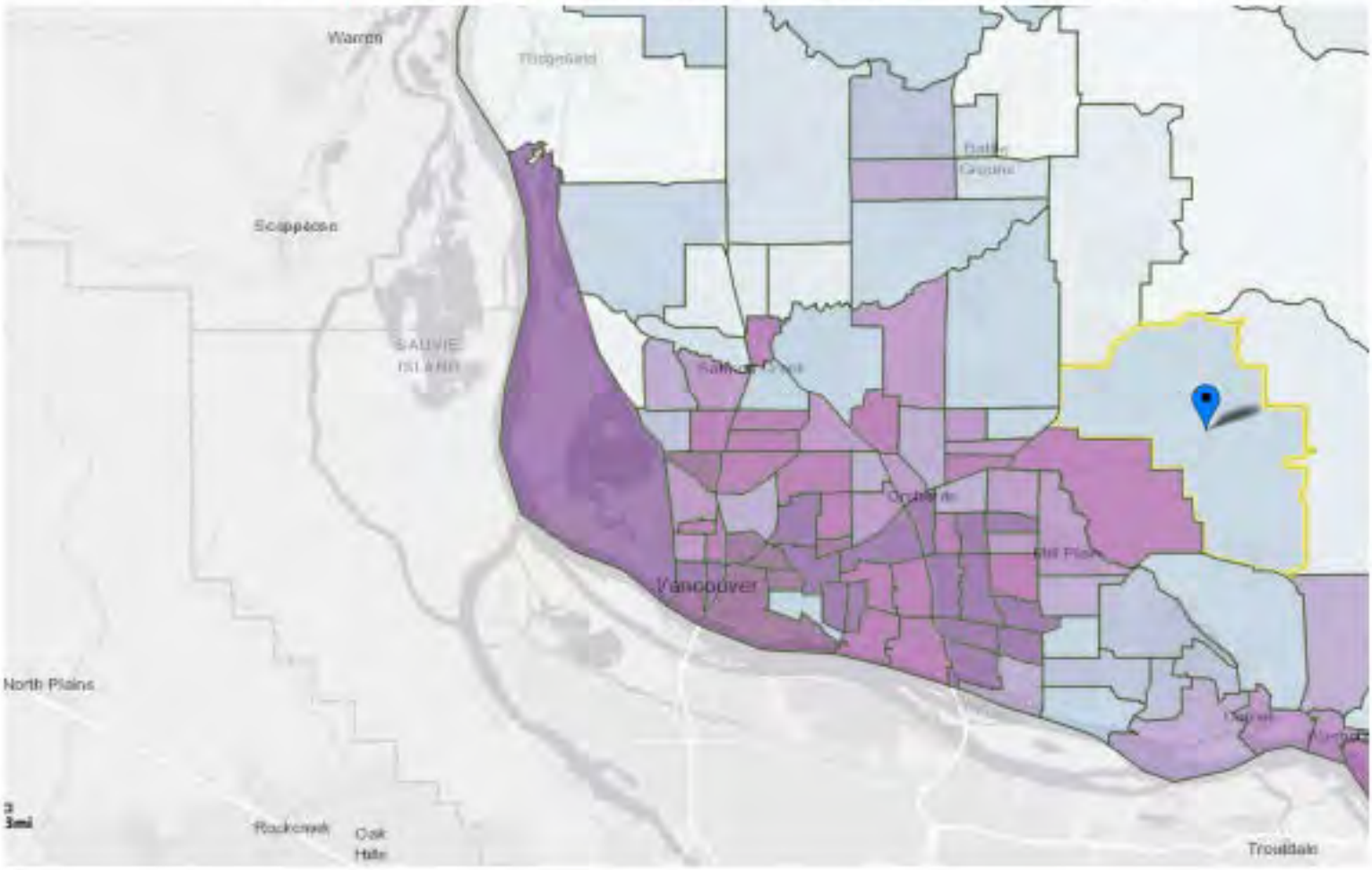
Appendix C
Vulnerable Population Log

Washington State Department of Health

Selection: Environmental Health Disparities V 2.0 **Date: 01/10/2025 at 1:29 PM**

Environmental Exposures, Environmental Effects, Socioeconomic Factors, Sensitive Populations

Legend: (High) 10 9 8 7 6 5 4 3 2 1 **(Low)**



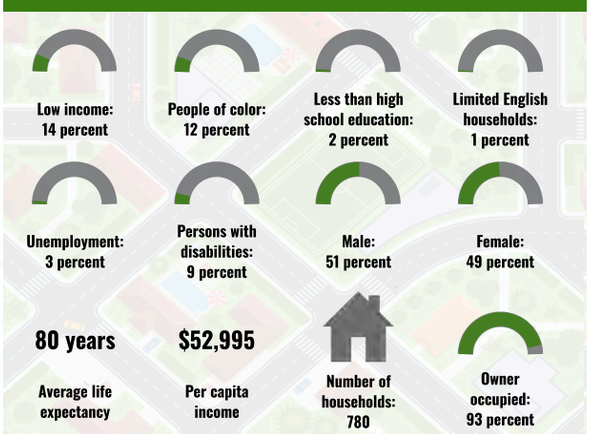
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

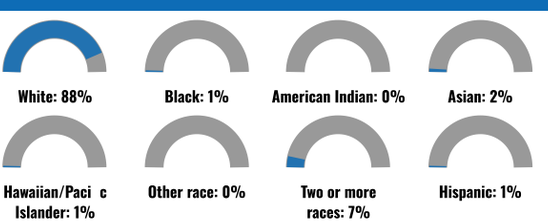
Camp B

2 miles Ring Centered at 45.686947,-122.424045
Population: 2,341
Area in square miles: 12.56

COMMUNITY INFORMATION



BREAKDOWN BY RACE



BREAKDOWN BY AGE

LIMITED ENGLISH SPEAKING BREAKDOWN

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2018-2022. Life expectancy data comes from the Centers for Disease Control.

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	88%
Spanish	1%
French, Haitian, or Cajun	2%
German or other West Germanic	1%
Russian, Polish, or Other Slavic	2%
Other Indo-European	5%
Total Non-English	12%

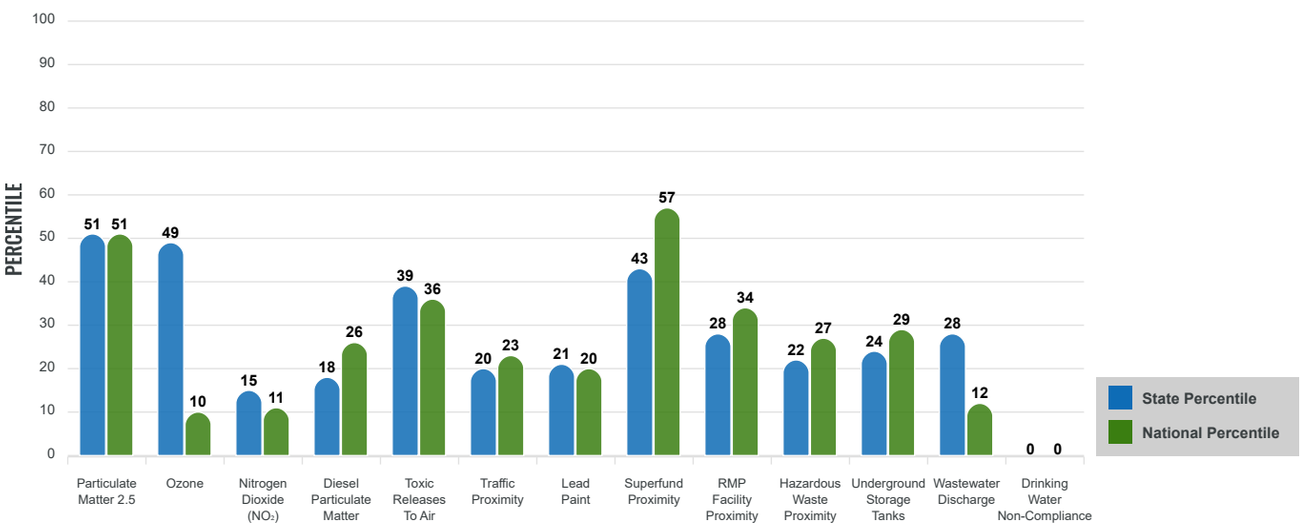
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

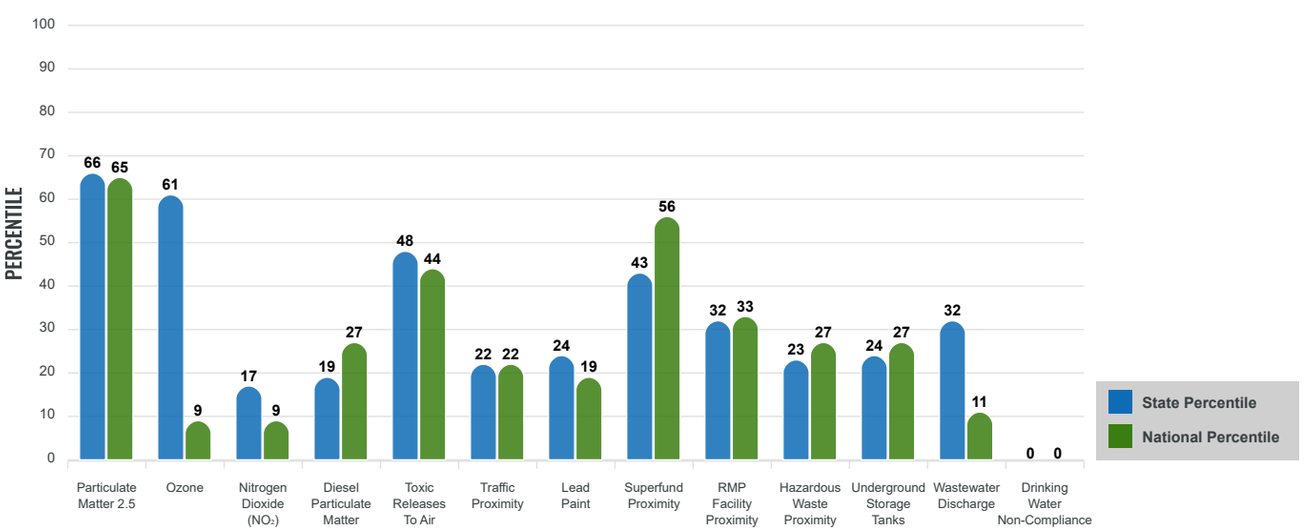
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low income, percent persons with disabilities, percent less than high school education, percent limited English speaking, and percent low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



Report for 2 miles Ring Centered at 45.686947,-122.424045

Report produced January 8, 2025 using EJScreen Version 2.3

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
ENVIRONMENTAL BURDEN INDICATORS					
Particulate Matter 2.5 ($\mu g/m^3$)	13.6	9.51	94	8.45	96
Ozone (ppb)	53.6	51.8	84	61.8	14
Nitrogen Dioxide (NO_2) (ppbv)	3.8	6.3	17	7.8	13
Diesel Particulate Matter ($\mu g/m^3$)	0.12	0.256	25	0.191	36
Toxic Releases to Air (toxicity-weighted concentration)	1,000	1,800	59	4,600	60
Traffic Proximity (daily traffic count/distance to road)	330,000	1,200,000	27	1,700,000	32
Lead Paint (% Pre-1960 Housing)	0.043	0.23	29	0.3	25
Superfund Proximity (site count/km distance)	0.055	0.53	42	0.39	56
RMP Facility Proximity (facility count/km distance)	0.15	0.51	35	0.57	39
Hazardous Waste Proximity (facility count/km distance)	0.59	2.9	28	3.5	36
Underground Storage Tanks (count/km^2)	0.12	6.1	29	3.6	34
Wastewater Discharge (toxicity-weighted concentration/m distance)	1.3	300	63	700000	23
Drinking Water Non-Compliance (points)	0	1	0	2.2	0
SOCIOECONOMIC INDICATORS					
Demographic Index USA	0.52	N/A	N/A	1.34	15
Supplemental Demographic Index USA	1	N/A	N/A	1.64	16
Demographic Index State	0.69	1.47	14	N/A	N/A
Supplemental Demographic Index State	0.85	1.37	21	N/A	N/A
People of Color	12%	33%	15	40%	25
Low Income	14%	23%	35	30%	26
Unemployment Rate	3%	5%	43	6%	43
Limited English Speaking Households	1%	4%	53	5%	60
Less Than High School Education	2%	8%	27	11%	21
Under Age 5	2%	5%	18	5%	21
Over Age 64	20%	17%	66	18%	64

*Diesel particulate matter index is from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 3
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within de ned area:

Schools 0
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment ..... No
Impaired Waters ..... Yes

Selected location contains American Indian Reservation Lands* ..... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community ..... No
Selected location contains an EPA IRA disadvantaged community ..... No

Report for 2 miles Ring Centered at 45.686947,-122.424045

Report produced January 8, 2025 using EJScreen Version 2.3

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	17%	18%	38	20%	28
Heart Disease	4.8	4.8	50	5.8	30
Asthma	10.8	10.9	46	10.3	69
Cancer	7.4	6.5	71	6.4	70
Persons with Disabilities	9%	13.4%	23	13.7%	23

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	8%	11%	63	12%	59
Wildfire Risk	0%	12%	0	14%	0

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	3%	8%	35	13%	23
Lack of Health Insurance	2%	6%	12	9%	12
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access Burden	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for 2 miles Ring Centered at 45.686947,-122.424045

Report produced January 8, 2025 using EJScreen Version 2.3

Appendix G. Clark County Final Periodic Review Support Report

To: Kevin Tyler (Clark County)
Betsy Wing (Clark County)
CC: Amy Hargrove (Ecology)
Forrest Malone (Ecology)
Erik Snyder (Ecology)

Date: October 6, 2025

Subject: Inclusion of the Periodic Review Support Report in the Administrative Record

On August 6, 2025, the Department of Ecology (Ecology) received a report from Clark County Public Works (County) titled "*Summary and Technical Assessment for Periodic Review Report*", prepared by APEX Companies, LLC and dated July 31, 2025. The County has requested this document be incorporated as part of Ecology's First Periodic Review for the US Army Camp Bonneville Cleanup Site.

This Report is a revised submission of the County's prior submittal titled *"Periodic Review"* Submitted to Ecology on January 21, 2025. On May 2, 2025, Ecology provided comments on that submission titled "*Subject: Ecology's comments on Periodic Review Submission*". Ecology stated that the County had fulfilled its obligation under paragraph 150 of the Amended Prospective Purchaser Consent Decree and would not require or review a revised submission. The County has chosen to revise the document to address Ecology's comments and ensure accuracy in the project records.

Ecology agrees to include the revised document along with this response as an appendix to the forthcoming Periodic Review with the caveat this document has not been reviewed by Ecology. Ecology intends to keep the draft report and the associated comments in the Periodic Review so there is a complete record of the report and subsequent revisions.

If you have any questions or concerns regarding these comments, please contact me by telephone at 564-233-9482 or email at Michael.Cronin@ecy.wa.gov.

Summary and Technical Assessment for Periodic Review Report

Camp Bonneville Military Reservation
Vancouver, Washington
Ecology FSID #69965472
Cleanup ID #11670

Prepared for:
Clark County Public Works
Vancouver, Washington

July 31, 2025
Apex Project 24011091

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Abbreviations and Acronyms

2,4,5-T	2,4,5-trichlorophenoxy acetic acid
2,4-D	2,4-dicholorophenoxy acetic acid
ACM	asbestos-containing material
AFFF	aqueous firefighting foam
amsl	above mean sea level
AOPI	area of potential interest
Apex	Apex Companies, LLC
APPCD	amended prospective purchaser consent decree
ARAR	Applicable or Relevant and Appropriate Requirement
Army	US Army
ASR	archive search report
AST	aboveground storage tank
ATF	Bureau of Alcohol, Tobacco, Firearms and Explosives
BCRRT	Bonneville Conservation Restoration and Renewal Team
bgs	below ground surface
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and total xylenes
CAP	cleanup action plan
CBMR	Camp Bonneville Military Reservation
CITA	Central Impact Target Area
COC	contaminant of concern
COPC	chemical of potential concern
County	Clark County
CS	2-chlorobenzalmalononitrile
CUL	cleanup level
CVF	Central Valley Floor
cy	cubic yard
DA2	Demolition Area 2
DA3	Demolition Area 3
DDT	dichloro-diphenyl-trichloroethane
DNR	Washington State Department of Natural Resources
DoD	United States Department of Defense
DOH	Washington State Department of Health
EBS	Environmental Baseline Survey
EC	engineering control
ECCR	Environmental Covenants, Conditions, and Restrictions
Ecology	Washington State Department of Ecology
EHD	Washington State Environmental Health Disparities
EJ	environmental justice
EM	electromagnetic
EO	Enforcement Order
EPA	Environmental Protection Agency
ESCA	Environmental Services Cooperative Agreement
FBI	Federal Bureau of Investigation
GPR	ground-penetrating radar
HEAL Act	Healthy Environment for All Act

HFPO-DA	hexafluoropropylene oxide dimer acid
HI	hazard index
HMX	High Melting Explosive
IC	institutional control
LF4/DA1	Landfill 4/Demolition Area 1
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
Ma	million years ago
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
MDAS	Material Documented as Safe
MDL	laboratory method detection limit
MEC	munitions and explosives of concern
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mm	millimeter
MPPEH	material potentially presenting an explosive hazard
MRL	laboratory method reporting limit
MTCA	Model Toxics Control Act
NFA	No Further Action
NFLC	North Fork Lacamas Creek
ng/L	nanograms per liter
NPDWR	National Primary Drinking Water Regulation
NT	non-target zone
O&M	Operation and Maintenance
OB	open burning
OD	open detonation
OTM	Other Test Method
PA	picric acid
PCB	polychlorinated biphenyl
PETN	pentaerythritol tetranitrate
PFAS	per- and polyfluoroalkyl substances
PFBA	perfluorobutanoic acid
PFBS	perfluorobutane sulfonate
PFHxA	perfluorohexanoic acid
PFHxS	perfluorohexane sulfonate
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PM	particulate matter
PPCD	Prospective Purchaser Consent Decree
PPL	Priority Pollutant List
PRG	preliminary remediation goal
Pt	Troutdale Formation
Qa	quaternary floodplain and stream channel alluvium and lacustrine deposits
Qfg	quaternary cataclysmic flood deposits
Qls	quaternary landslide deposit
Qtc	quaternary unnamed conglomerate

RAU	remedial action unit
RCRA	Resource Conservation and Recovery Act
RDX	hexahydro- 1,3,5-trinitro- 1,3,5-triazine
RI/FS	Remedial Investigation/Feasibility Study
RSL	regional screening level
SAL	Washington State Action Level
SERS	surface-enhanced Raman scattering
SHPO	Washington State Historic Preservation Office
SI	site investigation
SSRP	Site-Specific Remediation Plan
State	State of Washington
SVOC	semi-volatile organic compound
SWAT	Special Weapons and Tactics
Tbem	Basaltic Andesite of the Elkhorn Mountain
TCLP	Toxicity Characteristic Leaching Procedure
TNT	trinitrotoluene
TOC	total organic carbon
TPH	total petroleum hydrocarbons
Tsr	Sandy River Mudstone
TSRS	Technical Specifications and Requirements Statement
Ttfc	Troutdale Formation Conglomerate
Ttfh	Troutdale Formation Lower Member
Tv	Oligocene Volcanic Bedrock
USACE	US Army Corps of Engineers
UST	underground storage tank
UXO	unexploded ordnance
VOC	volatile organic compound
WAC	Washington Administrative Code
WMA	Wildlife Management Area
WSA	Western Slopes Area
WWTP	wastewater treatment plant
XRF	x-ray fluorescence

1 INTRODUCTION

Apex Companies, LLC (Apex) has prepared this Summary and Technical Assessment for Periodic Review Report (summary report) for the Camp Bonneville Military Reservation (CBMR) located at 23201 NE Pluss Road in Vancouver, Washington (Figure 1).

Clark County (County) is the current owner of the property. The US Army (Army) was the prior owner and operator of CBMR. In May 2012, the County entered an amended prospective purchaser consent decree (APPCD) number 06-2-05340-4 with the State of Washington (State) to address contamination at CBMR. This distinction is important as it explains the roles of each party in the management and remediation of the CBMR site. The Army was responsible for historical activities that led to the contamination, while the County is now managing the cleanup and environmental restoration efforts.

This summary report was prepared for the County in support of Washington State Department of Ecology's (Ecology) Periodic Review for CBMR. The report follows the requirements of the Model Toxics Control Act (MTCA) Cleanup Regulation for Periodic Review, specifically Chapter 173-340-420 of the Washington Administrative Code (WAC).

The key components of the summary report include:

1. Summary of site history, contamination sources, and site conditions
2. Summary of cleanup actions completed at each of the five remedial action units (RAUs)
3. Summary of additional information gathering and site inspections
4. Technical review of the effectiveness of remedial actions with consideration of the following:
    a. New scientific information for hazardous substances
    b. New state or federal laws
    c. Current site and resource uses
    d. Availability and practicability of more permanent remedies
    e. Availability and improved analytical techniques
5. Technical assessment summary
6. Recommendations and follow-up actions

2 SITE DESCRIPTION AND CHRONOLOGY

The following section provides an overview of CBMR's physical setting, usage, and infrastructure, as well as an overview of the site's chronology.

2.1 Site Description

CBMR occupies approximately 3,840 acres in Clark County, Washington, approximately 5 miles northeast of Vancouver, Washington, and 7 miles north of the Columbia River (Figure 1). It is located along the western foothills of the Cascade Mountain Range, with Camp Hill and Little Elkhorn Mountain to the northwest, Munsell Hill to the west, and Little Baldy Mountain to the south. Lacamas Creek, a tributary of the Columbia River, bisects the site. CBMR is composed of mostly undeveloped, forested hillsides, and creek side drainages. Former military barracks and training facilities are concentrated at the Killpack and Bonneville cantonments. Other developed areas include firing ranges, a paved two-lane road connecting the main gate with the two cantonment areas, and a network of unpaved roads (Figure 2).

2.2 Site Chronology

CBMR historically was used by the US Department of Defense (DoD) to provide training for active Army, Army Reserve, National Guard, Marine Corps Reserve, Navy Reserve, Coast Guard Reserve units, and other DoD personnel. The installation included the Bonneville cantonment and Killpack cantonment, 25 firing ranges, sewage lagoons, and 4 historical landfills.

Between 1910 and 1995, the DoD used CBMR for live fire of small arms, assault weapons, artillery, and field and air defense artillery. In the early 1950s, the DoD arranged to lease an additional 840 acres from the State of Washington (State) to expand training possibilities. DoD operations at the facility ceased in 1995 when CBMR was selected for closure under the 1995 Base Realignment and Closure (BRAC) process.

Since CBMR was officially closed, the DoD and its consultants conducted investigations to characterize the nature and extent of contamination at the site and to develop a plan for potentially transferring ownership to the County, which expressed interest in the site. Investigations began in 1997 in response to the BRAC process and have occurred every year to date on the numerous investigation areas identified at the site. During this time, the County prepared an initial Reuse Plan for the property (Otak, 2005).

CBMR was divided into RAUs in a Enforcement Order (EO) issued by Ecology on February 4, 2003 (Enforcement Order 03TCPHQ-5286; Ecology, 2003). The EO was modified in June 2004. RAUs were based on the nature of contaminants, not by physical location. Figures 3 through 7 show each RAU's location. The five RAUs, and their status post-remedy, are as follows:

- RAU 1—hazardous substance, other than military munitions, storage areas, no further action necessary under MTCA
- RAU 2A—small arms ranges, no further action necessary under MTCA
- RAU 2B—former open burning/demolition areas excluding Demolition Area 1, no further action necessary under MTCA
- RAU 2C—sitewide groundwater with emphasis on Landfill 4/Demolition Area 1 (LF4/DA1) area, still active under MTCA
- RAU 3 (Phases 1 through 4)—sitewide locations where munitions and explosives of concern (MEC) may be located:

- Phase 1—Central Valley Floor (CVF) and Associated Wetlands, no further action necessary under MTCA
- Phase 2—Central Impact Target Area (CITA)/Northern CITA expansion and firing points, no further action necessary under MTCA
- Phase 3—Open Burning (OB)/Open Demolition (OD) Areas, no further action necessary under MTCA.
- Phase 4 –Western Slopes Area, no further action necessary under MTCA

The Reuse Plan called for the majority of CBMR to be transferred to the County for the public benefit, education, law enforcement, and parks. Furthermore, it states that "timber revenues will be used to leverage matching grants that together will provide the ongoing revenues needed for both capital and operational costs." Several unsuccessful attempts to transfer CBMR from the DoD to the County were made prior to a successful transfer of ownership in 2006 under a prospective purchaser consent decree (PPCD) for CBMR (Ecology, 2006).

In October 2006, the Army transferred ownership of the property to the County, which immediately transferred the land to the Bonneville Conservation Restoration and Renewal Team (BCRRT). The transfer was a conservation conveyance that followed 10 U.S.C. 2694(a). A conservation conveyance limits use of the property to conservation purposes. Ownership was transferred from BCRRT back to the County in 2011 via a quitclaim deed, and cleanup activities have continued according to the Reuse Plan. In 2012, the PPCD was superseded with the APPCD, and work has continued under the APPCD from 2012 to present.

2.3 Physiography and Regional Setting

2.3.1 Regional Geology

The Cascade Mountain Range divides Washington into two distinct physiographic areas, the western side with moderate temperatures and abundant rainfall, and a semi-arid eastern side that experiences greater temperature extremes. The peaks and ridges of the range vary from 6,000 to 8,000 feet above mean sea level (amsl) with some volcanic peaks over 10,000 feet amsl. The Cascade Range borders the site to the east, consisting of Tertiary to Quaternary volcanic and sedimentary rocks. CBMR is situated between the western foothills of the Cascade Range and Portland Basin physiographic provinces.

The Portland Basin and surrounding area is characterized by low topographic relief with exposures of Oligocene volcanic basalt flows of the Elkhorn Mountain (approximately 26.5 million years ago [Ma]) at the eastern edges. Volcanism and uplift of the younger Cascade Range in the east caused the basin to fill with low-energy sediments, such as the Sandy River Mudstone, via the ancestral Columbia River. In the Miocene, more abrupt changes in relief resulted in higher energy sediments of the Troutdale Formation accumulating in the basin from eastern sources. An abrupt lifting of the Cascade Range in the late Miocene to early Pliocene (approximately 5 Ma) resulted in further sedimentation in the Columbia Valley, which caused much of the previously existing Troutdale Formation in the Portland Basin to erode. These events left Troutdale Formation remnants on the western foothills of the Cascades.

The geology of the Lacamas Creek 7.5-minute quadrangle is presented on a map published by the US Geological Survey (Evarts, 2006). The quadrangle is located south of the limits of Pleistocene glaciers emanating from the Cascade Range in Washington (Mundorff, 1984; Evarts, 2006). However, elevations below approximately 400 feet were periodically inundated by Pleistocene glacier-outburst floods from Glacial Lake Missoula (Mundorff, 1984; Evarts, 2006).

2.3.2 Local Geology

According to nomenclature found in the Lacamas Creek quadrangle (Evarts, 2006), five geologic formations are present at CBMR (Figure 8) and, from oldest to youngest, are the following:

- Quaternary floodplain and stream channel alluvium and lacustrine deposits (Qa), which mantle the Lacamas Creek valley floor.
- A Quaternary landslide deposit (Qls) of surface soils and bedrock displaced from the steep slope along David Creek.
- Sandy River Mudstone (Tsr) is a fine-grained, low-permeability siltstone deposit that only occurs between the Bonneville and Killpack cantonments in the small valley between Camp Hill/Munsell Hill along the north side of Lacamas Creek as it exits CBMR in the southwestern corner of CBMR.
- A thick sequence of Quaternary to Pliocene gravel, fine-grained sand, and cobbly and bouldery sand known as the Troutdale formation (Pt), which underlies areas to the west of the Bonneville cantonment. Lower Member (conglomerate) of the Troutdale Formation (Ttfc, Ttfh).
- Oligocene volcanic bedrock (Tv), which is exposed at the surface in the eastern part of CBMR as identified as the Basaltic Andesite of the Elkhorn Mountain (Tbem).

These units are presented in the Lacamas Creek quadrangle geologic map (Evarts, 2006).

2.3.3 Hydrogeology

CBMR lies within the Portland Basin portion of the Willamette Lowland Aquifer System. The Portland Basin is bounded to the east by the Cascade Mountains, to the north by the Lewis River, and to the west by the Coast Range. Groundwater flow in the uppermost alluvium aquifer within CBMR follows topography. Precipitation that recharges groundwater in the uplands flows downhill through the shallow, weathered zones of bedrock into the alluvium of the Lacamas Creek floodplain. Topographic contours and inferred groundwater flow direction at CBMR are shown in Figure 2.

The Tbem unit has little capacity to store or transmit water. Where water is present, it is located at the soil/rock interface or in fractured zones within the rock (Morgan and McFarland, 1996). At CBMR, this unit is not considered to be a productive aquifer, with some exceptions where potable water has been encountered in fracture zones.

Three wells at CBMR have been used for water supply since their installation (Figure 2). These wells are in the Central Valley and were installed between 350 and 600 feet below ground surface (bgs). According to well logs, competent bedrock was not reached until approximately 200 feet bgs. Estimates of the hydraulic conductivity of the bedrock indicated it is a low-yield aquifer (BCRRT, 2009a).

The Sandy River Mudstone is a low-permeability unit (Morgan and McFarland, 1996). This unit is only present in a small valley that extends between the Killpack and Bonneville cantonments.

The Troutdale Conglomerates are considered excellent water-bearing units and commonly serve as water sources for municipal, industrial, and irrigation supplies (Morgan and McFarland, 1996). In 2006, the Environmental Protection Agency (EPA) designated the Troutdale aquifer a sole-source aquifer in the County. This aquifer system provides approximately 99% of the available drinking water to the residents living over it. There are no other available drinking water sources that would be economically feasible to supply these residents (EPA, 2006). The Troutdale Sole-Source Aquifer System is a highly productive aquifer and includes not only the Troutdale Formation, but all productive, hydraulically interconnected overlying water-bearing

sedimentary units within the entire Portland Basin, including unnamed conglomerate (Qtc), cataclysmic flood deposits (Qfg), and Qa (EPA, 2006, using the nomenclature of Evarts, 2006).

At CBMR, the Conglomerate Member of the Troutdale Formation is present along the west-southwest portion (Evarts, 2006). In addition, a remnant of the formation is present at LF4/DA1. The remnant is disconnected/isolated from the Troutdale Formation located at the west-southwest property line of CBMR. The remnant was isolated from the rest of the unit to the west-southwest by the downcutting of Lacamas Creek. The Troutdale Aquifer, a major source of potable water in the area, is found within the Troutdale Formation.

CBMR lies within the Streamflow Source Area of the Troutdale Aquifer. The Streamflow Source Area is defined by EPA as "the upstream headwaters area of streams that flow into the recharge area of the aquifer" (EPA, 2006).

3 BACKGROUND

The following subsections describe the RAUs with respect to their location and historical site uses. The facilities associated with each RAU are no longer in use, with minimal exception (noted below).

3.1 Remedial Action Unit 1

The RAU 1 area consists of 20 discrete sites, where previous investigations and remedial activities found that chemicals of potential concern (COPCs) were either not detected or were below regulatory cleanup levels (CULs). Because RAU 1 included a number of sites, the list of COPCs was broad and included total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), lead, herbicides and pesticides, and asbestos. Brief descriptions of the sites included in RAU 1 are provided below, including their location within CBMR. Most of the sites were largely identified during the Environmental Baseline Survey (EBS) (Woodward-Clyde, 1997) conducted after the installation was selected for closure by the BRAC Commission.

3.1.1 Landfill 1

Landfill 1 was reportedly located east of the Bonneville cantonment area and just north of the existing sewage lagoons (Figure 3). It was identified as having potential historic significance based on a 1980 cultural resources survey, which stated that bottle fragments dating from the early 1900s were found in the area (Larson, 1980). There is no record of when the site was used or what other types of materials it may contain. In the 1980 archaeological survey, the site was described as a small (approximately 12 by 15 feet) shallow depression.

In 1997, a field reconnaissance and geophysical survey were completed. The exact location of the landfill could not be determined. No evidence of a landfill, either in the way of a depression or of debris, was identified (URS, 2004).

3.1.2 Landfill 2

Landfill 2 was discovered in approximately 1978 during excavation for the sewage lagoons. Landfill material was unearthed at the eastern and northern borders of the sewage lagoons. Description of the materials encountered during construction or records of the type or quantity of material that was placed in this landfill were not available. The EBS suggested that the landfill may have operated from 1940 to 1950 and that its use apparently preceded the mid-1970s (Woodward-Clyde, 1997). It was determined the site may instead have been a former homestead (URS, 2004).

The general Landfill 2 area is bounded by the sewage lagoons to the west and north and wooded areas to the south and east. The landfill area slopes gently southward toward Lacamas Creek. Although most of the site area is fairly flat, portions of the area are bumpy and uneven.

3.1.3 Landfill 3

Landfill 3 is located southeast of the sewage lagoons, near Lacamas Creek, and approximately 300 feet southeast of Landfill 2 (Figure 3). The location of Landfill 3 is an obvious mound of soil in an otherwise flat area on the Lacamas Creek floodplain. Lacamas Creek flows along the eastern and southern sides of Landfill 3. At its closest point, Lacamas Creek is approximately 20 feet east of the landfill area. The creek banks are nearly vertical with the top of the bank approximately 4 feet above stream level.

According to the EBS, this area was described by the previous CBMR Facility Manager as having been dug out as a trench and then used as a trash burial area from the mid- to late 1970s to the early to mid-1980s (Woodward-Clyde, 1997). Objects such as a refrigerator, a locker, wallboard, and paint cans were reportedly buried here. Soil was scraped from nearby and pushed onto the landfill, creating a broad mound.

3.1.4 Former Burn Area

The Former Burn Area is located immediately north of Landfill 3, to the southeast of the sewage lagoons (Figure 3). The area reportedly was used infrequently to burn wood and debris, although there is no record of the length of use or list of materials burned (Woodward-Clyde, 1997). This area has apparently not been used for burning material since the mid-1980s. According to the CBMR Facility Manager, debris had been piled on the site for three to four years before its removal in June 1997.

3.1.5 Buildings 1962 and 1983

Buildings 1962 and 1983 were located near the southeastern corner of the Bonneville cantonment area (Figure 3). The buildings were burned in place, and the burned debris was removed to an unknown location, leaving no visible trace of the footprints of the buildings. Based on their age and wood-frame type of construction, lead-based paint may have been used in the buildings. Lead from the paint could have been released to the soils over the life of the buildings and when they were burned. Asbestos and semi-volatile organic compounds (SVOCs) may also have been present in the composition roofing materials and other building materials.

3.1.6 Grease Pits

Three grease pits were identified at CBMR: two were located in the Bonneville cantonment north of Building 1828 (Figure 3), and one was located in the Killpack cantonment east of Building 4389 (Figure 3). Each of the grease pits consists of a gravel-filled excavation with a corrugated metal pipe extending vertically down into the gravel. The grease pits were used for disposal of waste cooking greases and oils from nearby mess halls. Use of the pits reportedly began around 1935. During an interview performed as part of the EBS, the potential for the disposal of unauthorized materials in the pits was suggested.

The two reported grease pits in the Bonneville cantonment are located north of the mess hall and associated structures. Each of the grease pits consists of a single corrugated metal pipe approximately 18 inches in diameter and are approximately 1.5 feet apart. There were no reported caps, and municipal waste was observed in both.

The grease pit at the Killpack cantonment is located approximately 10 feet east of the gravel road that runs north to south on the east side of the former mess hall building (Building 4389). The grease pit is located just inside a heavily wooded area; access is somewhat limited by the trees. The visible portion of the grease pit consists of two corrugated metal pipes, one inside the other. The outer pipe is approximately 16 inches in diameter, and the inner pipe is approximately 10 inches in diameter. The pipes are covered with a metal cap.

3.1.7 Former Sewage Pond

The Former Sewage Pond site is located south of the Bonneville cantonment area. The exact location and dimensions of the pond were not documented in the records reviewed for the EBS; however, the general area is indicated in Figure 3. According to the former facility caretaker, the pond was an unlined lagoon that, when abandoned, was pumped out and filled with clean soil derived from a local source. The pond reportedly was used for sewage disposal until 1978, when the sewage lagoons were constructed. The years of pond usage are not known; however, according to the facility caretaker, it may have been used for only a short period of time (Woodward-Clyde, 1997).

Although there are no records of hazardous materials disposal in the sewage pond and no evidence of contamination has been observed in the area, the potential for contamination could not be discounted given the nature and purpose of the facility. There was also the potential for unexploded ordnance (UXO) at the site because of munitions misfires impacting outside of established range fans, unauthorized munitions disposal,

or other activities. Water tends to pond in much of this area during the wet season. Lacamas Creek is approximately 200 feet southeast of the site at the closest point.

3.1.8 Hazardous Materials Accumulation Point

The Hazardous Materials Accumulation Point (Building 4476) is in the northeastern corner of the shop area in the Killpack cantonment (Figure 3). The building is a three-walled structure, built in 1990, with concrete masonry block walls and a concrete slab floor. The open front of the structure is secured with locking metal gates. The structure, also referred to as the Covered Vehicle Maintenance Storage, has been used for the storage of drums of liquids such as antifreeze and used oil and may have been used for temporary accumulation of drums for other hazardous materials. The concrete floor of the building includes a blind sump that measures approximately 2 feet square and is approximately 2 feet deep. The sump is a blind sump; no drains are present in the sump. Evidence or reports of spills were identified.

A vehicle fuel aboveground storage tank (AST), covered and within a concrete secondary containment structure, is immediately west of the building.

3.1.9 Drum Disposal Area

An anonymous former CBMR employee reported the existence of an area of buried drums located south of the Killpack cantonment and east of a gravel road south of the current storage area (Figure 3). The caller reported that pesticides, paints, and solvents were disposed of at this location. As a result of the call, a program was established to characterize the area. Drums were identified during a geophysical survey and were ultimately removed from the site.

3.1.10 Paint and Solvent Disposal Area

The existence of the Paint and Solvent Disposal Area was reported by the same anonymous former CBMR employee who reported on the Drum Disposal Area. The Paint and Solvent Disposal Area was reported to be south of the Killpack cantonment, in an open area where a tractor shed currently exists (Figure 3). The caller stated that paints, solvents, and pesticides were disposed of in this location. As a result of the call, a program was established to characterize the area. An electromagnetic (EM) survey was conducted, and several subsurface items were identified. Confirmation samples indicated COPCs were detected below CULs; however, paint chips were found that were considered a characteristic hazardous waste.

3.1.11 Washrack 1

Located immediately west of the shop office (Building 4475) in the Killpack cantonment (Figure 3), Washrack 1 was used to clean vehicles from approximately 1978 to 1994. Wastewater from the washing operations was reportedly discharged directly to ground via overland flow to a nearby ditch. Potential contaminants include vehicle fluids such as gasoline, used oil, lubricants, antifreeze, and solvents used for cleaning. Soil exceeding CULs was removed from CBMR. Confirmation samples indicated the remaining COPC concentrations were below CULs.

3.1.12 Washrack 2

The Washrack 2 site (former maintenance rack site) is located in the Killpack cantonment at the northeastern corner of the shop office area, near Building 4476, on the hillside in a small, relatively level clearing (Figure 3). The washrack was used for vehicle cleaning, and a rack for performing vehicle maintenance, including the draining of engine fluids, was present. The rack was originally constructed of two parallel timber ramps with gravel in between. If vehicles were washed at this location, wash water would have discharged by uncontrolled overland flow onto the surrounding area. According to the EBS, the washrack was demolished in the early 1980s and an adjacent 275-gallon gasoline underground storage tank (UST) was removed in 1978. Interviews

at the time of the EBS disclosed that evidence of a release was not observed during decommissioning (Woodward-Clyde, 1997).

3.1.13 Maintenance Pit (Building 4475)

A maintenance pit is located underneath a concrete slab within the western end of Building 4475 in the Killpack cantonment (Figure 3). It was formerly an area where mechanics repaired and maintained vehicles. Vehicle-related fluids such as fuel, used oil, lubricants, and antifreeze were potentially released to the ground. The pit was reported to be an unlined excavation, and no documentation exists concerning its depth or how long the pit was used. Soil excavation was completed at exterior areas; however, residual contamination remains beneath the building.

3.1.14 Pesticide Storage/Mixing Building (Building 1864)

Built in 1955, the Pesticide Storage/Mixing Building (Building 1864) was originally used as a fire station. Much later (1977 through 1980), it was used as an area where pesticides were stored and mixed. Fifty-five-gallon drums of 2,4,5-trichlorophenoxy acetic acid (2,4,5-T); 2,4-dicholorophenoxy acetic acid (2,4-D); and dichloro-diphenyl-trichloroethane (DDT) were reportedly stored here. A sink was used for pesticide mixing and pesticide container and applicator cleaning. This sink was discovered to discharge via a pipe to a dry well containing large drain rock to a depth of 3 feet. More recently, the building has been used as the grounds shop where equipment, vehicles, small gasoline containers, and car batteries are stored. The location of Building 1864 is indicated in Figure 3. Soil excavation was completed to remove contaminated soil in this area.

3.1.15 Aboveground Storage Tanks

Of the 26 ASTs currently at CBMR, 23 are located in the Bonneville cantonment and the remaining 3 are in the Killpack cantonment. Each of these ASTs has a 275-gallon capacity and was used since the 1920s and 1930s to store diesel fuel for heating. In July 1999, ASTs were reportedly still being used at the Camp Killpack shop office, the fire station, and the laundry. Surface sampling indicated releases from eight ASTs: AST #1 – Building 1833; AST #2 – Building 1837; AST #3 – Building 1828; AST #4 – Building 1940; AST #5 – Building 1922; AST #6 – Building 1923; AST #7- Building 1942; and AST#8 – Building T-1980 (Struthers, 2000). Soil was removed to the maximum extent practicable and confirmation sampling indicated residual contamination was below CULs, except at building T-1932. The contamination extended beneath this building foundation and additional excavation was not possible without compromising foundation integrity. Institutional controls (ICs) were put in place if future site activities included demolition of building T-1932.

3.1.16 Former CS Gas Training Building Site

The former CS Gas Training Building was located south of the Bonneville cantonment next to Range Road, between Lacamas Creek to the north and the 50-caliber firing range (Firing Range 7) to the south. This former structure was used to train troops in the use of protective equipment for chemical warfare. The primary substance reported to have been released during training exercises was CS gas (tear gas). CS is the common name for 2-chlorobenzalmalononitrile and is a military or police riot-control agent. The dates of use for the building are not documented, but the building is observed in aerial photographs from 1950, 1960, and 1970. The building was destroyed by fire in the late 1970s. The general location of the building is indicated in Figure 3.

3.1.17 CS Gas Chamber Building (Building 1834)

A second CS Gas Building (Building 1834) is located within the Bonneville cantonment and was also used historically to train troops in chemical warfare agents (Figure 3). The chemical warfare training conducted in this building was restricted to CS gas.

3.1.18 Pesticide Storage Building (Building 4126)

Building 4126, the Pesticide Storage Building, was located on the edge of a small, flat, grassy field approximately 75 feet south of the gravel road adjacent to the Killpack cantonment (Figure 3). This building was a skid-mounted shed used to store 55-gallon drums of 2,4,5-T; 2,4-D; and an unknown amount of DDT until 1977.

According to the US Army Corps of Engineers (USACE) and CBMR personnel (Woodward-Clyde, 1997), previous uses of the Pesticide Storage Building included towing it to various locations throughout the cantonment. Wooden skids attached to the underside of the floor further suggest this type of use. Following a cleanup interim action, final confirmation samples indicated the remaining COPCs were below CULs.

3.1.19 Ammunition Storage Magazines (#2950, #2951, and #2953)

Ammunition Storage Magazines #2950, #2951, and #2953 are located approximately 2,000 feet northeast of the Pesticide Storage Area on the south side of the road leading into the facility from the Killpack cantonment (Figure 3). They were constructed in 1976 and used to store munitions of various types that were brought to CBMR for training purposes. Currently, the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) stores small quantities of explosives materials in magazines near Building 2950.

3.1.20 Underground Storage Tank (Associated with Building 4475)

A UST was formerly located approximately 10 feet east of Building 4475 (Figure 3). This UST was part of a refueling system connecting one 275-gallon diesel AST with the 300-gallon diesel UST. The UST was thought to be leaking because the fuel consumption and tank filling records did not coincide. Additionally, petroleum stains were prevalent on the ground surface around the fueling site. As a result, the 300-gallon diesel UST was removed in 1995. Contaminated soil was discovered during the UST removal.

3.2 Remedial Action Unit 2A

RAU 2A consists of 17 small arms ranges that were previously identified within the boundaries of CBMR from maps dating back to 1958 during the remedial investigation and feasibility study (RI/FS) of the small arms ranges (BCRRT, 2007a) and the Cleanup Action Plan (BCRRT, 2008). Lead and explosive residue, such as nitroglycerine and nitrocellulose, are the COPCs in soil in these areas from the use of lead bullets and fragments. A small arms range used by the Federal Bureau of Investigation (FBI) was not included in cleanup actions because it remains active. This range will be remediated by the FBI once abandoned. The 17 small arms range designations are as follows:

- 1,000-Foot Range, 1,000-Foot Machine Gun and Moving Target Range (1,000-foot ranges)
- 25-Meter M60 Range/Pistol Range
- 25-Meter M60 Range, Machine Gun Range
- 25-Meter M60 Range/Pistol Range
- 25-Meter Record Fire Range
- Close Combat Range
- Combat Pistol Range
- Field Fire Rifle Ranges 1 and 2
- Field Firing Range and Piston Range
- Infiltration Course (North)
- Infiltration Course (South)
- Machine Gun Range—North
- Machine Gun Range—South
- Pistol Range
- Rifle Ranges 1 and 2
- TF Range
- Undocumented Pistol Range

Nine of the 17 ranges were remediated according to the RAU 2A cleanup action plan (CAP), except for RAU 2A-16 and RAU 2A-21, which correspond to the 1,000-foot ranges and field fire ranges 1 and 2, respectively. A soil cap was installed at these two locations (Weston, 2018b). Figure 4 shows the location of the firing ranges. Soil cap construction details are summarized in Section 4.2.

3.3 Remedial Action Unit 2B

RAU 2B consists of two demolition areas, Demolition Area 2 (DA2) and Demolition Area 3 (DA3), shown in Figure 5. COPCs at RAU 2B included explosives and related organic compounds (trinitrotoluene [TNT]; hexahydro- 1,3,5-trinitro- 1,3,5-triazine [RDX]; pentaerythritol tetranitrate [PETN]; picric acid [PA]; High Melting Explosive [HMX]; and nitroglycerine), propellants (nitrate, plasticizers, stabilizers, and ammonium perchlorate), as well as metals, TPH, SVOCs, and VOCs (BCRRT, 2007b).

3.3.1 Demolition Area 2

The exact location of historical activities at DA2 is unknown and site walks/field inspections have not resulted in the identification of specific suspect areas. Site workers reported that DA2 was historically used for destruction of unwanted ordnance. The general suspect area was identified through oral history, finding of debris in the general area, observation of a crater depression, and interpretation of historical aerial photographs and is located on the southwest-facing side slope at the head of Lacamas Creek Valley (Figure 5). The DA2 area is approximately 60 feet in diameter and forested with dense understory vegetation on mostly steep slopes. Investigation of DA2 was focused on impacts downgradient as the suspected DA was not physically found. COPCs exceeding CULs were not identified at DA2.

3.3.2 Demolition Area 3

DA3 is a location where a surficial depression exists that may be an excavation or detonation crater. The location is approximately 2,000 feet upstream of the Base Boundary area in Lacamas Creek Valley where Lacamas Creek exits the site (Figure 5). The crater is approximately 20 feet in diameter and 10 feet deep. DA3 may have been used for detonation of unwanted ordnance. The crater fills with water as the water table rises throughout the winter and becomes dry in the summer as the water table drops. COPCs exceeding CULs were not identified at DA3.

3.4 Remedial Action Unit 2C

RAU 2C encompasses sitewide groundwater with an emphasis on the LF4/DA1 area. Groundwater contaminants of concern (COCs) were not associated with RAU 1, 2A, and 2B; therefore, these areas were not included in RAU-2C. The COPCs at RAU 2C include explosives (perchlorate, RDX, 2,4-dinitrotoluene, 2,4,6-trinitrotoluene), and VOCs. The analysis of sitewide groundwater uses sentinel wells installed where Lacamas Creek exits the site (Base Boundary at Lacamas Creek) to evaluate whether COPCs could be exiting the site. At LF4/DA1, a groundwater monitoring well network monitors groundwater in two aquifer zones. Monitoring wells associated with LF4/DA1 and the Base Boundary are shown in Figure 6. The RI/FS is currently being prepared for the RAU 2C to characterize the nature and extent of contamination, assess risks, and inform the selection of remedy alternatives to address the COPCs located at the LF4/RA1.

Groundwater monitoring is ongoing. A monitoring program has been in place since 1998. Two areas associated with the RAU 2C sitewide groundwater are currently being monitored, which include LF4/DA1 and Base Boundary. Wells have been installed in these areas to monitor shallow and deeper groundwater zones to maximum depths of approximately 75 feet bgs. While COPCs (RDX, perchlorate, and 1,1-dichloroethene) have been detected at LF4/DA1, their levels have decreased significantly. The COPCs above cleanup criteria in groundwater are localized to the area near the former LF4/DA1 excavation area.

Three on-site drinking water wells are also monitored on a quarterly basis. COPCs have not been detected in drinking water wells above laboratory reporting limits (MRLs).

The potential for groundwater discharge to surface water through seeps at North Fork Lacamas Creek (NFLC) adjacent to the LF4/DA1 area has been inspected as a potential pathway. Seep inspections were initially completed in 2017 and were subsequently added to the groundwater monitoring program in 2023. Seeps have not been observed during any of the inspection events. Surface water samples are collected from NFLC on an annual basis at designated locations, with the third quarter 2024 sample event being the most recent. There have been no detections of COPCs above respective MRLs in the surface water samples since periodic sampling started in 2013.

3.5 Remedial Action Unit 3

A final Archives Search Report (ASR) dated July 1997 was completed by the USACE and included site inspection, review of historical records, and interviews of former CBMR personnel and generated. The ASR concluded that the potential for MEC exists throughout a majority of the CBMR installation. The ASR concluded that most of the installation has the potential for MEC, which includes small arms ammunition, as well as larger munitions such as artillery rounds, mortars, rockets, and grenades. RAU 3 is not associated with COPCs; rather, it involves identification and removal of MEC.

The areas recommended by the ASR for further assessment included the identified ranges and safety fans, mortar positions, artillery firing points, demolition areas, and the central impact target area (USACE, 1997). These areas are described below. Firing points and target area are shown in Figure 7. The phased remediation of RAU 3 is discussed in Section 4.5.

3.5.1 Training Areas

Three former training range/target areas were located in the southeastern area of the site, east of the CVF. The areas were composed of a hand grenade range, a rifle grenade range and target area, and a 3.5-inch rocket range and target area, with a total combined area of approximately 7.6 acres (Weston, 2015). These areas included target area features, such as automobile/appliance targets, engineered wooden structures, and expended MEC items located downrange.

3.5.2 Central Impact Target Area

The CITA is shown in Figure 7 and includes multiple artillery and mortar practice targets. This area was initially determined by the Army to be roughly 465 acres and now also includes 107 acres in the Northern CITA Expansion Area. The CITA includes multiple target areas and is surrounded by non-target areas. While the target areas received the bulk of the munitions, the non-target areas were within the range fans of the artillery and mortar rounds. The Northern CITA Expansion Area was established following the 2010 RAU-3 CAP and RAU-3 Supplemental RI/FS. The entire CITA (both target and non-target areas) is designated as No-Reuse Access Restricted.

3.5.3 Open Burn/Open Demolition Areas

The OB/OD MEC sites consist of three locations at CBMR, known as Demolition Areas 1, 2 and 3 (DA1 through DA3). DA1 is in the northwestern quadrant of the site, east of Little Elkhorn Mountain; DA2 is located adjacent to and west of the CITA; while DA3 is in the southwestern quadrant of the CBMR, adjacent to Lacamas Creek and the natural gas pipeline.

In 2004, the USACE physically removed the contents and associated contaminated soils at DA1, as part of the Landfill 4 Interim Removal Action (Tetra Tech, 2005). MEC at DA2 and DA3 were addressed as part of the RAU1 cleanup activities for these areas.

3.5.4 Firing Points

The Firing Points at CBMR consist of six mortar firing positions, nine artillery firing positions, one rifle grenade range firing point, one 3.5-inch rocket range firing point, and one M203 40-millimeter (mm) HE Grenade Range (Range 4). Firing Points are located near the apex of each range.

3.5.5 Roads and Trails

There are approximately 46 miles of roads and trails throughout CBMR (BCRRT, 2010). Roads and trails outside of the CITA have the same munitions-related historical use and characteristics as the Maneuver Areas. Roads and trails are shown in Figure 7.

3.5.6 Wildlife Management Area

The Wildlife Management Area (WMA) is composed of approximately 2,188 acres and includes the former Washington State Department of Natural Resources (DNR) leased lands. Discussion of the WMA excludes the CITA because the CITA has separately been remediated. Most of the WMA overlies one or more Range Safety Fans.

3.5.7 Central Valley Floor and Associated Wetlands

The CVF and associated wetlands (adjacent to Lacamas Creek) have a gentle topographic slope and low vegetative cover. These areas cover approximately 445 acres along the Lacamas Creek valley floor.

Wetlands extend throughout the CVF along the Lacamas Creek basin and total roughly 110 acres. These wetlands contain sensitive ecological habitats, easily disturbed soils, and flora and fauna that require additional regulatory management. MEC clearance in sensitive areas (wetlands or cultural resource locations) was limited to hand tools at accessible locations during dry seasons. Some inaccessible areas have not been delineated.

4 REMEDIAL ACTIONS

The following sections describe the cleanup actions completed at each RAU or the basis for No Further Action (NFA) finding if cleanup actions were not required. Engineering controls (EC) or ICs, and associated operations and maintenance requirements, are summarized when applicable. Copies of institutional controls that have developed and recorded with the County are included in Appendix A.

COPCs were identified sitewide and include the following:

- Lead
- TPH
- VOCs
- SVOCs
- Polychlorinated biphenyls (PCBs)
- Nitroaromatic and nitramine explosives, inclusive of PETN and PA

Additional COPCs are listed at specific areas, such as pesticides and herbicides. Tables 1 through 5 list the maximum concentration of COPCs detected in soil and/or groundwater at RAU 1, 2A, and 2B. Where applicable, COPC concentrations remaining following remedial action are also included. CULs at the time of implementation of the RAU's CAP and current CULs for individual analytes are listed.

4.1 Remedial Action Unit 1

RAU 1 included 20 sites that were primarily identified during the 1997 EBS (Woodward-Clyde, 1997). Independent investigation and remediation actions were undertaken between 1997 and 2003. Site investigation (SI) data demonstrated that the concentrations of target analytes in 10 of the sites within RAU 1 did not exceed applicable CULs and did not require further investigation or remedial action (URS, 2004). The locations of the 20 sites included in RAU 1 are shown in Figure 3.

The remaining 10 sites, including the Drum Disposal area, the Paint and Solvent Disposal area, Washrack 1, the Maintenance Pit, the Pesticide Storage and Mixing area, the Aboveground Fuel Storage Tank areas, the CS Gas Training Building, Pesticide Storage Building 4126, the Ammunition Storage Magazines, and the UST associated with Building 4475 required remedial action through excavation and removal of debris and contaminated media. A 2004 CAP (URS, 2004) summarized each of the cleanups that were completed and identified two sites where cleanup activities were completed but CULs could not be achieved. A brief description of the remedial actions and rationale for NFA are listed below in Section 4.1.1.

In 2008, Ecology determined that the independent remedial actions conducted, and restrictive covenants implemented at RAU 1 where necessary, were sufficient to meet the substantive requirements in MTCA and that NFA was necessary (Ecology, 2008).

4.1.1 Remedial Action Unit 1 Remedy Implementation

A brief summary of investigative and remedial actions for each of the 20 RAU 1 sites is below. This information is primarily summarized from the *Final Cleanup Action Plan for Remedial Action Unit 1, Camp Bonneville, Vancouver, Washington, Contract No. DACA67-02-D-2003* (URS, 2004). The SI was primarily completed between 1997 and 2000. Cleanup and remediation at areas selected for further action was primarily completed in 2000 and 2001.

4.1.1.1 Cleanup Actions at Landfill 1

- UXO avoidance/screening surveys were completed in December 1997 north and northwest of the sewage lagoons, where the historic landfill was reportedly located. A second search of the area was completed using metal-detecting equipment.
- No evidence of the landfill was identified in either search, and it was determined that the reported landfill was likely to be a small debris pile associated with a former residence was observed in the area (URS, 2004).
- Cleanup actions were not required for Landfill 1.

4.1.1.2 Cleanup Actions at Landfill 2

- The landfill was located using UXO, EM, and ground-penetrating radar (GPR) surveys in 1997. Metallic debris and one undetonated 2.76-inch light anti-tank weapon were identified and later removed and disposed of by the Fort Lewis Explosive Ordinance Detachment.
- A soil gas survey consisting of 64 sample locations within the landfill area was completed in 1997. Soil gas samples were analyzed for concentrations of halogenated hydrocarbons and benzene, toluene, ethylbenzene, and total xylenes (BTEX) compounds as a screening tool to determine whether VOCs may be present and emanating from the landfill. No target analytes were detected above laboratory reporting limits, except chloroform in two samples, which appeared to have been due to laboratory contamination (URS, 2004).
- Three soil borings were drilled outside the estimated perimeter of Landfill 2 in July 1998 and were converted to temporary monitoring wells. Groundwater was encountered at depths of 2.6 and 2.9 feet in the downgradient monitoring wells. The upgradient monitoring well was dry; however, evidence of shallow seasonal groundwater was observed.
- One soil sample collected from each boring was analyzed for TPH, VOCs, SVOCs, PCBs/pesticides, nitroaromatic and nitramine explosives, PETN, PA, cyanide, total organic carbon (TOC), and priority pollutant metals. With the exception of metals, no target analytes were detected in any of the soil samples. Eleven of the Priority Pollutant List (PPL) metals were detected in all soil samples collected at Landfill 2, but at concentrations below CULs. Selenium and mercury were not detected above laboratory reporting limits. Arsenic and chromium concentrations in all samples exceeded the regulatory CULs; however, the concentrations did not exceed expected regional background levels.
- Groundwater samples were collected from both downgradient monitoring wells; however, the upgradient monitoring well was dry. Groundwater samples were analyzed for TPH, VOCs, SVOCs, PCBs/pesticides, nitroaromatic and nitramine explosives, PETN, PA, cyanide, TOC, and priority pollutant metals. One VOC, naphthalene, was detected in one groundwater sample at a concentration below CULs. Nine PPL metals were detected in one or both groundwater sample; however, all concentrations were below CULs.
- Cleanup actions were not required for Landfill 2.

4.1.1.3 Cleanup Actions at Landfill 3

- Landfill 3 was identified in the area of a dirt mound approximately 50 feet in width and 70 feet in length. UXO and EM surveys performed in 1997 confirmed that the landfill area coincided with the mound. Non-UXO metallic debris was found at and near the landfill surface.

- A December 1997 soil gas survey included 11 soil gas samples collected in the landfill area. Soil gas samples were analyzed for concentrations of halogenated hydrocarbons and BTEX compounds as a screening tool to determine whether VOCs may be present and emanating from the landfill. No target analytes were detected above laboratory reporting limits.
- Five soil borings were drilled outside the estimated perimeter of Landfill 3 in July 1998 and four of the borings were converted to temporary monitoring wells. Three of the monitoring wells were placed downgradient of Landfill 3 and the remaining well was placed upgradient (URS, 2004).
- One soil sample collected from the capillary fringe in each boring was analyzed for TPH, VOCs, SVOCs, PCBs/pesticides, nitroaromatic and nitramine explosives, PETN, PA, cyanide, TOC, and priority pollutant metals. With the exception of PPL metals, no target analytes were detected in any of the soil samples. Twelve of the PPL metals were detected in some or all soil samples collected at Landfill 3, but at concentrations below CULs. Mercury was not detected above laboratory reporting limits. Arsenic and chromium concentrations in all samples exceeded the regulatory CULs; however, the concentrations did not exceed expected regional background levels.
- Groundwater samples were collected from each of the four monitoring wells. Groundwater samples were analyzed for TPH, VOCs, SVOCs, PCBs/pesticides, nitroaromatic and nitramine explosives, PETN, PA, cyanide, TOC, and priority pollutant metals. One VOC, naphthalene, was detected in one groundwater sample, at a concentration below CULs. Ten PPL metals were detected in one or both groundwater samples; however, all concentrations were below regulatory CULs.
- Cleanup actions were not required for Landfill 3.

4.1.1.4 Cleanup Actions at Former Burn Area

- Prior to initiation of the 1997 field investigation, unspecified surface debris was removed to provide access for the SI to assess potential impacts to surface and near surface soils (URS, 2004).
- Three sampling locations were placed within the perimeter of the former burn area, and one sample each placed upgradient and downgradient of the area. Two soil samples were collected from each sampling location to assess surface soil conditions (at a depth of 0 to 1 foot) and near-surface soil conditions (at a depth of 1 to 2 feet). The upgradient sample was saturated at a depth of 1.2 feet (URS, 2004).
- Each of the soil samples were analyzed for TPH, VOCs, SVOCs, PCBs/pesticides, nitroaromatic and nitramine explosives, PETN, PA, cyanide, TOC, and priority pollutant metals. Except for VOCs and PPL metals, no target analytes were detected in any of the soil samples. VOC detections included xylenes, toluene, and acetone, but all concentrations were below regulatory CULs. Ten of the PPL metals were detected at concentrations below CULs. Of these 10, thallium and zinc exceeded expected background levels. Arsenic and chromium concentrations in all samples exceeded the regulatory CULs; however, the concentrations did not exceed expected regional background levels.
- Cleanup actions were not required for the former burn area.

4.1.1.5 Cleanup Actions at Burned Buildings 1962 and 1983

- Approximate former building footprints were located using a magnetometer and aerial map survey.
- A soil survey completed in February 1998 included 15 surface and near surface soil samples in and around the estimated building footprints. Ten of the soil samples were collected from five sampling locations within the former building footprints. The remaining five samples were collected from locations approximately 50 feet from the estimated former building locations (URS, 2004).

- Each of the soil samples was analyzed for SVOCs, asbestos, and lead. SVOCs and asbestos were not detected in any of the 15 samples collected. Lead was detected in all the soil samples; however, none of the concentrations exceeded regulatory CULs.
- Cleanup actions were not required for burned buildings 1962 and 1983.

4.1.1.6 Cleanup Actions at Camp Bonneville Grease Pits

- A July 1998 soil investigation was completed to assess potential subsurface impact from the grease pits. The pits were lined with large drain rock and contained debris, which prevented drilling directly through the grease pits; therefore, two soil borings were placed adjacent to the grease pits. Groundwater was not encountered in the borings; however, soil staining indicated that seasonal high groundwater may be as shallow as 3.5 feet in the grease pit area.
- Two soil samples were collected from each boring at depth intervals of 3 to 5 feet and 5 to 7 feet. The four soil samples were analyzed for TPH, SVOCs, PCB/pesticides, VOCs, and PPL metals. TPH, VOCs, and PCBs were not detected at concentrations above laboratory reporting limits. Eight of the PPL metals were detected in some or all soil samples at concentrations below regulatory cleanup limits, including copper and barium in one soil sample that exceeded expected background levels.
- Lindane, a pesticide, was detected in soil at concentrations above CULs in one location in the grease pits. Lindane is not associated with cooking greases and was detected in only one of five samples (GP-SB02-02) at a concentration of 2.0 milligrams per kilogram (mg/kg), which is below the historical MTCA Method A concentration and minimally exceeds the historical Method B CUL. The source of lindane was not identified (Shannon & Wilson Inc., 1999).
- Cleanup actions were not required for the Camp Bonneville grease pits.

4.1.1.7 Cleanup Actions at Camp Killpack Grease Pit

- An August 1998 soil investigation was completed to assess potential subsurface impact from the grease pit. The pit was lined with large drain rock and contained debris, which prevented drilling directly through the grease pits. One soil boring was placed adjacent to the grease pits. Groundwater was not encountered in the boring; however, soil coloration indicated that seasonal high groundwater may be as shallow as 3.5 feet in the grease pit area (URS, 2004).
- Two soil samples were collected from the boring at depth intervals of 3 to 5 feet and 5 to 7 feet. The soil samples were analyzed for TPH, SVOCs, PCB/pesticides, VOCs, and PPL metals. VOCs and PCBs were not detected at concentrations above laboratory reporting limits. TPH was detected in one soil sample; however, the chromatographic profile was not consistent with fuel standards. Eight of the PPL metals were detected in some or all soil samples at concentrations below regulatory cleanup limits, including barium in one soil sample that exceeded expected background levels. Chromium was detected at a concentration exceeding CULs but below expected background levels.
- Arsenic was detected in one soil sample at a concentration above CULs; however, the sample concentration was close to the background values (7.9 mg/kg versus 7 mg/kg). The remaining samples contained concentrations of arsenic below background values. Although the arsenic concentration slightly exceeded CULs in the one soil sample, the concentration at the Camp Killpack grease pit is extremely localized and because of incomplete exposure pathways, the concentrations were considered to not pose a risk to human health or the environment.
- Cleanup actions were not required for the Camp Kilpatrick grease pit.

4.1.1.8 Cleanup Actions at Former Sewage Pond

- The approximate limits of the former sewage pond were located using UXO avoidance screening and EM surveys. GPR was not used due to uneven terrain (URS, 2004).
- A soil investigation completed in July 1998 included five soil borings to characterize soil conditions in and around the former sewage pond area. Three sample borings were placed within the former pond area and drilled into volcanic bedrock. One soil boring each was placed upgradient and downgradient of the former sewage pond and converted into temporary monitoring wells. Groundwater was encountered in the monitoring wells at depths of 4 to 5.5 feet.
- Three soil samples were collected from each boring, with the uppermost sample collected at the shallower of either 4 to 5 feet in depth or at the capillary fringe. The soil samples were analyzed for TPH, SVOCs, PCB/pesticides, VOCs, and PPL metals. Two VOCs, acetone and carbon disulfide, were detected at concentrations below regulatory limits and were believed to be caused by laboratory cross-contamination. Seven of the PPL metals, including arsenic and lead, were detected in one or both groundwater soil samples at concentrations below regulatory cleanup limits. Chromium was detected at a concentration exceeding CULs but below expected background levels. Arsenic was detected at a concentration exceeding CULs but similar to expected background levels. No other target analytes were detected above laboratory reporting limits.
- Groundwater samples were collected from each of the two monitoring wells at depths of 4 to 5.5 feet. Groundwater samples were analyzed for TPH, VOCs, SVOCs, PPL metals, and water quality parameters. TPH, VOCs, and SVOCs were not detected above laboratory reporting limits in either sample. Ten PPL metals were detected in one or both groundwater samples; however, all concentrations were below regulatory CULs. Water quality parameters were similar between the two wells; cyanide, nitrates, and orthophosphates were not detected in either groundwater sample.
- Cleanup actions were not required for the former sewage pond.

4.1.1.9 Cleanup Actions at Hazardous Materials Accumulation Point Building 4476

- A February 1990 soil investigation included collection of one surface soil sample at each of two locations directly in front of the Hazardous Building Materials Accumulation Building.
- The soil samples were analyzed for TPH, SVOCs, PCB/pesticides, and PPL metals. Pesticides and PCBs were not detected above laboratory reporting limits. TPH was detected at concentrations below regulatory CULs. One SVOC was detected, likely due to laboratory contamination. Nine PPL metals were detected at concentrations less than CULs and expected background levels. Cadmium was detected at a concentration that exceeded background levels but below regulatory CULs. Arsenic was detected a concentration exceeding regulatory CULs but below expected background levels.
- The concrete sump was pumped and cleaned for further inspection. The sump contents were pumped into a 55-gallon drum. A waste characterization sample of the sump contents was collected and analyzed for TPH, SVOCs, VOCs, PCBs/pesticides, and metals. The substance appeared to be a mixture of weathered hydrocarbons. The contents of the drum were disposed of as non-Resource Conservation and Recovery Act (RCRA) waste. Following cleaning, the concrete sump was inspected and determined to be in good condition (URS, 2004).
- Cleanup actions were not required for the hazardous materials accumulation point.

4.1.1.10 Cleanup Actions at Drum Disposal Area

- An EM study and limited subsurface investigation were conducted in 1998 to delineate the extent of the buried drums and potentially contaminated surrounding soils. Drum contents were unknown; therefore, surrounding soils were analyzed for a wide range of analytes.
- SI soil samples contained petroleum hydrocarbon concentrations less than CULs. Detected VOC concentrations were below CULs, and no SVOCs, PCBs, pesticides, or explosive compounds were detected in soil samples. Except for antimony, detected metals concentrations were less than background concentrations. The antimony concentration was below CULs.
- Excavation of surface and subsurface debris was conducted in June 2000. During excavation, contaminated soil was encountered, and a solvent-like odor was observed. Fieldwork was discontinued to allow for additional SI and excavation of test pits to determine the source and extent of the solvent-like odor.
- In June 2000, the area of the solvent-like odor was investigated by excavation of 26 test pits. In addition, rainwater flowed into the excavations from the surrounding area. The test pits had concentrations of toluene, methoxychlor, and metals exceeding CULs in soil samples. Naphthalene, ethylbenzene, toluene, and lead exceeded CULs in samples of rainwater in the excavation.
- An additional EM survey completed in June 2000 revealed 13 anomalies, each of which was evaluated by trenching with a backhoe. One of the excavations contained paint cans, paint, and miscellaneous debris. The other evaluated anomalies appeared to be the result of pipes, reinforcement bar, barbed wire, and scrap metal.
- Following excavation of the test pits and waste characterization in 2000, approximately 110 tons of soil and metallic and nonmetallic debris were removed from the former drum storage area and transported to a Subtitle D landfill for disposal. Post-excavation soil samples indicated that the concentrations of target analytes were either not detected or were below CULs (URS, 2004).
- Following site remediation, additional cleanup actions were not required for the drum disposal area.

4.1.1.11 Cleanup Actions at Paint and Solvent Disposal Area

- An EM study and limited subsurface investigation were conducted in 1998 to delineate the extent of the buried drums and metal debris. Two disposal areas were identified (URS, 2004).
- A soil investigation completed in 1998 included two borings next to each of the two disposal areas. One soil sample was collected from each of the four borings at a depth estimated to be below the base of the debris. Laboratory analysis of each soil sample included TPH, VOCs, SVOCs, PCBs/pesticides, explosive compounds, and PPL metals. TPH was detected at concentrations less than the regulatory CULs. PPL metals were detected in all samples at concentrations less than regulatory CULs, except for arsenic and chromium; however, their concentrations were below expected regional background levels. No other target analytes were detected above laboratory reporting limits.
- Site cleanup was conducted in June 2000 and consisted of removing wiring, paint debris, and paint chips found in near surface soils. The soil contaminated with paint chips was determined to be hazardous waste and was transported to the Chemical Waste Management facility in Arlington, Oregon, for proper disposal. Remaining soil and debris were designated nonhazardous and were transported to the Hillsboro Landfill for disposal.
- Post-excavation soil characterization was determined to be unnecessary since pre-excavation soil sampling indicated that concentrations of target analytes were below CULs.

- Following site cleanup, no further cleanup action was required for the paint and solvent disposal area.

4.1.1.12 Cleanup Actions at Washrack 1

- A 1998 soil investigation included the collection of two surface soil samples and three subsurface samples from a boring placed in the Washrack 1 area to a depth of 11.5 feet.
- The two surface soil samples were analyzed for TPH, SVOCs, PCBs/pesticides, and PPL metals. The three subsurface samples were analyzed for TPH, VOCs, SVOCs, and PPL metals. TPH was detected in four of the five soil samples, including a surface sample concentration that exceeded regulatory CULs. PPL metals were detected in all samples, including lead concentrations in one surface soil sample that exceeded both background level and regulatory CULs. Arsenic and chromium concentrations exceeded regulatory CULs but were below expected background levels in all samples. No other metals were detected at concentrations above both CULs and expected regional background levels. No other target analytes were detected at concentrations above laboratory reporting limits.
- Site cleanup commenced in June 2000 and included removal of washrack timbers and soil excavation to a depth of 3.5 feet over the footprint of the building. Post-excavation soil samples collected from the excavation cavity revealed concentrations of TPH and lead exceeding regulatory CULs. An additional 3 feet of soil was removed from the excavation sidewalls and floor. Subsequent soil confirmation sampling indicated that TPH and lead levels were below regulatory CULs (URS, 2004).
- Following remediation, additional cleanup actions were not required for Washrack 1.

4.1.1.13 Cleanup Actions at Washrack 2

- A 1998 soil investigation included the collection of two surface (at a depth of 0 to 1 foot) and two near-surface (at a depth of 1 to 2 feet) soil samples in the Washrack 2 area (URS, 2004).
- The four soil samples were analyzed for TPH, SVOCs, and PPL metals. TPH was detected above laboratory detection limits in all four samples, but concentrations were below regulatory CULs. PPL metals were detected in all samples, but none were detected both above regulatory CULs and expected background levels.
- Cleanup actions were not required for Washrack 2.

4.1.1.14 Cleanup Actions at Building 4775 Maintenance Pit

- A 1998 soil investigation completed adjacent to the former Maintenance Pit in Building 4775 included the collection of six soil samples from two soil borings.
- Soil samples were analyzed for TPH, VOCs, SVOCs, chlorinated pesticides, and PPL metals. TPH, VOCs, SVOCs, and chlorinated pesticides were detected at concentrations below CULs. PCBs were not detected. PPL metals were detected in some or all samples, but concentrations were below regulatory CULs, with the exception of arsenic, chromium, and lead. Arsenic and chromium concentrations were below expected regional background levels but lead concentrations in one sample exceeded both CULs and background levels.
- In June 2000, shallow soils were excavated to a depth of 0.8 feet along the northern border of Building 4775 (URS, 2004). Post-excavation soil samples revealed elevated concentrations of diesel and heavy-range petroleum and lead exceeded regulatory CULs. Additional soil removal to a depth of 2.7 feet was completed and post-excavation soil samples indicated that concentrations of target analytes were below regulatory CULs. All excavated soil was characterized as nonregulated waste and disposed of at the Hillsboro Landfill.

- Assessment of soil conditions directly beneath the maintenance pit was not possible due to continued use of Building 4775. Target contaminants are suspected to be present directly below the existing Maintenance Pit Building, although this could not be confirmed without demolishing the building.
- Due to uncertainty about soil conditions beneath Building 4775, ICs were implemented for this building requiring additional investigation and remediation of petroleum-contaminated soils in the event of redevelopment (Ecology, 2008).
- Following site remediation and implementation of ICs, no additional cleanup actions were required for the former Maintenance Pit at Building 4475.

4.1.1.15 Cleanup Actions at Pesticide Storage and Mixing Building 1864

- Investigation of surface soil, subsurface soil, and groundwater was completed to assess potential impacts from spillage during mixing and use of pesticides. Surface soil samples were collected from two locations, and subsurface samples were collected at three depth intervals in each of three borings in the vicinity of Building 1864. Monitoring wells were installed upgradient and downgradient of the site.
- Surface and sub-surface soil samples collected were analyzed for TPH, VOCs, SVOCs, chlorinated pesticides, chlorinated herbicides, PCBs, organophosphorus pesticides, and PPL metals. TPH was detected in all soil samples at concentrations below regulatory CULs. With the exception of lead, cadmium, and chromium, all target analytes were either not detected above laboratory reporting limits or were detected at concentrations below regulatory CULs. In surface samples, lead concentrations exceeded CULs. Cadmium and chromium were detected in subsurface samples at concentrations exceeding CULs; however, only the cadmium concentration also exceeded expected regional background levels.
- One groundwater sample was collected from each monitoring well and was analyzed for TPH, VOCs, SVOCs, chlorinated pesticides, chlorinated herbicides, PCBs, organophosphorus pesticides, and PPL metals. No target analytes were detected at concentrations exceeding regulatory CULs.
- Soil excavation was conducted to remove contaminated soils in June 2000. All soils were characterized as nonregulated waste and were transported to the Hillsboro Landfill for disposal. Initially, soil excavation to a depth of 2.5 feet was completed; however, confirmation soil sampling revealed remaining concentrations of lead exceeded the regulatory CULs. Additional excavation was completed in August 2000 (URS, 2004). Post-excavation confirmation soil samples indicated that remaining lead concentrations were below CULs.
- Additional cleanup actions were not required at the Pesticide Storage and Mixing Building.

4.1.1.16 Cleanup Actions at Aboveground Storage Tank Areas

- Visual inspections of twenty-three 275-gallon heating oil ASTs located in the Bonneville cantonment and three 275-gallon heating oil ASTs in the Camp Kilpatrick cantonment were completed to identify evidence of leaks and spills. The visual inspections indicated possible localized impacts to surface soils beneath eight of the ASTs (URS, 2004).
- The eight ASTs identified for additional assessment were associated with Buildings T-1833, T-1837, T-1828, T-1940 (Day Room), T-1942, and T-1980, and two ASTs at Building T-1922 (Struthers, 2000).
- In March 1998, one surface soil sample was collected beneath each of the eight ASTs identified during the visual inspection. Soil samples were analyzed for TPH and concentrations of diesel and high-weathered diesel exceeding regulatory CULs were identified in seven of the eight samples collected.

- Petroleum-contaminated soil beneath the ASTs was excavated at depths ranging from 2 to 5 feet based on field indicators. One composite sample was collected from each excavation cavity and submitted for TPH analysis. Elevated TPH concentrations were identified in three of the excavation cavities. Additional soil excavation was completed in only two of the three excavation cavities due to structural concerns associated with continued excavation at Building T-1932. Following additional excavation, laboratory analysis indicated that TPH concentrations were below regulatory CULs. All heating oil-contaminated soil was characterized as nonregulated waste and disposed of at the Hillsboro Landfill.
- Petroleum-contaminated soil remains in place beneath Building T-1932. Excavation of this soil would have required demolition or relocation of the building. The maximum residual concentration identified was a diesel-range organic concentration of 2,690 mg/kg adjacent to Building T-1932. Soil conditions beneath Building T-1932 have not been characterized, but there is likely to be a small pocket of heating oil-contaminated soil present. Previous reports conservatively estimate a maximum of 33 cubic yards (cy) of petroleum-contaminated soil may be encountered during future redevelopment.

4.1.1.17 Cleanup Actions at CS Gas Training Building

- A soil investigation at the CS Gas Training Building included five soil borings. One surface sample and one subsurface sample were collected from each boring.
- All soil samples collected were analyzed for CS gas and cyanide. Additionally, four surface samples and one subsurface sample were analyzed for SVOCs and lead. CS gas and cyanide were not detected above laboratory reporting limits in any of the samples analyzed. SVOCs were detected, but at concentrations below regulatory CULs. Lead was detected in two samples exceeding both the regulatory CUL and expected regional background levels.
- In June 2000, lead-contaminated soil was excavated across the CS Gas Training Building site to a depth of 2 feet bgs. Post-excavation soil sampling indicated concentrations of lead exceeding CULs. The excavation was extended to 3 feet in depth; one post-excavation soil sample indicated that remaining lead concentrations were below regulatory CULs (URS, 2004). Excavated soil was classified as nonregulated waste and was transported to the Hillsboro Landfill for disposal.
- Following remediation, additional cleanup actions were not required at the CS Gas Training Building.

4.1.1.18 Cleanup Actions at CS Gas Chamber Building 1834

- In 1997, a pre-demolition survey was conducted at Building 1834, including investigation of near-surface soil conditions.
- One surface sample was collected beneath the foundation of Building 1834 and one surface sample was collected approximately 10 feet downwind of the building. Both samples were analyzed for the presence of CS gas and associated breakdown products, which were not detected at concentrations above laboratory reporting limits in either sample. Lead concentrations were screened in the field using an x-ray fluorescence (XRF), and one soil sample was sent for laboratory analysis. All XRF readings showed concentrations below the equipment detection limit of 93 mg/kg (URS, 2004). One soil sample was sent for laboratory analysis for lead and was determined to have a concentration of 17 mg/kg, below regulatory CULs.
- Building materials were tested for lead and asbestos. No asbestos-containing material (ACM) was discovered. Lead concentrations were below CULs in soil samples and below Washington Dangerous

Waste levels in building materials. Building 1834 was demolished and the debris was disposed of in a municipal landfill.

- Cleanup actions were not required at the former CS Gas Chamber Building 1834.

4.1.1.19 Cleanup Actions at the former Pesticide Storage Building 4126

- In June 2000, a supplemental SI was conducted (Gary Struthers Associates, 2001). The building contents were transferred to Pesticide Building 1864, Building 4126 was demolished, and 1 foot of soil was removed. Two soil samples and one flooring sample were collected and analyzed for chlorinated pesticides and herbicides, PCBs, petroleum hydrocarbons (gasoline- and diesel-range), and metals.
- Pesticides and herbicides were detected in some or all soil samples at concentrations below CULs. PCBs were not detected at concentrations above laboratory reporting limits. Gasoline-range TPH was not detected in any samples collected; diesel-range TPH was detected at concentrations below CULs in soil samples and above CULs in flooring material. Lead was detected in soil concentrations that exceeded both CULs and background levels. Other detected metals were either below background values or CULs.
- Building 4126 was demolished in May 2001 and soil was over-excavated to a depth of 1 foot across the former building footprint (URS, 2004). Post-excavation soil sampling revealed that remaining concentrations of target analytes were below regulatory CULs. Excavated soil was managed as Discarded Chemical Products (U060, U061) and wood removed from the building was managed as listed waste (D008). All waste generated from the demolition and remediation of Building 4126 was transported to the Chemical Waste Management facility in Arlington, Oregon, for proper disposal.
- Following demolition and excavation, additional cleanup actions were not required at the former Pesticide Storage Building 4126.

4.1.1.20 Cleanup Actions at Ammunition Storage Magazines #2950, #2951, and #2953

- A 1998 soil investigation included the collection of surface and subsurface soil samples, along with wipe samples at three ammunition storage magazines.
- All soil samples were analyzed for PPL metals. Additionally, samples collected from Storage Magazine #2953 were analyzed for 2,4-dinitrotoluene, PETN, and PA, and samples collected from Storage Bunker #2950 were analyzed for RDX, 2,4-dinitrotoluene, PETN, and PA. In 2000, a supplemental SI was completed to evaluate potential soil contamination associated with the recent removal of black powder from the building. Concentrations of PPL metals, explosives, and propellants exceeded CULs in surface soil samples. Groundwater was not encountered.
- In May 2001, ammunition magazines were disinfected and contaminated soil was excavated to a depth of 1 foot at each of the three ammunition storage magazines. Post-excavation soil sampling indicated that concentrations of target analytes were all either below regulatory CULs or expected regional background levels. Excavated soil was characterized as nonhazardous and disposed of at a Subtitle D landfill. Wood from pallets in the magazines was characterized as listed waste and disposed of at a Subtitle C landfill (URS, 2004).
- Following disinfection and soil excavation, additional cleanup actions were not required at the ammunition storage magazines.

4.1.1.21 Cleanup Actions at Underground Storage Tank (Associated with Building 4475)

- A 300-gallon diesel UST was removed from the east side of Building 4475 in 1995. Soil sampling conducted at the time of the UST removal indicated diesel concentrations exceeding CULs. Later investigations in 1996 and 1997 revealed petroleum-contaminated soil in the UST area and an adjacent drainage area.
- Remediation activities completed between November 1996 and October 1997 included excavation of approximately 375 cy of petroleum-contaminated soil. Excavated soil was transported to TPST Soil Recyclers in Portland, Oregon, for thermal desorption treatment, and 250 gallons of petroleum-contaminated water were transported to Enviroservice, Inc. in Seattle, Washington, for disposal (URS, 2004).
- Post-excavation soil sampling indicated that petroleum-contaminated soil from the UST and adjacent areas was removed. However, residual concentrations of TPH remained at the site beside the adjacent roadway. The maximum remaining concentration of 860 mg/kg was below the MTCA Method A CUL for diesel fuel of 2,000 mg/kg.
- Following UST removal and petroleum-contaminated soil excavation, additional cleanup actions were not required for the UST site associated with Building 4475.

4.1.2 Actions Subsequent to Closure

Following review of independent SI and cleanup activities undertaken by the Army, the RAU 1 sites were conferred NFA status by Ecology in 2008 (Ecology, 2008). No subsequent investigative or remediation activities have been completed for RAU 1.

4.1.3 Remedial Action Unit 1 Operation, Maintenance, and Monitoring

ICs were implemented for the contamination associated with building T-1932 (AST release) and building T-1932. The ICs include: 1) additional investigation and remediation (if required) of contaminated soils; 2) posting notification signs; and 3) obtaining any required permits for demolition and soil excavation that may be required.

4.2 Remedial Action Unit 2A

An RI/FS was completed on 17 firing ranges (BCRRT, 2007a) and cleanup was required at nine of those ranges (BCRRT, 2008). Cleanup at the nine RAU 2A small arms ranges began in October 2007 and continued in 2008 and 2009, with some work continuing into 2010. Because confirmatory sampling and visual observations indicated lead-impacted soil remains at portions of ranges RAU 2A-16 and RAU 2A-21, additional cleanup actions were required (Weston, 2018b). The 2012 APPCD describes that the County was to submit an amended CAP for RAU 2A-16 and RAU 2A-21, which was submitted in June 2017 (Weston, 2018b). Soil with residual lead contamination at RAU 2A-16 and RAU 2A-21 was capped with clean fill in 2017 (Weston, 2018b). The active firing range that is currently used by the FBI was excluded from RAU 2A and will undergo the cleanup process upon its closure.

Ecology reviewed the independent cleanup action in 2019 and determined the remedial actions conducted at RAU 2A are sufficient to meet the substantive requirements in MTCA and issued an NFA (Ecology, 2019a). A restrictive covenant was required by Ecology in the NFA letter for RAU 2A-16 and RAU 2A-21 in order to document that intrusive activities did not disturb the cap.

4.2.1 Remedial Action Unit 2A Remedy Implementation

The RAU 2A remedy included excavation of lead-contaminated soils and sifting to remove lead fragments at the following nine ranges:

- RAU 2A-4, Combat Pistol Range
- RAU 2A-15, Undocumented Pistol Range
- RAU 2A-16, 1,000-Foot Rifle Range and Machine Gun Range
- RAU 2A-17, 25-Meter M60 and Pistol Range
- RAU 2A-18, 25-Meter Machine Gun Range
- RAU 2A-19, 25-Meter Record Firing Range and Field Firing Range
- RAU 2A-20, Field Firing Ranges
- RAU 2A-21, Rifle Ranges/Field Fire Ranges 1 and 2
- RAU 2A-22, Rifle Ranges/Field Fire Ranges 1 and 2

These ranges are shown in Figure 5.

The remedy included specific soil handling procedures for RCRA soils. At RAU 2A, RCRA soils were designated based on the leachability characteristic and testing using the Toxicity Characteristic Leaching Procedure (TCLP) for lead. These analytical results were used to determine the final categorization, treatment, and disposition of the excavated soils.

MTCA-regulated soils, defined as having a total lead concentration less than 250 mg/kg and TCLP concentration less than 5 milligrams per liter (mg/L), were transported to the eastern sewage lagoon ponds (Figure 3) for temporary storage prior to disposal. During storage, soil was placed on a 6-mil reinforced liner that was placed at the bottom and along the northern walls of the lagoon prior to adding soil in the disposal area.

RCRA-regulated soils were sifted using a vibrating multi-stage screening system and treated using a proprietary stabilization process. Removed bullets and bullet fragments were staged securely in a designated location and recycled when economically feasible. The treated soil piles were sampled and analyzed for TCLP lead at the rate of 1 composite sample for every 500 cy of soil being disposed of off site. Following treatment confirmation sampling, the characteristic RCRA designation was removed, and the soils were disposed of at a Subtitle D landfill.

Excavation at the ranges was completed until an average concentration of 118 mg/kg was attained within a given grid square. Specific excavation approaches were adopted for the range berms, pop-up target areas, and the range floors. Excavation was sequentially completed along the face of the berms, in the following order of operation:

- Upper 12 inches of soil were excavated and presumed to be RCRA soil;
- Next 12 inches of soil excavated and presumed to be MTCA soil; and
- Additional soils were removed in 6-inch increments until visual observations (e.g., lead bullets or bullet fragments seen on the surface of the excavation) and confirmation sampling confirmed concentrations were below CULs.

For ranges with pop-up targets, a 15-foot radius area around each pop-up target base was excavated to a depth of 6 inches bgs.

Cleanup of the range floor was based on the results of the RI grid sampling program completed across each range (BCRRT, 2009a). The following lead concentrations in the RI sampling grids were used to determine the area of excavation:

- Category 1—average and individual lead sample concentrations less than 50 mg/kg; no excavation required
- Category 2—average lead sample concentration less than 50 mg/kg and no individual sample concentration greater than 118 mg/kg; no excavation required
- Category 3—average lead sample concentration greater than 50 mg/kg but less than 118 mg/kg and no individual sample concentration greater than 250 mg/kg; focused excavation required in a 29-foot by 29-foot area surrounding locations where concentrations exceed 50 mg/kg to a depth of 6 inches bgs
- Category 4—average lead sample concentration greater than 118 mg/kg but less than 250 mg/kg; focused excavation required in a 58-foot by 58-foot area surrounding locations where lead concentrations exceed 50 mg/kg to a depth of 6 inches bgs
- Category 5—average lead sample concentration is greater than 250 mg/kg; excavation required at the entire grid to a depth of 6 inches bgs

Areas referred to as "Special Conditions" were identified after the final RAU 2A CAP was generated and were not included in that document. Special Condition areas included areas where remedial actions (comprising excavation, sifting, stabilization, confirmatory sampling, and disposal) were not viable due to one or several of the following conditions:

- Standing water, presence of a creek, stream, or similar water body running through the range;
- Within an area of potential cultural significance; and
- Location outside of the firing line and/or the historical boundary of the range.

Soil sampling frequency was reduced in Special Condition areas to a rate of 5 discrete soil samples per 29-foot by 29-foot area. Sampling in areas of wetlands, creeks, and streams were coordinated with Ecology and other stakeholders.

4.2.1.1 Cleanup Actions at Remedial Action Unit 2A-4

RAU 2A-4 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—Soil was excavated along the natural slopes of the hillside berm. Additional excavation was required behind targets on the berm due to deeper penetration of lead slugs.
- Concrete Pop-Up Targets—Soil was excavated around 42 concrete pop-up target bases. The concrete bases were dismantled, cleaned of native soils, and disposed of at a local crushing plant. The outer boundaries of all pop-ups that were situated along the periphery of the range floor were used to establish the extent of excavation. Excavation was completed to a depth of 6 inches bgs.
- Range Floor—Soil excavation was completed to depths of 6 inches where Category 3 through 5 soils were encountered. Three 29-foot by 29-foot square areas on the range floor, which had been identified for excavation, were classified as Special Conditions since these areas were located outside the firing range boundary and within the buffer zone for cultural concerns. The areas were re-sampled and analyzed for total lead. Lead concentrations ranged from 58.5 to 165 mg/kg.
- Estimated volume of soil excavated, based upon truckloads, was 750 cy of RCRA soils and 105 cy of MTCA soils.

4.2.1.2 Cleanup Actions at Remedial Action Unit 2A-15

RAU 2A-15 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—Soil was excavated along the natural slopes of the hillside berm. Based on the results of confirmation samples, additional excavation was required on the front side of the berm (an area 6 feet wide by 70 feet long).
- Range Floor—Two 29-foot by 29-foot square areas on the range floor, which had been identified for excavation, were initially classified as Special Conditions since these areas were located outside the firing range boundary. The areas were sampled and analyzed for total lead. One of these grids, the grid surrounding 2A-15-1-E, showed levels of lead requiring excavation. Confirmation samples identified step-out excavation required to the southwest of the grid surrounding 2A-15-1-E. Step-out confirmatory sample results were less than 118 mg/kg.
- Estimated volume of soil excavated, based upon truckloads, was 45 cy of RCRA soils and 60 cy of MTCA soils.

4.2.1.3 Cleanup Actions at Remedial Action Unit 2A-16

RAU 2A-16 cleanup activities were completed between 2007 and 2017 and included the following:

- Berm—Soil was excavated along the natural slopes of the hillside berm. Additional excavation was required for the berm due to deeper penetration of visible lead slugs.
- Range Floor—A total of twenty 58-foot by 58-foot square areas and five 29-foot by 29-foot square areas on the range floor were identified for remedial actions. Most of these locations were close to each other and overlapped. Some of these 58-foot by 58-foot square areas were identified as Special Conditions because they were located outside the firing range boundary. One of the 58-foot by 58-foot square areas was identified as a Special Condition because it included a portion of the adjoining creek bed. Special Condition areas were sampled. Results confirmed elevated levels of lead reported by previous sampling efforts. No excavation was performed within the creek bed.
- Confirmatory sampling results showed elevated levels of lead on the range floor and berm.
- A total of 23 MEC and 20 munitions debris items were identified in the berm and on the range floor during excavation. Findings required subsurface clearance of the areas to be excavated.
- Estimated volume of soil excavated, based upon truckloads, was 510 cy of RCRA soils and 995 cy of MTCA soils.

The County and Ecology concurred that additional cleanup activities were required for RAU 2A-16 as documented in the APPCD (Ecology, 2012). Confirmatory soil sampling revealed that lead concentrations were increasing with depth in portions of RAU 2A-16, which was contrary to expectations and observations at the other small arms ranges. It was later determined that RAU 2A-16 was constructed over lead-impacted fill soil, which had apparently been brought to the range from another portion of the site and used to raise the elevation of the range floor and adjacent area above the flood level of Lacamas Creek (MKM, Inc., 2010). The lead-impacted fill soil area is approximately 1.76 acres.

Additional investigation and installation of a soil cap was completed in 2017. In accordance with the Addendum to the RAU 2A CAP (Weston, 2018b), the 1.76 acres of lead-impacted soil at RAU 2A-16 were capped with geotextile and 1 foot of clean fill. The lateral extent of the soil cap areas for RAU 2A-16 was marked and grade stakes were installed to mark areas requiring vegetation removal and placement of the 1-

foot thickness soil cap. Deadfall was removed and vegetation cut in the lead-contaminated areas before covering with geotextile and import soil.

4.2.1.4 Cleanup Actions at Remedial Action Unit 2A-17

RAU 2A-17 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—Soil was excavated along the natural slopes of the hillside berm. Deep penetration of bullets was identified during excavation. The penetration depth was 6 feet into the face of the berm. Confirmatory sampling results required step-out excavation of the berm.
- Range Floor—One 29-foot by 29-foot square area of the range floor was excavated.
- Step-out confirmatory sample results were less than 118 mg/kg.
- All excavated materials were sifted for the removal of lead slugs.
- Estimated volume of soil excavated, based upon truckloads, was 345 cy of RCRA soils and 705 cy of MTCA soils.

4.2.1.5 Cleanup Actions at Remedial Action Unit 2A-18

RAU 2A-18 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—Soil was excavated along the slopes of both the front and back faces of the freestanding berm. Results from 27 of the 36 berm confirmatory samples were greater than the 118 mg/kg CUL, which were excavated and resampled. Eight panels showed lead levels greater than 118 mg/kg and were excavated and resampled. Of these, five panels showed lead levels greater than 118 mg/kg and were excavated and resampled. Two of the five panels required additional excavation.
- Range Floor—The Operations Plan (BCRRT, 2008b) identified one 130-foot by 130-foot square area, four 58-foot by 58-foot square areas, and ten 29-foot by 29-foot square areas on the range floor that were excavated. Some of these areas were overlapping and some were located underneath the berm. Vertical and lateral step-outs were performed based on confirmation sampling results. Confirmation samples could not be collected from the floor of the grid surrounding RAU 2A-18-11-W due to the presence of bedrock.
- In early 2009, RAU 2A-18 was used as a staging site for waste from other ranges. Some excavation was delayed by the presence of stockpiles.
- A total of 15 items, presumed to be MEC items (3.5-inch rockets and 37-mm frag subsurface), were reportedly identified in locations east of the berm within the 3.5-inch rocket target area (MKM, 2010).
- All excavated materials were sifted for the removal of lead slugs.
- Estimated volume of soil excavated, based upon truckloads, was 225 cy of RCRA soils and 60 cy of MTCA soils.

4.2.1.6 Cleanup Actions at Remedial Action Unit 2A-19

RAU 2A-19 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—No berms are associated with this firing range.
- Range Floor—Two 130-foot by 130-foot square areas and six 29-foot by 29-foot square areas on the range floor were excavated. Vertical and lateral step-outs were performed based on confirmation sampling results.

- One confirmation sample collected from the southern sidewall step-out of the grid surrounding RAU 2A-19-34-C had a result of 156 mg/kg and was not further excavated.
- All excavated materials were sifted for the removal of lead slugs.
- Estimated volume of soil excavated, based upon truckloads, was 360 cy of RCRA soils and 170 cy of MTCA soils.

4.2.1.7 Cleanup Actions at Remedial Action Unit 2A-20

RAU 2A-20 cleanup activities were completed between 2007 and 2010 and included the following:

- Berm—Soil was excavated along the front face of a U-shaped berm. Additional areas behind targets on the berm were removed.
- Range Floor—One 130-foot by 130-foot grid, one 58-foot by 58-foot grid, and one 29-foot by 29-foot grid were excavated.
- Two additional 58-foot by 58-foot range floor grids were identified as Special Conditions.
- All excavated materials were sifted for the removal of lead slugs.
- Estimated volume excavated, based upon truckloads, was 480 cy of RCRA soils and 175 cy of MTCA soils.

4.2.1.8 Cleanup Actions at Remedial Action Unit 2A-21 and Remedial Action Unit 2A-22

RAU 2A-21 and RAU 2A-22 cleanup activities were completed between 2007 and 2017 and included the following:

- Berm—Soil was excavated along the front face of two berms. One panel on the RAU 2A-21 berm required additional excavation, which was completed, and confirmation results showed lead levels at 119 mg/kg. Ecology approved no further excavation.
- Concrete Pop-Up Targets—Soil was excavated from a 15-foot radius around each of 42 concrete pop-up target bases: 14 targets associated with RAU 2A-21 and 28 targets associated with RAU 2A-22.
- Range Floor—Two 130-foot by 130-foot grids, five 58-foot by 58-foot grids, and nine 29-foot by 29-foot grids were excavated. Vertical and lateral step-outs were performed based on confirmation sampling results. Lateral step-outs expanded the excavation as shown in Figure 10. The northern portion of the 130-foot by 130-foot grid surrounding RAU 2A-21-30-C was not excavated due to the presence of standing water. Two additional 130-foot by 130-foot grids (surrounding RAU 2A-21-31-C and RAU 2A-21-32-C) were considered Special Conditions and were not excavated due to the presence of standing water. A 58-foot by 58-foot grid surrounding RAU 2A-21-25-C was not sampled or excavated since it was located within a gravel road. The grid surrounding RAU 2A-21-15-N was bounded to the north by a road.
- Estimated volume excavated, based upon truckloads, was 2,610 cy of RCRA soils and 1,450 cy of MTCA soils.

The Cleanup Action Report included discussion of procedures for confirmation sampling (Weston, 2018). However, specific results were only provided for RAU-2A-16 and RAU-2A-21. Weston reports that additional excavation was completed as vertical or lateral step-outs until the contamination had been delineated and removed. Confirmation sampling would have been completed during this process and corresponding results are not reported in Weston (2018).

In January 2010, a boundary delineation investigation of the RAU 2A-21 overshoot area identified lead slugs and blank cartridges at the surface and at depths up to 18 inches bgs. The lead-impacted soil area was estimated to be 4.25 acres in size (MKM, 2010). The County and Ecology concurred that additional cleanup activities were required for the overshoot area associated with RAU 2A-21 as documented in the APPCD (Ecology, 2012).

Additional investigation of the RAU 2A-21 overshoot area and installation of a soil cap was completed in 2017. In accordance with the Addendum to the RAU 2A CAP (Weston, 2018b), the area of lead-impacted soil at RAU 2A-21, found to be 6.21 acres, was covered with geotextile and 1 foot of clean fill. The lateral extent of the soil cap areas for RAU 2A-21 was marked and grade stakes were installed to mark areas requiring vegetation removal and placement of the 1-foot-thick soil cap. Deadfall was removed and vegetation cut in the lead-contaminated areas before covering with geotextile and import soil. Trees greater than 6 inches in diameter were not removed. The deadfall was placed in nearby areas.

4.2.2 Actions Subsequent to Remedial Action Unit 2A Remedy Implementation

Cleanup actions have not been undertaken since the soil cap was completed in 2017.

4.2.3 Remedial Action Unit 2A Operation, Maintenance, and Monitoring

A restrictive covenant required in the RAU 2A NFA letter is intended to prohibit intrusive activities in the area of the soil caps at RAU-2A-16 and RAU-2A-21 (Ecology, 2019a).

4.3 Remedial Action Unit 2B

RAU 2B consists of DA2 and DA3, and a RI was completed in 2003 that culminated in a site closure report (Calibre, 2005). An SI was completed in 2003 to characterize soil and groundwater conditions at the two demolition areas in order to determine if further actions were required. The groundwater monitoring program was finished in 2005 with no detected COPCs exceeding CULs. DA2 and DA3 are described as follows:

- DA2 consists of an approximately 10-acre wooded area. The specific area of DA2 was interpreted to be approximately 60 square feet located within a steep forested slope. The investigative approach was to install and monitor groundwater downgradient of the DA2 area to determine if groundwater contamination is present and to sample surface and subsurface soil in the suspect area. Three shallow wells were used for this characterization.
- DA3 consists of a detonation crater approximately 20 feet in diameter and 10 feet deep. The investigative approach at DA3 was to monitor groundwater surrounding the crater and sample soils in and around the crater. Four shallow wells and one deep well were used for this characterization.

NFA status was provided in 2009 by Ecology (Ecology, 2009).

4.3.1 Remedial Action Unit 2B Remedy Implementation

The basis for the 2009 NFA status for DA2 and DA3 is summarized below.

4.3.1.1 Demolition Area 2

Soils samples were collected across DA2 and from a berm next to a road on the south side of the demolition area. Soil samples were analyzed for explosives, perchlorate, and metals. Soil sampling and laboratory analyses conducted at DA2 did not detect explosives or perchlorate residues above reporting limits. Concentrations of metals were not detected above regional background concentrations and corresponding CULs (Ecology, 1994).

Groundwater was monitored for explosives, perchlorate, total and dissolved metals, and water quality parameters from the three shallow wells at DA2. The results did not detect explosives, perchlorate, or total and dissolved metals at concentrations at or above CULs.

4.3.1.2 Demolition Area 3

Soil samples were collected during drilling of the DA3 monitoring wells from the surface to depths of 15 feet bgs. Additional surface and near-surface soil samples were collected across DA3. Concentrations of four explosives were detected in surface and subsurface soil samples. The concentrations detected were significantly below 1 mg/kg and below any corresponding EPA Region 9 Preliminary Remediation Goals (PRGs). Two explosive compounds, 2-Am 4,6-DNT and 4-Am 2,6-DNT, were detected at 0.22 mg/kg and 0.14 mg/kg, respectively. PRGs were not available for these compounds. Detected concentrations were below the relevant EPA Region 3 Residential risk-based concentration of 4.7 mg/kg available for both these compounds. These concentrations were attributed to outdoor storage of spent shells.

Groundwater monitoring results at DA3 did not detect explosives, perchlorate, or total and dissolved metals at concentrations above CULs.

4.3.2 Actions Subsequent to Remedial Action Unit 2B Remedy Implementation

Groundwater monitoring was conducted in 2013 in response to a low-level detection of HMX in groundwater from monitoring well LC-MW01D, which is included in the "Base Boundary" well grouping within the Lacamas Creek area. The sample collected from the well had a detection of HMX at 0.22 micrograms per liter (µg/L). Another well (LC-MW02D) had a detection of HMX between the laboratory method reporting limit (MRL) and the laboratory method detection limit (MDL). The appearance of HMX at the downgradient Base Boundary location was unexpected, and it was decided that additional groundwater assessment was warranted in the DA3 area. Because the Base Boundary area is downgradient of the five existing Demolition Area 3 wells, the five DA3 monitoring wells were redeveloped and sampled in March and May 2013.

Samples were analyzed for perchlorate, HMX, and RDX. Perchlorate, HMX, and RDX were not detected in the DA3 monitoring wells in the March or May 2013 monitoring events. Following DA3 well sampling efforts, it was determined that laboratory quality control was a probable cause of the HMX detections. There have been no subsequent detections in seven years following changing the analytical laboratory.

4.3.3 Remedial Action Unit 2B Operation, Maintenance, and Monitoring

Operations, maintenance, and monitoring requirements are not included in the APPCD for RAU 2B.

4.4 Remedial Action Unit 2C

RAU 2C is in the RI/FS process and a draft RI/FS document has been submitted to Ecology for consideration with four remedial alternatives. Additional information can be found in the draft documents.

An interim remedial action was completed in December 2004 and included removal and disposal of OB/OD ordnance and landfill materials and associated contaminated soils. Soil was removed until confirmation samples indicated that perchlorate was at concentrations below MTCA Method B soil CULs for protection of groundwater of 0.5 mg/kg or 500 micrograms per kilogram (µg/kg). In one area, on the western boundary of the landfill, excavation continued to approximately 27 feet bgs where saturated soils were encountered, and sample results indicated that perchlorate levels continued to exceed CULs. Excavation at this location ceased due to safety concerns. Ecology determined that residual contamination remaining at this depth would be remediated during a groundwater remediation phase of work. It was estimated that 13,300 cy of impacted material were removed from the landfill, and that approximately 900 cy of potential impacted soil remain in

place at depths greater than 27 feet bgs (Tetra Tech, 2005). The interim soil removal was reported to have removed approximately 93% of the impacted soil.

4.5 Remedial Action Unit 3

RAU 3 includes the entire site where UXO and munitions are located. Initially, interim actions for RAU 3 were completed between 2000 and 2011 that included time critical removal actions for ordnance and explosives, MEC clearance at LF4/DA1, the environmental study area, emergency surface clearance along the property perimeter and CITA perimeter, surface clearance of road and trail buffers, and fence maintenance. Site-wide cleanup was subsequently conducted in phases throughout the site, as required by the APPCD. The APPCD stipulated that remediation of RAU 3 was to be conducted in the following four phases:

- Phase I (Central Valley Floor; CVFAW)—subsurface MEC clearance of the CVF and associated wetlands
- Phase II (CITA and Firing Points)—MEC surface and subsurface clearance of the CITA and Firing Points as required in the final CAP for RAU 3
- Phase III (Demolition Areas 1 and 2)—MEC surface clearance of DA1 and DA2
- Phase IV (Western Slopes)—MEC surface clearance of the western slopes

The APPCD noted that the order and numbering of the final phases may change. Final phasing included remediation DA1 and DA2 as part of Phase II and the CITA was completed as Phase III. Cleanup activities were completed for all phases by 2021. Ecology issued NFA determinations for each phase between 2017 and 2021.

4.5.1 Roads and Trails

The CBMR road and trail system traverses the entire RAU 3 area. MEC clearance and removal activities for the road and trail system were mostly completed in 2007 and documented in *After Action Report, Roads and Trails, Camp Bonneville Military Reservation* (BCRRT, 2009c). This report describes that roads and trails were not specifically cleared of MEC based on their long-term use and maintenance activities, including grading and cut/fill for construction. Generally, a 20-foot buffer was surface cleared on either side of the CBMR roads, except for roads and trails near the site boundary where a 30-foot buffer was cleared on the CBMR side of the road (BCRRT, 2009b).

Additional clearance measures were implemented for the CITA access road and the Northern CITA Expansion as part of Phase II of the RAU 3 remedial action (Weston, 2021).

- The CITA Road Alignment, surface and subsurface clearance to 14 inches bgs was completed for the entire 6,800-foot length (approximate) of the 10-foot road-wide road alignment.
- The Northern CITA Expansion Area, the perimeter road was cleared to a depth of 14 inches during road construction (Weston, 2021). Surface clearance was completed for a 10-foot buffer on the CITA site of the boundary fence and surface clearance was completed for a 20-foot buffer on the other side.

4.5.2 Remedial Action Unit 3, Phase I

The CVFAW is composed of 329 acres in the CVF and 120 acres in the Associated Wetlands, totaling 449 acres. Phase I remediation was completed between 2012 and 2017 and included the removal of surface and subsurface MECs, material potentially presenting an explosive hazard (MPPEH), munitions debris, and other materials documented as safe items, small arms, and all other metallic items to clear anomaly locations to a depth of 14 inches bgs within the Phase I area. The remedial action is documented in *Site Specific Final Report,*

Munitions and Explosives of Concern, Remedial Action Unit 3, Central Valley Floor and Associated Wetlands (Weston, 2018).

The CVFAW was partitioned into a total of 2,241 one-hundred-foot grids (including partial boundary grids). A total of 43 full grids were cleared using DGM survey techniques, 118 full grids were cleared using a mechanized excavation and screening process, and 2,066 grids cleared using analog "mag and dig" methods. The remaining 14 grids consisting of approximately 2 acres were not cleared; 3 grids were inaccessible due to steep terrain, and 11 grids are part of an active training range currently used by the FBI.

A total of 515 MEC and MPPEH items were recovered within the CVFAW boundary during the clearance activities, to include artillery projectiles, rockets, mortars, grenades, pyrotechnics, training devices, and fuses. Munitions constituents including 1 pound of TNT, 1 pound of 2.75-inch rocket propellant, and 7 pounds of bulk high explosives were recovered. All recovered munitions debris was 100% inspected by UXO personnel and classified as material documented as safe (MDAS) or non-munitions scrap. MDAS was shipped off site for demilitarization and scrap metal was recycled off site.

4.5.3 Remedial Action Unit 3, Phase II

RAU 3 Phase II included munitions cleanup at 58.84 acres outside the Central Valley Floor between 2018 and 2019. The munitions cleanup included removal of MEC, MPPEH, MDAS, MD, and other metallic items. Munitions cleanup was completed at the following areas of RAU 3 during Phase II:

- Demolition Areas 1 and 2 (0 to 3 inches bgs clearance)
- Range Target Areas—Hand Grenade Range; Rifle Grenade Range; and 3.5-inch Rocket Range (0 to 3 inches bgs clearance)
- Firing Positions and Points—Artillery Positions 1, 2, 3, 4 and 7; Mortar Positions 1, 2, 5 and 6; Rifle Grenade Firing Point; and 3.5-inch Rocket Range Firing Point (0 to 14 inches bgs clearance)
- Road and Trail Stepout Areas (0 to 3 inches bgs clearance)

A total of 86 MEC and MPPEH items were recovered during the Phase II munitions cleanup, including four MEC items recovered during stepout activities performed in 2018 and 2019. MCs, including 1 pound of 2.75-inch rocket propellant and 2 pounds of cartridge propellant, were recovered and recorded as MPPEH. The MEC/MPPEH items were recovered from DA1, the 3.5-inch Rocket Range Target Area (and associated stepout area), the 3.5-inch Rocket Range Firing Point, and Mortar Position 5. There were no MEC or MPPEH items recovered from the other Phase II munitions cleanup areas.

4.5.4 Remedial Action Unit 3, Phase III

The CITA is composed of approximately 465 acres and the Northern CITA Expansion includes 107 acres adjacent to the Northern CITA boundary. Together, the CITA and Northern CITA Expansion are classified as a No-Reuse Restricted Access Area with no designated reuse or facilities planned.

Phase III remediation was completed between 2017 and 2020 and included the removal of MEC/MPPEH items within specific areas. The remedial action is documented in *Site Specific Final Report, Munitions and Explosives of Concern, Remedial Action Unit 3, Central Impact Target Area and Northern CITA Expansion, Former Camp Bonneville Army Reservation, Vancouver, Washington* (Weston, 2021).

The CITA clearance area is a 100-acre polygon that is composed of 15 documented target areas, and the locations of previously removed MEC items within the CITA Expansion (BCRRT, 2009b). Stepouts were

implemented for 17 acres composed of ninety-four 100-foot by 100-foot grids after the identification of MEC/MPPEH items in the primary search area boundary subgrids using the stepout criteria.

- CITA Target Areas Polygon—surface clearance (0 inches) consisting of a 100-acre polygon encompassing 15 identified target areas and previous MEC findings locations
- CITA Road Alignment—subsurface clearance to 14 inches bgs within the 10-foot-wide road alignment within the CITA boundary (approximately 6,800 linear feet of roadway)
- Northern CITA Expansion Perimeter Fence/Road Easement, 40 feet wide and approximately 9,050 linear feet in length (see Figures 3 and 5):
    - A 10-foot-wide area inside the fence alignment (surface clearance to 0 inches bgs)
    - A 10-foot-wide roadway alignment located just outside the fence line (surface and subsurface clearance to 14 inches bgs)
    - A 20-foot-wide area outside the roadway alignment (surface clearance to 0 inches bgs)
- CITA Stepout Grids (when required based on identification of MEC/MPPEH items in primary search areas)

A total of 96 MEC and MPPEH items were recovered within the CITA Target Areas (87 in the 100-acre polygon and 9 in stepout areas), including artillery projectiles, 40-mm projectiles, mortar rounds, grenades, pyrotechnics, training devices, and fuzes. All encountered MEC and MPPEH items were blown in place or consolidated on site and then later disposed. All other recovered material was 100% inspected by UXO personnel and classified as MDAS or non-munitions scrap. MDAS items were shipped off site for demilitarization and recycling. Scrap metal was also shipped off site for recycling.

MEC and MPPEH items were not recovered within the CITA Road Alignment. Material recovered was 100% inspected by UXO personnel and classified as MDAS or non-munitions scrap and managed as described above.

One MPPEH item (an unfuzed artillery projectile) was recovered within the Northern CITA Expansion Perimeter Fence/Road Easement in February 2019 during a surface sweep prior to removal of vegetation. The MPPEH item was destroyed during a consolidated disposal and reclassified as MEC. No MEC items were recovered during subsequent construction of the Northern CITA Expansion Perimeter Fence/Road. All other recovered material was 100% inspected by UXO personnel and classified as MDAS or non-munitions scrap. MDAS and scrap metal were managed as described above.

Because the CITA was designated as restricted access, a fence consisting of five-strand barbed wire was constructed around the CITA. Warning signs were installed every 50 feet.

4.5.5 Remedial Action Unit 3, Phase IV

Phase IV consists of the Western Slopes Area (WSA) that includes approximately 600 acres along the western portion of the site. Initially, it was stated that 425 acres would be surface-cleared based on slopes of 25 degrees or less (BCRRT, 2010). The WSA pilot study (Weston, 2018) completed MEC clearance and removal over a 17-acre area within the WSA (Weston, 2018). The results of the pilot study were used to identify additional clearance actions that might be appropriate for the remaining accessible portions of the WSA. In summary:

- One MEC item was recovered during the WSA Pilot Study;

- An Mk1 37-mm projectile, three-hundred pounds of MDAS (drums, inert munitions, and small arms); and Scrap metal were recovered during RAU 3, Phase IV.

Based on the results of the WSA pilot study, it was determined that slopes of 14 degrees or less (25%) would be cleared. This is documented in the November 2018 *Proposed Changes to the 2010 Cleanup Action Plan for Remedial Action Unit 3, Site-wide Munitions Contamination* (Ecology, 2018). The proposed changes to the CAP were approved in Ecology's Summary Response to Public Comments (Ecology, 2019b). Accordingly, the 425 acres identified in the CAP for clearance was reduced to 195 acres based on accessibility.

The RAU 3 WSA cleanup action was conducted between 2019 and 2020 to remove MEC and MPPEH in accessible portions of the site. Accessibility was defined as slopes less than 25% (approximately 14 degrees) without restricted accessibility. The objective was to ensure that all MEC, MPPEH, MD, and other metallic debris were removed from ground surface to 3 inches bgs. The remedial action was documented in *Site Specific Final Report, Munitions and Explosives of Concern, Remedial Action Unit 3, Western Slopes Area* (Weston, 2020b).

- Twenty-four MEC and MPPEH items were recovered during the WSA analog clearance. Seventeen of these items were determined to be MDAS following demolition and seven were confirmed to be MEC.
- MD (164 items weighing approximately 302.65 pounds) were recovered during clearance activities. This includes 17 items weighing 115.5 pounds that were initially identified as MEC/MPPEH and later determined to be MDAS and recovered small arms, and 18.35 pounds, also classified as MDAS.
- During the MEC clearance activities, cultural debris items such as wire, nails, cable, horseshoe, rebar, pipe, barbed wire, bolt, can, chain, fencing, fence post, vehicle parts, and other metal debris that were possible to remove were contained in roll-off bins. Scrap metal from the WSA surface clearance was not segregated from scrap metal recovered during other MEC clearance activities conducted concurrently at CBMR.
- A total of 89 historic-period items were identified for collection as a result of the surface clearance activities.

4.5.6 Findings Subsequent to Remedial Action Unit 3 Remedy Implementation

Additional remedial actions have not been taken following the remedy implementation. Interviews conducted for this periodic review indicated that an M60 time fuse igniter had been discovered near Landfill #4. The M60 time fuse igniter was disposed of by Clark County Sheriff's Office bomb technicians. Additionally, the FBI indicated that a mortar round was identified near the barracks in 2019. The FBI indicated the area was marked with a safety flag and CBMR was notified for removal.

4.5.7 Remedial Action Unit 3 Operation, Maintenance, and Monitoring

The current monitoring and maintenance program as outlined in the RAU 3 CAP (BCRRT, 2010) and CAP Addendum (Ecology, 2017) includes:

- A fencing and signage program to either restrict access or to increase public awareness of past military activities conducted at the site including the following:
    - Fencing and signage along the perimeter of the facility
    - Ground-disturbance permit notification program and standard operating procedures for ground-disturbing activities.
    - Maintenance of the existing fence and signage surrounding the CITA

- Annual surface MEC inspection and surface MEC inspection after heavy rainstorms to minimize potential risks from frost heave.
- A UXO Technician I certification for two Clark County Park Employees

Sitewide requirements for monitoring and maintenance also apply. These are described in Section 4.6.

4.6 Sitewide Institutional Control and Remedy Implementation

Cleanup action has concluded at four of the five RAUs, with RAU 2C in the final stages of the RI/FS process. Following initial investigations beginning when CBMR was identified for closure in the BRAC process, a quitclaim deed was issued in September 2006 transferring ownership of the site from the DoD to the County. The original PPCD was referenced in the quitclaim deed, later revised with the APPCD, and included reference to each CAP from the five RAUs with their associated remedies, including ICs and ECs.

Section 2.1.3(6) of Attachment E.1 – Technical Specifications and Requirements Statement (TSRS) of Environmental Services Cooperative Agreement (ESCA) Number W8128F-06-2-0160 between the Army and the County includes requirements to document annual compliance with the Environmental Covenants, Conditions, and Restrictions (ECCR). These ECCRs were incorporated into and made enforceable parts of the quitclaim deed from the Army to the County as Exhibit C to that deed.

ICs have been implemented for RAU-1 and the quitclaim deed. ICs for RAU-2A and RAU-3 are discussed in their corresponding cleanup plans; however, they have not been recorded. A long-term Operation and Maintenance (O&M) plan that formally documents the ICs and actions necessary to ensure the long-term effectiveness of the cleanup is required under the APPCD. Sitewide ICs were also assigned to CBMR as described in the quitclaim deed. An IC and EC summary is illustrated in Figure 9. At a minimum, the long-term O&M plan will summarize and document procedures for the following activities:

- Residential Use Restriction: property to be used solely for conservation of natural resources. Residential use, childcare facilities, and health care facilities are prohibited.
- Fencing and signage program to restrict access and to increase public awareness of past military activities conducted at the site including the following:
    - Maintain the perimeter fence and ensure signage is affixed at 50-foot intervals.
    - Maintain the CITA fence and ensure signage is affixed at 50-foot intervals.
    - Signage at select target areas and each firing point.
    - Signs along roads and trails at appropriate intervals.
- Sitewide groundwater use restriction.
- Inspection, including annual surface MEC inspection and surface MEC inspection after heavy rains.
- Public Information Program:
    - Permit Notification Program for permits for construction or installations of building foundations, aboveground/underground utility lines, roads, and other paved or graded gravel areas, land surveying, timber management, and other tasks which will or may involve land disturbance activities.
    - Construction support activities for forest management and fire suppression logging work.

  - Standard Operating Procedures for construction- and maintenance-related activities and other potential land disturbing tasks.
  - Printed media program and on-site information kiosk.
  - Public access restriction to the CITA.
  - Preservation covenant to notify the Washington State Historic Preservation Office (SHPO) to maintain previously identified archaeological sites and all other as yet undiscovered archaeological sites.
- A UXO Technician I for two Clark County Park Service employees

The APPCD and the RAU 3 NFA letter indicate that institutional controls that result from the long-term O&M plan must be recorded on the property deed.

4.7 Additional Actions

Per- and polyfluoroalkyl substances (PFAS) compounds were identified as an emerging contaminant and subsequently identified as a source of human health risks. PFAS are associated with a wide range of commercial and industrial uses including paints, varnishes, sealants, hydraulic fluid, surfactants, and firefighting foams. In 2023, the Army conducted a preliminary assessment (PA; Leidos, 2023a) and SI (Leidos, 2023b) to characterize the usage, storage, disposal, or release of PFAS at Camp Bonneville.

The PA for Camp Bonneville focused on ascertaining and documenting the following information regarding PFAS history and use, storage, or disposal at Camp Bonneville:

- On-post fire training activities
- Use of PFAS-based aqueous firefighting foam (AFFF) in fire suppression systems or other systems
- AFFF stored, used, and/or disposed of at buildings and crash sites
- Activities or use of materials that are likely to contain PFAS, such as metal plating operations
- Wastewater treatment plants (WWTPs) and landfills that may have received PFAS-containing materials
- Studies conducted to assess environmental impacts at the facility
- Potential PFAS use at parcels post-transfer
- Potential off-post sources that may impact Camp Bonneville

Areas of potential interest (AOPIs) were identified based on records review, aerial photographic analysis, site reconnaissance, and interviews. The scope of the PA activities is summarized as follows.

- **Records Review.** Records reviewed for the PA are discussed in Section 3.1 of the PA. These records included consultant, DoD, and Army reports related to BRAC programs. Information gathered during the record reviews helped identify data gaps and enabled elimination of several areas based on their historical use. Data gaps associated with facility operations; PFAS-containing material use, storage or disposal; and current exposure receptors at Camp Bonneville were used to identify potential AOPIs. Areas with little potential to result in a PFAS release, such as residential buildings, hospitals, cafeterias, and recreational areas, were eliminated from further evaluation.
- **Aerial Photograph Analysis.** Aerial photograph review is described in Section 3.2 of the PA and were used to identify potential activities or developments that may suggest the potential use, storage, or disposal of PFAS-containing materials, including AFFF (e.g., evidence of fire training activities, such as fire pits or burn scars). No conclusions on AFFF use or storage were drawn from the aerial photograph review.

- **Site Reconnaissance.** The PA site visit is summarized in Section 3.3 of the PA and included a site walk and visual inspection of all readily accessible areas at Camp Bonneville to identify potential sources of PFAS and gather information for developing conceptual site models at AOPIs.
- **Interviews.** Interviews were conducted and are summarized in Section 3.4 of the PA. Interviews included the Vancouver Fire Department, Clark County Fire District 3, and other regional fire department personnel regarding historical fires, historical fire response procedures, and AFFF use. The parties interviewed were not aware of usage or training with AFFF foams at the property. Between 1989 and CBMR closure, 20 gallons of AFFF, stored in 5-gallon pails, were kept on the fire truck staged at the fire station building (No. 4483) by the City of Vancouver Fire Department. Each pail included a lockout tag. The AFFF was never reported to be used. AFFF was not otherwise stored on the property.

Sections 4 and 5 of the PA summarize and evaluate the data and identify three AOPIs, as follows.

- **Building 1864 Fire Station.** Building 1864 in the Bonneville cantonment operated as a fire house, fire equipment shed, and fire truck storage area from the late 1940s until the late 1970s. Based on historical uses, AFFF storage or use is possible.
- **Building 4483 Fire Station.** Building 4483 in the Killpack cantonment operated as a fire station from the late 1980s until approximately 2007. AFFF was historically stored on the fire truck inside the fire station.
- **Washracks 1 and 2.** Washrack 1 consisted of a wooden two track vehicle ramp and was used for vehicle washing between 1978 and approximately 1994. Washrack 2, also referred to as the vehicle maintenance rack, was constructed with two parallel wooden timbers with gravel in between and was used until the 1980s. Both washracks were in the shop office area at the Killpack cantonment, in the vicinity of the Building 4483 Fire Station. Fire truck washing could have resulted in a release of PFAS compounds through the washrack.

The three AOPIs at the property were investigated during the SI. Soil, groundwater, sediment, and/or surface water samples were collected. PFAS compounds that were analyzed included: perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA); perfluorobutanoic acid (PFBA), perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA), perfluorohexanoic acid (PFHxA), perfluorohexane sulfonate (PFHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA; also known as GenX).

Samples collected during this SI were compared to EPA regional screening levels (RSLs) for a residential scenario, calculated using the EPA RSL calculator. In summary, concentrations of PFAS were detected:

- In 3 of 29 soil samples at concentrations below RSLs. When detected, concentrations were minimally above MRLs or estimated concentrations between the MRL and the MDL.
- In 4 of 4 groundwater samples at concentrations below the RSLs. The highest detections of PFAS were detected in groundwater sample CBV-1864-2 from the Building 1864 Fire Station AOPI.
- In 1 of 3 surface water samples at concentrations below the groundwater RSLs. Surface water RSLs were not available for PFAS compounds.
- In 2 of 4 sediment samples, PFOS was detected at estimated concentrations between the MRL and MDL. Sediment RSLs were not available for PFAS compounds.

Target PFAS concentrations did not exceed RSLs in samples from any media.

Based on these results, further investigation was not recommended by the Army.

5 ADDITIONAL INFORMATION GATHERING AND SITE INSPECTIONS

The purpose of this summary report is to evaluate the implementation and performance of the implemented remedies at CBMR in order to determine human health and the environment are being protected. In order to collect information on site operations since the remedies were implemented, interviews and inspections were completed.

5.1 Interviews

Interview questionnaires were developed and distributed to property users and manager, as follows:

- Clark County Land Management Division
- Clark County Parks Division
- ATF
- DNR helicopter tactical team (Heli-tack)
- Ecology former site managers
- Clark County Sheriff's Office
- FBI
- Metro Explosives Disposal Unit

The completed interview questionnaires are included in Appendix B. Information from the interview questionnaires was incorporated into Section 6.

5.2 Site Inspections

A site inspection was completed on December 5 and 6, 2024. The purpose of the site inspection was to inspect the ECs and ICs in place at the site. Ecology and Apex conducted separate but concurrent inspections. The results of the inspection are summarized below. Representative photographs summarizing the inspection activities are included in Appendix C.

5.2.1 Remedial Action Unit 1

RAU 1 includes 20 hazardous subsurface sites located across the Property. ICs are required at Building 4475 and Building T-1932 within RAU 1 to notify of the presence of contaminated soil and instruct that excavation is not permissible without approval.

Signage was present at both Building 4475 and Building T-1932. Evidence of ground disturbance at either location was not observed.

Maintenance and annual inspection records were not available. ECCR reports documenting compliance with ICs established in the quitclaim deed were submitted annually.

5.2.2 Remedial Action Unit 2A

RAU 2A includes lead contamination at firing ranges. ECs are in place at two locations within RAU 2A where lead-contaminated soils were capped, RAU-2A-16 and RAU-2A-21.

RAU-2A-16 Soil Cap:

- Boundary markers were not observed. The general soil cap area was identified based on the area of reworked soil and extent of a silt fence along the north side.
- Signage indicating the presence of a soil cap was not observed.

- Tire tracks were observed along the south side of the capped area. The tire tracks traversed the cap and exited across the area north of cap. The tire tracks left an approximately 6-inch indentation along their track.
- An area of streambank erosion was observed along the northeastern edge of the cap. The shortest separation distance was 4.5 feet from the edge of the soil cap to the stream.

Evidence of ground disturbance at the RAU-2A-16 soil cap was not observed, with the exception of the tire tracks.

RAU-2A-21 Soil Cap:

- Boundary markers were not observed. The soil cap area was identified based on visual observation of mounded soil.
- Signage indicating the presence of a soil cap was not observed.
- Indications of a breach of the cap were not identified.
- Mature trees across the soil cap were observed to be dead (likely as a result of the cap installation burying the tree bases) and several trees had been cut down.

Evidence of ground disturbance at the RAU-2A-21 soil cap was not observed.

Maintenance and inspection records were not available for the two RAU 2A soil caps.

5.2.3 Remedial Action Unit 2B

RAU 2B includes the former demolition areas DA 2 and DA 3. Remedial actions were not required at these two areas. DA3 was accessed for inspection to confirm there was no ground disturbance. DA2 could not be accessed.

5.2.4 Remedial Action Unit 2C

The RI/FS for RAU 2C is underway. Inspection activities related to RAU 2C did not identify any evidence of ground disturbance, and no seeps were observed along the adjacent streambank. Monitoring wells were observed to be in good condition.

5.2.5 Remedial Action Unit 3

RAU 3 includes munitions cleanup and removal of MEC and other metallic items. Munitions cleanup of RAU3 was completed in phases. ECs in effect for RAU 3 include fencing the entire area of the CITA and restricting access. ICs in effect for the CITA include requirements for signage at 50-foot intervals along the CITA boundary fence.

- Barbed wire fencing was present surrounding the entire CITA. In multiple areas, treefall had compromised the fence.
- Warning signs were present; however, the signs were not present uniformly at the required distances (1 every 50 feet).
- The gate to the access road bisecting the CITA was open at the time of inspection.

Maintenance and inspection records were not available for the CITA or CITA boundary fence. ECCR reports documenting compliance with ICs established in the quitclaim deed were submitted annually.

5.2.6 Sitewide Controls

Sitewide ICs were also assigned to CBMR as described in the APPCD. Future long-term O&M requirements were to be documented in an O&M plan. In summary:

- A long-term O&M plan was not available for review. O&M plans related to UXO were not available.
- Fencing and signage program to restrict access was present around the perimeter of the facility, but signage was not present uniformly at the required distances (1 sign every 50 feet) around the full perimeter.
- Hurricane fencing was present near areas of higher population density, near the west and south fence line. Barbed wire fencing was present along other areas of the boundary fence. Treefall had compromised the fence in multiple areas, particularly in the northwest quadrant of the perimeter. Biological activity (elk) and trespassers occasionally have compromised the perimeter fence. County workers were noted as being in the process of repairing the fence.
- Signage highlighting former military operations was largely not present. One kiosk with some information was present at the main gate.
- Signage indicating water was non-potable was observed in areas where sinks were present. Bottled water was available at these locations. Not all sinks were inspected.
- Signage on roads and trails identifying possible MEC risks off-trail were not observed.
- The Public Information Program was not in place. Ground-disturbing activities are coordinated through the Clark County Land Management Division. Active construction or indications of recent construction were not observed.
- Documentation that two County employees had received the UXO Technician I certification was not available. The County reports that it currently employs one UXO Technician I.

6 TECHNICAL ASSESSMENT

This section evaluates the status of each of the RAUs according to the factors presented in WAC 173-340-420 (4).

6.1 Effectiveness of Cleanup Actions

This section describes the effectiveness of the remedies in place for each of the RAUs, including how the completed remedies have performed relative to their design intent as per WAC 173-340-420 (4)(a). Each of these remedies includes RAU-specific or sitewide institutional and engineering controls and rely on the maintenance of those controls to remain protective.

Remedial effectiveness of the cleanup decision or the completed cleanup action was evaluated by identifying the maximum concentration of individual constituents detected at each RAU and comparing them to CULs in effect at the time of the cleanup decision or cleanup action, as well as current CULs that would be applicable. This screening is summarized in Table 1 to Table 5 and is described in the sections below. Screening is completed to each RAU, and individual cleanup sites within an RAU, except RAU-2C.

6.1.1 Effectiveness of Remedy for Remedial Action Unit 1

6.1.1.1 Remedial Action Performance

The 20 discrete sites that comprise RAU 1 have been defined as areas where previous investigations and remedial activities found that COPCs were either not detected or were below regulatory CULs (either during the individual site assessments or following a focused cleanup action). For sites that had exceedances of the CULs, the removal of soil and debris was completed to permanently reduce the potential for human or ecological exposure to the contamination as the wastes were either placed in an on-site containment facility or were taken off site for disposal at a permitted landfill. The associated institutional and engineering controls maintain the remedy protectiveness by ensuring that the site conditions remain consistent with the exposure assumptions (such as by preventing residential land uses).

A total of 166 site characterization soil samples were collected for RAU 1 (Table 1). Soil samples were not collected at Landfill 1 because the location could not be confirmed (URS, 2004). Investigation data demonstrated that the concentrations of target analytes in 10 of the sites within RAU 1 did not exceed applicable CULs and did not require further investigation or remedial action. Note that in Table 1, Landfills 2 and 3 are combined in a single data summary; similarly, the two grease pits are also combined in Table 1. Exceptions are noted below where concentrations used for cleanup decisions exceeded applicable CULs or were revised downward. These included:

- Maximum arsenic concentrations at the Camp Killpack grease pit (7.9 mg/kg) and former sewage pond (7.2 mg/kg) exceeded background concentrations and the current Method B CUL. Cleanup decisions were made with Method A concentration limits, which are 20 mg/kg. While the detected concentrations exceed the Method B CUL, because they only minimally exceed the published background concentration (7.0 mg/kg) and are well below the Method A CUL, the detected arsenic concentrations do not reduce the effectiveness of the cleanup action.
- The maximum lindane concentration at the grease pits was detected in only one of five samples (GP-SB02-02) at a concentration of 2.0 mg/kg, which is below the historical MTCA Method A concentration and minimally exceeds the historical Method B CUL. The Method B CUL has decreased since the cleanup. The current CUL is 0.91 mg/kg. Based on the frequency of detection and exceedance factor compared to the revised CUL (approximately 2), the detected concentrations of lindane does not reduce the effectiveness of the cleanup action.

Remediation was completed at nine sites. Each of these cleanup actions involved excavation and disposal of contaminated soil and debris. A total of 122 post-remediation soil samples were used to document final remediation of COCs at each site. Based on the screening in Table 1, COPCs were below CULs in all post-excavation soil samples, with one exception for the following:

- At one of the AST locations (building T-1932) concentrations of diesel-range hydrocarbons (2,690 mg/kg) exceeded applicable CULs at the time of remediation. This is known contamination within the area covered by RAU 1 restrictive covenant. Accordingly, the detected concentrations do not reduce the effectiveness of the cleanup action.
- At the Former CS Training Building, concentrations in one of the confirmation samples, 290 mg/kg, exceeds the 250 mg/kg MTCA Method A CUL that was applied at the site. This nominal CUL exceedance does not affect the effectiveness of the remedial action.

A total of 15 groundwater samples were collected from 5 RAU 1 sites.

- In groundwater samples collected from Landfills 2 and 3, the former sewage pond, hazardous materials accumulation point, and drum disposal area, concentrations of arsenic exceed historical and current Method B CULs. These detected are expected to be derived from natural background concentrations and do not reduce the effectiveness of the cleanup action.
- In groundwater samples collected from the hazardous materials accumulation point and drum disposal area, maximum concentrations of lead exceed current and historical Method B CULs. The detected lead concentrations are expected to be derived from natural background concentrations and do not reduce the effectiveness of the cleanup action.
- In groundwater samples collected from the drum disposal area, concentrations of benzene, ethylbenzene, xylenes, toluene, and 1,2,4-trimethylbenzene exceed historical and/or current Method B CULs. This groundwater sample was collected from shallow groundwater seepage in a test pit. This area was remediated by excavation, contaminated soils were removed, and confirmation samples were collected. Additional groundwater samples were not detected. Because confirmation soil samples were collected and below CULs, the historical groundwater concentration exceedances are considered to be removed by excavation.

Site uses within RAU 1 have not changed; however, some of the Method B CULs have been adjusted since the time of assessment and remediation. A review of the historical data against current CULs demonstrates that the revised CULs did not change the effectiveness of the RAU 1 soil remedies. Because there are no changes to the current or proposed land use, and the changes to the cleanup goals do not fundamentally affect the assessment of protectiveness, the RAU 1 remedial action is considered effective (pending the resolution of residual contamination beneath two buildings, as discussed in Section 6.1.1.2).

RAU 1 cleanup was primarily based on soil results. When sampled, concentrations of COPCs in groundwater were mostly below historical groundwater CULs. CULs for petroleum-related VOCs have decreased since remedial actions were implemented.

6.1.1.2 Implementation of Institutional and Engineering Controls

The restrictive covenant for Camp Bonneville Military Preserve Remedial Action Unit 1 was executed on November 21, 2006, and filed on November 27, 2006. The restrictive covenant includes requirements for additional sampling in the event of demolition, signage, permit requirements in the event of demolition at Building 4475 (maintenance pit) and T-1392 (AST), and annual reporting requirements. The buildings remain and signage is present.

The County documented compliance with the reporting requirements in annual ECCR reports that were consistently prepared by the County and submitted to the Army on an annual basis. For RAU 1, each annual report addresses ground disturbance and disruption of remedies. These ECCR reports were provided to Ecology in order for their assessment of effectiveness. Records of Annual reports from 2008 to 2021 and 2023 were reviewed for this summary report. The annual reports documented compliance with restrictions associated with residential land use, groundwater use, excavation and land disturbance, public access, archeological preservation, munitions, and asbestos and lead in building materials.

The annual ECCR reports document requirements included in the quitclaim deed and the restrictive covenant for RAU 1. The APPCD requires annual reporting to the Army. Other than multiple instances where fencing and signage maintenance was required, the EECR reports document compliance with the requirements if the quitclaim deed applicable to RAU 1.

The long-term O&M plan has not been prepared. The annual ECCR reports to the Army document compliance with a comprehensive list of restrictions, but not all the restrictions outlined in the restrictive covenant for RAU 1 or other restrictions contemplated or proposed in associated cleanup plans. Additional institutional controls may be required once the O&M plan is complete.

Property inspection in December 2024 (Section 5.4) identified deficiencies related to public information; boundary fencing and signage; and inspections and associated recordkeeping. The inspection identified that the property was in general compliance with requirements related to land use, water use, public access, and signage at Building 4715 and Building T-1932.

6.1.2 Effectiveness of Remedy for Remedial Action Unit 2A

6.1.2.1 Remedial Action Performance

A total of 17 sites were included in RAU 2A and were assessed for potential elevated concentrations of lead associated with historical use as firing ranges. A total of 1,535 site assessment soil samples were collected across RAU 2A. Lead concentrations at seven of the sites were below applicable human health CULs and no remediation was completed. Concentrations at three of the sites (Infiltration Course South, Machine Gun Range South, and M31 Sub-Caliber Ranges 1 and 2) exceed CULs for ecological receptors. Elevated concentrations of lead (135 and 423 mg/kg) were identified at the Machine Gun Range South Site, but records of remediation were not identified. Remediation occurred at 9 of the 17 sites and included excavation and/or ECs as described below.

Elevated concentrations of lead identified at sites selected for remediation ranged from 219 mg/kg at the 25-meter M60 range to as high as 10,200 mg/kg at the 1,000-Foot Ranges. The remedy for RAU 2A included excavation across 9 sites and disposal of 9,045 cy of soil with lead-contaminated soil. Soils with lead concentrations in excess of the leachability characteristic were treated, stabilized, and transported off site for disposal as a nonhazardous waste. The remaining volume was placed in the east sewage lagoon for temporary storage prior to disposal (as noted below).

Confirmation sampling would have been completed during this process to confirm remedial effectiveness but are not reported in Weston (2018). Specific results were only provided for RAU-2A-16 and RAU-2A-21. Confirmation sampling would have been completed to confirm remediation effectiveness.

Following the excavation and disposal, the remaining lead concentrations were reported as below the human health based CUL of 250 mg/kg, with the exception of two sites, RAU-2A-16 and RAU-2A-21, where remaining elevated lead concentrations range from 660 mg/kg to 5,400 mg/kg and extend beyond the surface soil

interval. Remediation at these sites included the placement of a demarcation geotextile and 1-foot soil cap over the residual wastes. The soil remedies permanently reduced the potential for human exposure to the contamination by either placing the waste in a managed facility, or through the installation of the cap as long as that structure remains intact. The emplaced ICs will likewise maintain the remedy protectiveness by ensuring that the site conditions remain consistent with the remedy's design assumptions.

The east sewage lagoon was used as an on-site temporary storage location for soil with concentrations of lead less than 250 mg/kg, which corresponds to the human health based CUL, but greater than ecological based CULs for plants and wildlife (50 mg/kg and 118 mg/kg, respectively). The 2008 Operations Plan for RAU 2A indicated that these soils would ultimately be capped with clean soil (BCRRT, 2008b). However, information obtained from Daily Reports completed by the RAU 3 remediation contractor, PIKA International, Inc., indicate that all soils from the east sewage lagoon were profiled for disposal and transported off site in late August and early September 2009. Soils were disposed of at the Wasco County Landfill (PIKA, 2009).

The caps currently remain in reasonably good physical condition, (and so the remedy for RAU 2A is currently effective for human health protection). The covers are susceptible to damage from rutting (noted across the RAU-2A-16 cover) and from the toppling of trees (particularly the RAU-2A-21 cover). Because the cap is 12 inches thick, there is an opportunity for bushes and trees with deeper root zones to damage the demarcation barrier, reach contaminated soil, and potentially bring lead contamination to the surface through root uptake and leaf/stem deposition.

As noted below, continued inspection and maintenance of the covers will be needed to continue their effectiveness, but improvements to the covers should be considered (e.g., removal of deep-rooted plants and engineered protections against erosion).

6.1.2.2 Implementation of Institutional and Engineering Controls

In addition to the sitewide ICs and ECs (overall access restrictions and signage), specific ICs and ECs for RAU-2A have not been developed. Applicable requirements for similar ECs include posting signage, routine cap inspection, and maintenance. Routine inspection of the two capped areas is necessary to maintain the protectiveness of the remedy followed by the repair of any observed deficiencies. Additional maintenance considerations needed to maintain the effectiveness of the soil covers include the following:

- Removal of the trees that are located on the RAU-2A-21 soil cover area to prevent windthrow (or similar toppling of trees) and the associated potential for the raising of lead-impacted soil in the tree root ball (alternatively this protection could be accomplished by routine inspection of the capped area and removal of any fallen trees along with repair of the soil cover).
- Routine inspection of the caps for non-grassy plants (such as shrubs or saplings) followed by their removal to prevent uptake of lead in the deeper-rooted plant species (lead uptake could eventually result in the emergence of surficial lead through the deposition of lead-impacted leaf or stem detritus).
- Demarcation of the boundary of the soil covers (such as through simple fencing or other permanent control) and installation of signage to provide notice of the restricted land use.
- Physical maintenance of the soil covers, such as repair of the rutted tire tracks on RAU-2A-16 and installation of a barrier and signage across the road frontage of the capped area.
- An official schedule and documentation of inspections should be developed.

6.1.3 Effectiveness Remedy for Remedial Action Unit 2B

6.1.3.1 Remedial Action Performance

COPCs were not identified at RAU 2B during the site investigation at concentrations above the CULs at the time and no remedial action was performed. A total of 68 soil samples were collected across RAU 2B. Four explosive compounds were detected in soil at concentrations above laboratory detection limits; however, the concentrations were well below CULs at the time of the assessment. Several metals were detected at concentrations exceeding laboratory detection limits; however, at the time of the assessment, the detected concentrations were considered within the range of naturally occurring background concentrations. Several samples from DA 2 detected concentrations above historical and current MTCA Method A CULs. For arsenic, the Method A CUL (20 mg/kg) has remained consistent over time. A Method B CUL is available that is significantly lower than the Method A CUL. The Method B CUL is 0.31 mg/kg. Maximum arsenic concentrations were measured at 30.1 mg/kg.

A total of nine groundwater samples were collected during initial site assessment from borings placed in RAU-2B. Concentrations of nitrate/nitrite and perchlorate were identified in some samples. An additional nine groundwater samples were collected from Base Boundary wells. Exceedances of groundwater CULs were not identified.

There are no changes to the site condition or use and changes to the CULs, when promulgated, do not affect the cleanup decision. Therefore, there are no changes to the cleanup goals that would affect the assessment of effectiveness.

6.1.3.2 Implementation of Institutional and Engineering Controls

The sitewide institutional and engineering controls apply to each of the sites within RAU 2B (DA2 and DA3).

6.1.4 Effectiveness Remedy for Remedial Action Unit 2C

6.1.4.1 Remedial Action Performance

The remedy for RAU 2C has not yet been implemented. A draft RI/FS document has been submitted to Ecology for review.

6.1.4.2 Implementation of Institutional and Engineering Controls

There are existing restrictions that prohibit groundwater use underlying LF4/DA1 and requiring that the development of groundwater use elsewhere within RAU 2C be reviewed and approved by Ecology and USACE. These restrictions, together with the sitewide ICs and ECs, are protective by not allowing contact with impacted groundwater, but require maintenance and enforcement until the final remedy is selected and implemented.

6.1.5 Effectiveness of Remedy for Remedial Action Unit 3

6.1.5.1 Remedial Action Performance

During the implementation of the RAU 3 remedial action, MEC or MPPEH were removed and disposed of during interim actions and four phases of clearance activities. Therefore, the potential risk presented by these specific items has been effectively addressed. However, as per the CAP, the clearance of area within RAU 3 varied.

Across the Central Valley Floor, clearance was completed to the frost depth. This was reported to be a depth of 14 inches at CBMR, which is reasonably consistent with the relatively higher elevation of the site compared to much of the County and the associated 12-inch frost depth defined by the local building code.

At areas outside of the Central Valley Floor, clearance depths consisted of:

- DA1 and DA2 (0 to 3 inches bgs clearance)

- Range Target Areas—Hand Grenade Range; Rifle Grenade Range; and 3.5-inch Rocket Range (0 to 3 inches bgs clearance)
- Firing Positions and Points—Artillery Positions 1, 2, 3, 4 and 7; Mortar Positions 1, 2, 5 and 6; Rifle Grenade Firing Point; and 3.5-inch Rocket Range Firing Point (0 to 14 inches bgs clearance)
- Road and Trail Stepout Areas (0 to 3 inches bgs clearance)

Areas associated with the CITA were cleared as follows:

- CITA Target Areas Polygon—surface clearance (0 inches) consisting of a 100-acre polygon encompassing 15 identified target areas and the locations of previous MEC findings locations.
- CITA Road Alignment—subsurface clearance to 14 inches bgs within the 10-foot-wide road alignment within the CITA boundary (approximately 6,800 linear feet of roadway).
- Northern CITA Expansion Perimeter Fence/Road Easement, 40 feet wide and approximately 9,050 linear feet in length:
    - A 10-foot-wide area inside the fence alignment (surface clearance to 0 inches bgs).
    - A 10-foot-wide roadway alignment located just outside the fence line (surface and subsurface clearance to 14 inches bgs).
    - A 20-foot-wide area outside the roadway alignment (surface clearance to 0 inches bgs).

For areas within the western slopes, surface clearance was completed for areas with slopes less than 25%. Clearance was not completed when slopes exceeded 25%.

Materials remain at depth below the MEC clearance intervals. For example, Figure 6 of the Central Valley Floor Site-Specific Final Report (Weston, 2018) documents anomalies remaining across the Central Valley Floor. Maintenance of the ICs and ECs is necessary to be protective of human health.

6.1.5.2 Implementation of Institutional and Engineering Controls

Three of the four NFA letters issued for RAU 3 included a copy of the Quit Claim deed. The NFA letters for the CITA and Central Valley Floor specified that the County was to identify any new restrictions or appropriate modifications specific to RAU 3. If required, updated covenant provisions were to be reviewed and approved by Ecology. Institutional and engineering controls for RAU 3 were proposed in the Final RAU 3 CAP (BCRRT, 2010). The record does not include recording of covenants that require additional controls beyond those required in the Quit Claim deed.

An inspection in December 2024 identified that, while maintenance of fencing is ongoing, multiple fencing breaches are present due to downed trees and limbs. The fencing requires regular maintenance and enforcement to remain effective. Trespasser access has occurred on occasion at CBMR during periods that the fence is down or trespassers have caused the fence to be down. With some maintenance, the RAU-3 boundary and CITA fence effectiveness can be restored.

6.2 WAC 173-340-420 (4)(b) Is New Scientific Information Available for Hazardous Substances at the Site

This section summarizes new scientific information that may be available for COCs at CBMR.

6.2.1 Site Applicability—New Information for COCs

New information was not identified for the TPH and lead.

Toxicological information for RDX was last updated in 2018 to revise slope factors for carcinogenic risk (suggestive evidence exists of carcinogenic potential of RDX) and the reference dose for oral exposure (based on nervous system disruptions). Toxicological information for perchlorate was last revised in 2005. RDX and perchlorate are COPCs for RAU-2B. These changes are reflected in the preliminary CULs for this site. Additionally, case studies that support the effective use of enhanced bioremediation to address RDX and perchlorate in groundwater, as also included in the draft RI/FS for RAU-2C. New methods for the discovery of explosive materials are discussed below in Section 6.6.

Updated CULs based on revised toxicological information for RDX are reflected in the preliminary CULs for this site.

6.2.2 Site Applicability—PFAS

Information regarding human health risks for PFAS, and their application to cleanup projects, has been consistently evolving since its identification as an emerging contaminant.

In April 2024, EPA finalized a National Primary Drinking Water Regulation (NPDWR) for the following six PFAS: PFOA, PFOS, HFPO-DA, PFBS, PFHxS, and PFNA. EPA established the following MCLs:

PFOA	4 nanograms per Liter (ng/L)
PFOS	4 ng/L
PFHxS	10 ng/L
PFNA	10 ng/L
HFPO-DA	10 ng/L

In addition, EPA set an MCLG and MCL based on a hazard index (HI) of 1 for mixtures of two or more of the following PFAS: PFHxS, PFNA, HFPO-DA, and PFBS. That is, the sum of the individual hazard quotients for these PFAS in a water sample cannot exceed an HI of 1.

Both MCLs (for carcinogens and noncarcinogens) and MCLGs (for noncarcinogens) are identified as Applicable or Relevant and Appropriate Requirements (ARARs) under MTCA. The State has adopted these MCLs as its Method B CULs.

In September 2024, EPA published final science-based water quality concentrations for 10 PFAS that will help protect fish and other aquatic life from these chemicals. The levels, referred to as water quality criteria and benchmarks, are not regulatory and are not required. States and Tribes can consider using them to develop water quality standards, which inform the implementation of other Clean Water Act programs, like wastewater discharge permits.

Tables 6 and 7 screen the 2023 SI data consistent with current EPA and Ecology methodology. The maximum detected PFOA concentration in sample CB186402-GW-01, 4.9 ng/L, exceeds the MTCA Method B screening level that is based on the MCL. This is the only PFAS compound that exceeds a current criterion. Soil and surface water concentrations were below CULs. An HI was calculated using the maximum concentration in groundwater samples. The resulting HI was 0.4, below the criterion of 1.

6.3 WAC 173-340-420 (4)(c) Are New State or Federal Laws for Hazardous Substances at the Site Applicable?

New state or federal laws specific to TPH, lead, RDX, and perchlorate were not identified. New regulations or laws are available relating to PFAS and State requirements for consideration of environmental justice (EJ) in state actions.

6.3.1 New Regulations or Laws—PFAS

In 2021, Ecology concluded PFAS compounds are a Dangerous Waste and meet the definition of a hazardous substance under MTCA. Also, the Washington State Department of Health (DOH) issued final groundwater Washington State Action Levels (SALs) for the following PFAS compounds: PFOA, PFOS, PFNA, PFHxS, and PFBS.

In April 2024, EPA finalized a critical rule to designate two widely used PFAS, PFOA and PFOS, as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act.

In April 2024, EPA issued the first-ever national, legally enforceable drinking water standard to protect communities from exposure to PFAS. EPA established legally enforceable levels, called MCLs, for five PFAS in drinking water, PFOA, PFOS, PFHxS, PFNA, and HFPO-DA as contaminants with individual MCLs, and PFAS mixtures containing at least two or more of PFHxS, PFNA, HFPO-DA, and PFBS using an HI MCL to account for the combined and co-occurring levels of these PFAS in drinking water. EPA also finalized health-based, non-enforceable maximum contaminant level goals (MCLGs) for these PFAS. As part of the rule, public drinking water systems are required to comply with a PFAS monitoring and reduction program, summarized below:

- Public water systems must monitor for these PFAS and have three years to complete initial monitoring (by 2027), followed by ongoing compliance monitoring. Water systems must also provide the public with information on the levels of these PFAS in their drinking water beginning in 2027.
- Public water systems have five years (by 2029) to implement solutions that reduce these PFAS if monitoring shows that drinking water levels exceed these MCLs.
- Beginning in five years (2029), public water systems that have PFAS in drinking water which violates one or more of these MCLs must take action to reduce levels of these PFAS in their drinking water and must provide notification to the public of the violation.

The Dangerous Waste listing for PFAS compounds is a relevant future consideration. Designation of PFAS as hazardous substances make them subject to cleanup under Ecology's MTCA rules. If future PFAS cleanup is required, compliance with the Dangerous Waste regulations will be required.

A public water system is defined by EPA as a public or private water system that provides water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year. The water system at the property has the capacity to be a public system but does not currently meet that definition. The on-site wells are for non-potable purposes only because of contamination from other hazardous substances. PFAS sampling of the on-site water wells has not been conducted.

6.3.2 New Regulations or Laws—HEAL Act

The Healthy Environment for All Act (also known as the HEAL Act) was enacted in 2021 to create a coordinated and collaborative approach to EJ, making it a priority and part of the mission of key state agencies. State actions, in this case the CBMR cleanup, are required to consider possible impacts to vulnerable populations and overburdened communities, as required under WAC 173-340-350(6)(h)(iii). This review was prepared following the guidance in Section 4.0 of Implementation Memo No. 25, Identifying Likely Vulnerable Populations and Overburdened Communities under the Cleanup Regulations (Ecology, 2024). The table below summarizes the review. Supporting information is included in Appendix D.

Criteria	Test	Result
Washington State Environmental Health Disparities (EHD) Index	Ranking on EHD Map	EHD Map Result: 4
EJ Screen Demographic Index	80th percentile or greater	Limited English speaking (Spanish, Indo-European Languages, Asian Pacific Island, other): 56% Over the age of 65: 73%
EJ Screen Environmental Burden Indicator	80th percentile or greater	Particulate Matter 2.5: 96%
EJ Screen Supplemental Demographic Index	80th percentile or greater	Supplemental Indexes: all less than 80%

EHD were not identified (EHD Index Map result = 4).

The EJ demographic index indicates vulnerable populations are not present. All percentile markers came in at less than 80%. The most notable environmental burden indicator was for particulate matter 2.5 (PM2.5) at 96%. The Supplemental Demographic Index values also reflected a percentile of less than 80%. Common sources of PM2.5 include wood smoke, wildfires, vehicles, industry, power plants, construction and agriculture, and ships and trains. Cleanup activities that generate PM2.5 are not ongoing. Episodic PM2.5 generation related to trucking and equipment use for remediation is possible. Future operation as a regional park could result in excess PM2.5 generation. Use of the EJ Screen model was discontinued by EPA in early 2025 after this evaluation was completed.

6.4 WAC 173-340-420 (4)(d) Current and Projected Site and Resource Uses

As summarized in the APPCD, the projected end use of the property is a regional park. The County's reuse plan is summarized in the Camp Bonneville Reuse Plan (Otak, 2005). A timeline for development of this property has not yet been approved by County Council. Current interim uses are limited and consist of law enforcement training, seasonal use by DNR helicopter tactical team (Heli-Tact), and some logging.

6.4.1 Law Enforcement Training

The FBI currently operates a firing range that it constructed at Camp Bonneville in 1995. The FBI range is shown in Figure 10. Mobile response, patrol, close quarter, and Special Weapons and Tactics (SWAT) training activities are also conducted by the law enforcement organizations at the Camp Bonneville Cantonment. Ammunition is stored at the FBI range by the FBI and Clark County Sheriff's Office. Additionally, the ATF stores small quantities of explosives materials in magazines near Building 2950.

Interviews conducted for this summary report identified that the FBI includes quarterly firearms training for its law enforcement officials and monthly training for its SWAT operators. Quarterly firearms training is four sessions per quarter and involves pistol and rifle qualifications and marksmanship skill building. It also involves medical training and search/arrest procedures. SWAT trains four times per month and conducts firearms drills and close quarter clearing/arrest techniques.

Interviews conducted for this summary report identified that the Clark County Sheriff uses the range twice a month for a firearms open range day for deputies to practice and qualify. In addition, the Sheriff's Office reserves up to 14 days a year to potentially use it for patrol training days, though its actual use may be less.

The Mobile Response Team infrequently uses the range for training. A few additional days a year are sometimes used for the citizens academy and new hire firearms orientation. Finally, the Metro Explosive Disposal Unit (MEDU) uses the FBI range for firearm training. MEDU infrequently uses areas outside the FBI range for robot and bomb squad training.

6.4.2 DNR Heli-Tack Operations

The County has an interlocal, short-term lease agreement with DNR, which establishes a forward operating base for helicopter operations. DNR's helicopter operations at Camp Bonneville assist its efforts to mitigate and improve response times for wildfires in the area. DNR has been using Camp Bonneville to conduct these operations since 2019 (CCPW, 2022). The agreement includes adequate space for a helicopter, fuel truck, and Building T-4155 to house crew members and limits WDNR's access of Camp Bonneville to only the barracks, parking area, one additional building (T-1980), and airfield near the main camp entrance.

6.4.3 Forestry Operations

Logging to promote forest health is periodically completed. Logging is completed by outside contractors and consists of thinning/dead limb removal from below and removing smaller trees. Logging is only completed in areas outside of the CITA or critical areas (wetlands, etc.). Ground disturbance protocols are communicated in the contract documents and logging contractors receive MEC training. Logging is completed under permit from DNR. DNR notifies Ecology of logging activities. Table 8 summarizes the forestry practices at CBMR since 2012. As shown on the table, all activities were related to thinning, hazard removal, and replanting to promote forest health.

6.4.4 Projected Site Uses

Projected site uses include the regional park plan. The County's reuse plan has nine specific components: regional park, law enforcement training center, rustic retreat center/outdoor school, Native American culture center, Clark College environmental education, trails and nature area, FBI firing range, timber resource management area, and habitat restoration (Otak, 2005). The concept for the park redevelopment is shown in Figure 10.

6.5 WAC 173-340-420 (4)(e) Availability and Practicability of More Permanent Remedies

6.5.1 Remedial Action Unit 1

Further remedy is required by institutional controls in place for RAU-1 to address the residual contamination beneath Building 4475 and Building T-1932 in the event that the buildings are removed (or the contaminated soil becomes otherwise accessible). In the event that Building 4475 and Building T-1932 are demolished, a permanent remedy involving excavation could be readily implemented.

6.5.2 Remedial Action Unit 2A

The remedies completed at RAU-2A have successfully addressed potential risks to human health and it was determined that no further remedy is needed. However, the two soil covers (RAU-2A-16 and RAU-2A-21) are susceptible to damage and will require perpetual inspection and maintenance to remain effective. Further removal of the underlying contaminated soil could be considered to be a more permanent remedy, but it would not be considered practicable as it would require removal of the existing clean overburden as well as an undefined extent of underlying contaminated soil over a large area. Improvements to the existing soil covers (as outlined in Section 6.1) could be reasonably practicable and could address concerns about erosion and re-emergence of underlying contamination but would still require inspection and maintenance.

6.5.3 Remedial Action Unit 2B

There is no further remedy needed for RAU-2B.

6.5.4 Remedial Action Unit 2C

The remedy for RAU 2C has not yet been implemented. The draft RI/FS includes consideration of permanent remedies (including the permanent destruction of COPCs).

6.5.5 Remedial Action Unit 3

The cleanup action for RAU-3 has included the permanent removal of MEC/MPPEH items from the Site, but it is likely that additional MEC items exist in areas that were not cleared. The final reports for RAU 3 Phases I through IV indicate that metallic anomalies are present at depths below the MEC clearance completed for RAU 3. The potential for MEC to remain on site is highest within the CITA, relative to other areas of CBMR. Physical removal would be the only permanent remedy for the MEC/MPPEH but is only practicable when the discrete items are located with detection equipment prior to removal and located away from steep terrain where excavation is less practicable.

The predominant method that has previously been used at the Site for location of subsurface items was analog detectors (F1 Minelab all-metals detectors; Weston, 2018). Other technologies exist for locating subsurface items, including the recent development of drone-mounted GPR units (Taranenko, 2019; Troscianko, 2022). Drone-mounted GPR units have been used successfully for the discovery of buried MEC at other sites and are uniquely suitable for difficult terrain and dangerous sites. However, the minimum size that can be resolved with currently available airborne GPR equipment is greater than 5 centimeters (about 2 inches), which is larger than several of the items known to present a potential explosive hazard (such as the 37-mm projectile fuze and 14.5-mm subcaliber projectile (Weston, 2018) Therefore, this method has similar issues as were encountered with the digital geophysical mapping methods previously used. The aerial GPR may be suitable for identifying larger MEC items in the areas identified as being inaccessible (such as on slopes that were greater than 25%) but could not be relied on to identify all MEC/MPPEH items. Additional clearance should be completed in areas of future ground disturbance.

6.6 WAC 173-340-420 (4)(e) Availability and Improved Analytical Techniques

Since the completion of the cleanup actions at the site and associated reporting, significant developments have been made in the detection of trace explosives, but the majority of these developments require a material sample or contact with the material (including spectrometry, biosensors, and surface-enhanced Raman scattering [SERS]), which would not be suitable for the discovery of MEC at the Site. Other methods are reportedly being developed that use non-contact methods, such as monitoring for trace quantities of vapors from explosive materials or using laser-acoustic technology (LAMBDIS), but these methods are not currently available for commercial use and are unlikely to be suitable to CBMR due to the heterogeneity of the ground, the abundance of organic material and plants, and the depth of the potential MEC.

6.6.1 Availability and Improved Analytical Techniques: PFAS

Until recently, PFAS was primarily analyzed using EPA 537, which is a drinking water method modified for environmental media. In January 2024, the EPA released three methods to better measure PFAS in the environment:

- Final EPA Method 1633, a method to test for 40 PFAS compounds in wastewater, surface water, groundwater, soil, biosolids, sediment, landfill leachate, and fish tissue
- Final EPA Method 1621, which can broadly screen for the presence of chemical substances that contain carbon-fluorine bonds, including PFAS, in wastewater

- Other Test Method (OTM)-50, which measures 30 volatile fluorinated compounds in air

6.6.1.1 Site Applicability

The SI analyzed samples using an equivalent method to EPA 537, which includes analysis for eight compounds (PFOS, PFOA, PFBA, PFBS, PFNA, PFHxA, PFHxS, and HFPO-DA/GenX). Method EPA 1633, released in 2024, provides for analysis of 40 PFAS-related compounds. Future sampling of environmental media at the site should utilize EPA 1633.

EPA 1633 has MRLs that are approximately 3 and 10 times lower than the modified 537 method that were used in the SI. As summarized in Tables 6 and 7, the higher MRLs that were used during the SI did not result in MRLs that were above the RSLs used in the SI.

6.7 Technical Assessment Summary

In general, the technical review of the CBMR cleanup actions identified the need to complete planned tasks (such as the site O&M Plan), record applicable restrictive covenants for RAU 2A and RAU 3, implement a defined inspection program, and intensify sitewide fence maintenance. Specifics for each remedial action unit are described below.

6.7.1 Remedial Action Unit 1

Previous actions across RAU-1 have addressed exceedances of the reported CULs. The institutional controls associated with the residual contamination beneath Building 4475 and Building T-1932 are in place and effective for the current use. Maintenance of these controls will be necessary until that contamination is addressed (such as through a cleanup action following a future change in site use that includes the removal of the buildings).

6.7.2 Remedial Action Unit 2A

Significant waste removal actions have permanently improved the condition of RAU-2A. Two minor exceptions were identified:

- Elevated concentrations of lead (135 and 423 mg/kg) above applicable CULs were identified at the Machine Gun Range South Site, but records of remediation were not identified. Machine Gun Range South was identified in the RAU 2A RI/FS and RAU 2A CAP (BCCRT, 2008). Machine Gun Range South was not selected for remedy, likely because the average concentrations was less than 250 mg/kg.
- Confirmation sample results are not reported in the 2018 Cleanup Action Report (Weston, 2018) for RAU-2A.

These conditions are considered data gaps.

Further improvements to the two soil caps (RAU-2A-16 and RAU-2A-21) are recommended to improve effectiveness and reduce the potential for future releases, including:

- Signage at both areas alerting to the presence of the soil cap and prohibiting vehicular access
- Removal of the trees within the RAU-2A-21 soil cover and filling any related voids in the cover
- Physical maintenance of the caps to include fill of tracked area and protection against further erosion at RAU-2A-20
- Demarcation of the boundary of both soil covers and installation of signage
- Annual inspection program, including monitoring erosion distance to RAU-2A-16 streambank

- Removal of non-grassy plants (such as shrubs or saplings) across both soil cover areas

6.7.3 Remedial Action Unit 2B

Data for the cleanup decision for RAU-2B largely did not identify exceedances of CULs in soil and groundwater, the exception of detected arsenic concentrations at DA 2 being present above naturally occurring background concentrations and CULs. The precise location of DA 2 is not known. Groundwater assessment of DA 2 concluded impacts to groundwater have not occurred.

6.7.4 Remedial Action Unit 2C

RAU 2C is still undergoing RI/FS and quarterly monitoring continues. Cleanup may be initiated following Ecology's acceptance of the RI/FS report and development of an updated Cleanup Action Plan.

6.7.5 Remedial Action Unit 3

While significant amounts of MEC/MPPEH have been removed from RAU-3, it is expected that residual items remain, particularly with the Central Valley Floor and CITA. For example, numerous unidentified items were mapped at depths below the clearance depth of 14 inches across the Central Valley Floor and are also expected to be present below the clearance depths across the rest of RAU-3, and outside areas where clearance/cleanup was not performed.

Institutional and engineering controls were required for RAU 3 in the RAU 3 CAP (BCRRT, 2010) and the 2017 CAP amendment (Ecology, 2017). These included annual surface MEC inspection and surface MEC inspection after heavy rainstorms, signage to inform the public about this area's past usage, fencing to restrict access, land use controls (restrictive deed covenants) to prohibit any future development and/or forestry and intrusive activities at this site (no change to 2010 RAU 3 CAP), and maintenance of the CITA as an access restricted area.

6.7.6 Sitewide Considerations

The long-term O&M plan has not been prepared. While the annual ECCR reports to the Army document compliance with a comprehensive list of restrictions and some plans are in place, O&M requirements are not documented in a comprehensive plan as required by the APPCD. The long-term O&M plan should include provisions for routine inspections, maintenance of records, and other requirements under the APPCD. Institutional or engineering controls developed based on the long-term O&M plan must be recorded on the property deed.

The boundary fence is damaged in multiple places, and improvements for timely repair are needed to maintain effectiveness.

The 2023 PFAS PA and SI identified minimal potential for PFAS sources at the site. A single PFAS compound in groundwater was detected in excess of CULs. The HI calculated using maximum groundwater concentrations was acceptable. Two data gaps were identified in association with the PFAS PA and SI:

- The Drum Disposal Area, Paint and Solvent Disposal Area, and the former sewage lagoons were excluded from sampling during the PFAS PA. Paints, solvents, and municipal wastewater can be sources of PFAS. Sampling of these areas should be considered if PFAS is evaluated further.

The SI utilized a shorter compound list and did not use EPA Method 1633, which was adopted in January 2024. EPA 1633 is currently the industry-wide practice for PFAS analysis because it tests for 40 PFAS compounds.

If the sitewide groundwater use restriction is modified to allow drinking water use, PFAS sampling should be completed as required for public water systems.

7 CONCLUSIONS

The summary report prepared for the CBMR included a summary of the basis of each cleanup action, a summary of the cleanup actions completed, inspections, interviews with key personnel, and evaluated the cleanup actions following WAC 173-340-420 (4). Based on the evaluation of the cleanup actions, data gaps or deficiencies related to the effectiveness and protectiveness of the remedial actions or implementation of institutional controls were identified. Key institutional controls including land use restrictions, public access, and groundwater use restrictions have been implemented. Unacceptable risks or exposures under the current land uses as a facility closed to the public were not identified. Each of the considerations related to the effectiveness and protectiveness of the remedial actions, as summarized below, can be readily corrected prior to park development.

RAU 1. Information compiled for the summary report indicates RAU 1 is in compliance. Additional actions are not recommended for RAU 1. Established institutional controls should remain in place.

RAU 2A. Information compiled for the summary report indicates RAU 2A is in general compliance, although a covenant for RAU 2A-16 and RAU 2A-21 has not been recorded. One exception was identified:

- Remediation was completed across RAU-2A. However, confirmation sampling results from RAU 2A excavation areas, other than RAU-2A-16 and RAU-2A-21, were not included in the Cleanup Action Report for RAU-2A Small Arms Ranges (Weston, 2018).

Each of these data gaps should be resolved through by locating applicable resources that resolve the data gaps or environmental sampling.

Improvements to the soil covers at RAU-2A-16 and RAU-2A-21 should be incorporated into the long-term O&M Plan. The following items are recommended to improve effectiveness and reduce the potential for future releases, including:

- Demarcation of the lateral boundary and installation of signage at both areas alerting to the presence of the CAP and prohibiting vehicular access
- Removal of the trees within the RAU-2A-21 soil cover and filling trunk scars
- Physical maintenance of the caps to include fill of tracked area at RAU-2A-20
- Routine inspection program, including monitoring erosion distance to RAU-2A-16 streambank
- Removal of non-grassy plants (such as shrubs or saplings) across both soil cover areas

RAU 2B. RAU 2B is in compliance. One remaining sample location is documented to exceed CULs:

- Detected arsenic concentrations at DA2 are present above naturally occurring background concentrations and CULs. DA2 is in a remote location and the physical location cannot be determined.

This exceedance of CULs was known and evaluated at the time of decision. No recommendations are offered for this RAU.

RAU 2C. Remedial Investigation is ongoing at this RAU. No recommendations are offered for this RAU.

RAU 3. Development potentially in conflict with land use controls was not identified, the CITA is maintained as an access restricted area, and CBMR regularly conducts MEC awareness training for contractors and visitors. Elements of the IC and EC program that were not being undertaken or could be improved include:

- The boundary fence and the CITA fence are down at multiple locations; intensive fence maintenance is required.
- Signage to inform the public about this area's past usage.
- Implementation of an inspection program that includes annual inspections and inspections following intense rain fall.

While significant amounts of MEC have been removed from RAU-3, residual items remain, particularly with the CITA. Numerous unidentified items were mapped at depths below the clearance depth of 14 inches across the Central Valley Floor.

Sitewide Considerations. The site is not in compliance with multiple institutional controls and the requirement to prepare a long-term O&M plan summarizing and documenting procedures for complying with engineering and institutional controls. The County is in compliance with land use requirements, conducts MEC awareness training, and maintains the access restrictions to CBMR. These measures have been effective on an interim basis at protecting contractors and visitors, as well as restricting access to CBMR. Priority should be assigned to completing the long-term O&M plan.

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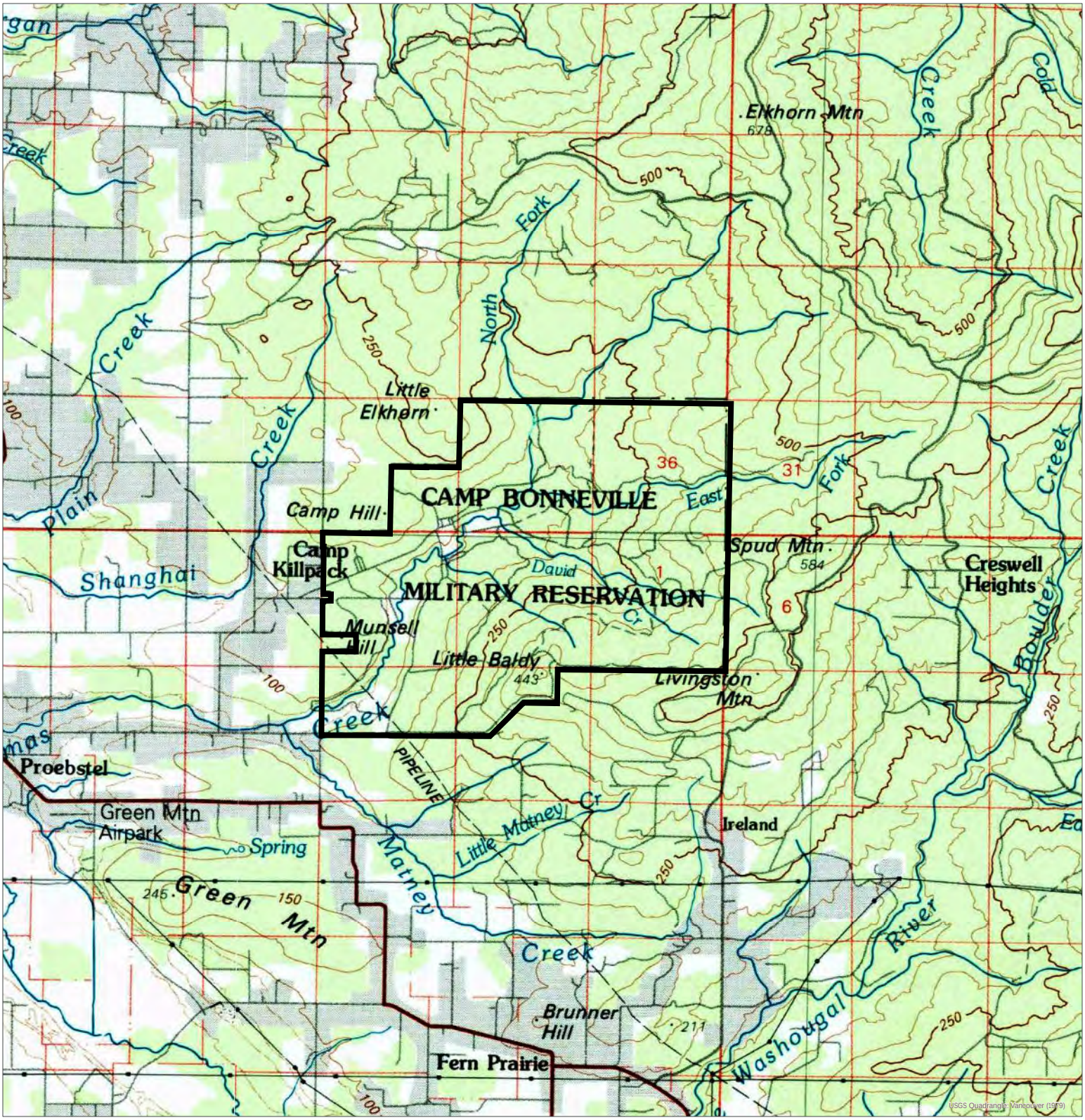
Figure 8. Camp Bonneville Sitewide Geologic Map
Figure 9. Institutional and Engineering Control Plan
Figure 10. Camp Bonneville Reuse Plan



Site Vicinity

23201 NE Pluss Road, Vancouver, Washington

Date: July 2025 | Project: CLA061-0314013-24011091

Figure: 1

Site Boundary

N

1 INCH = 1 MILE

0 ½ 1 Miles

PBS

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Site Plan

23201 NE Pluss Road
Vancouver, Washington

Date: July 2025
Project: CLA061-0314013-24011091

Figure: 2

- Water Supply Well
- General Groundwater Flow Direction
- Road/Trail
- Waterway
- Former Sewage Lagoon
- Central Valley
- Camp Bonneville Area
- Site Boundary
- Elevation Contour (20' Interval, via Clark County)

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

PBS

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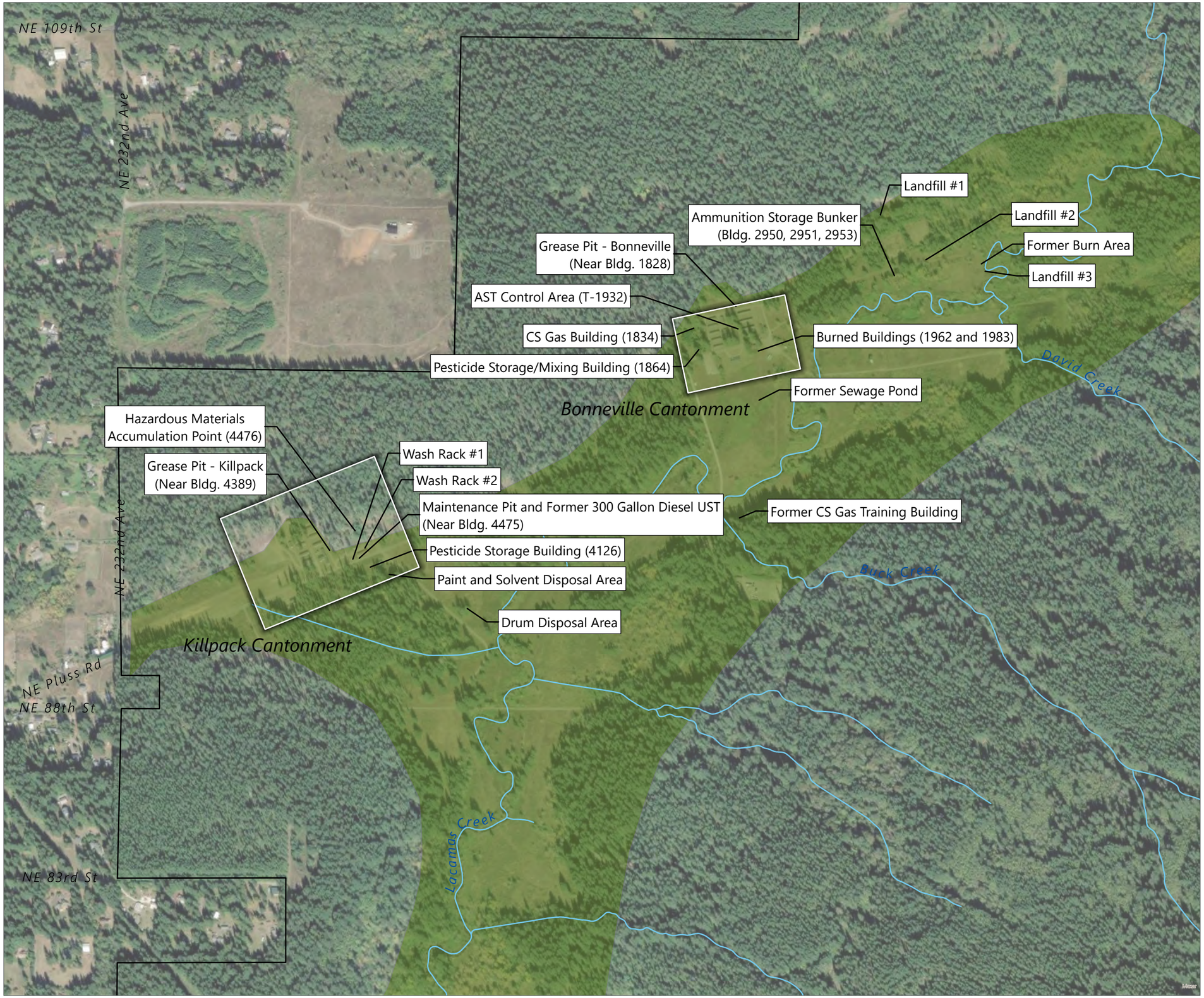

Remedial Action Unit #1

23201 NE Pluss Road
Vancouver, Washington

Date: July 2025

Project: CLA061-0314013-24011091

Figure: 3

- Waterway
- Base Boundary
- Central Valley

N

1 INCH = 750 FEET

0 750 1,500 Feet

PBS

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NAD 1983 StatePlane Washington South FIPS 4602 Feet | L:\Projects\76000\76100-76199\76151_Camp Bonneville, Vancouver\DWG\GIS\FiveYearReview\CampB5Year\CampB5Year.aprx | 7/24/2025 11:41 AM

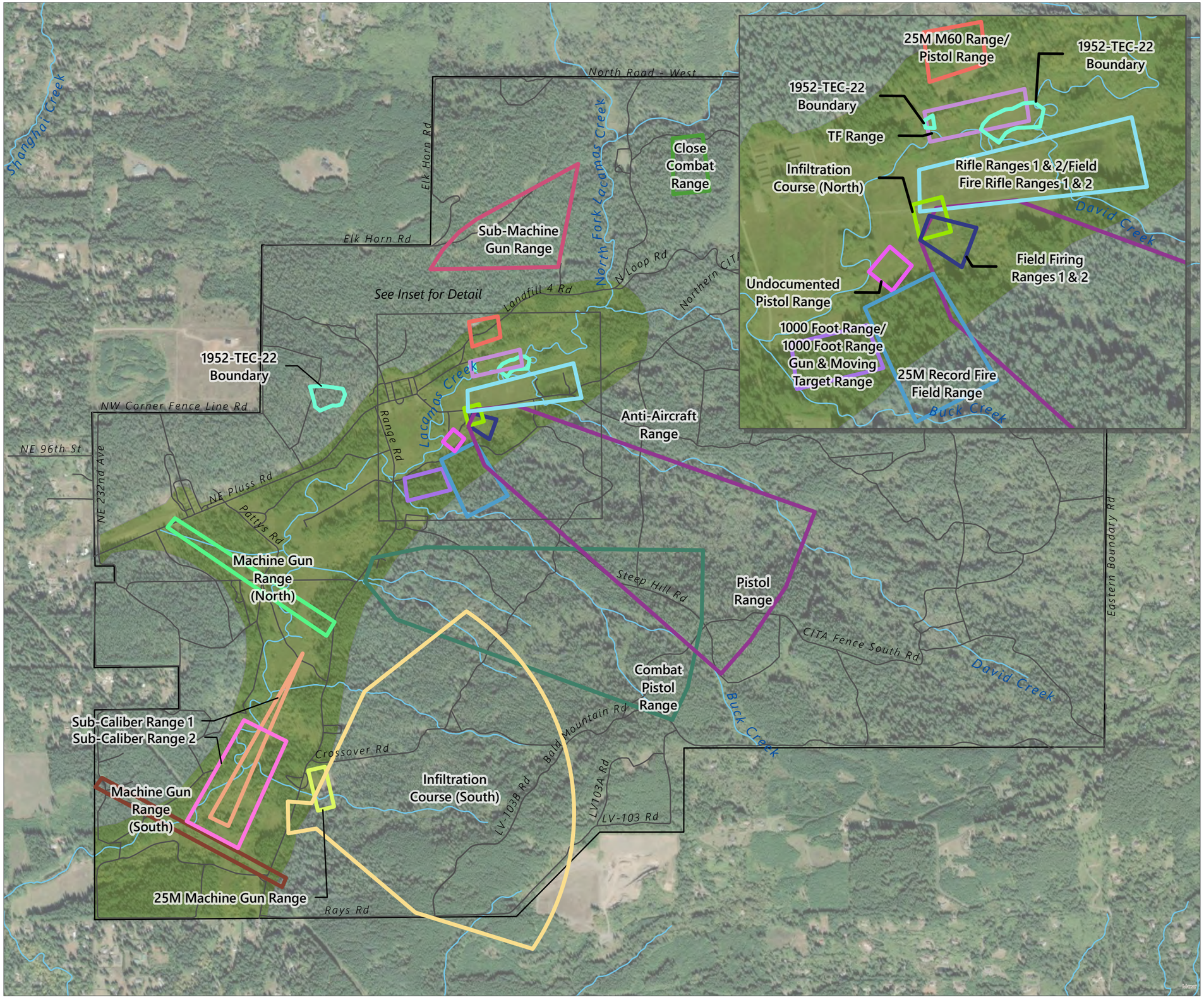
Remedial Action Unit #2A

23201 NE Pluss Road
Vancouver, Washington

Date: July 2025

Project: CLA061-0314013-24011091

Figure: 4



Ranges

- 1000 Foot Range/1000 Foot Range Gun & Moving Target Range
- 1952-TEC-22 Boundary
- 25M M60 Range/Pistol Range
- 25M Machine Gun Range
- 25M Record Fire Field Range
- Close Combat Range
- Combat Pistol Range
- Field Firing Ranges 1 & 2
- Infiltration Course (North)
- Infiltration Course (South)
- Machine Gun Range (North)
- Machine Gun Range (South)
- Pistol Range
- Rifle Ranges 1 & 2/Field Fire Rifle Ranges 1 & 2
- Sub-Caliber Range 1
- Sub-Caliber Range 2
- Sub-Machine Gun Range
- TF Range
- Undocumented Pistol Range
- Waterway
- Road/Trail
- Central Valley
- CBMR Boundary

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

PBS

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Remedial Action Unit #2B

23201 NE Pluss Road
Vancouver, Washington

Date: July 2025

Project: CLA061-0314013-24011091

Figure: 5

- Waterway Road/
- Trail Gas
- Pipeline Central
- Valley
- CBMR Boundary

1 INCH = 1,500 FEET

N

0 1,500 3,000 Feet

PBS

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

RAU-2C Well Locations

23201 NE Pluss Road
Vancouver, Washington

Date: July 2025

Project: CLA061-0314013-24011091

Figure: 6

- Monitoring Well
- Road/Trail
- Waterway
- Landfill 4/Demolition Area 1 (Tetra Tech, 2004)
- Central Valley
- Base Boundary
- Elevation Contour (20' Interval, via Clark County)

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

PBS

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

NAD 1983 2011 StatePlane Washington South FIPS 4602 Ft US | L:\Projects\76000\76100-76199\76151_Camp Bonneville, Vancouver\GIS\RIFS\76151_CampB_RIFS2022\76151_CampB_RIFS2022.aprx | 1/8/2025 11:32 AM

RAU 3 Areas

23201 NE Pluss Road
Vancouver, Washington

Date: August 2025

Project: CLA061-0314013-24011091

Figure: 7

RAU 3 Phase I and Phase II
- Wetland (via Clark County)
- Ranges and Firing Points (BCRRT, 2009)
- Demolition Area (Weston, 2020a)
- RAU 3 Phase 2 Boundary (Weston, 2018a)
- RAU 3 Phase 2 Stepout (Weston, 2018a)

RAU 3 Phase III
- Central Impact Target Area (Weston, 2021)
- Northern Central Impact Target Area Expansion (Weston, 2021)

RAU 3 Phase IV
- Greater than 25% Slope (Weston, 2020b)
- Less than 25% Slope (Weston, 2020b)
- Environmental Study Area (BCRRT, 2009)

Road/Trail (Weston, 2021)
- Road Graded, Buffer Zone Clearance (BCRRT, 2009)
- Road or Trail Not Part of BCRRT, 2009
- Northern CITA Access Road and Buffer MEC Clearance (Weston, 2021)

- Waterway
- CBMR Boundary

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

PBS

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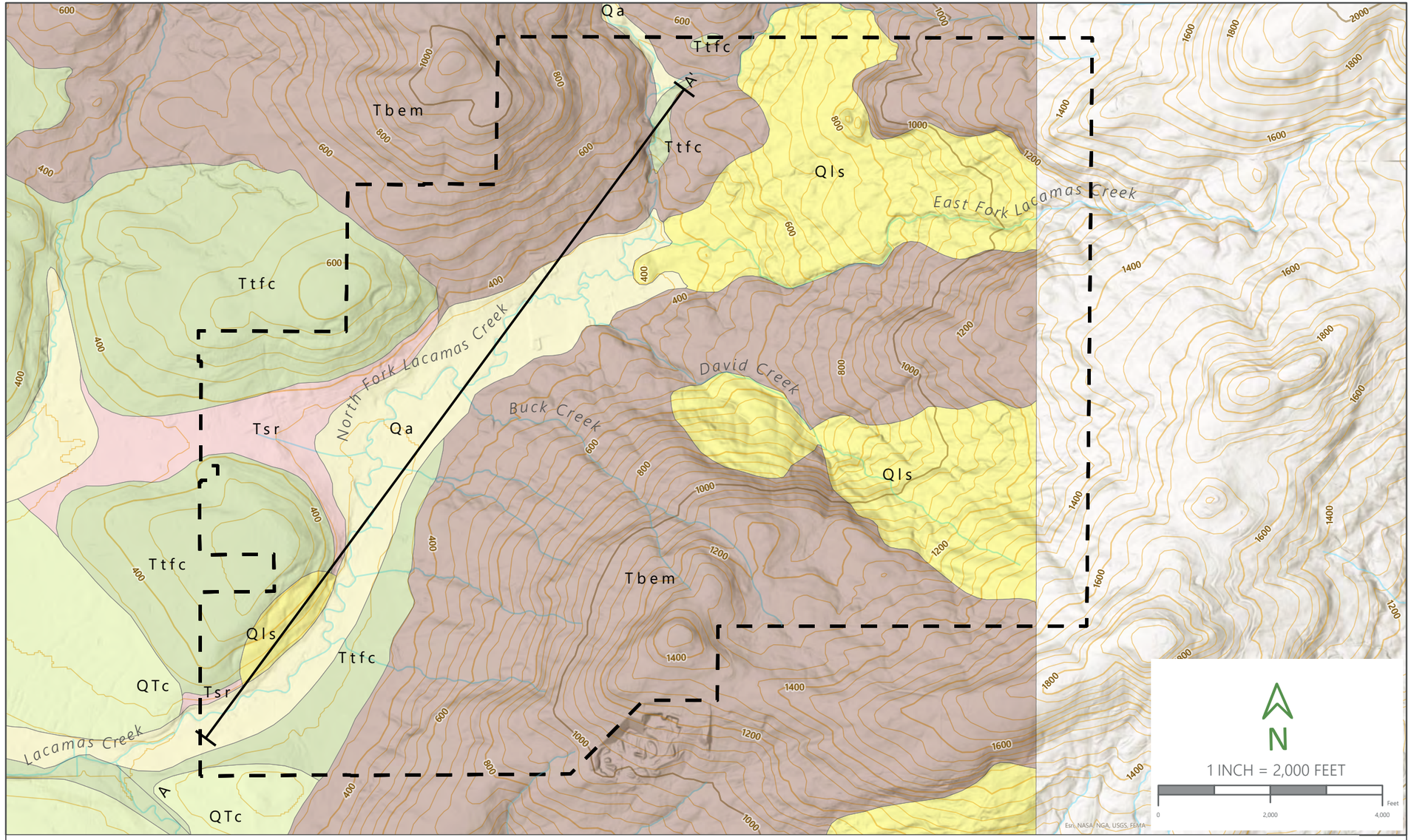
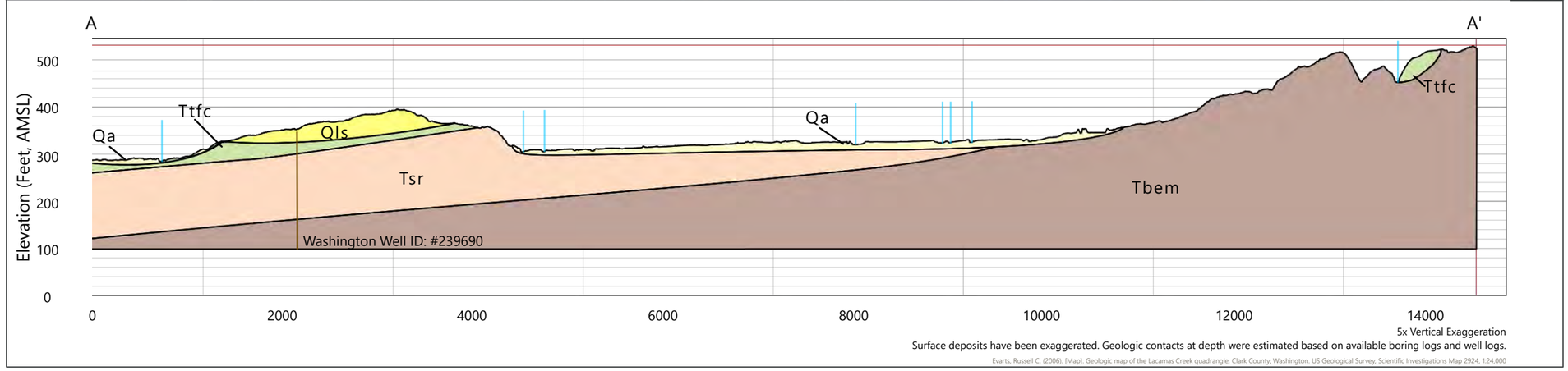
Camp Bonneville Sitewide Geologic Map

23201 NE Pluss Road
Vancouver, Washington

Date: July 2025
Project: CLA061-0314013-24011091

Figure: 8





Surface deposits have been exaggerated. Geologic contacts at depth were estimated based on available boring logs and well logs.

Evarts, Russell C. (2006). [Map]. Geologic map of the Lacamas Creek quadrangle, Clark County, Washington. US Geological Survey, Scientific Investigations Map 2924, 1:24,000

- Waterway
- Topographic Contour (40 Foot Interval)
- Site Boundary

Geologic Unit

- Alluvial Sediments (Qa)
- Landslide Deposits (Qls)
- Lower Troutdale Member (Ttfc)
- Sandy River Mudstone (Tsr)
- Basaltic Andesite of Elkhorn Mountains (Tbem)

PBS

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Institutional and Engineering Control Summary

23201 NE Pluss Road
Vancouver, Washington

Date: August 2025

Project: CLA061-0314013-24011091

Figure: 9

- Water Supply Well
- Waterway

Road/Trail (Weston, 2021)

- Road Graded, Buffer Zone Clearance (BCRRT, 2009)
- Road or Trail Not Part of BCRRT, 2009
- Northern CITA Access Road and Buffer MEC Clearance (Weston, 2021)
- Soil Cap
- Demolition Area 1/ Landfill 4 Groundwater Restriction
- Central Impact Target Area Fence and Signage - Restricted Area
- Boundary Fence with signage at 50' interval
- Elevation Contour (20' Interval, via Clark County)

Bldg. 4475
Bldg. T-1932 Institutional Control - Ground Disturbance

Note: This map summarizes the institutional and engineering controls that have been implemented and are associated with physical features at CBMR.

Note: This plan does not show the location of cultural resource sites 45-CL-318 in Quitclaim Deed and others identified during RAU3 remediation.

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

PBS

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Camp Bonneville Reuse Plan

23201 NE Pluss Road
Vancouver, Washington

Date: July 2025

Project: CLA061-0314013-24011091

Figure: 10

- Central Impact Target Area
- Regional Park
- Wildlife Management Area
- Road/Trail
- Waterway
- CBRM Boundary
- Elevation Contour (20' Interval, via Clark County)

N

1 INCH = 1,500 FEET

0 1,500 3,000 Feet

PBS

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Tables

Table 1. Effectiveness Screening RAU 1 Soil
Table 2. Effectiveness Screening RAU 1 Water
Table 3. Effectiveness Screening RAU 2A Soil
Table 4. Effectiveness Screening RAU 2B Soil
Table 5. Effectiveness Screening RAU 2B Groundwater
Table 6. SI Soil Boring Results: PFAS
Table 7. SI Drinking Water Results: PFAS
Table 8. Forestry Activity Summary

Table 1. Effectiveness Screening RAU 1 Soil
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Metal Background	Current MTCA B*	Landfill 2 & 3		Burn Area		Former Building (1962-1983)	Grease Pits		Former Sewage Pond		Hazardous Material Accumulation Point (Building 4476)		Drum Disposal Area		Paint And Solvent Disposal	Washrack 1 (Near Building 4475)		Washrack 2 (Near Building 4475)		Maintenance Pit (Near Building 4475)		Pesticide Mixing Building 1864		Aboveground Tank (Building T-1932)		Former CS Training Building		Pesticide Storage Building 4126		Ammunition Sotrage (Buildings 2950, 2951, 2953)		Underground Storage Tank (Near Building 4475)	
		Pre/Post Remedial Action				NA		NA		NA	NA		NA		NA		Pre	Post	NA	Pre		NA		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Total Number Samples Collected						9		11		16	5		17		3		4	6	5	5		5		9		12		9		11		3		27		15	
METALS—MAXIMUM CONCENTRATION																																					
Antimony	mg/kg	NS	32	0.12	32	0.079		0.1		--	0.088		0.24		0.062		0.65	--	0.12	0.26		0.088		0.28		0.54		--		--		7	ND	20		2.5		--	
Arsenic	mg/kg	20	0.667	7	0.31	4.5		3.4		--	**7.9**		**7.2**		0.96		2.5	5.73	5.3	4.1		3.9		3.8		**10.1**		1.89		--		--		1.8		**15.5**		5.36		--	
Barium	mg/kg	NS	5,600	257	16,000	255		--		--	374		--		91.8		388	230	181	244		143		176		242		--		--		--		1.8		2,590		208		--	
Beryllium	mg/kg	NS	160	2	160	1.3		1.3		--	1.2		1.1		0.36		1.3	--	1.2	1.3		0.87		1.3		1		--		--		--		1		5.6		0.824		--	
Cadmium	mg/kg	2	NS	1	80	0.13		0.19		--	0.055		1.5		1.3		1.45	0.71	1.1	1.8		0.68		1.2		**2.7**		0.847		--		--		0.9		**18.3**		1.21		--	
Chromium	mg/kg	2,000	120,000	42	120,000	29.3		33.8		--	24.2		31.4		6.1		34.7	56.3	34.7	31.6		22.6		37.8		28.9		--		--		--		30.2		114		43.4		--	
Copper	mg/kg	NS	2,960	114	3,200	134		104		--	133		123		48.5		125	118	79.2	163		82		149		166		--		--		--		85.8		297		120		--	
Lead	mg/kg	250	NS	17	250	13.1		17.9		149	24.4		13.2		12.4		71.3	50.1	14.2	**766**		88.7		12.8		**633**		NA		**295**		46.3		--		--		**674**		**290**		**970**		221		**566**		38.2		--	
Mercury	mg/kg	2	24	0.07	2	ND		0.07		--	ND		0.038		ND		ND	ND	ND	0.042		--		0.03		0.054		--		0.044		--		--		--		--		0.12		--		**4.2**		--		--	
Nickel	mg/kg	NS	1,600	38	880	12.7		15.1		--	19.9		23.3		13.7		14.4	--	12.9	9.9		--		9.7		9.5		--		14.8		--		--		--		--		18		--		117		20.9		--	
Selenium	mg/kg	NS	400	NS	400	0.1		0.23		--	0.34		0.13		ND		1.73	1.43	ND	0.62		--		ND		0.37		--		ND		--		--		--		--		--		--		<0.6		--		--	
Silver	mg/kg	NS	400	NS	400	0.24		0.26		--	0.24		0.32		0.21		0.287	--	0.19	0.22		--		0.13		0.24		--		0.18		--		--		--		--		0.7		--		2.9		--		--	
Thallium	mg/kg	NS	56	0.27	0.8	0.16		0.29		--	0.28		0.36		ND		ND	--	ND	ND		--		ND		0.26		--		0.24		--		--		--		--		--		0.49		ND		--	
Zinc	mg/kg	NS	24,000	86	24,000	92.3		182		--	78.1		80.2		51.5		74.7	--	150	158		--		66.5		364		--		350		--		--		--		--		330		--		525		84.4		--	
VOLATILE ORGANIC COMPOUNDS—MAXIMUM CONCENTRATION																																															
Acetone	mg/kg	NS	8,000	NS	72,000	--		0.013		--	--		0.0037		--		0.24	--	--	0.083		--		0.052		--		0.026		--		--		--		--		--		--		--		--		--		--	
cis-1,2-Dichloroethene	mg/kg	NS	800	NS	160	--		--		--	--		--		--		--	--	--	--		--		ND		--		--		--		--		--		--		--		--		--		--		--		--	
2-Butanone (MEK)	mg/kg	NS	48,000	NS	48,000	--		--		--	--		--		--		0.05	ND	--	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
Ethylbenzene	mg/kg	6	8,000	NS	8,000	--		--		--	--		--		--		**62.9**	ND	--	--		--		--		--		--		--		--		--		--		--		--		--		--		--		0.4	
Isopropylbenzene	mg/kg	NS	8,000	NS	8,000	--		--		--	--		--		--		0.01	ND	--	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
n-Propylbenzene	mg/kg	NS	NS	NS	8,000	--		--		--	--		--		--		0.0075	ND	--	--		--		ND		--		--		--		--		--		--		--		--		--		--		--		--	
p-isopropyltoluene	mg/kg	NS	NS	NS	NS	--		--		--	--		--		--		--	ND	--	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
1,3,5-Trimethylbenzene	mg/kg	NS	NS	NS	800	--		--		--	--		--		--		11.3	--	--	--		--		ND		--		--		--		--		--		--		--		--		--		--		--		--	
1,2,4-Trimethylbenzene	mg/kg	NS	NS	NS	800	--		--		--	--		--		--		4.03	ND	--	--		--		ND		--		--		--		--		--		--		--		--		--		--		--		--	
tert-Butylbenzene	mg/kg	NS	NS	NS	8,000	--		--		--	--		--		--		0.006	--	--	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
sec-Butylbenzene	mg/kg	NS	NS	NS	8,000	--		--		--	--		--		--		--	ND	--	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
p-Cumene	mg/kg	NS	NS	NS	NS	--		--		--	--		--		--		0.02	--	--	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
2-Hexanone	mg/kg	NS	NS	NS	400	--		--		--	--		--		--		--	--	--	--		--		ND		--		--		--		--		--		--		--		--		--		--		--		--	
Carbon disulfide	mg/kg	NS	8,000	NS	8,000	--		--		--	--		0.0052		--		--	--	--	--		--		0.003				0.013		--		--		--		--		--		--		--		--		--		--	
Toluene	mg/kg	7	16,000	NS	6,400	--		0.002		--	--		--		--		**973**	ND	--	--		--		--		--		--		--		--		--		--		--		--		--		--		--		ND		--	
Naphthalene	mg/kg	0.1	1,600	NS	1,600	--		--		--	--		--		--		0.0032	ND	--	--		--		--		--		--		--		--		--		--		--		--		--		--		--		--	
m- & p-Xylenes	mg/kg	9	160,000	NS	16,000	--		0.0025		--	--		--		--		**169**	ND	--	--		--		ND		--		--		--		--		--		--		--		--		--		--		--		ND		--	

Table 1. Effectiveness Screening RAU 1 Soil
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Metal Background	Current MTCA B*	Landfill 2 & 3	Burn Area	Former Building (1962-1983)	Grease Pits	Former Sewage Pond	Hazardous Material Accumulation Point (Building 4476)	Drum Disposal Area		Paint And Solvent Disposal	Washrack 1 (Near Building 4475)		Washrack 2 (Near Building 4475)	Maintenance Pit (Near Building 4475)		Pesticide Mixing Building 1864		Aboveground Tank (Building T-1932)		Former CS Training Building		Pesticide Storage Building 4126		Ammunition Sotrage (Buildings 2950, 2951, 2953)		Underground Storage Tank (Near Building 4475)	
		Pre/Post Remedial Action				NA	NA	NA	NA	NA	NA	Pre	Post	NA	Pre	Post	NA	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Total Number Samples Collected						**9**	**11**	**16**	**5**	**17**	**3**	**4**	**6**	**5**	**5**	**8**	**5**	**9**	**6**	**12**	**4**	**9**	**49**	**11**	**8**	**3**	**6**	**27**	**17**	**15**	**18**
o-Xylene	mg/kg	9	160,000	NS	16,000	--	0.0026	--	--	--	--	**57.4**	ND	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--
Vinly Chloride	mg/kg	NS	0.667	NS	0.67	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--
Remaining VOCs	mg/kg	Varies	Varies	NS	Varies	ND	--	--	ND	--	ND	ND	ND	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--
SEMI-VOLATILE ORGANIC COMPOUNDS—MAXIMUM CONCENTRATION																															
Bis(2-ethylhexyl)phthalate	mg/kg	NS	71.4	NS	71	--	--	--	--	--	0.033	--	--	--	0.19	--	--	ND	--	0.18	--	--	--	0.063	--	--	--	0.38	--	--	--
Butyl benzyl phthalate	mg/kg	NS	16,000	NS	530	--	--	--	--	--	--	20.5	--	--	--	--	--	--	--	0.1	--	--	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	mg/kg	1	0.137	NS	1.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	0.055	--	--	--	--	--	--	--
Benzoic Acid	mg/kg	NS	320,000	NS	320,000	--	--	--	--	--	--	4.16	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diethyl phthalate	mg/kg	NS	64,000	NS	64,000	--	--	--	0.081	--	--	--	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dinitrotoluene	mg/kg	NS	160	NS	3.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.7	--	--	--	--	--	--	--
2,6-Dinitrotoluene	mg/kg	NS	80	NS	0.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.051	--	--	--	--	--	--	--
Di-n-butyl phthalate	mg/kg	NS	8,000	NS	8,000	--	--	--	--	--	--	--	--	--	0.075	--	--	--	--	0.19	--	--	--	0.17	--	--	--	--	--	--	--
N-nitrosodiphenylamine	mg/kg	NS	204	NS	200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5	--	--	--	--	--	--	--
Hexachlorobenzene	mg/kg	NS	0.625	NS	0.63	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.19	<0.10	--	--	--	--	--	--	--	--	--	--
Pyrene	mg/kg	NS	2,400	NS	2,400	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.066	--	--	--	--	--	--	--
Remaining SVOCs		Varies	Varies	NS	Varies	ND	ND	ND	--	ND	ND	ND	ND	ND	--	--	ND	--	--	--	--	--	ND	ND	ND	--	--	--	--	--	--
EXPLOSIVES—MAXIMUM CONCENTRATION																															
2,4,6-trinitrotoluene	mg/kg	NS	33.3	NS	33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.12	--	--	--
2,4-dinitrotoluene	mg/kg	NS	160	NS	3.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.2	ND	--	--
2-amino-4,6-dinitrotoluene	mg/kg	NS	NS	NS	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.28	--	--	--
4-amino-2,6-dinitrotoluene	mg/kg	NS	NS	NS	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.53	--	--	--
RDX	mg/kg	NS	9.09	NS	13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**410**	ND	--	--
HMX	mg/kg	NS	4,000	NS	4,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.18	--	--	--
PETN	mg/kg	NS	NS	NS	230	0.22	ND	--	--	--	--	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.4	ND	--	--
Picric Acid	mg/kg	NS	NS	NS	NS	ND	ND	--	--	--	--	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1	ND	--	--
Remaining Explosives		Varies	Varies	NS	Varies	--	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCBs—MAXIMUM CONCENTRATION																															
Arochlor 1260	mg/kg	NS	NS	NS	0.5	ND	ND	--	ND	ND	ND	0.0286	ND	--	ND	--	--	--	ND	ND	ND	--	--	--	--	--	--	--	--	ND	--
PESTICIDES—MAXIMUM CONCENTRATION																															
4,4'-DDD	mg/kg	NS	4.17	NS	4.2	--	--	--	--	--	--	--	ND	--	--	--	--	0.14	0.119	0.022	0.00172	--	--	--	--	0.076	0.201	--	--	--	--
4,4'-DDE	mg/kg	NS	2.94	NS	2.9	--	--	--	--	--	--	--	ND	--	--	--	--	0.091	0.102	0.044	<0.001	--	--	--	--	0.23	0.0342	--	--	--	--
4,4'-DDT	mg/kg	3	2.94	NS	2.9	--	--	--	--	--	--	--	ND	--	0.013	--	--	1	0.719	0.077	<0.001	--	--	--	--	2.7	0.108	--	--	--	--
Beta-BHC	mg/kg	NS	NS	NS	0.56	--	--	--	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--	--	0.0042	--	--	--	--	--
Endrin	mg/kg	NS	24	NS	24	--	--	--	--	--	--	--	ND	--	--	--	--	0.013	--	--	--	--	--	--	--	--	--	--	--	--	--

Table 1. Effectiveness Screening RAU 1 Soil
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Metal Background	Current MTCA B*	Landfill 2 & 3		Burn Area		Former Building (1962-1983)		Grease Pits		Former Sewage Pond		Hazardous Material Accumulation Point (Building 4476)		Drum Disposal Area		Paint And Solvent Disposal		Washrack 1 (Near Building 4475)		Washrack 2 (Near Building 4475)		Maintenance Pit (Near Building 4475)		Pesticide Mixing Building 1864		Aboveground Tank (Building T-1932)		Former CS Training Building		Pesticide Storage Building 4126		Ammunition Sotrage (Buildings 2950, 2951, 2953)		Underground Storage Tank (Near Building 4475)	
		Pre/Post Remedial Action				NA		NA		NA		NA		NA		NA		Pre	Post	NA		Pre	Post	NA		Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Total Number Samples Collected						9		11		16		5		17		3		4	6	5		5	8	5		9	6	12	4	9	49	11	8	3	6	27	17	15	18
Endosulfan Sulfate	mg/kg	NS	NS	NS	480	--		--		--		--		--		--		--	ND	--		--	--	--		0.015	--	--	--	--	--	--	--	--	--	--	--	--	--
Alpha Chlordane	mg/kg	NS	NS	NS	40	--		--		--		--		--		--		--	ND	--		0.0022	--	--		0.069	0.0508	--	--	--	--	--	--	--	--	--	--	--	--
Gamma Chlordane	mg/kg	NS	NS	NS	40	--		--		--		--		--		--		--	ND	--		0.0013	--	--		0.065	34.8	--	--	--	--	--	--	--	--	--	--	--	--
Gamma-BHC (Lindane)	mg/kg	20	1.67	NS	0.91	--		--		--		**2**		--		--		--	ND	--		--	--	--		--	--	--	--	--	--	--	--	0.002	--	--	--	--	--
2,4-D	mg/kg	NS	800	NS	800	--		--		--		--		--		--		--	--	--		--	--	--		--	--	0.081	<0.040	--	--	--	--	ND	--	--	--	--	--
2,4,5-T	mg/kg	NS	800	NS	800	--		--		--		--		--		--		--	--	--		--	--	--		--	--	0.026	<0.050	--	--	--	--	0.23	2.19	--	--	--	--
Methoxychlor	mg/kg	NS	400	NS	400	--		--		--		--		--		--		15.2	ND	--		--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Remaining Pesticides		Varies	Varies	NS	Varies	ND		ND		--		--		ND		ND		ND	ND	--		--	--	--		--	--	--	--	--	--	--	--	ND	--	--	--	--	--
HERBICIDES—MAXIMUM CONCENTRATION																																							
2,4-DB	mg/kg	NS	640	NS	NS	--		--		--		--		--		--		--	--	--		--	--	--		--	--	--	--	--	--	--	--	ND	ND	--	--	--	--
MCPP	mg/kg	NS	NS	NS	80	--		--		--		--		--		--		--	--	--		--	--	--		--	--	--	--	--	--	--	--	ND	ND	--	--	--	--
PETROLEUM HYDROCARBONS—MAXIMUM CONCENTRATION																																							
Gasoline-Range hydrocarbon	mg/kg	100	NS	NS	100	ND		ND		--		ND		ND		--		--	ND	--		--	--	--		--	--	--	--	--	--	--	--	ND	--	ND	--	--	--
Diesel-Range Hydrocarbon	mg/kg	2,000	NS	NS	2,000	ND		ND		--		ND		ND		--		--	ND	--		--	264	--		--	330	220	--	**37,000**	**2,690**	--	--	59	41.2	ND	--	**9,600**	1,500
Motor-Oil Hydrocarbon	mg/kg	2,000	NS	NS	2,000	ND		ND		--		ND		ND		--		--	ND	--		--	837	--		--	597	--	--	--	164	--	--	230	--	ND	--	--	--
Unknown hydrocarbon	mg/kg	2,000	NS	NS	2,000	--		--		--		82		--		20		61	ND	160		**2,100**	--	22		210	--	--	--	**9,000**	--	--	--	--	--	--	--	--	--

Notes

Bold exceeds historical MTCA cleanup level

Shaded exceeds current MTCA cleanup level

Bold and Shaded exceeds historical and current cleanup level

--: Not reported

*: MTCA A cleanup level used for petroleum hydrocarbons, lead, mercury

µg/kg: micrograms per kilogram

mg/kg: milligrams per kilogram

MTCA: Model Toxics Control Act

NA: not applicable

ND or <: not detected above reporting limit

NS: not set

PCB: polychlorinated biphenyl

Table 2. Effectiveness Screening RAU 1 Water
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Current MTCA B	Landfills 2 & 3	Burn Area	Former Building (1962-1983)	Grease Pits (Near Building 1828)	Former Sewage Pond	Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1 (Near Building 4475)	Washrack 2 (Near Building 4475)	Maintenance Pit (Near Building 4475)	Pesticide Mixing Building 1864	Aboveground Tank (Building T-1932)	Former Training Building	Pesticide Storage Building 4126	Ammunition Sotrage (Buildings 2950, 2951, 2953)	Underground Storage Tank (Near Building 4475)
Total # samples collected					**7**	**NA**	**NA**	**NA**	**2**	**3**	**NA**	**NA**	**NA**	**NA**	**2**	**NA**	**NA**	**NA**	**NA**	**NA**
TOTAL METALS—MAXIMUM CONCENTRATION																				
Antimony	mg/L	NS	0.0064	0.0064	ND	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--
Arsenic	mg/L	0.005	0.0000583	0.000058	**0.0035**	--	--	--	**0.0012**	**0.00298**	--	--	--	--	ND	--	--	--	--	--
Barium	mg/L	NS	1.12	3.2	0.038	--	--	--	0.039	0.47	--	--	--	--	0.19	--	--	--	--	--
Beryllium	mg/L	NS	0.032	0.032	ND	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--
Cadmium	mg/L	0.005	0.008	0.008	ND	--	--	--	ND	0.00153	--	--	--	--	0.00017	--	--	--	--	--
Chromium	mg/L	0.05	24	0.05	0.0021	--	--	--	0.0035	0.00125	--	--	--	--	ND	--	--	--	--	--
Copper	mg/L	NS	0.592	0.64	0.0044	--	--	--	0.0051	--	--	--	--	--	0.0035	--	--	--	--	--
Lead	mg/L	0.015	NS	0.015	0.00031	--	--	--	0.00056	**0.0666**	--	--	--	--	0.0027	--	--	--	--	--
Nickel	mg/L	NS	0.32	0.32	0.00095	--	--	--	0.0032	--	--	--	--	--	0.0027	--	--	--	--	--
Selenium	mg/L	NS	0.08	0.08	0.00019	--	--	--	0.00016	0.0021	--	--	--	--	0.0002	--	--	--	--	--
Silver	mg/L	NS	0.08	0.08	ND	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--
Thallium	mg/L	NS	0.00112	0.00016	0.00026	--	--	--	ND	--	--	--	--	--	0.00017	--	--	--	--	--
Zinc	mg/L	NS	4.8	4.8	0.0039	--	--	--	0.0056	--	--	--	--	--	0.029	--	--	--	--	--
Mercury	mg/L	0.002	0.0048	0.002	ND	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--
DISSOLVED METALS—MAXIMUM CONCENTRATION																				
Antimony	mg/L	NS	0.0064	0.0064	0.0002	--	--	--	0.00017	--	--	--	--	--	0.00036	--	--	--	--	--
Arsenic	mg/L	0.005	0.0000583	0.000058	**0.0035**	--	--	--	**0.0017**	--	--	--	--	--	**0.00042**	--	--	--	--	--
Barium	mg/L	NS	1.12	3.2	0.032	--	--	--	0.031	--	--	--	--	--	0.19	--	--	--	--	--
Beryllium	mg/L	NS	0.032	0.032	ND	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--

Table 2. Effectiveness Screening RAU 1 Water
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Current MTCA B	Landfills 2 & 3	Burn Area	Former Building (1962-1983)	Grease Pits (Near Building 1828)	Former Sewage Pond	Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1 (Near Building 4475)	Washrack 2 (Near Building 4475)	Maintenance Pit (Near Building 4475)	Pesticide Mixing Building 1864	Aboveground Tank (Building T-1932)	Former Training Building	Pesticide Storage Building 4126	Ammunition Sotrage (Buildings 2950, 2951, 2953)	Underground Storage Tank (Near Building 4475)
Total # samples collected					**7**	**NA**	**NA**	**NA**	**2**	**3**	**NA**	**NA**	**NA**	**NA**	**2**	**NA**	**NA**	**NA**	**NA**	**NA**
Cadmium	mg/L	0.005	0.008	0.008	ND	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--
Chromium	mg/L	0.05	24	0.05	0.0019	--	--	--	0.0012	--	--	--	--	--	ND	--	--	--	--	--
Copper	mg/L	NS	0.592	0.64	0.0047	--	--	--	0.0041	--	--	--	--	--	0.0098	--	--	--	--	--
Lead	mg/L	0.015	NS	0.015	ND	--	--	--	ND	--	--	--	--	--	0.0023	--	--	--	--	--
Mercury	mg/L	0.002	0.0048	NS	ND	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--
Nickel	mg/L	NS	0.32	0.32	0.00063	--	--	--	0.003	--	--	--	--	--	0.0038	--	--	--	--	--
Selenium	mg/L	NS	0.08	0.08	ND	--	--	--	ND	--	--	--	--	--	0.00015	--	--	--	--	--
Silver	mg/L	NS	0.08	0.08	ND	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--
Thallium	mg/L	NS	0.00112	0.00016	0.00015	--	--	--	ND	--	--	--	--	--	0.00027	--	--	--	--	--
Zinc	mg/L	NS	4.8	4.8	0.0043	--	--	--	0.0053	--	--	--	--	--	0.018	--	--	--	--	--
VOLATILE ORGANIC COMPOUNDS—MAXIMUM CONCENTRATION																				
Acetone	µg/L	NS	800	7,200	--	--	--	--	--	38.7	--	--	--	--	--	--	--	--	--	--
Benzene	µg/L	NS	0.795	32	--	--	--	--	--	**18.4**	--	--	--	--	--	--	--	--	--	--
Bromoform	µg/L	NS	5.54	5.5	--	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--
2-Butanone	µg/L	NS	4,800	NS	--	--	--	--	--	34.2	--	--	--	--	--	--	--	--	--	--
sec-Butylbenzene	µg/L	NS	NS	800	--	--	--	--	--	90.7	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	µg/L	NS	0.521	0.52	--	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--
Ethylbenzene	µg/L	NS	800	800	--	--	--	--	--	**2,150**	--	--	--	--	--	--	--	--	--	--
Isopropylbenzene	µg/L	NS	1,600	NS	--	--	--	--	--	23.2	--	--	--	--	--	--	--	--	--	--
p-Isopropylbenzene	µg/L	NS	NS	NS	--	--	--	--	--	17.2	--	--	--	--	--	--	--	--	--	--
Naphthalene	µg/L	NS	160	160	0.36	--	--	--	--	8.24	--	--	--	--	--	--	--	--	--	--
n-Propylbenzene	µg/L	NS	NS	NS	--	--	--	--	--	22.5	--	--	--	--	--	--	--	--	--	--
4-Methyl-2-pentanone	µg/L	NS	640	NS	--	--	--	--	--	58	--	--	--	--	--	--	--	--	--	--
m- & p-Xylenes	µg/L	NS	16,000	1,600	--	--	--	--	--	7,120	--	--	--	--	--	--	--	--	--	--

Table 2. Effectiveness Screening RAU 1 Water
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Current MTCA B	Landfills 2 & 3	Burn Area	Former Building (1962-1983)	Grease Pits (Near Building 1828)	Former Sewage Pond	Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1 (Near Building 4475)	Washrack 2 (Near Building 4475)	Maintenance Pit (Near Building 4475)	Pesticide Mixing Building 1864	Aboveground Tank (Building T-1932)	Former Training Building	Pesticide Storage Building 4126	Ammunition Sotrage (Buildings 2950, 2951, 2953)	Underground Storage Tank (Near Building 4475)
Total # samples collected					**7**	**NA**	**NA**	**NA**	**2**	**3**	**NA**	**NA**	**NA**	**NA**	**2**	**NA**	**NA**	**NA**	**NA**	**NA**
o-Xylene	µg/L	NS	16,000	1,600	--	--	--	--	--	2,940	--	--	--	--	--	--	--	--	--	--
Toluene	µg/L	NS	1,600	640	--	--	--	--	--	**3,010**	--	--	--	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	µg/L	NS	NS	80	--	--	--	--	--	29.7	--	--	--	--	--	--	--	--	--	--
1,2,4-Trimethylbenzene	µg/L	NS	NS	80	--	--	--	--	--	105	--	--	--	--	--	--	--	--	--	--
Remaining VOCs	µg/L	Varies	Varies	Varies	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SEMI-VOLATILE ORGANIC COMPOUNDS—MAXIMUM CONCENTRATION																				
Benzoic Acid	µg/L	NS	64,000	64,000	--	--	--	--	--	566	--	--	--	--	--	--	--	--	--	--
3 & 4 Methylphenol	µg/L	NS	800	NS	--	--	--	--	--	72.3	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl) phthalate	µg/L	NS	6.25	6.3	--	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--
Remaining SVOCs	µg/L	Varies	Varies	Varies	ND	--	--	--	ND	--	--	--	--	--	ND	--	--	--	--	--
PCBs		NS	NS	NS	--	--	--	--	--			--	--	--	ND	--	--	--	--	--
PESTICIDES	µg/L	Varies	Varies	Varies	--	--	--	--	--	--	--	--	--	--	ND	--	--	--	--	--
Explosives	µg/L	Varies	Varies	Varies	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TPH	µg/L	Varies	Varies	Varies	ND	--	--	--	--	--	--	--	--	--	ND	--	--	--	--	--
WATER QUALITY—MAXIMUM CONCENTRATION																				
Alkalinity total	mg/L	NS	NS	NS	--	--	--	--	112	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Bicarbonate, as CaCO3	mg/L	NS	NS	NS	--	--	--	--	112	--	--	--	--	--	--	--	--	--	--	--
Alkalinity Carbonate as CaCO3	mg/L	NS	NS	NS	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--
Alkalinity Hydroxide as CaCO3	mg/L	NS	NS	NS	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--
Chloride	mg/L	NS	NS	NS	--	--	--	--	1.6	--	--	--	--	--	--	--	--	--	--	--
Fluoride	mg/L	NS	0.96	0.96	--	--	--	--	0.17	--	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/L	NS	1.6	26	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--
Orthophosphate as P	mg/L	NS	NS	NS	--	--	--	--	ND	--	--	--	--	--	--	--	--	--	--	--
Sulfate	mg/L	NS	NS	NS	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--	--	--

Table 2. Effectiveness Screening RAU 1 Water
Camp Bonneville Periodic Review
Vancouver, Washington

Parameters	Units	Historical MTCA A	Historical MTCA B	Current MTCA B	Landfills 2 & 3	Burn Area	Former Building (1962-1983)	Grease Pits (Near Building 1828)	Former Sewage Pond	Drum Disposal Area	Paint and Solvent Disposal Area	Washrack 1 (Near Building 4475)	Washrack 2 (Near Building 4475)	Maintenance Pit (Near Building 4475)	Pesticide Mixing Building 1864	Aboveground Tank (Building T-1932)	Former Training Building	Pesticide Storage Building 4126	Ammunition Sotrage (Buildings 2950, 2951, 2953)	Underground Storage Tank (Near Building 4475)
Total # samples collected					**7**	**NA**	**NA**	**NA**	**2**	**3**	**NA**	**NA**	**NA**	**NA**	**2**	**NA**	**NA**	**NA**	**NA**	**NA**
Total Suspended Solids	mg/L	NS	NS	NS	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--
Calcium	mg/L	NS	NS	NS	--	--	--	--	20.9	--	--	--	--	--	--	--	--	--	--	--
Iron	mg/L	NS	NS	11	--	--	--	--	8.1	--	--	--	--	--	--	--	--	--	--	--
Magnesium	mg/L	NS	NS	NS	--	--	--	--	9.5	--	--	--	--	--	--	--	--	--	--	--
Manganese	mg/L	NS	2.24	0.75	--	--	--	--	1.2	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/L	NS	NS	NS	--	--	--	--	1.5	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/L	NS	NS	NS	--	--	--	--	10	--	--	--	--	--	--	--	--	--	--	--

Notes
Bold exceeds historical MTCA cleanup level
Shaded exceeds current MTCA cleanup level
Bold and Shaded exceeds historical and current cleanup level
--: analyte not tested
*: MTCA A cleanup level used for petroleum hydrocarbons, chromium, lead, mercury
ND: not detected above reporting limit
NS: not set
mg/L: milligrams per liter
µg/L: micrograms per liter
MTCA: Model Toxics Control Act
PCB: polychlorinated biphenyl
SVOC: semi-volatile organic compound
VOC: volatile organic compound

Table 3. Effectiveness Screening RAU 2A Soil
Camp Bonneville Periodic Review
Vancouver, Washington

RANGE	Number of Samples Collected (table 5-2)	Soil Volume Removed (cubic yards)	Maximum Lead Concentration (mg/kg)	
			Pre-Remedial Action	Post-Remedial Action
Close Combat Range	120	--	23.9	--
25 Meter M60 Range/Pistol Range (RAU-2A-17)	20	1,050	219	NCS
Sub Machine Gun Range	35	--	18.4	--
TF Range	40	--	30.2	--
Rifle Ranges 1 & 2 (RAU-2A-21)	160	4,060	(4,330)	(5,400)
Field Firing Ranges 1 & 2 & Pistol Range (RAU-2A-22)	110		(2,300)	NCS
Field Fire Rifle Ranges 1 & 2 (RAU-2A-20)	70	655	(7,150)	NCS
Infiltration Course North	20	--	44.1	--
Undocumented Pistol Range (RAU-2A-15)	5	105	154	NCS
1,000 Foot Range, Machine Gun & Moving Target Range (RAU-2A-16)	150	1,505	(10,200)	(660)
Combat Pistol Range (RAU-2A-4)	85	855	(785)	NCS
Machine Gun Range North	165	--	158	--
Machine Gun Range South	130	--	(423)	--
M31 Sub-Caliber Ranges 1 & 2	125	--	51.3	--
25 Meter and Machine Gun Range (RAU-2A-18)	65	285	(26,300)	NCS
Infiltration Course South	35	--	105	--
25 M Record Fire Field/Field Firing Range (RAU-2A-19)	200	530	(8,880)	NCS
Ecological Indicator - Plants			50	
Ecological Indicator - Wildlife			118	
Ecological Indicator - Biota			500	
MTCA A-Unrestricted Land			*250*	

Notes
Bold Range indicates remedial action (excavation) occurred
Shaded Range indicates covered by a soil cap
Parentheses () indicates MTCA Method A cleanup level exceedance
--: Not Identified
mg/kg: milligrams per kilogram
MTCA: Model Toxics Control Act
NCS = Confirmation sample not identified
NRC = Record of remediation or cleanup record identified.

Table 4. Effectiveness Screening RAU 2B Soil
Camp Bonneville Periodic Review
Vancouver, Washington

Constituent	Units	Historical MTCA Method B Cleanup Levels	Current MTCA Method B Cleanup Levels	Demolition Area 2	Demolition Area 3
TOTAL # OF SAMPLES				36	32
Perchlorate	mg/kg	0.0036	56	<0.033	<0.033
EXPLOSIVES—MAXIMUM CONCENTRATION					
Octahydro-1,3,5,7, - tetranitro-1,3,5,7 tetrazocine (HMX)	mg/kg	3,100	4,000	<2.5	<2.5
Hexahydro-1,3,5-trinitro-1,3,5-trinitro-1,3,5,-triazine (RDX)	mg/kg	4.4	13	<2.5	0.27
1,3,5-Trinitrobenzene (1,3,5-TNB)	mg/kg	1,800	2,400	<2.5	<2.4
1,3-Dinitrobenzene (1,3-DNB)	mg/kg	6.1	8	<2.5	<2.4
Methyl-2,4,6-trinitrotolunene (Tetryl)	mg/kg	610	NS	<2.5	<2.4
Nitrobenzene (NB)	mg/kg	20	160	<2.5	<2.4
2,4,6-Trinitrotoluene (2,4,6-TNT)	mg/kg	16	33	<2.5	0.51
4-Amiro-2,6-dinitrotoluene (4-Am-DNT)	mg/kg	4.7	8	<2.5	0.12
2-Amino-4,6-dinitrotolunene (2-Am-DNT)	mg/kg	4.7	8	<2.5	0.22
2,4-Dinitrotolunene (2,4-DNT)	mg/kg	NS	3.2	<2.5	<2.4
2,6-Dinitrotolunene (2,6-DNT)	mg/kg	NS	0.67	<2.5	<2.4
2- Nitrotoluene (2-NT)	mg/kg	NS	4.5	<2.5	<2.4
3-Nitrotoluene (3-NT)	mg/kg	NS	8	<2.5	<2.4
4-Nitrotoluene (4-NT)	mg/kg	NS	63	<2.5	<2.4
Picric Acid	mg/kg	NS	NS	<10	<2.4
Pentaerthritol Tetranitrate (PETN)	mg/kg	NS	230	<4	< 12
METALS—MAXIMUM CONCENTRATION					
Antimony	mg/kg	31	32	<11.9	11.7
Arsenic	mg/kg	20	0.31	**30.1**	10.04
Barium	mg/kg	5,400	16,000	454	221
Beryllium	mg/kg	150	160	--	0.52
Cadmium	mg/kg	2	80	<1.2	1
Chromium	mg/kg	210	120,000	43.6	24.8
Copper	mg/kg	2,900	3,200	160	363
Lead	mg/kg	250	NS	28.5	120
Mercury	mg/kg	2	NS	--	1.19
Nickel	mg/kg	1,600	1,600	36.5	23
Selenium	mg/kg	NS	400	--	<0.2
Silver	mg/kg	NS	400	--	<0.19
Thallium	mg/kg	5.2	0.8	--	0.4
Zinc	mg/kg	23,000	24,000	101	144

Bold exceeds historical MTCA cleanup level
Shaded exceeds current MTCA cleanup level
Bold and Shaded exceeds historical and current cleanup level
--: not identified
<: not detected above reporting limit
*: MTCA A cleanup level used for petroleum hydrocarbons, lead, mercury
mg/kg: milligrams per kilogram
MTCA: Model Toxics Control Act
NS: not set

Table 5. Effectiveness Screening RAU 2B Groundwater
Camp Bonneville Periodic Review
Vancouver, Washington

CONSTITUENT	UNITS	Historical MTCA Method B Cleanup Levels	Current MTCA Method B Cleanup Level	Demolition Area 2	Demolition Area 3
Total # samples collected				**4**	**5**
Chloride	mg/L	NS	NS	1.5	780
Sulfate	mg/L	NS	NS	1.8	640
Total Alkalinity	mg/L as CaCO3	NS	NS	24	144
Dissolved Organic Carbon	mg/L	NS	NS	0.5	1.5
Nitrate/Nitrite as Nitrogen	mg/L	NS	NS	18	9.8
Total Organic Carbon	mg/L	NS	NS	0.5	1.5
Total Suspeneded Solids	mg/L	NS	NS	340	140
Explosivces/PETN/Pitric Acid	µg/L	NS	Varies	ND	ND
Perchlorate	µg/L	NS	11	0.25	12[a]
VOC's/SVOC's	µg/L	Varies	Varies	--	NA
Total Petroleum Hydrocarbon	µg/L	1,000	500	--	NA
TPH-Gasoline	µg/L	NS	1,000	--	NA
TPH-Diesel	µg/L	500	500	--	80
METALS—TOTAL					
Arsenic	µg/L	NS	0.058	ND	ND
Copper	µg/L	NS	640	ND	5.79
Lead	µg/L	15	15	5.14	5.29
Zinc	µg/L	500	4,800	14.3	27.6
METALS—DISSOLVED					
Arsenic	µg/L	10	0.058	ND	ND
Copper	µg/L	1,300	640	ND	ND
Lead	µg/L	NS	15	ND	ND
Zinc	µg/L	NS	4,800	ND	27.6

Notes
Bold exceeds historical MTCA cleanup level
Shaded exceeds current MTCA cleanup level
Bold and Shaded exceeds historical and current cleanup level
[a]: Sample result determined not to be valid, resample was < 2 µg/L
*: MTCA A cleanup level used for petroleum hydrocarbons, lead, mercury
mg/L: milligrams per liter
µg/L: micrograms per liter
MTCA: Model Toxics Control Act
ND: not detected above reporting limit
NS: not set

Table 6. SI Soil Boring Results: PFAS
Camp Bonneville Periodic Review
Vancouver, Washington

Perfluoroalkyl and Polyfluroalkyl Substances (PFAS) in soil in µg/kg						
Compound	**Current MRLs**	**SI MRLs**	**SI Maximum Concentration**	**MTCA Method B Noncancer Cleanup Levels**	**MTCA Method B Cancer Cleanup Levels**	**SI Cleanup Level**
PFBA	0.39	0.65	**0.26**	80,000	--	7800
PFPeA	0.19		--	--	--	--
PFHxA	0.19	0.65	<0.55	40000	--	3200
PFHpA	0.19		--	--	--	--
PFOA	0.19	0.65	<0.55	2.4	0.034	19
PFNA	0.19	0.65	<0.55	200	--	19
PFDA	0.19		--	--	--	--
PFUnA	0.19		--	--	--	--
PFDoA	0.19		--	--	--	--
PFTrDA	0.19		--	--	--	--
PFTeDA	0.19		--	--	--	--
PFBS	0.19	0.65	<0.55	24,000	--	1900
PFPeS	0.19		--	--	--	--
PFHxS	0.19	0.65	<0.55	780	--	130
PFHpS	0.19		--	--	--	--
PFOS	0.19	0.65	**1**	8	25	13
PFNS	0.19		--	--	--	--
PFDS	0.19		--	--	--	--
PFDoS	0.19		--	--	--	--
4:2 FTS	0.39		--	--	--	--
6:2 FTS	0.39		--	--	--	--
8:2 FTS	0.39		--	--	--	--
PFOSA	0.19		--	--	--	--
NMeFOSA	0.19		--	--	--	--
NEtFOSA	0.19		--	--	--	--
NMeFOSAA	0.19		--	--	--	--
NEtFOSAA	0.19		--	--	--	--
NMeFOSE	0.97		--	--	--	--
NEtFOSE	0.97		--	--	--	--
HFPO-DA	0.19	2.6	<2.3	240	--	23
ADONA	0.19		--	--	--	--
PFMPA	0.19		--	--	--	--
PFMBA	0.19		--	--	--	--
NFDHA	0.19		--	--	--	--
9Cl-PF3ONS	0.19		--	--	--	--
11Cl-PF3OUdS	0.19		--	--	--	--
PFEESA	0.19		--	--	--	--
3:3 FTCA	0.39		--	--	--	--
5:3 FTCA	0.97		--	--	--	--
7:3 FTCA	0.97		--	--	--	--

Notes
Current Maximum Reporting Limit (MRLs) based on Perfluoroalkyl and Polyfluroalkyl Substances (PFAS) by EPA Method 1633
SI MRLs = Method Reporting Limits from SI (2023)
SI Maxiumum Concentration based on all soil results from SI (2023)
Soil cleanup levels from the MTCA Method B 173-340 WAC (July 2024 update).
Bold indicates analyte detected
< = Analyte was not detected above the MRL
-- = not analyzed or value not available

Table 7. SI Drinking Water Results: PFAS
Camp Bonneville Periodic Review
Vancouver, Washington

Perfluoroalkyl and Polyfluroalkyl Substances (PFAS) in Water in ng/L						
Sample Location ID	**MRL**	**SI MRLs**	**SI Maximum Concentration**	**MTCA Method B Potable Groundwater Cleanup Level (MCL)**	**EPA MCL**	**RSL Calculator (2023)**
PFBA	**0.2**	**2.1**	**31**	8,000	--	1800
PFPeA	**0.2**	--	--	--	--	--
PFHxA	**0.2**	**2.1**	**8.6**	8,000	--	990
PFHpA	**0.2**	--	--	--	--	--
PFOA	**0.2**	**2.1**	**4.9**	4	4	6
PFNA	**0.2**	**2.1**	<2.1	10	10	5.9
PFDA	**0.2**	--	--	--	--	--
PFUnA	**0.2**	--	--	--	--	--
PFDoA	**0.2**	--	--	--	--	--
PFTrDA	**0.2**	--	--	--	--	--
PFTeA	**0.2**	--	--	--	--	--
PFBS	**0.2**	**2.1**	**3.3**	4,800	--	600
PFPeS	**0.2**	--	--	--	--	--
PFHxS	**0.2**	**2.1**	<2.1	10	10	39
PFHpS	**0.2**	--	--	--	--	--
PFOS	**0.2**	**2.1**	<2.1	4	4	4
NMeFOSAA	**0.2**	--	--	--	--	--
NEtFOSAA	**0.2**	--	--	--	--	--
4:2 FTS	**0.4**	--	--	--	--	--
6:2 FTS	**0.4**	--	--	--	--	--
8:2 FTS	**0.4**	--	--	--	--	--
9Cl-PF3ONS	**0.2**	--	--	--	--	--
HFPO-DA/GenX	**0.2**	**4.2**	<4.2	10	10	6
11Cl-PF3OUdS	**0.2**	--	--	--	--	--
ADONA	**0.2**	--	--	--	--	--
NFDHA	**0.2**	--	--	--	--	--
PFMBA	**0.2**	--	--	--	--	--
PFMPA	**0.2**	--	--	--	--	--
PFEESA	**0.2**	--	--	--	--	--
PFTeDA	**0.2**	--	--	--	--	--
PFNS	**0.2**	--	--	--	--	--
PFDS	**0.2**	--	--	--	--	--
PFDoS	**0.4**	--	--	--	--	--
PFOSA	**0.2**	--	--	--	--	--
NMeFOSA	**0.2**	--	--	--	--	--
NEtFOSA	**0.2**	--	--	--	--	--
NMeFOSE	**1.0**	--	--	--	--	--
NEtFOSE	**1.0**	--	--	--	--	--
3:3 FTCA	**0.4**	--	--	--	--	--
5:3 FTCA	**1.0**	--	--	--	--	--
7:3 FTCA	**1.0**	**--**	**--**	--	--	--
Hazard Index Rating			**0.4**	1		

Notes
Current Maximum Reporting Limit (MRLs) based on Perfluoroalkyl and Polyfluroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 1633
SI Maxiumum Concentration based on all soil results from SI (2023)
Shaded results exceed the Model Toxics Control Act (MTCA) Method A soil cleanup level for unrestricted land use
Shading indicates Screening Level exceedance
Soil cleanup levels from the MTCA Method B 173-340 WAC (July 2024 update)
Hazard Index calcualted using HFPO-DA, PFBS, PFHxS, and PFNA
Bold indicates analyte detected
< = Analyte was not detected above the MRL
-- = Not Analyzed or value not available
J = Result is estimated
J+ = Result is estimated and may be biased high.
ng/L = nanograms per liter
SI MRLs = Method Reporting Limits from SI (2023)
UJ = The not detected result is estimated.

Table 8. Forestry Activity Summary
Camp Bonneville Periodic Review
Vancouver, Washington

Year	Acres Harvested	Volume Harvested		Primary Prescription	Priority Focus
		Saw (BF)	Pulp (tons)		
2012	50	979,800		Release thin	Dense stands near access roads
2013	200	2,750,320		Release thin	High-density Douglas-fir units
2014	101	686,020		Release thin	High-density Douglas-fir units
2015	--	--	--	--	--
2016	--	--	--	--	--
2017	79	1,360,440	2,225	Mixed thinning and replanting	Expanded thinning in Priority I areas
2018	150	966,470		Release thin—hazard removal	Expanded thinning in Priority I areas
2019	130	1,015,740	1,323	Release thin—hazard removal	Expanded thinning in Priority I areas
2020	194	925,850	3,024	Complete release thin—hazard removal	Expanded thinning in Priority I areas
2021	--	--	--	--	--
2022	46	454,380	200	Release thin—hazard removal	Expanded thinning in Priority I areas
2023	144	1,428,650	745	Complete release thin—hazard removal	Expanded thinning in Priority I areas
2024	--	--	--	--	--
Totals	1,094	10,567,670	7,517		

Notes
SAW(BF) = lumber in boa

Appendix A
Institutional Controls

PA 06-167

RESTRICITVE COVENANTS
CAMP BONNEVILLE MILITARY RESERVE
REMEDIAL ACTION UNIT 1

Comes now the Bonneville Conservation Restoration and Renewal Team, LLC, a California nonprofit limited liability company, authorized to do business in the State of Washington, and hereby files this restrictive covenant, pursuant to the (1) Prospective Purchaser Consent Decree ("PPCD"), filed in the Superior Court, County of Clark, State of Washington, on October 13, 2006, in Cause No. _____, and (2) the Final Cleanup Action Plan for Remedial Action Unit (RAU) 1 ("CAP RAU 1"), and (3) the Finding of Suitability for Early Transfer ("FOSET") (Camp Bonneville, Clark County, Washington) prepared and published by the U.S. Department of Army in July 2006.

RAU 1 consists of the 20 areas at the Property identified and illustrated in Exhibit A. The documents referenced above require the imposition of certain specific restrictive covenants on two of the buildings within RAU 1. Specifically, institutional controls, which this Restrictive Covenant constitutes, are required for (1) the maintenance pit within Building 4475 at the Camp Killpack cantonment, a map of which is attached as Exhibit B hereto and incorporated herein by reference, and (2) the subsurface area underlying Building T-1932 in the Camp Bonneville cantonment, a map of which is attached as Exhibit C hereto and incorporated herein by reference. Building 4475 and Building T-1932 are hereinafter together referred to as the "Buildings".

In Building 4475, a maintenance pit is located under a concrete slab within the west end of the building. The pit is abandoned and covered with a slab and was an area in which vehicles were repaired and maintained. Based on this use, it is possible that vehicle fluids such as gasoline, used oil, lubricants, antifreeze, and solvents may have been released to the ground. This pit could not be sampled in the past. If in the future the building is demolished, additional soil sample will be required.

In Building T-1932, one sample previously collected contaqined concentrations of contaminated soil which exceeded the Model Toxics Control Act ("MTCA") Method A cleanup level used at the time. It was determined after an attempt at excavation that further attempts at evaluation would undermine the foundation of the building. Therefore, with the concurrence of the Washington Department of Ecology, or any successor agency (collectively the "WDOE"), excavation was terminated and the site was backfilled using clean, imported soil. If in the future, the building is demolished, additional soil sampling will be required and removal may be required.

BCRRT hereby covenants, as current owner of the Camp Bonneville property, a description of which is attached as Exhibit D hereto and incorporated

herein by reference, with the understanding that this Restrictive Covenant shall run with the Camp Bonneville property and obligate future owners to its terms, conditions and requirements, that (1) in the event that Building 4475 or Building T-1932 are demolished at any time in the future, that additional soil sampling shall be performed and that in the event that such soil sampling reveals a need for further remediation, that such remediation will be undertaken such that the Washington Department of Ecology (Ecology), or it successor agency is satisfied that the Buildings, or either one of them, so remediated are safe for their then intended use, (2) that a sign shall be posted permanently on or in each Building identifying the potential environmental contamination associated with the particular Building and providing notification that upon demolition that additional soil sampling is required and additional remediation may be required, and (3) that such permits, if and as are required by law at the time of demolition and soil excavation, shall be obtained prior to initiating any such work on the Buildings.

Authority to enforce these restrictive covenants is hereby specifically granted to the United States Department of Army, Ecology, and during the time of ownership of the Camp Bonneville property by the BCRRT, to Clark County, a political subdivision of the State of Washington. Any party becoming aware of any violation of these restrictive covenants shall report same to each of the entities referenced in this paragraph in timely fashion. Each agency identified above shall have authority to judicially enforce the terms of these restrictive covenants in order to compel cessation of any behavior which violates the terms of these restrictive covenants.

In the event that at any time in the future the Ecology determines that these restrictive covenants are no longer necessary for the protection of the safety and health of those utilizing the Buildings and that the sites on which these Buildings stood are suitable for unrestricted use, then Ecology shall execute a document to be filed in the real property records of Clark County, Washington, which shall release the Camp Bonneville property from these restrictive covenants.

The owner of the Camp Bonneville property shall make annual reports on these restrictive covenants such that their effectiveness can be assessed as part of the MTCA 5-year review process. Additionally, the existence of these restrictive covenants shall be incorporated into any hazard awareness program adopted for the Camp Bonneville property.

[Intentionally left blank.]

IN WITNESS WHEREOF, these restrictive covenants are executed this 21 day of November, 2006, and shall be filed of record in the Clark County, Washington real property records upon being fully executed.

BONNEVILLE CONSERVATION RESTORATION AND RENEWAL TEAM, LLC, a California nonprofit limited liability company authorized to do business in the State of Washington

By: CONSERVATION RESTORATION AND RENEWAL TEAM, a California nonprofit public benefit corporation
ITS SOLE MEMBER

By: _____
Michael J. Gage, President

STATE OF WASHINGTON)
) ss.
COUNTY OF CLARK)

SUBSCRIBED AND SWORN TO before me a notary public this 21 day of November, 2006, by Michael J. Gage, President of the Conservation Restoration and Renewal Team, a California nonprofit public benefit corporation, Sole Member of the Bonneville Conservation Restoration and Renewal Team, LLC, a California nonprofit limited liability company, on behalf of said company.

_____
Notary Public

My commission expires:
1-26-08
(SEAL)

LOUISE DARLENE RICHARDS NOTARY PUBLIC STATE OF WASHINGTON COMMISSION EXPIRES JANUARY 26, 2008

REVIEWED AND APPROVED:

CLARK COUNTY, a political subdivision of the State of Washington

By: _____

Name: Marc Boldt

Title: Chair - Commissioner

Date: 11-21-06

Approved as to form only:

By: _____
Deputy Prosecuting Attorney

EXHIBIT A to Restrictive Covenant
(Identification of RAU 1 Sites, Camp Bonneville, FOSET Table 1)

Table 1- Description of Property

Table 1 DESCRIPTION OF PROPERTY*				
Site/Area	**EBS Parcel Designation**	**Description**	**Investigation/Remediation**	**ECP Category**
Remedial Action Unit 1				
Landfill 1 (Historic Landfill)	2 (7) HR(P)	This site (small shallow depression) was identified as a landfill based on the presence of bottle fragments. There is no record of when the site may have been used or what other materials it may contain.	In December 1997, a field reconnaissance and geophysical survey were performed in the area of landfill 1. The exact location of the landfill could not be determined and it was determined that the site may have been a former homestead.	1
Landfill 2 (Sewage Lagoons and Historic Landfill)	3 (7) HR(P)	This landfill was discovered in 1978 during the construction of the sewage lagoon. The landfill may have been used from the 1940s to the 1950s; however, the type and quantity of material located at this site is unknown.	A UXO avoidance/screening and electromagnetic survey identified pipes, vehicle parts, wiring and one undetonated 2.76-inch light anti-tank weapon, which was disposed of by the Ft Lewis EOD. A soil gas survey of the site detected chloroform, which was determined to be a possible sample or analytical procedure contaminant. Three borings were advanced around the landfill (one up-gradient and two down-gradient), sampled and converted to monitoring wells. One soil sample was collected from each boring and tested for TPH, VOCs, SVOCs, PCBs, pesticides, nitroaromatic and nitramine explosives, PETN, cyanide, TOC, and PPL metals. Test results of soil samples indicate TPH, VOCs, SVOCs, PCBs, pesticides, cyanide, and explosive compounds including PETN and PA were below the detection limit for all samples. PETN was detected in one sample at an estimated concentration of 0.22 mg/kg. There are no regulatory screening levels for PETN. Various metals were detected at concentrations above one or more of the regulatory cleanup criteria for soils; however, only copper (134 mg/kg) was detected above background levels (114 mg/kg). Groundwater samples were collected from the two down-gradient wells and tested for TPH, VOCs, SVOCs, PCBs, pesticides, nitroaromatic and nitramine explosives, PETN, cyanide, TOC, and PPL metals (total and dissolved). Test results show no detectable levels of TPH, SVOCs,	3

Table 1 DESCRIPTION OF PROPERTY*				
Site/Area	EBS Parcel Designation	Description	Investigation/Remediation	ECP Category
			explosives compounds, PCBs, and pesticides. Naphthalene was detected at an estimated quantity (below its cleanup criteria). Numerous metals were detected in the groundwater samples but at concentrations below regulatory cleanup levels except for arsenic. Arsenic was detected above the U.S. EPA Region 3 risk-based criterion (0.000045 mg/l) and the MTCA screening level (0.00005 mg/l), but below the Federal MCL.	
Former Burn Area (Historic Burn Site)	4 (7) HR(P)	The former burn area is located immediately north of Landfill 3 and southeast of the existing sewage lagoon. The area was reportedly used to burn wood and debris, although there is no record of the length of use or list of materials burned. The area has apparently not been used since the 1980s.	A UXO avoidance/screening survey was performed across the former burn site. In December 1997, surface and near-surface soil samples were collected in and adjacent to the area. All test results were below regulatory cleanup levels, site-specific background concentrations for metals, or below MTCA levels for thallium and zinc.	3
Landfill 3 (Trash Burial Site)	5 (7) HR(P)	This former landfill is located southeast of the existing sewage plant, and at its closest point is 20 feet west of Lacamas Creek. The landfill was reportedly used in the 1970s and 1980s. Uncovered objects include domestic appliances and paint cans.	A UXO avoidance/screening and electromagnetic survey identified corrugated metal, pipes, drums, and wiring. No UXO debris was observed. A soil gas survey of the Landfill 3 area detected no analytes above the testing instrument's detection limit. The results of soil sampling conducted around the perimeter of the landfill showed no analyte concentrations above regulatory cleanup levels or site-specific background levels for metals. Groundwater samples were collected from one up gradient and three down-gradient wells located at the perimeter of the landfill. All test results were below regulatory cleanup levels.	3
Grease Pits - Bonneville	6 (7) HR(P)	There are two former grease pits north of Building 1828. The grease pits consist of corrugated metal pipes that extend into an underground pit filled with gravel. The pits were built to accept grease from nearby mess halls and are reported to have been used from the mid-1930s to the 1990s.	Two soil borings were advanced immediately adjacent to the grease pit. Two soil samples were collected from each boring and tested for TPH, VOCs, SVOCs, PCBs, pesticides, and PPL metals. One of the two soil samples collected at the grease pit contained the pesticide lindane at 2.0 mg/kg (cleanup concentration is 0.769 mg/kg). The presence of lindane at this concentration does not pose an unacceptable risk to human health or the environment because there are no complete exposure pathways. Numerous metals were	3

Table 1 DESCRIPTION OF PROPERTY*				
Site/Area	**EBS Parcel Designation**	**Description**	**Investigation/Remediation**	**ECP Category**
			detected, but at concentrations below the regulatory cleanup levels. The concentrations of arsenic and chromium detected exceeded the regulatory cleanup level, but were below the site-specific background concentrations.	
Above Ground Storage Tank Sites **Building T-1932**	7 (2) PS	This site includes the entire Property. There are twenty-six 275-gal. diesel ASTs in the two cantonment areas (Bonneville and Killpack). The ASTs were used for heating buildings. All buildings are reported to have been converted to electrical heat.	All ASTs were visually inspected for evidence of a release. Stained soil, odors, and/or elevated PID readings were observed at eight AST locations. In 1998, soil samples were collected from the eight AST locations and tested for TPH. Test results indicate that seven samples had concentrations above the MTCA for TPH (2,000mg/kg). In 1998, soil excavations began at the seven AST locations. Confirmatory samples were collected and tested for TPH. Three AST locations had confirmatory sample test results that exceeded the MTCA for TPH. Additional excavations took place at two of these locations followed by another round of confirmatory sampling, which showed no results above the MTCA for TPH. Additional excavations could not be done at Building 1932 (third location) because the excavation could have undermined the building. The maximum TPH concentration detected in the confirmatory sample from this building was 2,690 mg/kg. It is assumed that there could be as much as 33 cys of TPH contaminated soil remaining beneath this building. The WDOE concurred that leaving the TPH contaminated soil in place was acceptable. All contaminated soil, except as noted above, was disposed of at an off-site facility. All excavations were backfilled to grade. No further removal actions are required at this time. If the building is demolished in the future, additional soil sampling and removal may be required.	2
Burned Buildings 1962 & 1983 Building 1962	8 (7) HR(P)	Former Building 1962 was located near the southeast corner of Camp Bonneville cantonment area. The building was burned in place at an unknown date. The debris	A geophysical survey of the area detected building materials at a specific location, which was assumed to be the footprint of former Building 1962. Surface soil samples were collected from within the assumed building footprint and immediately adjacent to the footprint. All test results were below the	3

Table 1

DESCRIPTION OF PROPERTY*

Site/Area	EBS Parcel Designation	Description	Investigation/Remediation	ECP Category
Building 1983	8 (7) HR(P)	was removed to an unknown location, leaving no visible trace of the building. Former Building 1983 was located near the southeast corner of Camp Bonneville cantonment area. The building was burned in place at an unknown date. The debris was removed to an unknown location, leaving no visible trace of the building.	regulatory cleanup level. A geophysical survey of the area detected building materials at a specific location, which was assumed to be the footprint of former Building 1983. Surface soil samples were collected from within the assumed building footprint and immediately adjacent to the footprint. All test results were below the regulatory cleanup level.	3
Pesticide Storage/Mixing Building 1964	9 (7) HR(P)	This wood-framed building was originally constructed in 1955 as a fire station and later used to store and mix pesticides. Pesticides including 2,4,5-T, 2,4-D, and DDT were reportedly stored in this building. More recently, the building was used as the grounds shop where equipment, vehicles, small gasoline containers and car batteries are stored. A sink inside the building drained to a dry well.	Surface, subsurface, and groundwater samples were collected at the site and tested for TPH, VOCs, (subsurface samples only) SVOCs, chlorinated pesticides, PCBs, organophosphorus pesticides, chlorinated herbicides, and PL metals. Test results indicate that surface and sub-surface soil samples had concentrations of various metals (cadmium, chromium and lead) above regulatory cleanup levels. The concentrations of cadmium and lead exceeded background levels. Groundwater samples collected from the two monitoring wells installed at the site contained no analytes above regulatory criteria. Remediations began in June 2000 that included soil excavations to an average depth of 0.8 feet bgs. Confirmatory samples were collected from the excavation, and the test results indicated that the concentration of TPH (diesel and heavy oil range) and lead exceeded cleanup criteria. Based on that data, the excavation was extended to 2.7 feet bgs (average). Confirmatory samples were collected, and all test results showed target analyte concentrations to be below their respective cleanup criteria. The contaminated soil excavation was competed in 2000, and all contaminated soil was disposed of at an off-site facility. The excavation was backfilled to grade.	4

Table 1

DESCRIPTION OF PROPERTY*

Site/Area	EBS Parcel Designation	Description	Investigation/Remediation	ECP Category
CS Gas Training Building 1834 (Building 1834 CS Gas Chamber)	10 (1)	This building was used for chemical warfare training, but records indicate that only CS was used. This is a wood frame one-story post-on-pier converted barracks. This facility was used for gas mask training for an unknown period of time.	In preparation for demolishing Building 1834, a survey was conducted that included testing soil samples for CS gas and its breakdown products, field screening surface soil samples for lead, and screening the building for asbestos. A surface soil sample was collected from beneath the building and another sample was collected from 10 feet (approximately) in the prevailing downwind direction from the building. No CS gas or its breakdown products, lead, or asbestos were detected in the soil or building components above regulatory cleanup criteria. The building was demolished and the debris was disposed of off-site at a municipal landfill.	3
Grease Pit - Killpack (Grease Pit)	11 (7) HR(P)	This grease pit is located on the east side of the former mess hall (Building 4389). The grease pit consists of two corrugated metal pipes that extend into an underground pit filled with gravel. The pit was built to accept grease from the mess hall and is reported to have been used from the mid-1930s to the 1990s.	Two soil borings were advanced immediately adjacent to the grease pit. Two soil samples were collected from each boring and tested for TPH, VOCs, SVOCs, PCBs, pesticides, and PPL metals. VOCs and PCBs were not detected. No organic compounds were detected in the two soil samples collected at this pit. Numerous metals were detected. Chromium, lead, and thallium were detected above regulatory cleanup levels, but below site-specific concentrations. Arsenic was detected above its regulatory cleanup and site-specific background levels. Arsenic does not pose an unacceptable risk to human health or the environment because there are no complete exposure pathways.	3
Maintenance Pit (Building 4475)	12 (7) PR(P)HR(P)	Building 4475 had a maintenance pit that reportedly received waste oil and antifreeze associated with vehicle maintenance activities. The concrete floor of the building currently covers the pit. Small-scale pesticide mixing and loading occurred in the building.	Six soil samples were collected from two borings advanced at the Maintenance pit. The soil samples collected at the drainage pit were tested, and the results showed unidentified hydrocarbons, VOCs, SVOCs and chlorinated pesticides at concentrations below regulatory criteria. No PCBs were detected in any of the samples. Several metals were detected above the regulatory cleanup concentration (arsenic, chromium, and lead) but below site-specific background concentrations with the exception of one sample, which had a lead concentration above background. In June 2000, all accessible lead-contaminated	4

Table 1

DESCRIPTION OF PROPERTY*

Site/Area	EBS Parcel Designation	Description	Investigation/Remediation	ECP Category
			soils were excavated and disposed of at an off-site facility. The excavation was stopped to avoid undermining the building. Contaminated soil may be present beneath the building. Potential contaminants may include petroleum hydrocarbons, VOCs, SVOCs, metals. The excavation was backfilled to grade. No further removal actions are required at this time. If the building is demolished in the future, additional soil sampling may be required.	
Hazardous Materials Accumulation Point (Buildings 4475B and 4476A)	13 (7) PR(P)/HR(P)	The January 1997 *Environmental Baseline Survey Report for Camp Bonneville, Washington* indicates that Buildings 4475B and 4476A stored hazardous substances. The *July 2004 Final Cleanup Action Plan, Remedial Unit 1, Camp Bonneville, Vancouver, Washington* identified Building 4475a, in addition to Buildings 4475B and 4476, as storing hazardous materials (antifreeze and POLs). Building 4476 consists of three masonry block walls on a concrete slab floor. The open front of the structure is secured with locking metal gates. Building 4475B is used to store POLs associated with vehicle maintenance, and Building 4476A is a storage shed that contains a 1,000-gal. diesel AST with secondary containment. The site is also referred to as the Covered Vehicle Maintenance Storage building. Drums of antifreeze and waste oil, as well as the temporary storage of hazardous	Two soil samples were collected from directly in front of the site and tested for TPH, SVOCs, PCBs, Pesticides, and PPL metals. Pesticides and PCBs were not detected at concentrations above the testing instrument's reporting limits. Test results show hydrocarbon compounds and metals at concentrations below the regulatory cleanup or background concentrations. The contents of a sump located in Building 4475B were tested, and the results showed unknown hydrocarbons. The contents were removed from the sump and disposed of at an off-site facility. Visual inspection of the sump found no crack or outlets, and the concrete was observed to be in good condition.	3

Table 1

DESCRIPTION OF PROPERTY*

Site/Area	EBS Parcel Designation	Description	Investigation/Remediation	ECP Category
		material have been stored in this building. The building currently contains empty drums.		
Wash Rack 1 (Former Vehicle Maintenance Rack and UST)	14 (7) PR(P)	This wash rack is located near Building 4476. The wash rack was constructed of timbers and demolished in the early 1980s. Wastewater from washing operations discharged directly onto the ground. A UST was reportedly located adjacent to the wash rack, and was removed in 1978.	Two surface and two subsurface soil samples were collected from this site. Test results indicate that all analyte concentrations were below regulatory cleanup criteria. Petroleum hydrocarbons were detected in all samples but at concentrations below the MTCA Method A cleanup criteria. Metals were detected above regulatory cleanup criteria, but below background levels.	2
Pesticide Storage Building 4126 (Building 4126)	16 (7) HR(P)	This building was used to store 55-gal. drums of the pesticides 2,4,5-T, 2,4-D, and DDT until 1977. The building was constructed of wood and included skids on the bottom of the building. It is reported that the building was moved to various locations at Camp Bonneville.	Soil samples and an indoor floor sample were collected and tested for chlorinated pesticides and herbicides, PCBs, PPL metals (plus barium) and TPH (gasoline and diesel ranges). Test results on these samples indicate that pesticides (4,4-DDT, 4,4-DDD, 4,4-DDE, beta-BHC, lindane, 2,4-D, 2,4-DB, 2,4,5-T, and MCPP), petroleum hydrocarbons, and several metals were detected but at concentrations below regulatory cleanup and background concentrations. Polychlorinated biphenyls were not detected at concentrations exceeding the laboratory reporting limit. Petroleum hydrocarbons were detected in floor samples above regulatory cleanup standards. Lead was detected in a surface soil sample above regulatory cleanup and background concentrations. Based on the floor and soil sample results, the building was dismantled and soil was excavated under the building footprint to a depth of one foot. Confirmatory samples were collected and test results show no analyte concentration above regulatory cleanup criteria. The building debris and excavated soils were disposed of at an off-site facility. The excavation was backfilled to grade.	4
Former Sewage Pond	17 (7) HR(P)	The former sewage pond is located in the Camp Bonneville cantonment area, although the exact location and dimensions are unknown. The pond is	A UXO avoidance/screening and electromagnetic survey identified fence posts: no UXO debris was observed. No organic compounds were detected in the soil or groundwater samples collected at the pond. Antimony, cadmium, copper, chromium, and thallium were detected, but at concentrations	3

Table 1

DESCRIPTION OF PROPERTY*

Site/Area	EBS Parcel Designation	Description	Investigation/Remediation	ECP Category
		reported to have been unlined and used for a short period of time ending in 1978.	below regulatory concentrations. One of 17 soil samples had arsenic concentrations above the regulatory and site-specific background concentrations.	
Drum Disposal Area (Suspect Drum Burial Site)	18 (7) HR(P)	This area is reported to contain an unknown number of buried drums. There is no information on the contents of the drums.	An electromagnetic survey of the area identified anomalies. Soil borings were advanced in this area and samples collected. No SVOCs, PCBs, pesticides, or explosive compounds were detected in the samples, and there was no evidence of the presence of explosives. Petroleum hydrocarbons, certain VOCs, and metals were detected, but at concentrations below regulatory cleanup criteria and/or background concentrations. In 2000, the area was excavated to remove buried drums and debris (paint cans, corrugated metal, scrap metal and barbed wire). Twenty-six test pits were excavated to assess the area of drum disposal. Soil samples collected from the tests pits, and samples of rainwater that had accumulated in the pits were tested. The soil sample test results indicated that toluene, arsenic, barium, chromium and methoxychlor exceeded regulatory cleanup criteria. The rainwater sample test results indicate that naphthalene, ethyl benzene, toluene, and lead were present above cleanup levels. A second EM survey was conducted to determine if buried objects could have caused or contributed to the contamination. Thirteen additional anomalies were identified and investigated by trenching. One excavation contained among other things paint cans and paint. The other trenches contained scrap metal, reinforcement bars, barbed wire and firing point survey markers. Cleanup activities were initially conducted to address the debris, but later to address the organic compounds and metal detected in the test pits. Approximately 110 tons of soil and debris were excavated and disposed of at an off-site facility. Confirmatory sample results indicate all target analyte concentrations were either not detected or below regulatory cleanup criteria. The excavation was backfilled to grade.	4
Paint and Solvent Disposal Area	19 (7) HR(P)	This area is reported to contain waste paints and	An electromagnetic survey of the area was conducted in July 1998. The survey identified	2

Table 1 DESCRIPTION OF PROPERTY*				
Site/Area	**EBS Parcel Designation**	**Description**	**Investigation/Remediation**	**ECP Category**
(Suspect Disposal Site)		solvents.	two anomalies suspected of being disposal areas. Two soil borings were advanced at each of these locations, and soil samples were collected. Test results of these samples showed that the concentrations of VOCs, SVOCs, PCBs, pesticides, and explosives compounds were below the testing instrument's detection limits. Petroleum hydrocarbons and metals were detected, but at concentrations below regulatory cleanup criteria. Arsenic and chromium were detected at concentrations above regulatory cleanup criteria, but below background concentrations. In June 2000, cleanup activities were conducted to remove the debris, which included a paint can, paint chips, pipes, and wires. Confirmatory samples were not collected because the soil sample test results did not identify analyte concentrations above regulatory cleanup of background criteria. The excavation was backfilled to grade and the debris was disposed of at an off-site facility. A notification of hazardous substance, storage, release, or disposal is not required because this cleanup was not a result of a CERCLA listed hazardous substance.	
Wash Rack 2 (Wash Point)	20 (7) PR(P)/HR(P)	This area is associated with a former vehicle washing point south of Building 4475, and consists of a gravel pullout on the side of the road, and a water hose. The water hose was used to rinse dirt and mud off vehicles returning from training exercises. There is no oil-water separator at this wash point.	The January 1997 *Environmental Baseline Survey Camp Bonneville, Washington* (EBS) states that there were no obvious indications of potential environmental impacts at the wash point or the areas where wash water would drain. The EBS also indicates that there is a low probability of being a potential source of contamination.	1
Former CS Gas Training Building	25 (7) HR(P)	This site is located in the central part of the installation north of Firing Range 7. The exact location of the building and the period of time it was in use are not known. The site is the location of a	Five soil borings were advanced in the area and soil samples were collected. Test results indicate that CS gas and cyanide were not detected. Semi-volatile organic compounds were detected but at concentrations below regulatory criteria. Lead was detected above regulatory cleanup and background criteria.	4

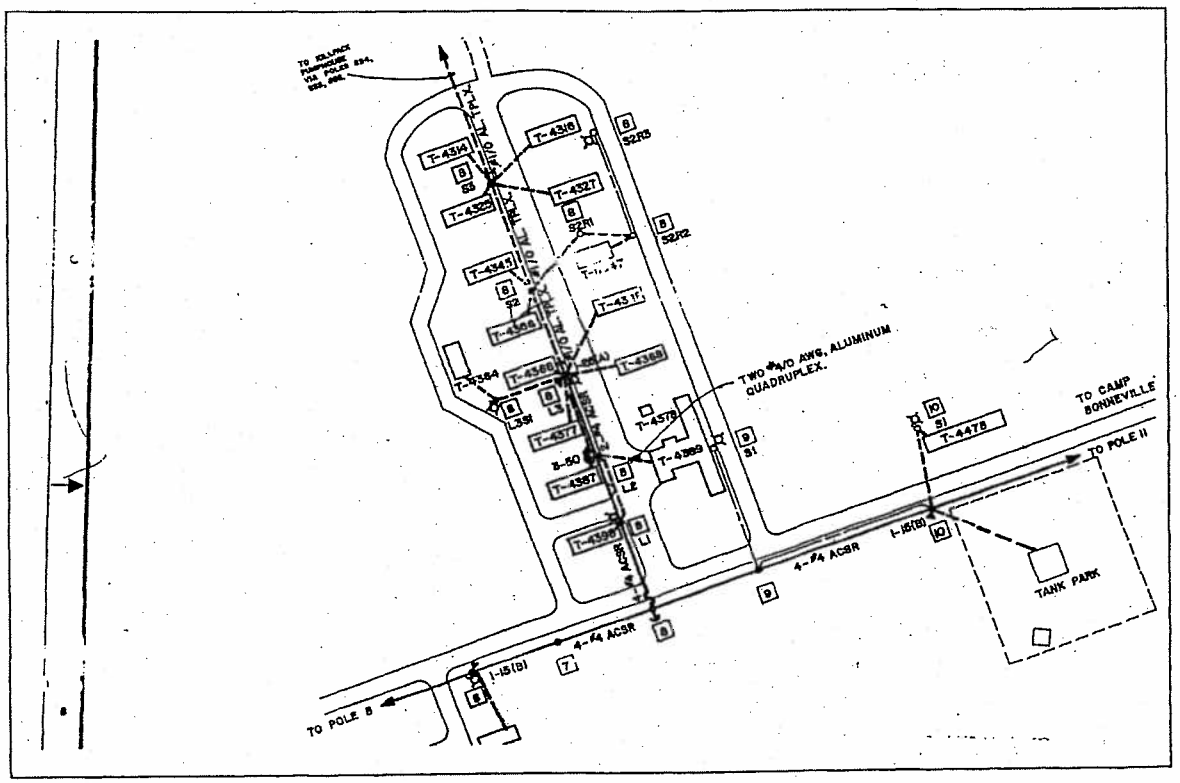
Table 1

DESCRIPTION OF PROPERTY*

Site/Area	EBS Parcel Designation	Description	Investigation/Remediation	ECP Category
		former building used for tear gas training. Records suggest that the building was destroyed by fire in the late 1970s. The building number is not known.	In June 2000, contaminated soil excavation activities commenced. The excavation extended to 3-feet below grade. Confirmatory sample test results indicate that all analyte concentrations were below MTCA cleanup criteria. The excavation was backfilled to grade and all contaminated soil was disposed of at an off-site facility.	
Ammunitions Storage Bunkers (Facility Nos. 2950, 2951, and 2953)	NA	These bunkers were constructed in 1976 to store various munitions. They range in size from 4 sq. ft. to 100 sq. ft. The magazines are fenced.	In 1998, fifteen sampling locations (nine at the largest bunker and three each at the two smaller bunkers) were selected for the collection of surface and subsurface soil samples. A soil boring was also advanced at each bunker based on the results of the surface soil tests from soil samples collected from inside the bunkers. Wipe samples were collected from the floors in each magazine. The soil samples collected from inside the bunker and the wipe sample tests results show RDX (below reporting levels) and all the PPL metals except selenium and thallium in Facility 2950. Arsenic, beryllium, cadmium, chromium, lead, and mercury were detected in the soil samples collected from inside the bunker at concentrations that exceed the MTCA cleanup criteria. Arsenic, beryllium, and cadmium concentrations were also above background levels. PETN was detected in one bunker; however, there is no established cleanup concentration for PETN. No organic compounds were detected above reporting limits in the surface soil samples collected outside the bunker. Arsenic, cadmium, chromium, and lead were detected at concentrations above MTCA cleanup criteria and background levels in the surface soil samples collected outside the bunker. In 2001, surface and subsurface soil samples were collected from Facility 2953. PETN, picric acid, and 2,4-dinitrotoulene were detected in the surface soil samples at concentrations below MTCA cleanup criteria. No ordnance compounds or propellants were detected in the subsurface soil samples. Metals were detected in the surface soil samples. Arsenic and chromium were detected above MTCA cleanup criteria. Lead was detected above the MTCA cleanup criteria and background levels. In May 2001, contaminated soils at the three	4

Table 1 DESCRIPTION OF PROPERTY*				
Site/Area	**EBS Parcel Designation**	**Description**	**Investigation/Remediation**	**ECP Category**
			bunker were excavated to 1-foot below grade. Confirmatory samples were collected and the test results indicated no residual contaminants above regulatory criteria or background levels. The excavations were backfilled and the contaminated soil and wood from pallets inside the bunker were disposed of at an off-site facility. The interior surfaces of the bunker were cleaned.	

EXHIBIT B To Restrictive Covenant



Camp Bonneville Reuse Plan, Appendix A, Killpack Cantonment

EXHIBIT C to Restrictive Covenant

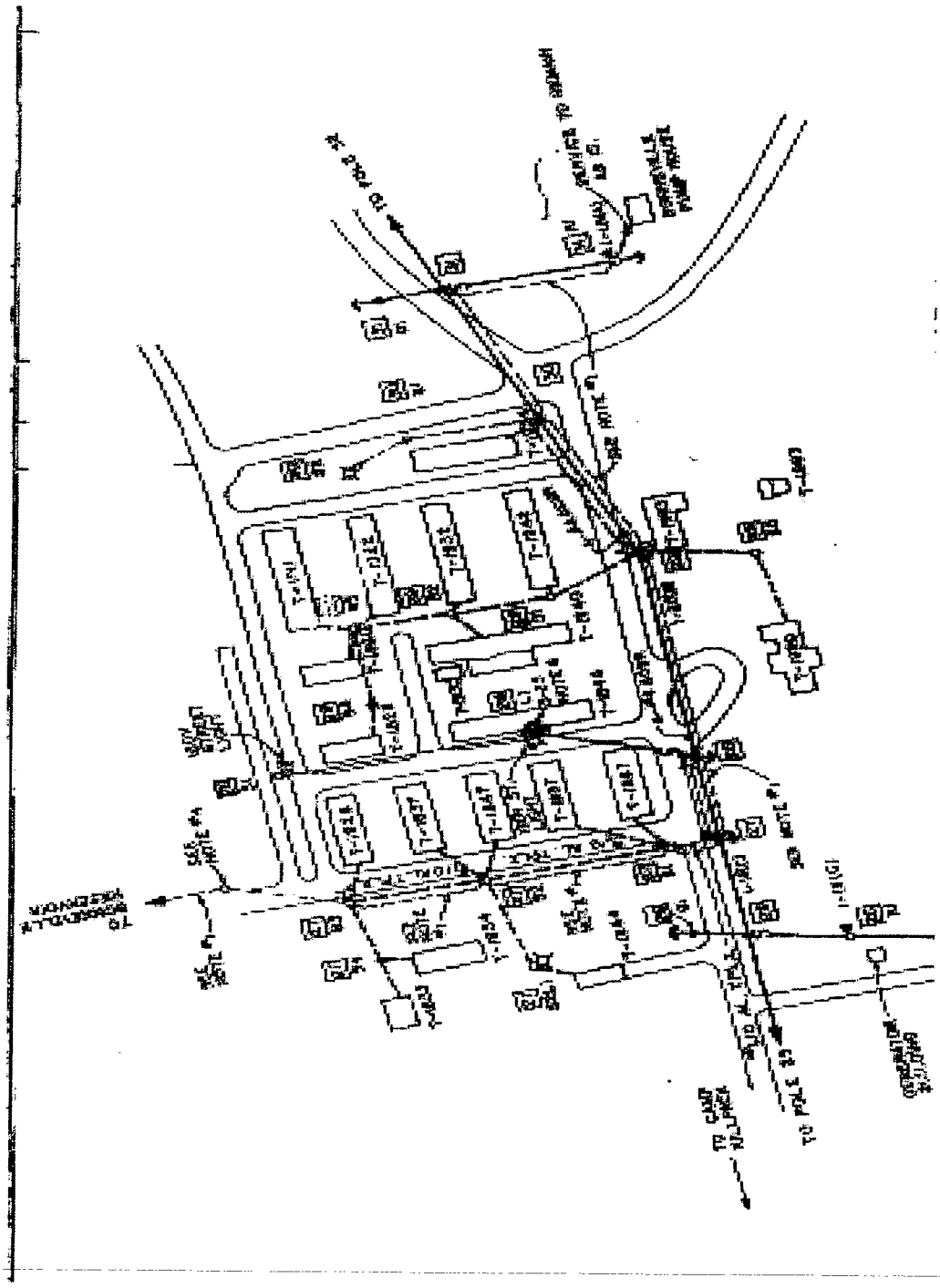


EXHIBIT D

LEGAL DESCRIPTION

A parcel of land located in Sections 34 and 35 of Township 3 North, Range 3 East of the Willamette Meridian, and in Sections 1, 2, 3, and 10 of Township 2 North, Range 3 East of the Willamette Meridian, all in Clark County, Washington, more particularly described as follows:

BEGINNING at a 3 inch aluminum cap marking the southwest corner of Section 34 Township 3 North, Range 3 East, Willamette Meridian; thence South 88° 25' 57' East, 2,635.07 feet along the south line of the southwest quarter (SW¼) of said Section 34 to a 3¼ inch aluminum cap marking the south quarter corner of said Section 34; thence North 02° 00' 17" East, 2,648.35 feet along the west line of the southeast quarter (SE¼) of said Section 34 to a ½ inch iron rod with yellow plastic cap marked "Hart 12974" marking the center of said Section 34 per that record of survey recorded in book 39 of Surveys at page 34, Records of Clark County, Washington; thence South 88° 11' 19" East, 2,643.06 feet along the north line of the southeast quarter (SE¼) of said Section 34 to the east quarter corner of said Section 34, as calculated per that Record of Survey recorded in Book 21 of Surveys, at Page 132, Records of Clark County, Washington; thence North 02° 11' 12" East, 2,637.25 feet along the west line of the northwest quarter (NW¼) of Section 35 to a 3 inch brass cap marking the northwest corner of said Section 34, being also the northeast corner of Section 35, Township 3 North, Range 3 East; thence South 88° 07' 36" East, 2,644.51 feet along the north line of the northwest quarter (NW¼) of said Section 35 to a 3¼ inch aluminum cap marking the north quarter corner of said Section 35; thence South 88° 07' 57" East, 2,644.52 feet to the northeast corner of said Section 35, said corner having a witness corner marked by a 3 inch brass cap bearing North 02° 13' 29" East, 5.00 feet, as set per that Record of Survey recorded in Book 21 of Surveys, at Page 132, Records of Clark County, Washington; thence South 02° 13' 29" West, 5,196.56 feet along the east line of said Section 35, to a 3 inch brass cap marking the southeast corner of said Section 35, being also the southwest corner of Section 36, Township 3 North, Range 3 East, as calculated per that Record of Survey recorded in Book 21 of Surveys, at page 132, records of Clark County, Washington; thence South 89° 00' 11" East, 5,286.83 feet along the south line of said Section 36, to a 3 inch brass cap marking the southeast corner of said Section 36, being also the northeast corner of Section 1, Township 2 North, Range 3 East; thence South 01° 10' 01" West, 5,302.22 feet along the east line of said Section 1, to a 3 inch brass cap marking the southeast corner of said Section 1; thence North 88° 46' 24" West, 5,266.51 feet along the south line of said Section 1, to a ½ inch iron rod with yellow plastic cap marked "TBH PLS 10920" marking the southwest corner of said Section 1, per that Record of Survey recorded in Book 21 of Surveys, at Page 95, Records of Clark County, Washington, being also the southeast corner of Section 2, Township 2 North, Range 3 East; thence North 88° 31' 25" West, 2,637.03 feet along the south line of the southeast quarter (SE¼) of said Section 2, to a ⅞ inch drill shaft marking the south quarter corner of said Section 2; thence North 88° 40' 34" West, 2,621.18 feet to a 3¼ inch aluminum cap marking the southwest corner of said Section 2, being also the northeast corner of Section 10, Township 2 North, Range 3 East; thence South 01° 25' 00" West, 2.640.69 feet to a 3¼ inch aluminum cap marking the east quarter corner of said Section 10; thence North 89° 15' 33" West, 5,294.16 feet along the south line of the North half (N½) of said Section 10 to a 3½ inch brass cap marking the west quarter corner of said Section 10; thence North 01° 27' 42" East, 2.641.85 feet along the west line of the northwest quarter (NW¼) of said Section 10 to a 1¼ inch iron pipe marking the northwest corner of said Section 10, being also the southwest corner of Section 3, Township 2

North, Range 3 East, per that Record of Survey recorded in Book 17 of Surveys, at Page 87, Records of Clark County, Washington;. thence North 00° 52' 55" East, 2650.31 feet along the west line of the southwest quarter (SW¼) of said Section 3, to a ¾ inch iron pipe marking the west quarter corner of said Section 3, per said Record of Survey in Book 17 of Surveys, at Page 87; thence North 00° 52' 57' East, 2,671.49 feet to the northwest corner of said Section 3, being also the southwest corner of Section 34, Township 3 North, Range 3 East and the **POINT OF BEGINNING**.

EXCEPT the north half of the southwest quarter of the southwest quarter (N½SW¼SW¼) of Section 3, Township 3 North, Range 3 East, Willamette Meridian, per that Record of Survey recorded in Book 23 of Surveys, at Page 91, Records of Clark County, Washington.

ALSO EXCEPT that tract of land conveyed to the Public, by Quit Claim Deed recorded under Auditor's File Book 24, Page 223 on August 29, 1894, in Clark County, Washington, being a portion of the southwest quarter of the northwest quarter (SW¼NW¼) of Section 3, Township 2 North, Range 3 East, of the Willamette Meridian, described as follows:

BEGINNING at the southwest corner of the northwest quarter (NW¼) of said Section 3; thence east along the south line or said northwest quarter (NW¼), 330 feet (20 rods); thence north parallel with the west line of said northwest quarter (NW¼), 264 feet (16 rods); thence west parallel with the south line of said northwest quarter (NW¼), 330 feet (20 rods), to the west line of northwest quarter (NW¼) of Section 3; thence south along said west line 264 feet (16 rods), to the **POINT OF BEGINNING**.

ALSO EXCEPT any portion lying within the right of way of Northeast 232nd Avenue, and

ALSO EXCEPTING any portion lying within the right of way of Northeast 68th Street.

This description contains 3,013 acres, more or less.

This description based on survey preformed by Clark County, Washington 15 May 2006 as recorded in Book 56 of Surveys, at page 007, Records of Clark County, Washington. The Basis of Bearing is the south line of the southwest quarter of Section 34, Township 3 North, Range 3 East, Willamette Meridian, being held as South 88° 25' 57" East and distances are based on grid distances with a combined factor of 1.0000365 to obtain ground distances. Survey is based on the Washington State Plane Coordinate System, South Zone, NAD83/91 Adjustment.

RECEIVED
NOV 27 2006
Prosecuting Attorney
Civil Division

CLARK COUNTY STAFF REPORT

DEPARTMENT/DIVISION: **Prosecutor's Office**

DATE: November 16, 2006

REQUEST: Authorize Chair to approve the filing of restrictive covenants related to RAU1 of Camp Bonneville.

CHECK ONE: **__X__ Consent** **____ Routine**

BACKGROUND:

Under the terms of the Prospective Purchaser Consent Decree, restrictive covenants need to be filed which restrict the use of certain areas of Camp Bonneville in certain ways. The attached Restrictive Covenant relates to two buildings existing at Camp Bonneville. It provides that if either building is demolished, soil samplings will be performed to determine what actions, if any, are necessary to remediate any contamination of the soil existing under the buildings. If further requires that notices be posted on the buildings indicating this obligation.

BUDGET IMPLICATIONS:

None.

ACTION REQUESTED:

Authorize Chair to sign the attached Restrictive Covenant.

DISTRIBUTION:

Jerry Barnett, Dept. of Public Works
E. Bronson Potter, Prosecutor's Office

E. Bronson Potter, WSBA #9102
Sr. Deputy Prosecuting Attorney

Approved: NOV 21, 2006
Clark County Board of Commissioners

SR 394-06

4231239 D
RecFee - $115.00 Pages: 34 - CLARK COUNTY
Clark County, WA 10/04/2006 02:20

RETURN ADDRESS

Bronson Potter
Clark County

Real Estate Excise Tax
Ch. 11 Rev. Laws 1951
EXEMPT
Affd. # 599463 Date 10/4/06
For Details of tax paid see
Affd. #
Doug Lasher
Clark County Treasurer
By
Deputy

Please print neatly or type information

Document Title(s)

Quit Claim Deed

Reference Numbers(s) of related documents:

Additional Reference #'s on page ____

Grantor(s) (Last, First and Middle Initial)

US of America

Additional grantors on page ___

Grantee(s) (Last, First and Middle Initial)

Clark County Washington

Additional grantees on page ____

Legal Description (abbreviated form: i.e. lot, block plat or section, township, range, quarter/quarter)

Sec 34+35 3 - 3 E SEC 1-2, 3 & 10 2, 3 E

Additional legal is on page ____

Assessor's Property Tax Parcel/Account Number

208417-000 167940-000 170186-000
167837-000 168044-000 208215-000

Additional parcel #'s on page ____

The Auditor/Recorder will rely on the information provided on this form. The staff will not read the document to verify the accuracy or completeness of the indexing information provided herein.

I am requesting an emergency nonstandard recording for an additional fee as provided in RCW 36.18.010. I understand that the recording processing requirements may cover up or otherwise obscure some part of the text of the original document.

Signature of Requesting Party

This deed was prepared/reviewed by:
Bruce G. Rohde, Attorney
U.S. Army Engineer District, Seattle
P.O. Box 3755
Seattle, WA 98124-3755

QUITCLAIM DEED
FORMER CAMP BONNEVILLE
CLARK COUNTY, WASHINGTON

THIS QUITCLAIM DEED, between the UNITED STATES OF AMERICA (hereinafter the "GRANTOR"), acting by and through the Deputy Assistant Secretary of the Army (Installations and Housing), pursuant to a delegation of authority from the SECRETARY OF THE ARMY (hereinafter the "SECRETARY"), under the authority of 10 U.S.C. § 2694a, as amended, and Clark County, Washington (hereinafter the "GRANTEE").

WITNESSETH THAT, the GRANTOR, for and in consideration of the benefit that will accrue to the United States from the use of the property conveyed herein for the conservation of natural resources and other good and valuable consideration the receipt of all of which is hereby acknowledged, does hereby REMISE, RELEASE, AND FOREVER QUITCLAIM unto the GRANTEE, its successors and assigns, all its right, title, and interest in the property situated, lying and being in the County of Clark, in the State of Washington, containing approximately 3,013 acres as more particularly described in Exhibit A, attached hereto and made a part hereof (hereinafter referred to as the "Property"); provided that the right of the GRANTEE to conduct revenue-producing activities on the Property shall be limited to the conduct of incidental revenue-producing activities that are compatible with the use of the Property for conservation purposes; provided further that the right of the GRANTEE to convey the Property shall be limited to conveyances to another eligible entity, as defined in 10 U.S.C. § 2694a(b), and shall be subject to the approval of the SECRETARY, and that any and all such further conveyances of the Property shall be subject to the same terms, reservations, restrictions, covenants and conditions set forth in this Deed; and provided that if any portion of the premises shall be used for any purpose other than natural resource conservation as provided in 10 U.S.C. § 2694a and incidental revenue-producing activities that are compatible with the use of the Property for conservation purposes, the title and interest in and to the portion of the premises so used shall revert to and become the property of the GRANTOR, at its option, and it shall have the immediate right of entry.

SUBJECT TO all valid and existing restrictions, reservations, covenants, conditions, and easements, including, but not limited to, rights-of-way for railroads, highways, pipelines, and public utilities, if any, whether of public record or not.

TO HAVE AND TO HOLD the Property granted herein to the GRANTEE and its successors and assigns, together with all and singular the appurtenances, rights, powers and privileges thereunto belonging or in anywise appertaining, and all the estate, right, title, interest, or claim whatsoever of the GRANTOR, either in law or in equity, and subject to the terms, reservations, restrictions, covenants, and conditions set forth in this Deed.

AND IT IS FURTHER AGREED AND UNDERSTOOD by and between the parties hereto that the GRANTEE, by its acceptance of this Deed, agrees that, as part of the consideration for this Deed, the GRANTEE covenants and agrees for itself, its successors and assigns, forever, that this Deed is made and accepted upon each of the following covenants, which covenants shall be binding upon and enforceable against the GRANTEE, its successors and assigns, in perpetuity by the GRANTOR and other interested parties as allowed by federal, state or local law; that the notices, use restrictions and restrictive covenants set forth herein are a binding servitude on the Property herein conveyed and shall be deemed to run with the land in perpetuity; and that the failure to include the notices, use restrictions and restrictive covenants in subsequent conveyances does not abrogate the status of these notices, use restrictions and restrictive covenants as binding upon the GRANTEE, its successors and assigns:

1. CERCLA NOTICE

A. Pursuant to section 120(h)(3)(A)(i)(I) and (II) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, (hereinafter "CERCLA") (42 U.S.C. § 9620(h)(3)(A)(i)(I) and (II)), available information regarding the type, quantity, and location of hazardous substances, as defined in section 101(14) of CERCLA, and the time at which such substances were stored, released, or disposed of, is provided in Exhibit B, attached hereto and made a part hereof. Additional information regarding the storage, release, and disposal of hazardous substances on the Property has been provided to the GRANTEE, receipt of which the GRANTEE hereby acknowledges. Such additional information includes, but is not limited to, the following documents: Final Environmental Baseline Survey Report, Final Multi-Sites Investigation Report, Final Environmental Assessment and other documents as listed in Attachment 3 to the Finding of Suitability for Early Transfer dated August 2006.

B. Pursuant to section 120(h)(3)(A)(i)(III) of CERCLA, (42 U.S.C. § 9620(h)(3)(A)(i)(III)), a description of the remedial action taken, if any, on the Property is provided in Exhibit B. Additional information regarding the remedial action taken, if any, has been provided to the GRANTEE, receipt of which the GRANTEE hereby acknowledges. Such additional information includes, but is not limited to, the following documents: Final Closure Report – Environmental` Restoration, Multi-Sites; Final Closure Report, Environmental Restoration, Pesticide Building #4126 and Ammunition Bunkers #2953, #2951 and #2950; Final Landfill 4 Investigation Report; BRAC HTRW Site Closure Report for Landfills 1, 2 and 3, Former Burn Area, Buildings 1962 and 1963, Grease Pits at the Camp Bonneville and Camp Killpack Cantonments, Former Sewage Pond and Hazardous Materials Accumulation Point and other documents.

2. CERCLA COVENANT

Pursuant to section 120(h)(3)(A)(ii)(II) of CERCLA, the GRANTOR warrants that any additional remedial action found to be necessary after the date of this Deed with regard to any hazardous substances remaining on the Property as of the date of this Deed shall be conducted by the GRANTOR. This covenant shall not apply in any case in which the person or entity to whom the Property or any portion thereof, is transferred is a potentially responsible party with respect to the Property or any such portion thereof. For purposes of this covenant, the GRANTEE shall not be considered a potentially responsible party solely due to the presence of a hazardous substance remaining on the Property on the date of this Deed. Further, The GRANTOR shall not be relieved of any obligation under CERCLA to perform any remedial action found to be necessary after the date of this Deed with regard to any hazardous substances remaining on the Property as of the date of this Deed if the GRANTEE is

subsequently determined to be a potentially responsible party with respect to hazardous substances placed on the Property after the date of this Deed.

3. RIGHT OF ACCESS

A. Pursuant to section 120(h)(3)(A)(iii) of CERCLA, the GRANTOR retains and reserves a perpetual and assignable easement and right of access on, over, and through the Property, to enter upon the Property in any case in which an environmental response action or corrective action is found to be necessary on the part of the GRANTOR, without regard to whether such environmental response action or corrective action is on the Property or on adjoining or nearby lands. Such easement and right of access includes, without limitation, the right to perform any environmental investigation, survey, monitoring, sampling, testing, drilling, boring, coring, test-pitting, installing monitoring or pumping wells or other treatment facilities, response action, corrective action, or any other action necessary for the GRANTOR to meet its responsibilities under applicable laws and as provided for in this Deed. Such easement and right of access shall be binding on the GRANTEE, its successors and assigns, and shall run with the land.

B. In exercising such easement and right of access, the GRANTOR shall provide the GRANTEE or its successors or assigns, as the case may be, with reasonable notice of its intent to enter upon the Property and exercise its rights under this covenant, which notice may be severely curtailed or even eliminated in emergency situations. The GRANTOR shall use reasonable means, but without significant additional costs to the GRANTOR, to avoid and to minimize interference with the GRANTEE's and the GRANTEE's successors' and assigns' quiet enjoyment of the property. Such easement and right of access includes the right to obtain and use utility services, including water, gas, electricity, sewer, and communications services available on the Property at a reasonable charge to the GRANTOR. Excluding the reasonable charges for such utility services, no fee, charge, or compensation will be due the GRANTEE nor its successors and assigns, for the exercise of the easement and right of access hereby retained and reserved by the GRANTOR.

C. The GRANTOR and the GRANTEE agree that if any action of the GRANTOR's officers, employees, agents, contractors of any tier, or servants in the exercise of this right of access results in damage to the Property, the GRANTOR shall, at its sole discretion, make reasonable repairs to, or compensate for, such damage. In no event shall such repair, or compensation, exceed the fair market value of the damaged portion of the Property at the time immediately preceding such damage. The GRANTOR's liability under this clause shall be contingent upon the availability of, and shall not exceed, appropriations available for such payment and nothing contained in this Deed may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. In addition, the GRANTEE covenants for itself, its successors and assigns not to interfere with any response action or corrective action conducted by the GRANTOR on the Property.

4. "AS IS"

A. The GRANTEE acknowledges that it has inspected or has had the opportunity to inspect the Property and accepts the condition and state of repair of the Property. The GRANTEE understands and agrees that the Property and any part thereof is conveyed "AS IS" without any representation, warranty, or guaranty by the GRANTOR as to quantity, quality, title, character, condition, size, or kind, or that the same is in a condition or fit to be used for the purposes intended by the GRANTEE, and no claim for allowance or deduction upon such grounds will be considered.

B. No warranties, either express or implied, are given with regard to the condition of the Property, including, without limitation, whether the Property does or does not contain asbestos or lead-based paint. The GRANTEE shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any asbestos, lead-based paint, or other conditions on the Property. The failure of the GRANTEE to inspect or to exercise due diligence to be fully informed as to the condition of all or any portion of the Property will not constitute grounds for any claim or demand against the GRANTOR.

C. Nothing in this "As Is" provision will be construed to modify or negate the GRANTOR's obligation under the "CERCLA Covenant" or any other statutory obligations.

5. HOLD HARMLESS

A. To the extent authorized by law, the GRANTEE, its successors and assigns, covenant and agree to indemnify and hold harmless the GRANTOR, its officers, agents, and employees from (1) any and all claims, damages, judgments, losses, and costs, including fines and penalties, arising out of the violation of the notices, use restrictions, and restrictive covenants in this Deed by the GRANTEE, its successors and assigns, and (2) any and all claims, damages, and judgments arising out of, or in any manner predicated upon any failure to comply with the provisions in this Deed regarding asbestos and lead-based paint after the date of conveyance.

B. The GRANTEE, its successors and assigns, covenant and agree that the GRANTOR shall not be responsible for any costs associated with modifications or termination of the notices, use restrictions, and restrictive covenants in this Deed, including, but not limited to, any costs associated with additional investigation or remediation of asbestos or lead-based paint.

C. Nothing in this "Hold Harmless" provision will be construed to modify or negate the GRANTOR's obligation under the "CERCLA Covenant" or any other statutory obligations.

6. ENVIRONMENTAL PROTECTION PROVISIONS

The GRANTEE shall neither transfer the Property, lease the Property, nor grant any interest, privilege, or license whatsoever in connection with the Property without the inclusion of the Environmental Protection Provisions set forth in Exhibit C, attached hereto and made a part hereof, and shall require the inclusion of the said Environmental Protection Provisions in all subsequent deeds, easements, transfers, leases, or grant of any interest, privilege, or license in, on, of, or to the Property or any portion thereof.

7. NON-DISCRIMINATION

The Grantee covenants for itself, its successors, and assigns and every successor in interest to the Property hereby conveyed, or any part thereof, that the said GRANTEE and such successors, and assigns shall not discriminate upon the basis of race, color, religion, age, gender, or national origin in the use, occupancy, sale, or lease of the Property, or in their employment practices conducted thereon. This covenant shall not apply, however, to the lease or rental of a room or rooms within a family dwelling unit; nor shall it apply with respect to religion to premises used primarily for religious purposes. The GRANTOR shall be deemed a beneficiary of this covenant without regard to whether it remains the owner of any land or interest therein in the locality of the Property hereby conveyed and shall have the sole right to enforce this covenant in any court of competent jurisdiction.

8. INDEMNIFICATION OF TRANSFEREES OF CLOSING DEFENSE PROPERTY

The GRANTOR and the GRANTEE are aware of their respective obligations and responsibilities under section 330 of the National Defense Authorization Act for Fiscal Year 1993, Public Law 102-484, Oct. 23, 1992, 106 Stat. 2371, as amended by section 1002 of the National Defense Authorization Act for Fiscal Year 1994, Public Law 103-160, Nov. 30, 1993, 107 Stat. 1745.

9. ANTI-DEFICIENCY ACT

The GRANTOR's obligation to pay or reimburse any money under this Deed is subject to the availability of funds appropriated for this purpose to the Department of the Army and nothing in this Deed shall be interpreted to require obligations or payments by the GRANTOR in violation of the Anti-Deficiency Act, 31 U.S.C. § 1341.

10. NO WAIVER

The failure of the GRANTOR to insist in any one or more instances upon complete performance of any of the said notices, covenants, conditions, restrictions, or reservations shall not be construed as a waiver or a relinquishment of the future performance of any such covenants, conditions, restrictions, or reservations and the obligations of the GRANTEE, its successors and assigns with respect to such future performance shall continue in full force and effect.

IN WITNESS WHEREOF, the GRANTOR has caused this Deed to be executed in its name by the Deputy Assistant Secretary of the Army (Installations and Housing), this the 29th day of September 2006.

UNITED STATES OF AMERICA

By: _____

JOSEPH W. WHITAKER
Deputy Assistant Secretary of the Army
(Installations and Housing)
OASA(I&E)

ACKNOWLEDGEMENT

COMMONWEALTH OF VIRGINIA)
) SS:
COUNTY OF ARLINGTON)

I, the undersigned, a Notary Public in and for the Commonwealth of Virginia, County of Arlington, do hereby certify that this day personally appeared before me in the Commonwealth of Virginia, County of Arlington, Joseph W. Whitaker, Deputy Assistant Secretary of the Army (Installations and Housing), whose name is signed to the foregoing instrument and who acknowledged the foregoing instrument to be his free act and deed on the date shown, and acknowledged the same for and on behalf of the UNITED STATES OF AMERICA.

Elizabeth Mitchell
Notary Public

My commission expires: March 31st 2010 EM

ACCEPTANCE BY GRANTEE

Clark County, a political subdivision of the State of Washington, GRANTEE, hereby accepts this Quitclaim Deed for itself, its successors and assigns, subject to all of the covenants, conditions, reservations, restrictions and terms contained herein, this 3 day of October 2006.

CLARK COUNTY

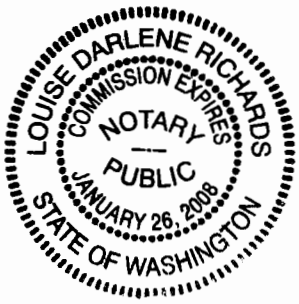
By: _____
Marc Boldt
Chair, Board of County Commissioners

ACKNOWLEDGEMENT

STATE OF WASHINGTON)
) SS.
COUNTY OF CLARK)

On this 3 day of October, 2006 before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared before me Marc Boldt, to me personally known, or proven on the basis of satisfactory evidence, to be the Chair, Board of County Commissioners, Clark County, Washington, whose name is subscribed to the foregoing instrument and who acknowledged the same to be the free and voluntary act and deed of Clark County, Washington on the date shown, and for the purposes therein mentioned, and on oath stated that he was authorized to execute the said instrument for and on behalf of Clark County Washington.

WITNESS my hand and seal hereto affixed the day and year in this certificate above written.



Notary Public in and for the State of Washington, residing at Vancouver, WA

My commission expires:

1-26-08

ATTORNEY'S CERTIFICATE

I, E. Bronson Potter, acting as Senior Deputy Prosecuting Attorney for Clark County, Washington, referred to as the "GRANTEE" in the foregoing Quitclaim Deed, do hereby certify that I have examined the said Quitclaim Deed and the proceedings taken by the GRANTEE relating thereto, and find that the acceptance thereof by the GRANTEE has been duly authorized and that the execution thereof is in all respects due and proper and in accordance with the laws of the State of Washington, and further that, in my opinion, the said Quitclaim Deed constitutes a legal and binding compliance obligation of the GRANTEE in accordance with the terms thereof.

Dated this 3RD day of OCTOBER, 2006.

By: _____

E. Bronson Potter
Senior Deputy Prosecuting Attorney
Clark County, Washington

EXHIBIT A

LEGAL DESCRIPTION

A parcel of land located in Sections 34 and 35 of Township 3 North, Range 3 East of the Willamette Meridian, and in Sections 1, 2, 3, and 10 of Township 2 North, Range 3 East of the Willamette Meridian, all in Clark County, Washington, more particularly described as follows:

BEGINNING at a 3 inch aluminum cap marking the southwest corner of Section 34 Township 3 North, Range 3 East, Willamette Meridian; thence South 88° 25' 57' East, 2,635.07 feet along the south line of the southwest quarter (SW¼) of said Section 34 to a 3¼ inch aluminum cap marking the south quarter corner of said Section 34; thence North 02° 00' 17" East, 2,648.35 feet along the west line of the southeast quarter (SE¼) of said Section 34 to a ½ inch iron rod with yellow plastic cap marked "Hart 12974" marking the center of said Section 34 per that record of survey recorded in book 39 of Surveys at page 34, Records of Clark County, Washington; thence South 88° 11' 19" East, 2,643.06 feet along the north line of the southeast quarter (SE¼) of said Section 34 to the east quarter corner of said Section 34, as calculated per that Record of Survey recorded in Book 21 of Surveys, at Page 132, Records of Clark County, Washington; thence North 02° 11' 12" East, 2,637.25 feet along the west line of the northwest quarter (NW¼) of Section 35 to a 3 inch brass cap marking the northwest corner of said Section 34, being also the northeast corner of Section 35, Township 3 North, Range 3 East; thence South 88° 07' 36" East, 2,644.51 feet along the north line of the northwest quarter (NW¼) of said Section 35 to a 3¼ inch aluminum cap marking the north quarter corner of said Section 35; thence South 88° 07' 57" East, 2,644.52 feet to the northeast corner of said Section 35, said corner having a witness corner marked by a 3 inch brass cap bearing North 02° 13' 29" East, 5.00 feet, as set per that Record of Survey recorded in Book 21 of Surveys, at Page 132, Records of Clark County, Washington; thence South 02° 13' 29" West, 5,196.56 feet along the east line of said Section 35, to a 3 inch brass cap marking the southeast corner of said Section 35, being also the southwest corner of Section 36, Township 3 North, Range 3 East, as calculated per that Record of Survey recorded in Book 21 of Surveys, at page 132, records of Clark County, Washington; thence South 89° 00' ll" East, 5,286.83 feet along the south line of said Section 36, to a 3 inch brass cap marking the southeast corner of said Section 36, being also the northeast corner of Section 1, Township 2 North, Range 3 East; thence South 01° 10' 01" West, 5,302.22 feet along the east line of said Section 1, to a 3 inch brass cap marking the southeast corner of said Section 1; thence North 88° 46' 24" West, 5,266.51 feet along the south line of said Section 1, to a ½ inch iron rod with yellow plastic cap marked "TBH PLS 10920" marking the southwest corner of said Section 1, per that Record of Survey recorded in Book 21 of Surveys, at Page 95, Records of Clark County, Washington, being also the southeast corner of Section 2, Township 2 North, Range 3 East; thence North 88° 31' 25" West, 2,637.03 feet along the south line of the southeast quarter (SE¼) of said Section 2, to a ⅞ inch drill shaft marking the south quarter corner of said Section 2; thence North 88° 40' 34" West, 2,621.18 feet to a 3¼ inch aluminum cap marking the southwest corner of said Section 2, being also the northeast corner of Section 10, Township 2 North, Range 3 East; thence South 01° 25' 00" West, 2.640.69 feet to a 3¼ inch aluminum cap marking the east quarter corner of said Section 10; thence North 89° 15' 33" West, 5,294.16 feet along the south line of the North half (N½) of said Section 10 to a 3½ inch brass cap marking the west quarter corner of said Section 10; thence North 01° 27' 42" East, 2.641.85 feet along the west line of the northwest quarter (NW¼) of said Section 10 to a 1¼ inch iron pipe marking the northwest corner of said Section 10, being also the southwest corner of Section 3, Township 2 North, Range 3 East, per that Record of Survey recorded in Book 17 of Surveys, at Page 87, Records of Clark County, Washington;. thence North 00° 52' 55" East, 2650.31 feet along the west line of the southwest

quarter (SW¼) of said Section 3, to a ¾ inch iron pipe marking the west quarter corner of said Section 3, per said Record of Survey in Book 17 of Surveys, at Page 87; thence North 00° 52' 57' East, 2,671.49 feet to the northwest corner of said Section 3, being also the southwest corner of Section 34, Township 3 North, Range 3 East and the **POINT OF BEGINNING.**

EXCEPT the north half of the southwest quarter of the southwest quarter (N½SW¼SW¼) of Section 3, Township 3 North, Range 3 East, Willamette Meridian, per that Record of Survey recorded in Book 23 of Surveys, at Page 91, Records of Clark County, Washington.

ALSO EXCEPT that tract of land conveyed to the Public, by Quit Claim Deed recorded under Auditor's File Book 24, Page 223 on August 29, 1894, in Clark County, Washington, being a portion of the southwest quarter of the northwest quarter (SW¼NW¼) of Section 3, Township 2 North, Range 3 East, of the Willamette Meridian, described as follows:

BEGINNING at the southwest corner of the northwest quarter (NW¼) of said Section 3; thence east along the south line or said northwest quarter (NW¼), 330 feet (20 rods); thence north parallel with the west line of said northwest quarter (NW¼), 264 feet (16 rods); thence west parallel with the south line of said northwest quarter (NW¼), 330 feet (20 rods), to the west line of northwest quarter (NW¼) of Section 3; thence south along said west line 264 feet (16 rods), to the **POINT OF BEGINNING.**

ALSO EXCEPT any portion lying within the right of way of Northeast 232nd Avenue, and

ALSO EXCEPTING any portion lying within the right of way of Northeast 68th Street.

This description contains 3,013 acres, more or less.

This description based on survey preformed by Clark County, Washington 15 May 2006 as recorded in Book 56 of Surveys, at page 007, Records of Clark County, Washington. The Basis of Bearing is the south line of the southwest quarter of Section 34, Township 3 North, Range 3 East, Willamette Meridian, being held as South 88° 25' 57" East and distances are based on grid distances with a combined factor of 1.0000365 to obtain ground distances. Survey is based on the Washington State Plane Coordinate System, South Zone, NAD83/91 Adjustment.

EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release or Disposal	Remedial Actions Taken
Remedial Action Unit 1			
Building 1864 Pesticide Storage/Mixing Building	**2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid, 4,4-dishlorodiphenotrichloroethant (DDT)** Cadmium Lead	**1977 - 1980** Unknown	**Records indicate that this facility stored 55-gallon drums of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid, and an unknown amount of 4,4-dishlorodiphenotrichloroethant (DDT). These materials came from Building 4126 in 1977 and in 1980 were moved to Fort Lewis.** Surface, subsurface, and groundwater samples were collected at the site and tested for TPH, VOCs, (subsurface samples only) SVOCs, chlorinated pesticides, PCBs, organophosphorus pesticides, chlorinated herbicides, and PL metals. Test results indicate that surface and sub-surface soil samples had concentrations of various metals (cadmium, chromium and lead) above regulatory cleanup levels. The concentrations of cadmium and lead exceeded background levels. Groundwater samples collected from the two monitoring wells installed at the site contained no analytes above regulatory criteria. Remediations began in June 2000 that included soil excavations to a depth of 0.8 feet bgs (on average). Confirmatory samples were collected from the excavation, and the test results indicated that the concentration of TPH (diesel and heavy oil range) and lead exceeded cleanup criteria. Based on that data, the excavation was extended to 2.7 feet bgs (on average). Confirmatory samples were collected, and all test results showed target analyte concentrations to be below their respective cleanup criteria. The contaminated soil excavation was completed in 2000, and all contaminated soil was disposed of at an off-site facility. The excavation was backfilled to grade.
Building 4126 Pesticide Storage	**2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid,**	**Unknown to 1977**	**Records indicate that this building stored 55-gallon drums of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 2,4-dichlorophenoxyacetic acid, and 4,4-dishlorodiphenotrichloroethant (DDT) until 1977 when these**

EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE FOR ACT RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)	Date of Storage, Release or Disposal	Remedial Action Taken
	4,4-dishlorodiphenotrichloroethant (DDT)		**materials were moved to Building 1864, see above.**
	Lead	Unknown	Soil samples and an indoor floor sample were collected and tested for chlorinated pesticides and herbicides, PCBs, PPL metals (plus barium) and TPH (gasoline and diesel ranges). Test results on these samples indicate that pesticides (4,4-DDT, 4,4-DDD, 4,4-DDE, beta-BHC, lindane, 2,4-D, 2,4-DB, 2,4,5-T, and MCPP), petroleum hydrocarbons, and several metals were detected but at concentrations below regulatory cleanup and background concentrations. Polychlorinated biphenyls were not detected at concentrations exceeding the laboratory reporting limit. Petroleum hydrocarbons were detected in floor samples above regulatory cleanup standards. Lead was detected in a surface soil sample above regulatory cleanup and background concentrations. Based on the floor and soil sample results, the building was dismantled and soil was excavated under the building footprint to a depth of 1-foot. Confirmatory samples were collected and test results show no analyte concentration above regulatory cleanup criteria. The building debris and excavated soils were disposed of at an off-site facility. The excavation was backfilled to grade.
4475	Broad-leaf herbicides	Unknown	Pesticides were formerly stored in this building. The duration and volume of pesticide storage is not known.
Building 4475 (Maintenance Pit)	Lead	Unknown	Six soil samples were collected from two borings advanced at the Maintenance pit. The soil samples collected at the drainage pit were tested, and the results showed unidentified hydrocarbons, VOCs, SVOCs and chlorinated pesticides at concentrations below regulatory criteria. No PCBs were detected in any of the samples. Several metals were detected above the regulatory cleanup concentration (arsenic, chromium, and lead) but below site-specific background concentrations with the exception of one sample, which had a lead concentration above background. In June 2000, all accessible lead-contaminated soils were excavated and disposed of at an off-site facility. The excavation was stopped to avoid undermining the building. Contaminated soil may be present beneath the

EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance(s)		
			building. Potential contaminants may include petroleum hydrocarbons, VOCs, SVOCs, metals. The excavation was backfilled to grade.
Suspect Drum Burial Site (Drum Disposal Area)	Arsenic Barium Chromium Methoxychlor Toluene	Unknown	An electromagnetic survey of the area identified anomalies. Soil borings were advanced in this area and samples collected. No SVOCs, PCBs, pesticides, or explosive compounds were detected in the samples, and there was no evidence of the presence of explosives. Petroleum hydrocarbons, certain VOCs, and metals were detected, but at concentrations below regulatory cleanup criteria and/or background concentrations. In 2000, the area was excavated to remove buried drums and debris (paint cans, corrugated metal, scrap metal and barbed wire). Twenty-six test pits were excavated to assess the area of drum disposal. Soil samples collected from the tests pits, and at some locations rainwater that accumulated in the pits, were tested. The soil sample test results indicate that toluene, arsenic, barium, chromium and methoxychlor exceeded regulatory cleanup criteria. The rainwater sample test results indicate that naphthalene, ethyl benzene, toluene, and lead above cleanup levels. A second EM survey was conducted to determine if buried objects could have caused or contributed to the contamination. Thirteen additional anomalies were identified and investigated by trenching. One excavation contained among other things, paint cans and paint. The other trenches contained scrap metal, reinforcement bars, barbed wire and firing point survey markers. Cleanup activities were initially conducted to address the debris, but later to address the organic compounds and metals detected in the test pits. Approximately 110 tons of soil and debris was excavated and disposed of at an off-site facility. Confirmatory sample results indicate all target analyte concentrations were either not detected or below regulatory cleanup criteria. The excavation was backfilled to grade.
Former CS Gas Training Building (Former CS Gas Training Building Site)	Lead	Unknown	Five soil borings were advanced in the area and soil samples were collected. Test results indicate that CS gas and cyanide were not detected. Semi-volatile organic compounds were detected but at concentrations below regulatory criteria. Lead was detected above regulatory cleanup and background criteria. In June 2000, contaminated soil excavation activities were commenced. The excavation extended to 3-feet below grade. Confirmatory sample test results indicate that all analyte concentrations were below MTCA cleanup criteria. The excavation was backfilled to grade and all contaminated soil was disposed of at an off-site facility.

EXHIBIT B

NOTIFICATION OF [illegible] SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name(s) of Hazardous Substance(s)	Quantity of Hazardous Substance Stored, Released or Disposed	Remedial Action
Ammunitions Storage Bunkers (Facility Nos. 2950, 2951, and 2953)	Lead	Unknown	In 1998, fifteen sampling locations (nine at the largest magazine and three each at the two smaller magazines) were selected for the collection of surface and subsurface soil samples. A soil boring was also advanced at each magazine based on the results of the surface soil tests from soil samples collected from inside the magazines. Wipe samples were collected from the floors in each magazine. The soil samples collected from inside the magazines, and the wipe sample tests results show RDX (below reporting levels) and all the PPL metals except selenium and thallium in Building 2950. Arsenic, beryllium, cadmium, chromium, lead, and mercury were detected in the soil samples collected from inside the magazines at concentrations that exceed the MTCA cleanup criteria. Arsenic, beryllium, and cadmium concentrations were also above background levels. PETN was detected in one magazine; however, there is no established cleanup concentration for PETN. No organic compounds were detected above reporting limits in the surface soil samples collected outside the magazines. Arsenic, cadmium, chromium, and lead were detected at concentrations above MTCA cleanup criteria and background levels in the surface soil samples collected outside the magazines. In 2001, surface and subsurface soil samples were collected from Building 2953. PETN, picric acid, and 2,4-dinitrotoulene were detected in the surface soil samples at concentrations below MTCA cleanup criteria. No ordnance compounds or propellants were detected in the subsurface soil samples. Metals were detected in the surface soil samples. Arsenic and chromium were detected above MTCA cleanup criteria. Lead was detected above the MTCA cleanup criteria and background levels. In May 2001, contaminated soils at the three magazines were excavated to one foot below grade. Confirmatory samples were collected and the test results indicated no residual contaminants above regulatory criteria or background levels. The excavations were backfilled and the contaminated soil and wood from pallets inside the magazines were disposed of at an off-site facility. The interior surfaces of the magazines were cleaned.
Remedial Action Unit 2A			
25Meter M60/Pistol Range	Lead	Unknown	Two soil samples collected from this site had lead concentrations of 136 mg/kg and 219 mg/kg.
25Meter Machine Gun Range	Lead	Unknown	The explosive residue (DNT) was detected in soil samples collected from the muzzle blast zone at concentrations that range from 4.9 mg/kg to 20 mg/kg, which are below regulatory criteria. Eleven soil samples had lead concentrations that ranged from 120 mg/kg to 26,300 mg/kg.

EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Hazardous Substance(s)	Date(s)	Remedial Action Taken
25Meter Record Fire Field Range	Lead	Unknown	Six soil samples collected from this site had lead concentrations that ranged from 150 mg/kg to 8,880 mg/kg.
Machine Gun Range- North	Barium and Lead	Unknown	Barium was detected in two soil samples at concentrations of 178 mg/kg and 200 mg/kg. Lead was detected in one soil sample at a concentration of 158 mg/kg.
Machine Gun Range- South	Barium and Lead	Unknown	Barium was detected in one soil sample at concentration of 192 mg/kg. Lead was detected in two soil samples at concentrations of 135 mg/kg and 423 mg/kg.
Infiltration Course-South	Lead	Unknown	Lead was detected in one soil sample at a concentration of 151 mg/kg.
Sub-machine Gun Range	Barium	Unknown	Barium was detected in one soil sample at a concentration of 133 mg/kg.
Field Firing Ranges 1 & 2	Lead	Unknown	Eight soil samples had lead concentrations that range from 125mg/kg to 7,150 mg/kg.
TF Range	Barium	Unknown	Barium was detected in one soil sample at a concentration of 163 mg/kg.
Combat Pistol Range	Lead	Unknown	Two soil samples contained lead at concentrations of 165 mg/kg and 785 mg/kg.
Close Combat Range	Barium	Unknown	Barium was detected in two soil samples at concentrations of 145 mg/kg and 227 mg/kg.
Rifle Ranges 1&2	Arsenic, Barium and Lead	Unknown	Arsenic and barium were detected in soil samples at 22.9 mg/kg and 202 mg/kg, respectively. Eighteen soil samples had lead concentrations that ranged from 130 mg/kg to 4,330 mg/kg.
Field Fire Rifle Ranges 1 & 2	Barium and Lead	Unknown	Soil test results show two samples with barium detected at concentrations of 146 mg/kg and 194 mg/kg. Two soil samples contained lead in concentrations of 149 mg/kg and 2,300 mg/kg.
Undocumented Pistol Range	Lead	Unknown	Lead was detected in one soil samples at a concentration of 154 mg/kg.
Remedial Action Unit 2B			
No sites			
Remedial Action Unit 2C			

EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Building Number	Name of Hazardous Substance	Quantity	Date(s) Stored, Released or Disposed
Demolition Area 1 and Landfill 4	RDX 2,4-DNT Perchlorate Dichlorofluoromethane 1,1,1-TCA 1,1-DCE PCE	Unknown	A site investigation (SI) was conducted in 1998-1999 4 to evaluate the potential for contamination resulting from past uses of the landfill. The SI included a UXO avoidance survey, geophysical survey, surface and subsurface sampling, and groundwater sampling. Test results of soil samples indicate concentrations of various metals. Only barium, copper, and chromium were detected at concentrations exceeding the regulatory/risk-based criteria. One or more SVOCs, insecticides, herbicides and VOCs were detected, but at concentrations below screening criteria. The only groundwater constituent detected at a concentration exceeding a screening level was RDX (44 ug/l). This compound was detected in the down-gradient well only. Surface water investigations of nearby streams were conducted in 1998 and 1999. Both investigations included the collection and analysis of stream water samples, which were extensively tested. Both investigations concluded that the activities conducted at the landfill do not appear to have affected the stream(s) investigated (primarily Lacamas Creek). In 2001, an expanded site investigation (ESI) of the landfill was conducted based on the previous detection of RDX. The ESI focused primarily on groundwater and included the installation of eight monitoring wells (one well could not be used because it was dry). Four quarterly rounds (July 2001, October 2001, January 2002, and April 2002) of groundwater sampling were conducted. Well samples were also collected in January 2003. Samples collected from the wells were tested for explosives residues, nitroguanidine, perchlorate ion, VOCs, SVOCs, organochlorine herbicides PPL metals (total and dissolved), total cyanide TPH and water quality parameters. Tests results indicate that explosives and propellants (2,4-DNT, RDX, and perchlorate) were detected in all but one monitoring well, and were also detected in the up-gradient well. These constituents were detected in concentrations exceeding screening criteria in the initial groundwater sampling rounds and the final sampling round. Dichlorofluoromethane, 1,1,1-TCA, 1,1-DCE, and PCE were also detected above screening levels. In 2004, approximately 5,000 cys of contaminated soil was removed (interim action) and disposed of at an off-site facility. The excavation was backfilled to grade. The monitoring wells at the site will be sampled on a quarterly basis.

[redacted]

Remedial Action Unit 3

No sites			

The information contained in this notice is required under the authority of regulations promulgated under section 120(h) of the Comprehensive Environmental Response, Liability, and Compensation Act (CERCLA or 'Superfund') 42 U.S.C. §9620(h). This table provides information on the storage of hazardous substances for one year or more in quantities greater than or equal to 1,000 kilograms or the hazardous substance's CERCLA reportable quantity (which ever is greater). In addition, it provides information on the known release of hazardous substances in quantities greater than or equal to the substances CERCLA reportable quantity. See 40 CFR Part 373.

Notes:

1) Sites and chemical compounds shown in bold type: records indicate that a CERCLA hazardous substance was stored, released, or disposed of at the identified facility at or above its reportable quantity.
2) Sites and chemical compounds not shown in bold type: records indicate a CERCLA hazardous substance was released or disposed of at the site/area indicated; however, the quantity is not known. These sites generally relate to a known or suspected release of a CERCLA hazardous substance that was detected at concentrations that require cleanup, the hazardous substance.
3) Chemical Abstract Service Registry Numbers:

Analyte	Case #	Reportable Quantity (lbs)
• Arsenic	7440382	1
• Barium	7440-39-3	-
• beta-BHC	319857	1
• Cadmium	7440439	1
• Chromium	440473	1

Acronyms:

CERCLA = Comprehensive Environmental Compensation liability Act
CFR = Code of Federal Regulations
CS = 2-chlorobenzalmalononitrile
D = dichlorophenoxy acetic acid
DB = dichlorophenoxy butyric acid
DCE = dichloroethylene
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
DDT =dichlorodiphenyltrichloroethane
DNT = 2,4-dinitrotoluene
EM = electromegnetic
ESI = expanded site investigation
Lbs = pounds
MCPP =2-(2-methyl-4-chlorophenoxy) propionic acid
MTCA = Model Toxics Control Act
PCB = polychlorinated biphenyls
PCE = Tetrachloroethylene

EXHIBIT B

NOTIFICATION OF HAZARDOUS SUBSTANCE STORAGE, RELEASE OR DISPOSAL

Hazardous Substance	Chemical Abstracts Service Registry Number	Reportable Quantity (RQ)
• Chlorobenzalmalononitrile	2698411	-
• 2,4-D	94757	100
• 2,4-DB	94826	-
• 1,1-DCE	75354	5000
• 4,4-DDT	50293	1
• 4,4-DDD	72548	1
• 4,4-DDE	72559	1
• Dichlorofluoromethane	75434	-
• DNT	121142	1000
• Lead	7439921	1
• Lindane	58999	1
• Methoxychlor	72435	1
• MCPP	7085190	-
• 2,4,5-T	93765	100
• 1,1,1-TCA	71556	1
• TCE	79016	1000
• Toluene	108-88-3	1000
• PCB	1336363	10
• PCE	127184	1
• Perchlorate	14797730	-
• RDX	121824	-
• Sodium hypochlorite	7681529	100

PETN = pentaerythritol tetranitrate
PPL Metals = priority pollutant metals
T = trichlorophenoxyacetic acid
TCA = trichloroethane
TCE = Trichloroethylene
TPH = total petroleum hydrocarbons
RDX = hexahydro-1,3,5-trinitro-1,3,5-triazine
SVOC = semi-volatile organic compounds
U.S.C. = United States Code
U.S. EPA = United States, Environmental Protection Agency
VOC = volatile organic compounds

EXHIBIT C

ENVIRONMENTAL PROTECTION PROVISIONS

1. LAND USE RESTRICTIONS

A. The United States Department of the Army (hereinafter the "Army") has undertaken careful environmental study of the Property and concluded that the land use restrictions set forth below are required to ensure protection of human health and the environment. The GRANTEE, its successors or assigns, shall not undertake nor allow any activity on or use of the Property that would violate the land use restrictions contained herein.

(1) Residential Use Restriction. The GRANTEE, its successors and assigns, shall use the Property solely for conservation of natural resources and not for residential purposes. For purposes of this provision, residential use includes, but is not limited to, single family or multi-family residences; child care facilities; and nursing home or assisted living facilities; provided, however, that residential purposes do not include multiple overnight stays associated with the Rustic Retreat Center and Outdoor School, day camping or overnight camping within existing or new buildings on the Property; provided further, however, that prior to the use of any buildings on the Property for such purposes, the responsible State of Washington and/or local government agency or agencies shall have made a written determination that the buildings are habitable and safe for such use under applicable state and/or local laws and regulations. Caretaker, security, and/or Parks & Recreation Department personnel wishing to live in existing buildings or newly-constructed buildings on the Property during remediation and post-remediation of the Property may not reside in such buildings until the responsible State of Washington and/or local government agency or agencies shall have made a written determination that such buildings are habitable and safe for such use under applicable state and/or local laws and regulations.

(2) Ground Water Restriction. The GRANTEE is hereby informed and acknowledges that there is limited contamination of the ground water under the Demolition Area 1/Landfill 4 area more particularly described in Exhibit D, attached hereto and made a part hereof. The GRANTEE, its successors and assigns, shall not have the right to access or use ground water underlying the Property for any purpose without the prior written approval of the Army and the Washington State Department of Ecology (hereinafter the "WDOE"). For the purpose of this restriction, "ground water" shall have the same meaning as in section 101(12) of CERCLA. The GRANTEE may, however, use the existing water systems at the Camp Killpack and Camp Bonneville cantonment areas and the caretaker's building for purposes of continuing to provide non-potable water to said facilities or for the provision of potable water provided that prior to use of said water systems for the provision of potable water, the responsible State of Washington and/or local government agency or agencies must make a determination that the water is suitable and safe for such use under applicable state and/or local laws and regulations. The GRANTEE shall have the right to develop other water systems, including those using groundwater underlying other areas of the Property, excluding the area underlying Demolition Area 1/Landfill 4 and the associated contaminant plume, provided, that the GRANTEE shall obtain the prior written approval of the WDOE and the Army.

(3) Excavation/Land Disturbance Restriction. The GRANTEE, its successors and assigns, shall not have the right to conduct, or permit others to conduct, any excavation or other intrusive activity on the Property, without qualified unexploded ordnance (hereinafter "UXO") personnel on staff or available and a Department of Defense (hereinafter "DoD") approved Explosives Safety Submission and/or explosives site plan.

(4) Public Access Restriction. The GRANTEE, its successors and assigns shall not have the right to provide access to the Property to members of the general public until such time as all remedial

action necessary to protect human health and the environment with respect to hazardous substances remaining on the Property as of the date of this Deed, including munitions and explosives of concern (hereinafter "MEC"), has been taken and this restriction is modified or released by the GRANTOR. The restriction imposed herein shall not restrict the right of the GRANTEE, its successors and assigns to provide access to the Property to officers, employees, agents, and contractors of any tier for the purpose of conducting environmental remediation and MEC response actions. The GRANTEE covenants and agrees to construct and maintain a fence along the perimeter of the Property to control or restrict public access as needed. The GRANTEE further covenants and agrees to provide and maintain appropriate signage to inform its officers, employees, agents, and contractors of any tier and the general public about potential hazards on the Property.

(5) Notice of Archaeological Site and Preservation Covenant. In consideration of the conveyance of the Property that includes site 45-CL-318, and may include other as yet undiscovered archaeological sites on the Property, the GRANTEE hereby covenants on behalf of itself, its successors, and assigns at all times to the Washington State Historic Preservation Officer (hereinafter the "SHPO") to maintain and preserve site 45-CL-318 and all other as yet undiscovered archaeological sites in accordance with the provisions of the following paragraphs of this covenant.

a. The GRANTEE, its successors or assigns shall notify the SHPO and the Cowlitz Indian Tribe in writing prior to undertaking any disturbance of the ground surface or any other action within 300 feet of the center of site 45-CL-318 that would affect its physical integrity. The center point of site 45-CL-318 is described as being located at 134810 E, 1150207 N, NAD 1983 HARN State Plane Washington South FIPS 4602 feet. Said site is more particularly described in Exhibit E, attached hereto and made a part hereof. Such notice shall describe in reasonable detail the proposed undertaking and its expected effect on the physical integrity of site 45-CL-318.

b. For ground-disturbing activities other than remediation of MEC, the GRANTEE, its successors or assigns shall prepare and submit to the SHPO and the Cowlitz Indian Tribe a written assessment of project effects in advance of any ground-disturbing activity having moderate to high potential impacts within areas mapped as "20-100% probability" in the Clark County Archaeological Predictive Model Map, attached hereto as Exhibit F and made a part hereof, and having slopes less than 5%. The assessment of project effects will describe the proposed undertaking in reasonable detail, discuss its expected effects upon recorded or unrecorded archaeological resources, and will conclude with recommendations concerning the need for additional archaeological survey or other actions to avoid or mitigate adverse effects to archaeological resources, taking into account previous cultural resource surveys at the Property and other recorded archaeological sites in close proximity to the proposed project.

c. The GRANTEE, its successors or assigns shall make every reasonable effort to prohibit any person from knowingly or inadvertently disturbing any archaeological object or archaeological site, as defined in RCW 27.53.030. In the event that any archaeological object or archaeological site is knowingly or inadvertently disturbed, the GRANTEE, its successors or assigns shall immediately stop the activity causing the disturbance and make a reasonable effort to protect the archaeological object or archaeological site from further disturbance. The GRANTEE, its successors or assigns shall provide written notification to the SHPO and the Cowlitz Indian Tribe within one (1) working day of the discovery. Within fifteen (15) calendar days of the discovery, the GRANTEE, its successors or assigns shall provide to the SHPO and the Cowlitz Indian Tribe a Draft Site Treatment and Restoration Plan to describe the actions the GRANTEE, its successors or assigns will take to mitigate the damage, restore the site of discovery, and provide for the treatment and disposition of any archaeological resources recovered.

d. Within thirty (30) calendar days of the SHPO's and Cowlitz Indian Tribe's receipt of notification provided by the GRANTEE, or its successors or assigns pursuant to paragraphs (a), (b), or (c) of this covenant, the SHPO and the Cowlitz Indian Tribe will respond to the GRANTEE, its successors or assigns in writing as follows:
    1. That the GRANTEE, its successors or assigns may proceed with the proposed undertaking without further consultation; or
    2. That the GRANTEE, its successors or assigns must initiate and complete consultation with the SHPO before it can proceed with the proposed undertaking.

    If the SHPO and the Cowlitz Indian Tribe fail to respond to the GRANTEE's or its successors' or assigns' written notice within thirty (30) calendar days of the SHPO's and the Cowlitz Indian Tribe's receipt of the same, then the GRANTEE may proceed with the proposed undertaking without further consultation.

e. If the response provided to the GRANTEE, its successors or assigns by the SHPO and the Cowlitz Indian Tribe pursuant to paragraph d.2. of this covenant requires consultation with the SHPO and the Cowlitz Indian Tribe, then all parties will so consult in good faith to arrive at mutually-agreeable and appropriate measures that GRANTEE, its successors or assigns will employ to mitigate any adverse effects associated with the proposed undertaking. Pursuant to this covenant, any mitigation measures to which GRANTEE, its successors or assigns and the SHPO mutually agree shall be carried out solely at the expense of GRANTEE, its successors or assigns.

f. The SHPO and the Cowlitz Indian Tribe shall be permitted at all reasonable times to inspect the Property in order to ascertain its condition and to fulfill their responsibilities hereunder.

g. In the event that another Indian tribe should request consultation regarding activities described in paragraphs (a), (b), or (c) of this covenant, the GRANTEE, its successors or assigns shall consult with such tribes consistent with Washington state law and ordinances of the GRANTEE.

h. In the event of a knowing violation of this covenant, and in addition to any remedy now or hereafter provided by law, the SHPO may, following reasonable notice to the GRANTEE, its successors or assigns, institute suit to enjoin said violation or to require the restoration of any archaeological site affected by such violation. The successful party shall be entitled to recover all costs or expenses incurred in connection with any such suit, including all court costs and attorney's fees.

i. This covenant is binding on the GRANTEE, its successors, and assigns in perpetuity. Restrictions, stipulations, and covenants contained herein shall be inserted by the GRANTEE verbatim or by express reference in any deed or other legal instrument by which it divests itself of either the fee simple title or any other lesser estate in site 45-CL-318 or any other portion of the Property.

j. The failure of the SHPO to exercise any right or remedy granted under this instrument shall not have the effect of waiving or limiting the exercise of any other right or remedy or the use of such right or remedy at any other time.

k. This covenant shall be a binding servitude upon the Property and shall be deemed to run with the land.

l. Execution of this Deed shall constitute conclusive evidence that GRANTEE agrees to be bound by the foregoing conditions and restrictions and to perform the obligations herein set forth.

B. Modifying Land Use Restrictions.

(1) The GRANTEE shall prepare Long Term Operation and Maintenance Plans (hereinafter "LTO&M Plans") as required by the Prospective Purchaser Consent Decree between the GRANTEE and Bonneville Conservation, Restoration, and Renewal Trust, LLC (hereinafter the "BCRRT") and Washington State Department of Ecology (hereinafter "WDOE") filed in the Clark County Superior Court. The LTO&M Plans shall identify any new land use restrictions or appropriate modifications to, or termination of, the land use restrictions established in this Deed based upon additional site characterization and remediation that will be completed pursuant to the Environmental Services Cooperative Agreement (hereinafter "ESCA") between the GRANTOR and the GRANTEE dated July 28, 2006, as modified. The LTO&M Plans must be reviewed by and agreed to by the GRANTOR prior to their submission to WDOE and must be approved by WDOE. Within 30 days of WDOE's approval of a LTO&M Plan, the GRANTOR and the GRANTEE shall prepare an appropriate instrument to revise, as necessary, the land use controls contained in this Deed to be consistent with those specified in the LTO&M Plan. This instrument shall be executed and recorded within 15 days of completion of the preparation of a mutually-satisfactory instrument.

(2) Nothing contained herein shall preclude the GRANTEE, its successors or assigns, from undertaking, in accordance with applicable laws and regulations and without any cost to the GRANTOR, such additional action necessary to allow for other less restrictive land use, groundwater, excavation/land disturbance or public access uses of the Property. Prior to such use of the Property, the GRANTEE, its successors or assigns shall consult with and obtain the approval of the GRANTOR, and, as appropriate, the State or Federal regulators, or the local authorities. Upon the GRANTEE's or its successors' or assigns' obtaining the approval of the GRANTOR and, as appropriate, state or federal regulators, or local authorities, the GRANTOR agrees to execute an instrument suitable for recordation in the local land records and modifying, as appropriate, the land use restrictions imposed hereunder. The recordation of any such instrument shall be the responsibility of the GRANTEE, or its successors or assigns and shall be accomplished at no additional cost to the GRANTOR.

(3) The GRANTEE, its successors and assigns, shall submit any requests for modifications to the land use restrictions set forth herein to the GRANTOR and the WDOE, by first class mail, postage prepaid, addressed as follows:

GRANTOR: U.S. Army Engineer District, Seattle
ATTN: CENWS-RE
3015 NW 54th Street,
Seattle, WA 98107

WDOE: Washington State Department of Ecology
Toxics Cleanup Program
P.O. Box 47600
Olympia, WA 98504-7600

2. ENVIRONMENTAL PROTECTION PROVISIONS BINDING AND ENFORCEABLE

The Environmental Protection Provisions in this Deed are binding on the GRANTEE, its successors and assigns and shall be included in subsequent deeds, shall run with the land, and are forever enforceable by the Grantor and appropriate regulatory agencies.

3. DISRUPTION OF REMEDIES PROHIBITED

Pursuant to section 120(h)(3)(C)(ii)(II), the GRANTEE covenants and agrees for itself, its successors, and assigns, that it shall not, nor shall it allow its sublessees, tenants, invitees or licensees to engage in activities that will disrupt any remedial investigation, response action, and/or oversight activities on the Property related to hazardous substances or MEC.

4. NOTICE OF THE POTENTIAL PRESENCE OF MUNITIONS AND EXPLOSIVES OF CONCERN (MEC)

A. The GRANTEE is hereby notified that due to the former use of the Property as a military installation, the Property may contain MEC. The term "MEC" means specific categories of military munitions that may pose unique explosives safety risks and includes: (1) unexploded ordnance ("UXO"), as defined in 10 U.S.C. § 101(e)(5); (2) discarded military munitions ("DMM"), as defined in 10 U.S.C. § 2710(e)(2); and (3) munitions constituents (e.g. TNT, RDX), as defined in 10 U.S.C. § 2710(e)(3), present in high enough concentrations to pose an explosive hazard.)

B. The Property was previously used as an operational range for live-fire training or testing, open burning, and for open detonation of munitions. A munitions response was conducted in 1998 and 2000. Munitions response activities have not been completed. A summary of MEC discovered on the Property is provided in Exhibit G, attached hereto and made a part hereof.

C. If the GRANTEE, its successors or assigns, any subsequent owner, or any other person should find any MEC on the Property after response activities are completed, they shall immediately stop any intrusive or ground-disturbing work in the area or in any adjacent areas and shall not attempt to disturb, remove or destroy it, but shall immediately notify Local Law Enforcement so that appropriate explosive ordnance disposal personnel can be dispatched to address such MEC as required under applicable law and regulations and the ESCA. This requirement does not apply while conducting munitions response. During such munitions responses, any MEC encountered will be addressed per the procedures outlined in the DDESB-approved explosives safety submission and/or the explosives site plan.

D. Easement and Access Rights.

(1) The GRANTOR reserves a perpetual and assignable easement and right of access on, over, and through the Property, to access and enter upon the Property in any case in which a munitions response action is found to be necessary or such access and entrance is necessary to carry out a munitions response action on adjoining property. Such easement and right of access includes, without limitation, the right to perform any additional investigation, sampling, testing, test-pitting, surface and subsurface clearance operations, or any other munitions response action necessary for the GRANTOR to meet its responsibilities under applicable laws and as provided for in this Deed. This easement and right of access shall be binding on the GRANTEE, its successors and assigns, and shall run with the land.

(2) In exercising this easement and right of access, the GRANTOR shall give the GRANTEE or the then record owner, reasonable notice of the intent to enter on the Property, except in emergency situations. The GRANTOR shall use reasonable means, without significant additional cost to the GRANTOR, to avoid and/or minimize interference with the GRANTEE's and the GRANTEE's successors' and assigns' quiet enjoyment of the Property. Such easement and right of access includes the right to obtain and use utility services, including water, gas, electricity, sewer, and communications services available on the property at a reasonable charge to the GRANTOR. Excluding the reasonable charges for such utility services, no fee, charge, or compensation will be due the GRANTEE or its

successors or assigns, for the exercise of the easement and right of access hereby retained and reserved by the GRANTOR.

(3) The GRANTOR and the GRANTEE agree that if any action of the GRANTOR's officers, employees, agents, contractors of any tier, or servants in the exercise of this right of access results in damage to the Property, the GRANTOR shall, at its sole discretion, either make reasonable repairs to or compensate for such damage. In no event shall such repair, or compensation, exceed the fair market value of the damaged portion of the Property at the time immediately preceding such damage. The GRANTOR's liability under this clause shall be contingent upon the availability of, and shall not exceed, appropriations available for such payment and nothing contained in this Deed may be considered as implying that Congress will at a later date appropriate funds sufficient to meet deficiencies. The GRANTEE covenants and agrees for itself, its successors and assigns that it shall not cause or permit any interference with any munitions response action conducted by the GRANTOR on the Property

E. The GRANTEE acknowledges receipt of or access to the Administrative Record which contains MEC related documents.

5. NOTICE OF THE PRESENCE OF ASBESTOS AND COVENANT

A. The GRANTEE is hereby informed and does acknowledge that friable and non-friable asbestos or asbestos containing material (hereinafter "ACM") has been found on the Property. The Property may also contain improvements, such as buildings, facilities, equipment, and pipelines, above and below the ground, that contain friable and non-friable asbestos or ACM. The Occupational Safety and Health Administration (OSHA) and the U.S. Environmental Protection Agency have determined that unprotected or unregulated exposure to airborne asbestos fibers increases the risk of asbestos-related diseases, including certain cancers that can result in disability or death.

B. The following buildings on the Property have been determined to contain friable asbestos: 1828, 1864, 1930, 1934, 1980, and 4155. The GRANTEE agrees to undertake any and all asbestos abatement or remediation in the aforementioned buildings that may be required under applicable law or regulation at no expense to the GRANTOR. The GRANTOR has agreed to transfer said buildings to the GRANTEE, prior to remediation or abatement of asbestos hazards, in reliance upon the GRANTEE's express representation and covenant to perform the required asbestos abatement or remediation of the said buildings.

C. The GRANTEE covenants and agrees that its use and occupancy of the Property will be in compliance with all applicable laws relating to asbestos. The GRANTEE agrees to be responsible for any future remediation or abatement of asbestos found to be necessary on the Property to include ACM in or on buried pipelines that may be required under applicable law or regulation.

D. The GRANTEE acknowledges that it has inspected or has had the opportunity to inspect the Property as to its asbestos and ACM condition and any hazardous or environmental conditions relating thereto. The GRANTEE shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any asbestos or ACM hazards or concerns.

6. NOTICE OF THE PRESENCE OF LEAD-BASED PAINT (LBP) AND COVENANT AGAINST THE USE OF THE PROPERTY FOR RESIDENTIAL PURPOSES

A. The GRANTEE is hereby informed and does acknowledge that all buildings on the Property, which were constructed or rehabilitated prior to 1978, are presumed to contain lead-based paint. Lead

from paint, paint chips, and dust can pose health hazards if not managed properly. Every purchaser of any interest in residential real property on which a residential dwelling was built prior to 1978 is notified that there is a risk of exposure to lead from lead-based paint that may place young children at risk of developing lead poisoning.

B. The GRANTEE covenants and agrees for itself, its successors and assigns that it shall not permit the occupancy or use of any buildings or structures on the Property as Residential Property, as defined under 24 Code of Federal Regulations Part 35, without complying with this notice and covenant and all applicable federal, state, and local laws and regulations pertaining to lead-based paint and/or lead-based paint hazards. Prior to permitting the occupancy of the Property where its use subsequent to conveyance is intended for residential habitation, the GRANTEE specifically agrees to perform, at its sole expense, the Army's abatement requirements under Title X of the Housing and Community Development Act of 1992 (Residential Lead-Based Paint Hazard Reduction Act of 1992), as amended.

C. The GRANTEE acknowledges that it has inspected or has had the opportunity to inspect the Property as to its lead-based paint content and condition and any hazardous or environmental conditions relating thereto. The GRANTEE shall be deemed to have relied solely on its own judgment in assessing the overall condition of all or any portion of the Property, including, without limitation, any lead-based paint hazards or concerns.

EXHIBIT D

Demolition Area 1/Landfill 4

A parcel of land located in the northeast quarter (NE¼) of Section 35, Township 3 North, Range 3 East, Willamette Meridian, situate in Clark County, Washington; and more particularly described as follows:

Commencing at the north quarter corner of the said Section 35, thence south 08°10'13" east, a distance of 975.35 feet to the northwest (NW) corner of said parcel and the **TRUE POINT OF BEGINNING;** thence north 90°00'00" east , a distance of 500 feet; thence south 0°00'00" east, a distance of 100 feet; thence south 90°00'00"east, a distance of 100 feet; thence south 0°00'00" east, a distance of 600 feet; thence south 90°00'00" west, a distance of 500 feet; thence north 0°00'00" east, a distance of 100 feet; thence south 90°00'00" west, a distance of 100 feet; thence north 0°00'00" east, a distance of 100 feet; thence south 90°00'00" west, a distance of 100 feet; thence north 0°00'00" east, a distance of 400 feet; thence south 90°00'00" east, a distance of 100 feet; thence north 0°00'00" east, a distance of 100 feet to the **TRUE POINT OF BEGINNING.**

Contains 10.1 acres, more or less.

This description is based on GIS data used for a map known as figure 5.1 (page 5.3) which is attached to a report titled "Camp Bonneville, Site Specific Fact Sheets, Remedial Action Unit 3, Vancouver, Washington". The report was provided by Parsons for the U.S. Army Corps of Engineers, Seattle District and Huntsville Center (dated August 2005, Contract No DACA87-00D-0038, delivery order 0017).

Doc. 001930.

All Public Land Survey section corners and section lines are based on a record of survey (ROS) performed by the county surveyor of Clark County, Washington (dated May 15, 2006 and filed in Book 56, page 7). The basis of bearing according to said ROS is grid and adjusted to the Washington State Plane Coordinate System, south zone, NAD 83 (91). All distances are grid.

EXHIBIT E

Cultural Area 45-Cl-318

A circular parcel of land located in the south half northeast quarter (S½NE¼) and the southeast quarter (SE¼) of Section 3, Township 2 North, Range 3 East, Willamette Meridian, Clark County, Washington; having a radius of 300 feet and with a location described as follows:

Commencing at the section corner common to Sections 3, 4, 9, and 10, Township 2 North, Range 3 East; thence north 22°00'34" west, a distance of 2,789.59 feet to the **CENTER** of the circle, said circle being the entire buffer area for Cultural Site 45-C1-318. Contains 6.5 acres, more or less.

This description is based on GIS data used for a report titled "Camp Bonneville, Site Specific Fact Sheets, Remedial Action Unit 3, Vancouver, Washington". The report was provided by Parsons for the U.S. Army Corps of Engineers, Seattle District and Huntsville Center (dated August 2005, Contract No DACA87-00D-0038, delivery order 0017).

Doc. 001940

All Public Land Survey section corners and section lines are based on a record of survey (ROS) performed by the county surveyor of Clark County, Washington (dated May 15, 2006 and filed in Book 56, page 7). The basis of bearing according to said ROS is grid and adjusted to the Washington State Plane Coordinate System, south zone, NAD 83 (91). All distances are grid.

Exhibit F

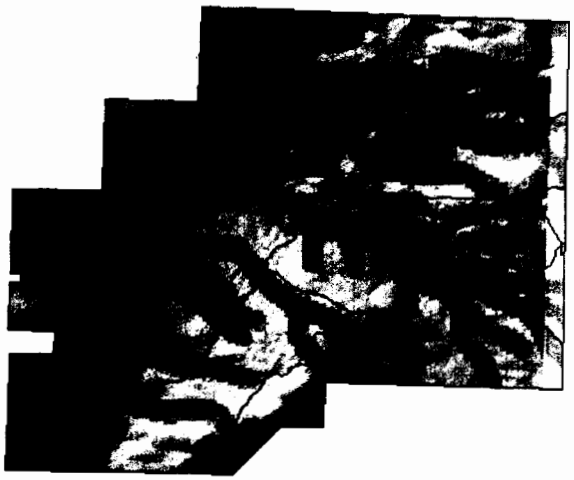
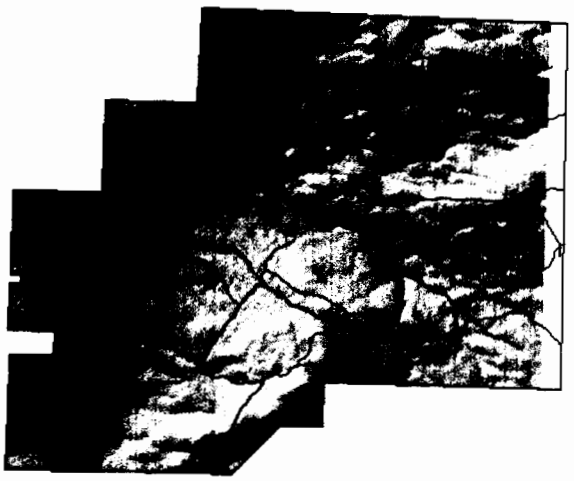
	
1. 45-CL-318 shown in purple with 300' diameter. Clark County shall notify the SHPO in writing prior to undertaking any disturbance of the ground surface or any other action that would affect its physical integrity.	2. Clark County Archaeological Predictive Model. Colored areas are "20-100% probability areas"
	
3. Areas with less than 5% slope are shown in green.	4. Areas mapped as "20-100% probability" in the Clark County Archaeological Predictive Model Map and having slopes less than 5%. Clark County shall prepare and submit to the SHPO a written assessment of project effects in advance of any ground-disturbing activity having moderate to high potential impacts within these areas.

EXHIBIT G

Site	Site Description	[illegible]	[illegible]
Unexploded Ordnance – Based on past reuse of the Property, the potential for MEC exists anywhere on site. Specific information regarding known target areas with higher likelihood of MEC is included below.			
Landfill 2 (Sewage Lagoons and Historic Landfill)	This landfill was discovered in 1978 during the construction of the sewage lagoon. The landfill may have been used from the 1940s to the 1950s; however, the type and quantity of material located at this site is unknown.	Unknown	A UXO avoidance/screening and electromagnetic survey identified pipes, vehicle parts, wiring and one undetonated 2.36-inch light anti-tank weapon, which was disposed of by the Ft Lewis EOD.
Demolition Area 3 (DA 3)	DA 3 is a surface depression that may be an excavation or possibly a detonation crater. The location is about 2000 feet upstream of the base boundary in Lacamas Creek Valley. The crater is approximately 20 feet in diameter and 10 feet deep. DA 3 is located west of the gas pipeline right-of-way that crosses Camp Bonneville. DA 3 may have been used for detonation of unwanted ordnance. The crater is situated several hundred feet south of Lacamas Creek in an area where the valley is wide and relatively flat. The ground surface at DA 3 is hummocky with seasonal wetland vegetation.	Unknown	Soil samples were collected from borings advanced immediately around the depression and from a nearby location where metallic debris (one drum and shell fragments) was found and later removed and disposed of. All soil samples were tested for explosives, perchlorate, and total metals. Test results of soil boring samples indicate no explosives or perchlorate concentrations above the testing instrument's reporting limit. Test results of soil samples collected from the former debris piles indicate no explosives, perchlorate, or picric acid. Metals were detected in samples collected from the borings and the debris pile but at concentrations at background levels and/or below screening or cleanup levels. Arsenic, barium, copper, and mercury were detected at concentrations that required a terrestrial ecological evaluation. The evaluation determined that these metals are not a potential threat to ecological receptors. No ordnance and explosives sampling and removal activities were conducted at this site, but a 37mm practice round was recovered form an old crushed burn barrel found at the site.
Small-arms Ranges – not considered/included as MEC	There are 21 small-arms ranges on the Property. For a description of the small-arms ranges see Table 1-Description of Property.	Unknown	The following is a general description of the investigations and remediations conducted at the 21 small-arms ranges. The U.S. Army Corps of Engineers (1997) prepared an archive search report (ASR) to collect information pertinent to the small - arms ranges at Camp Bonneville. The small arms ranges were investigated as part of the base-wide reconnaissance effort. As a result of this reconnaissance, a site investigation was conducted that consist of gridding the small-arms ranges and collecting soil samples. The soil samples were tested for total metals, perchlorate, explosives, and lead. Arsenic and barium were the only metals detected above background levels. Perchlorate was not detected in the soil samples. The compound 2, 4-dinitrotoluene (DNT) was the only explosive compound detected in the soil (small-arms range: 25M Machine Gun Range), and at concentrations that range from 4.9 to 20 mg/kg. The U.S. EPA Region 9 residential and industrial

[illegible]	[illegible]	[illegible]	[illegible]
			use criteria for DNT in soil are 120 and 1,800 mg/kg, respectively. Some OE sampling and removal activities were conducted in the area of the small-arms ranges as part of a site-wide effort performed by UXB (1998).
Site-wide Actions	This site/area is RAU 3, which consists of all artillery and mortar firing points and safety fans. Collectively these sites cover most of he Property. OE removal actions were conducted at Training Areas 8 (TA 8) and Training Area 9 (TA 9). These areas are located southeast of the cantonment areas and include portions of Sub-caliber Range 1 and Machine Gun Range-North. See Figures 6 Remedial Action Unit 2A and Figure 11 Training Ranges 8 and 9 for the location of the aforementioned ranges.	Unknown	MEC characterization and removal activities have been conducted at Camp Bonneville. UXB International, Inc. (1998) conducted a site-wide OE sampling and removal action; UXB (2000) also conducted an OE sampling and removal action at Training Area 8 (TA 8) and at TA 9, and Parsons Engineering Science, Inc. (2004) completed a remedial investigation/feasibility study (RI/FS) of RAU 3. Two hundred and seven grids were established throughout the site. Each grid measured 100 x 100 feet (a total area of approximately 50 acres). UXO technicians investigated 2,468 anomalies finding 25 live UXO; 212.7 pounds of OE-related scrap, and 185 pounds of non-OE related scrap. As a result of this effort, UXB returned and conducted a sampling and removal action in an 18.9-acre area encompassing TA 8 and TA 9. In addition, UXB conducted a preliminary survey of 1.5 acres at Demolition Area 1. During this action, 106, 341 areas were excavated. Nine UXO items were removed and disposed of. In addition, 3,888 pounds of OE scrap and 683 pounds of non-OE scrap were removed. A total of 16,004 discrete reconnaissance data waypoints have been collected, analyzed, and mapped using digital technology and GIS geo-spatial analysis during the 2001/2002 site reconnaissance efforts. Over 2,400 acres of the 3,980 total acres were characterized for munitions and explosives of concern (MEC) and related activities. A solitary UXO item (105 mm artillery shell) was located in the Central Impact Target Area. A total of 58 inert munitions debris (MD) were located and recovered during the reconnaissance field efforts. The MD items included a total of 27 expended pyrotechnic devices, 7 expended smoke grenades, 9 expended practice 40mm projectiles, and 15 expended practice rockets and rocket motors. Depending upon the location of a training area, the training area may include undeveloped land, firing points and ranges. Ordnance and explosives removal actions were conducted in Training areas 8 and 9, which are located southeast of the cantonment areas, Figure 12. The August 2000 *Final Removal Report Ordnance and Explosives Removal Actions Camp Bonneville, Vancouver, Washington* indicates that TA 8 and TA 9 were impact areas 60mm and 81mm full-size practice rounds, 35mm light anti-tank weapon rounds, and 40mm practice grenades.
Discarded Military Munitions			
Demolition Area 1 and Landfill 4	This area, located in the north-central part of the Property, was a former	Unknown	A site investigation (SI) was conducted in 1998-1999 4 to evaluate the potential for contamination resulting from past uses of the

	ordnance burn and ordnance detonation site and a landfill. The site slopes downward to the west, toward the north fork of Lacamas Cree which flows southward into the main branch of Lacamas Creek. Several patches of soil on the site surface were reported to have a pinkish-red hue and were generally devoid of vegetation. The cause of this discoloration was not known; however, similarly discolored soil had been reported at other sites where explosives contamination had been detected in shallow soil. A firebreak surrounds the area just outside of a barbed-wire fence line. Surface debris consisted primarily of metal scraps such as wiring, metal shards, and automobile parts. Vancouver Barracks reportedly used the site for the disposal of building demolition debris during the mid-1960s. In addition, the site has been used by a number of groups and agencies, including the Army, Portland Air National Guard (PANG), local fire departments and law-enforcement for training and disposal operations. Reportedly, the site has been used for the disposal of firearms, destruction of AIM 7E Sparrow Missiles and Mark 38 rocket motors, and for demolition training.		landfill. The SI included a UXO avoidance survey, geophysical survey, surface and subsurface sampling, and groundwater sampling. Test results of soil samples indicate concentrations of various metals. Only barium, copper, and chromium were detected at concentrations exceeding the regulatory/risk-based criteria. One or more SVOCs, insecticides, herbicides and VOCs were detected, but at concentrations below screening criteria. The only groundwater constituent detected at a concentration exceeding a screening level was RDX (44 ug/l). This compound was detected in the down-gradient well only. In 2001, an expanded site investigation (ESI) of the landfill was conducted based on the previous detection of RDX. The ESI focused primarily on groundwater and included the installation of eight monitoring wells (one well could not be used because it was dry). Four quarterly rounds (July 2001, October 2001, January 2002, and April 2002) of groundwater sampling were conducted. Well samples were also collected in January 2003. Samples collected from the wells were tested for explosives residues, nitroguanidine, perchlorate ion, VOCs, SVOCs, organochlorine herbicides PPL metals (total and dissolved), total cyanide TPH and water quality parameters. Tests results indicate that explosives and propellants (2, 4-DNT, RDX, and perchlorate) were detected in all but one monitoring well, and were also detected in the up-gradient well. These constituents were detected in concentrations exceeding screening criteria in the initial groundwater sampling rounds and the final sampling round. Dichlorofluoromethane, 1,1,1-TCA, 1,1-DCE, and PCE were also detected above screening levels. In 2004, approximately 5,000 cys of contaminated soil (metals and commercially available fireworks) was removed (interim action) and disposed of at an off-site facility. The excavation was backfilled to grade. The monitoring wells at the site will be sampled on a quarterly basis.
Munitions Constituents			
Ammunitions Storage Bunkers (Facility Nos. 2950, 2951, and 2953)	These bunkers were constructed in 1976 to store various munitions. They range in size from 4 sq. ft. to 100 sq. ft. The magazines are fenced.	Unknown	In 1998, fifteen sampling locations (nine at the largest bunker and three each at the two smaller bunkers) were selected for the collection of surface and subsurface soil samples. A soil boring was also advanced at each bunker based on the results of the surface soil tests from soil samples collected from inside the bunkers. Wipe samples were collected from the floors in each magazine. The soil samples collected from inside the bunker and the wipe sample tests results show RDX (below reporting levels) and all the PPL metals except selenium and thallium in Facility 2950. Arsenic, beryllium, cadmium, chromium, lead, and mercury were detected in the soil samples collected from inside the bunker at concentrations that

			exceed the MTCA cleanup criteria. Arsenic, beryllium, and cadmium concentrations were also above background levels. PETN was detected in one bunker; however, there is no established cleanup concentration for PETN. No organic compounds were detected above reporting limits in the surface soil samples collected outside the bunker. Arsenic, cadmium, chromium, and lead were detected at concentrations above MTCA cleanup criteria and background levels in the surface soil samples collected outside the bunker. In 2001, surface and subsurface soil samples were collected from Facility 2953. PETN, picric acid, and 2,4-dinitrotoulene were detected in the surface soil samples at concentrations below MTCA cleanup criteria. No ordnance compounds or propellants were detected in the subsurface soil samples. Metals were detected in the surface soil samples. Arsenic and chromium were detected above MTCA cleanup criteria. Lead was detected above the MTCA cleanup criteria and background levels. In May 2001, contaminated soils at the three bunkers were excavated to 1-foot below grade. Confirmatory samples were collected and the test results indicated no residual contaminants above regulatory criteria or background levels. The excavations were backfilled and the contaminated soil and wood from pallets inside the bunker were disposed of at an off-site facility. The interior surfaces of the bunker were cleaned.
Demolition Area 1 and Landfill 4	See Discarded Military Munitions	Unknown	See Discarded Military Munitions
Airstrip	The 4.5- acre airstrip is located along an open area near the main entrance.	Unknown.	No MEC was found during an investigation of this area.
Camp Bonneville Cantonment	This 5.1-acre area is comprised of buildings and open grassy areas.	Unknown	No MEC was found during an investigation of this area.
Camp Killpack	This 5-acre area was previously used for troop barracks.	Unknown.	No MEC was found during an investigation of this area.
Bonneville Parade Ground	This is an open grassy area.	Unknown.	No MEC was found during an investigation of this area.

Site	Site Description		
OB/OD Areas	This 6.5-acre area consists of 3 demolition areas.	Unknown.	Subsurface removal action is completed at demolition area 1.
Target Area	These areas combine to be approximately 12 acres.	Unknown.	A potential MEC–risk was identified during investigation.
Central Impact Target Area	This 465-acre area was previously used as an artillery target area.	Unknown.	A MEC–risk was identified during investigation.
Firing Points	The 19-acre Firing Points area consists of 6 mortar firing points, 7 artillery firing points, 1 rifle grenade firing point and 1 3.5-inch rocket firing point.	Unknown.	No MEC was found during an investigation of this area.
West Side of Proposed Park	This 600-acre area was historically used as a maneuver area.	Unknown.	No MEC was found during an investigation of this area.
Roads and Trails	The roads and trails have been in use for approximately 35 years. No MEC risk has been identified.	Unknown.	No MEC was found during an investigation of this area.
Wildlife Management Area	This 2050-acrea area was used as a former range fans and maneuver areas.	Unknown.	A potential MEC–risk was identified during investigation.
Current FBI Training Area	The parcel will continue to be used for FBI training until October 2006.	Unknown.	A potential MEC–risk was identified during investigation.
Designated Reuse Areas Located Outside the Park	This area includes a former combat pistol range.	Unknown.	A potential MEC–risk was identified during investigation.
Southwest Lacamas Valley	This 98-acre area was historically used for small arms training.	Unknown.	A potential MEC–risk was identified during investigation.

Notes:

1) Munitions and Explosives of Concern (MECs) distinguishes specific categories of military munitions that may pose unique explosives safety risks, means: (A) Unexploded Ordnance (UXO), as defined in 10 §101(e)(5); (B) Discarded military munitions (DMM), as defined in 10 U.S.C. §2710(e)(2); or (C) Munitions constituents (e.g., TNT, RDX), as defined in 10 U.S.C. §2710(e)(3), present in high enough concentrations to pose an explosive hazard.
2) See, Attachment 1-Document List for documents that pertain to MECs.

Appendix B
Interviews

Camp Bonneville Periodic Review
Periodic Review: ATF Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?

   The storage of explosives in approved magazines that are shared with Clark County Sheriff's Office.

2. How frequently does your agency use the property? Daily

3. At Camp Bonneville, there are two fenced areas with Type 2 portable storage magazines. One of these fenced compounds is unsecured with two empty and open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21. The other is a secured fenced yard adjacent/coinciding with Bldg 2950. In the secured yard, there are also two larger Type 2 portable storage magazines and one permanent, older magazine. These two larger magazines are closed, but with no access to the fenced yard, their usage cannot be determined.

   3.1. Which of these fenced compounds are under the supervision of the ATF? ATF uses the magazines in the secured yard where there are two larger Type 2 magazines and one permanent magazine.

   3.2. Are any of these magazines currently in use? All three are currently in use.

   3.3. Has the ATF formerly utilized any of these magazines? What was stored in them and when (how long)? Explosives evidence is stored within the magazines along with explosives. One magazine is for the storage of blasting caps, one magazine is for the storage of evidence, and one magazine is for the storage of explosives and evidence if need be. Each contains a small amount of net explosive weight.

   3.4. Does the ATF have an agreement with any other agencies for use of these magazines? If so, who maintains that documentation/inventory? ATF has an agreement with Clark County Sheriff's Office only.

   3.5. Does the ATF intend to use them in the future? Yes. We invested money into cleaning the area, brining two magazines into the location along with updating and outfitting the permanent magazine that was utilized by the military when the base was active. The site is important to our operation. It is a safe and secure location.

   3.6. If current or future use is planned, will the ATF provide appropriate signage, placarding, and maintenance to the fenced areas where the magazines are currently located. Yes, the magazines are in compliance with ATF Compliance Regulations and State of Washington Labor and Industries. The magazines are subject to inspection on an annual basis which was recently done in November 2024.

4. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?
   No. ATF does not use explosives on the base. It is only used to store explosives.

   If Yes:
   4.1. What do those activities entail?

   4.2. Where have these activities taken place?

   4.3. When or how frequently do these activities take place?

5. Are munitions, including small arms ammunition, stored by your agency on the property? No.

   If yes:
   5.1. where are munitions stored and how are they secured?

6. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property? No.

7. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property? No.

8. Has your agency performed any firefighting activities associated with your agency's use of the Property? No.

9. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities? No.

   If munitions or explosives were discovered:
   9.1. Where were these items discovered?

   9.2. What item was discovered?

   9.3. How were they reported?

   9.4. How was the item disposed of?

10. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? No.

Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Tony Schodowski	Special Agent	ATF	503-209-4499

Date Submitted: 12/16/2024

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has printed this response as a PDF.

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property? **While the site is not currently undergoing active cleanup, routine activities such as general maintenance and repair of the fence line and landscaping are performed. A formal Standard Operating Procedure (SOP) for these activities has not yet been established.**
2. What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards? **Visitors to the site are required to sign in and receive a general map orientation of the property. A safety briefing is conducted, which includes an overview of ordinance and training materials previously identified on the site. The briefing also emphasizes the "3 R's" safety protocol: Recognize, Retreat, and Report.**
3. Please describe who has access to the property and procedures for securing the property? **Access to the property is managed by the Clark County Sheriff's Office, which oversees entry and enforces security measures. Authorized vendors and contractors are granted access as needed to perform their work, following established protocols to ensure site security and safety.**
4. Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? **Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? The Central Impact Target Area (CITA) fences require ongoing maintenance on an as-needed basis. There is no set timeline for repairs. Maintenance activities for the property, including fence inspections and repairs, are managed by Clark County Public Works and recorded in the county's internal asset management system, Cartegraph.**
5. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property? **No**
6. Are chemicals or other hazardous materials stored at the Property? If yes:
    a. Please list the materials and approximate quantities. **Large Diesel above-ground storage tank, unknown quantity.**
    b. Please describe how and where these materials are stored? **Stored near an old army maintenance building.**
    c. Please describe how these materials used? **For fueling equipment.**
7. Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment? **Yes, there was an instance where the Portland Bomb Squad conducted a controlled (Training) detonation near the Camp**

Bonneville cantonment area. This activity was promptly addressed by Clark County to ensure proper procedures were followed.

8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
9. If munitions or explosives were discovered:
    a. Where were these items discovered? **Training fuse was located near landfill # 4**
    b. What item was discovered? **Training Fuse**
    c. How were they reported? **By Clark County staff**
    d. How was the item disposed of? **The item in question was properly disposed of by Clark County Sheriff's Office bomb technicians. The specific methodology used is not known to me.**
10. Are munitions stored on the property? **No**
    a. If yes, where are munitions stored and by which agency?
11. Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.
    a. What activities requiring ground disturbance are you aware of occurring? **None**
    b. Were permits issued or a similar review process followed? **Unknown to me.**
    c. Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities? **No**
12. Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review? **Sign-in and sign-out procedures are in place for the property, which is not open to the public. Visitors to the site are required to sign in and receive a general map orientation of the property. A formal safety briefing is the current procedure, which includes an overview of ordnance and training materials previously identified on the site. The briefing also emphasizes the "3 R's" safety protocol: Recognize, Retreat, and Report.**
13. Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)? **No**

LOCATION SPECIFIC QUESTIONS

1. Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.
    a. Who is responsible for maintaining this requirement? **Clark County Public Works**
    b. Has maintenance of this signage been required? If yes, how is maintenance documented? **Inspected and repaired if needed, documented in asset management system if need.**
2. At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports. **These reports are included in the monthly updates submitted to the Army, ensuring that all activities and updates are communicated regularly. Additionally, an annual report is compiled and submitted each December, providing a comprehensive summary of the year's operation**

3. Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017? **Unknown**
4. Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available? **Unknown**
5. Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? **The Central Impact Target Area (CITA) fences require ongoing maintenance on an as-needed basis. There is no set timeline for repairs. Maintenance activities for the property, including fence inspections and repairs, are managed by Clark County Public Works and recorded in the county's internal asset management system, Cartegraph.**

6. Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available? **The language regarding annual inspections in the CAP is vague and lacks measurable criteria for proper documentation. This lack of clarity makes it difficult to confirm whether the required inspections have been completed and whether the available records meet the intended requirements. Clear guidance and measurable standards are needed to ensure proper compliance and record-keeping for these annual surface inspections within the CITA for MEC.**

7. Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available? **It is unclear to Clark County what constitutes a significant rain event as outlined in the CAP. The language used in the CAP lacks clarity and measurable criteria, making it challenging to determine when such inspections should be conducted. To effectively address this requirement, clearer and more specific language would be needed to define what qualifies as a significant rain event. Without this clarification, it is difficult to confirm whether the required inspections have been completed or provide consistent inspection records.**

8. Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)? **No**
9. Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please provide details when this training will be completed. **Yes, please consult with Jacob Huston**
10. Has signage been installed at the target areas and firing points identified in the 2010 CAP? **Unknown since 2021.**

Questionnaire Documentation Form

Name	**Erik Harrison**
Title/Position	**Parks Operations Superintendent**
Department	**Parks Department**
Email Contact	**Erik.harrison1@gmail.com**
Years Affiliated	**3 years**

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has bolded the responses for clarity and removed formatting mistakes which changed the questions number and printed this response as a PDF. Note: From an Inspection of records, Email to Erik Harrison from Ronnie Johnson (Former Ecology UXO Expert) on 4/10/2023, the Training Fuse Identified in Sitewide Question Number 9, was a "M-60 time fuze igniter".

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property? **Yes- only for road and fence maintenance**
2. What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards? **Do not know**
3. Please describe who has access to the property and procedures for securing the property? **Clark County Public Works, Clark County Sheriff's Office, FBI, Dept of Ecology, and contractors**
4. Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? **Clark County Public Works inspects and maintains fence lines, Do not know the answers to other questions**
5. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property? **No**
6. Are chemicals or other hazardous materials stored at the Property? If yes **Do not know**
    a. Please list the materials and approximate quantities.
    b. Please describe how and where these materials are stored?
    c. Please describe how these materials used?
7. Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment? **No**
8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities? **No**
9. If munitions or explosives were discovered:
    a. Where were these items discovered? **Do not know**
    b. What item was discovered? **Do not know**
    c. How were they reported? **Do not know**
    d. How was the item disposed of? **Do not know**
10. Are munitions stored on the property? **Do not know**
    a. If yes, where are munitions stored and by which agency? **Do not know**

11. Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.
    a. What activities requiring ground disturbance are you aware of occurring? **Do not know**
    b. Were permits issued or a similar review process followed? **Do not know**
    c. Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities? **Do not know**
12. Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review? **There is a description of UXO's, and an explanation of the CITA, Do not know about records**
13. Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)? **Do not know**

LOCATION SPECIFIC QUESTIONS

1. Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.
    a. Who is responsible for maintaining this requirement? **Do not know**
    b. Has maintenance of this signage been required? If yes, how is maintenance documented? **Do not know**
2. At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports. **Do not know**
3. Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017? **Do not know**
4. Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available? **Do not know**
5. Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available? **Clark County Public Works maintains and inspects fence lines, do not know about documentation**
6. Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available? **Do not know**
7. Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available? **Do not know**
8. Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)? **Do not know**
9. Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please

provide details when this training will be completed. **Jacob Huston has completed this training, I don't have the documentation**

10. Has signage been installed at the target areas and firing points identified in the 2010 CAP? **Do not know**

Questionnaire Documentation Form

Name	**Jeremy Stevens**
Title/Position	**Grounds Maintenance Crew Chief**
Department	**Parks**
Email Contact	**Jeremy.stevens@clark.wa.gov**
Years Affiliated	**2 with Camp Bonneville, 10 with Clark County Public Works**

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has bolded the responses for clarity and removed formatting issues with Microsoft Word which changed the question numbering and printed this response as a PDF.

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

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The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property?
    a. The Clark County Forest Stewardship Plan guides forest practices and noxious weed control work at the site.
2. What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards?
    a. It is my understanding that this process has included a UXO briefing at Range Control for all new users of the site. Public Works is working to formalize this process with a procedure, training materials, and log of completed training.
3. Please describe who has access to the property and procedures for securing the property?
    a. Clark County Public Works employees who perform work on the property have access.
    b. Clark County Sheriff's Office employees have access.
    c. FBI employees have access.
    d. ATF employee(s) have access.
    e. Other service providers including garbage, port-a-potty, drinking water, etc. gain access to provide services.
    f. The property is behind a locked gate that uses an electronic key card for access. The Sheriff's Office currently maintains the list of employees who have key card access. FBI also maintains a key code entry system and maintains the security for that system.
4. Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?
    a. Clark County Public Works, Parks Operations and Maintenance, North Parks Crew currently maintains the fence lines at Camp Bonneville.
    b. Do not know the process and timeline for completing inspections, but fences have all be inspected and the crew is working on making repairs.
    c. Maintenance records are available in the county's asset management system (Cartegraph).

5. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property?
    a. Not aware of any.
6. Are chemicals or other hazardous materials stored at the Property? If yes:
    a. Please list the materials and approximate quantities.
        i. Tree marking paint, several cases
        ii. Small amounts (1-2 gallons) of fuel for chainsaw and ATV
        iii. Diesel fuel for vehicles, many gallons
    b. Please describe how and where these materials are stored?
        i. Stored on shelves in a storage building
        ii. Stored in cabinets in a storage building
        iii. Stored in an above-ground storage tank
    c. Please describe how these materials used?
        i. For marking trees for harvesting
        ii. For fueling chainsaw and ATVs
        iii. For fueling tractor and other small equipment
7. Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment?
    a. I am aware of only on such use. There is some munitions storage in the location of former building 2950 in storage magazines managed by the ATF.
8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
    a. Yes, one item a training timing fuse was found near landfill 4 by a noxious weed management staff a few years ago. It was reported to the site manager, who coordinated with the Clark County Sheriff's Office to remove the item from the property.
9. If munitions or explosives were discovered:
    a. Where were these items discovered? See explanation above
    b. What item was discovered?
    c. How were they reported?
    d. How was the item disposed of?
10. Are munitions stored on the property?
    a. If yes, where are munitions stored and by which agency? The FBI and Sheriff's office store ammunition at the shooting range.
11. Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.
    a. What activities requiring ground disturbance are you aware of occurring? Forest practices, road maintenance, bridge repair/replacement

   b. Were permits issued or a similar review process followed? Do not know about permits; a similar review process was performed by the site manager at the time

   c. Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities? Unexploded ordinance (UXO) technician performing approved anomaly avoidance practices was not deemed necessary since areas with forest management operations were previously cleared of UXO.

12. Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review? This will be developed in preparation for the property being opened to the public. Otherwise, please refer to the answer to question 2.

13. Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)?

    Not aware of any

LOCATION SPECIFIC QUESTIONS

1. Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.

   a. Who is responsible for maintaining this requirement? The site manager.

   b. Has maintenance of this signage been required? If yes, how is maintenance documented? No, signs are in good shape.

2. At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports.
   a. I have not been a part of developing the annual reports only finalizing the most recent annual report.

3. Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017?

   a. Do not know.

4. Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available?

   a. Do not know.

5. Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?

   a. Asked and answered under question 4 of sitewide questions.

6. Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available?

   a. Do not know.

7. Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available?

   a. Do not know.

8. Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)?
    a. The county has not reached the redevelopment phase of the project, so road and trail signs have not been installed.
9. Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please provide details when this training will be completed.
    a. The county currently has one level I UXO technician on staff and will be working to get a 2nd employee trained in 2025.
10. Has signage been installed at the target areas and firing points identified in the 2010 CAP?
    a. Do not know

Questionnaire Documentation Form

Name	Kevin Tyler
Title/Position	Lands Management Division Manager
Department	Public Work
Email Contact	Kevin.tyler@clark.wa.gov
Years Affiliated	12

Ecology – 12/30/2024 Michael Cronin: Received as a word document to Ecology on 12/19/2024 via email. Ecology has printed this response as a PDF. Note: From an Inspection of records, Email to Erik Harrison from Ronnie Johnson (Former Ecology UXO Expert) on 4/10/2023, the Training Fuse Identified in Sitewide Question Number 9, was a "M-60 time fuze igniter".

Camp Bonneville Periodic Review
Periodic Review: Former Managers Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

You have been identified as a former employee of Ecology, DoD contractor, and/or Clark County involved in the oversight of the cleanup. Ecology is requesting your input as your employment covered the time period relevant to this periodic review.

Please complete this questionnaire by December 18, 2024, if you are unable to answer a question, please state "I Do not know".

Name: **Ronnie Johnson**
Date Submitted: **December 17, 2024**

QUESTIONNAIRE

1. What was your role and former agency, and how long did you work on the Camp Bonneville Cleanup?

I worked on Camp Bonneville from approximately 2012 – 2020. I was Ecology's munitions expert.

2. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property during your period of employment?

No

3. Are you aware of any firefighting activities on the Property?

No
If Yes:
3.1. When, where, and why did firefighting activities take place?

4. Were site specific operations and maintenance plans prepared for any of the Remedial Action Units?
No, only site wide.

5. What was the process for training users of the site about the site hazards?
UXO safety briefings, covering all associated explosive hazards. Briefings conducted by Clark county munitions safety advisor or contractor safety specialist.

6. What was the protocol for discovery of potential unexploded ordnance (UXO) outside of the remedial cleanup activities?

Mark the item conspicuously, preferably with engineer tape and notify range operations of the location and description of the item.

7. Are you aware of any UXO or potential UXO identified at the property outside of remedial cleanup activities during your period of employment?

   No

   If munitions or explosives were discovered:
   7.1. Where and when were these items discovered?

   7.2. What item was discovered?

   7.3. How were they reported?

   7.4. How was the item disposed of?

8. Describe how operations and maintenance activities in support of the institutional controls were managed and documented?

   Clark County was tasked by Ecology with developing a site wide O&M plan.

9. The RAU-1 CAP requires soil excavation permits and the RAU-3 CAP requires a permit notification program for construction and maintenance related excavation activities and other potential land disturbing tasks.

   9.1. What activities requiring ground disturbance are you aware of occurring? **None**

   9.2. Were permits issued or a similar process followed?

   9.3. Were safety measures (e.g. UXO technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities?

10. RAU 1 has restrictive covenants in place with a requirement for annual reporting. During your period on the project were annual reports prepared for these restrictive covenants? **I was not employed by Ecology at the time of RAU 1.**

11. The 2017 RAU 3 CAP Amendment requires annual inspections of the central impact target area (CITA) and inspections following storm events. Were these inspections performed during your period of employment and if performed how were these inspections documented? **No**

12. Did Clark County maintain Level I UXO technician certification for two Clark County Park employees during your period of employment? **No**

13. Have munitions been stored on the property since transfer of the property to Clark County? **Yes**

    If yes:

    13.1. where are munitions stored and by which agency? **The UXO contractors had 2 explosives magazines on site.**

14. At Camp Bonneville, there are two fenced areas with Type 2 portable storage magazines. One of these fenced compounds is unsecured with two empty and open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21. The other is a secured fenced yard adjacent/coinciding with Bldg 2950. In the secured yard, there are also two larger Type 2 portable storage magazines and one permanent, older magazine. These two larger magazines are closed, but with no access to the fenced yard, their usage cannot be determined.

    14.1. Were any of these magazines being utilized during your period on the project, if so, how were they being used and by whom? **One of them was utilized by the UXO contractors. The other I was not familiar with**..

    14.2. Who was responsible for maintaining the magazines, including documentation and inventory? **UXO contractor.**

    14.3. Which of these fenced compounds and associated magazines were utilized as a part of the cleanup? **Open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21**

    14.4. If any, or all, how were they procured for the cleanup? Were they rented or purchased? **Do not know**.

    14.5. If purchased, who assumed ownership after the conclusion of the cleanup? **Do not know**.

15. Are you aware of any law enforcement training activities occurring outside of the active shooting range (FBI range)? **Yes, room clearing activity, IED and breaching training**.

16. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? Ecology is interested in which range was used, how cleanup following training was completed and reported to Project Management. **No**

Ecology – 1/9/2025 Michael Cronin: Received as a word document to Ecology on 12/17/2024 via email. Ecology has bolded the responses for clarity and printed as a PDF.

Camp Bonneville Periodic Review
Periodic Review: Former Managers Questionnaire

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You have been identified as a former employee of Ecology, DoD contractor, and/or Clark County involved in the oversight of the cleanup. Ecology is requesting your input as your employment covered the time period relevant to this periodic review.

Please complete this questionnaire by December 18, 2024, if you are unable to answer a question, please state "I Do not know".

Name: Hun S. Park
Date Submitted: 12/11/2024

QUESTIONNAIRE

1. What was your role and former agency, and how long did you work on the Camp Bonneville Cleanup?
   Site manager – mainly cleanup for 3 years
2. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property during your period of employment?
   Not that I know.
3. Are you aware of any firefighting activities on the Property?
   yes. There was a big wild-fire around the Area.

   If Yes:

   3.1. When, where, and why did firefighting activities take place?
   DNR used the property as a helicopter refueling base in 2023.
4. Were site specific operations and maintenance plans prepared for any of the Remedial Action Units?
   NO. The county was preparing/planning while I was working on 2023.
5. What was the process for training users of the site about the site hazards?
   I don't know. There must be a process between county.
6. What was the protocol for discovery of potential unexploded ordinance (UXO) outside of the remedial cleanup activities?
   I don't remember the detail.
7. Are you aware of any UXO or potential UXO identified at the property outside of remedial cleanup activities during your period of employment?
   NO. Not that I know.

   If munitions or explosives were discovered:

   7.1. Where and when were these items discovered?
   I don't know.

7.2. What item was discovered?

N/A

7.3. How were they reported?

N/A

7.4. How was the item disposed of?

N/A → See the Cleanup reports

8. Describe how operations and maintenance activities in support of the institutional controls were managed and documented?

These procedures are described in detail at First Consent decree/amended consent decree.

9. The RAU-1 CAP requires soil excavation permits and the RAU-3 CAP requires a permit notification program for construction and maintenance related excavation activities and other potential land disturbing tasks.

9.1. What activities requiring ground disturbance are you aware of occurring?

9.2. Were permits issued or a similar process followed?

9.3. Were safety measures (e.g. UXO technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities?

please refer to the clean-up report of RAU-1.

10. RAU 1 has restrictive covenants in place with a requirement for annual reporting. During your period on the project were annual reports prepared for these restrictive covenants?

NO

11. The 2017 RAU 3 CAP Amendment requires annual inspections of the central impact target area (CITA) and inspections following storm events. Were these inspections performed during your period of employment and if performed how were these inspections documented?

Annual reports including routine inspection was conducted. No report to Ecology.

12. Did Clark County maintain Level I UXO technician certification for two Clark County Park employees during your period of employment?

Please check with the County staff.

13. Have munitions been stored on the property since transfer of the property to Clark County?

If yes: I don't know.

13.1. where are munitions stored and by which agency?

14. At Camp Bonneville, there are two fenced areas with Type 2 portable storage magazines. One of these fenced compounds is unsecured with two empty and open magazines underneath wooden canopy structures near the Field Fire Ranges No.1 and No. 2, RAU 2A-21. The other is a secured fenced yard adjacent/coinciding with Bldg 2950. In the secured yard, there are also two larger Type 2 portable storage magazines and one permanent, older magazine. These two larger magazines are closed, but with no access to the fenced yard, their usage cannot be determined.

I don't know anything about this stuff.

14.1. Were any of these magazines being utilized during your period on the project, if so, how were they being used and by whom?

14.2. Who was responsible for maintaining the magazines, including documentation and inventory?

14.3. Which of these fenced compounds and associated magazines were utilized as a part of the cleanup?

14.4. If any, or all, how were they procured for the cleanup? Were they rented or purchased?

14.5. If purchased, who assumed ownership after the conclusion of the cleanup?

15. Are you aware of any law enforcement training activities occurring outside of the active shooting range (FBI range)?

NO. Not that I know.

16. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? Ecology is interested in which range was used, how cleanup following training was completed and reported to Project Management.

NO.

Camp Bonneville Periodic Review
Periodic Review: < Law Enforcement AGENCY> Questionnaire

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Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?
   Our agency shoots at the range, conducts ATV driver's training on the gravel roads and occasionally the SWAT team uses wooded areas for land navigation training. We also use the encampment for entry training and building clearing training.

2. How frequently does your agency use the property?

~~2.~~ It varies depending on the month. Anywhere from four to 10 times a month depending on if we have a class scheduled at the range. The use of the encampment and roads is far less frequent.

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3. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?

~~3.~~ yes

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If Yes:

3.1. What do those activities entail?

~~3.1.~~ Details are described in question 1.

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3.2. Where have these activities taken place?

~~3.2.~~4. Gravel roads and the encampment

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4.1. When or how frequently do these activities take place?

~~3.3.~~5. It varies depending on the month but activities outside the range area may not occur at all or a couple of times per month.

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6. Are munitions, including small arms ammunition, stored by your agency on the property?

~~4.~~ yes

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If yes:

6.1. where are munitions stored and how are they secured?

~~4.1.~~ We store small arms ammunition which is secured inside a locked box, inside a locked room inside the locked building where the bathrooms are located at the range.

7. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?

~~5.~~ Yes, there are cleaning supplies for firearms and a small amount of gasoline for the power tools.

8. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?

~~6.~~ NO.

9. Has your agency performed any firefighting activities associated with your agency's use of the Property?

~~7.~~ No.

10. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?

11.

~~8.~~12. No.

If munitions or explosives were discovered:

~~8.1.~~12.1. Where were these items discovered?

~~8.2.~~12.2. What item was discovered?

~~8.3.~~12.3. How were they reported?

~~8.4.~~12.4. How was the item disposed of?

13. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training?

~~9.~~ I do not have any information regarding this training.

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Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Tom Dennison, Commander, Clark County Sheriff's Office, Enforcement Branch, 564-397-3393			

Date Submitted: 12/05/24

Camp Bonneville Periodic Review
Periodic Review: < Law Enforcement AGENCY> Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?

The Clark County Sheriff's Office conducts firearms, 40mm less lethal, and PepperBall training at the dedicated firearms range and hands-on/non-firearms training at the Barracks where one of the buildings is used for patrol tactics (building clearing, flashlight usage, movement).

2. How frequently does your agency use the property?
   The Sheriff's Office uses the range twice a month for a firearms open range day for deputies to practice and qualify. In addition, the Sheriff's Office reserves days in advance, up to fourteen days a year, to potentially use for Patrol Training Days, but those days are not always utilized. There are additional days during the year which the Mobile Response Team may use the range for training. A few additional days a year may be used for the citizens academy and new hire firearms orientation.

3. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?
   The Sheriff's Office has utilized trails on the property for our UTV (Utility Terrain Vehicle) unit to train on their equipment.

   If Yes:

   3.1. What do those activities entail?
   Training intended to familiarize deputies with safe operation of UTV in a variety of off-road environments.

   3.2. Where have these activities taken place?
   Instructors of these activities have been instructed to utilize the trails on the west and north ends of the property.

   3.3. When or how frequently do these activities take place?
   I am not certain, but I believe this was the first year and it was used for two to four days. Two of those days were the Sheriff's Office assisting the Cowlitz Tribal Police with their own UTV unit.

4. Are munitions, including small arms ammunition, stored by your agency on the property?
   Yes
   If yes:
   4.1. where are munitions stored and how are they secured?

Munitions are stored in a heavy-duty storage cabinet with a heavy-duty padlock. The cabinet is stored inside a locked room inside a locked building at the FBI Range.

5. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   There are spray paints kept inside a shed at the FBI Range that are use to mark targets and lane markings for the range. There are some firearms cleaning solvents kept in the "garage" at the FBI Range which is used for cleaning of weapons (the solvents are small bottle/spray bottle size).
6. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   I am not aware.
7. Has your agency performed any firefighting activities associated with your agency's use of the Property?
   Not that I am aware of.
8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
   I am not aware of any.
   If munitions or explosives were discovered:
   8.1. Where were these items discovered?

   8.2. What item was discovered?

   8.3. How were they reported?

   8.4. How was the item disposed of?

9. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training?
   I do not know

Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Thomas Yoder	Sergeant – Training Unit	Clark County Sheriff	Thomas.yoder@clark.wa.gov

Date Submitted: 12/10/2024

Ecology – Michael Cronin – Responses received via email 12/10/2024. Edited on 1/8/2025 to Bold answers and print Document as PDF

Camp Bonneville Periodic Review
Periodic Review: Law Enforcement Agency Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?
   The FBI conducts Quarterly Firearms Training for it's Law Enforcement Officials and monthly training for it's SWAT Operators. Quarterly Firearms Training is four sessions per quarter and involve pistol and rifle qualifications and marksmanship skill building. It also involves Medical Training and search/arrest procedures. SWAT trains four times per month and conducts firearms drills and close quarter clearing/arrest techniques.

2. How frequently does your agency use the property?
   The FBI uses Camp Bonneville between 70 and 80 days per year.

3. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?
   Yes

   If Yes:
   3.1. What do those activities entail?
   Group runs. Vehicle stop procedures

   3.2. Where have these activities taken place?
   On pre-existing roads.

   3.3. When or how frequently do these activities take place?
   Approximately 2x per year.

4. Are munitions, including small arms ammunition, stored by your agency on the property?
   Yes – The FBI stores small arms munitions in the form of 9mm, .223, and .40 cal.

   If yes:
   4.1. where are munitions stored and how are they secured?
   Munitions are stored in a double locked shed with a security gate (no windows exist on the shed)

5. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   Yes – The FBI stores small quantities of gasoline on site to operate an ATV and yard tools. Approximate amount of fuel stored on site is 2 gallons. The FBI also stores solvents on site for cleaning weapons. Approximate amount of solvent stored on site is 1 gallon.

6. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
   No. The FBI is obligated to dispose and handle hazardous materials in accordance with OSHA standards.

7. Has your agency performed any firefighting activities associated with your agency's use of the Property?
   The FBI and CCSO have worked together to reduce risk of fires and increase our ability to suppress any fire should it occur, As an example, we have taken extra measures to ensure water can be delivered to all areas of the range and supplied extra fire extinguishers. No fires have ever occurred on site while the FBI was at the range.

8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?
   Yes. Item was located in 2019.

   If munitions or explosives were discovered:
   8.1. Where were these items discovered?
   Near the barracks

   8.2. What item was discovered?
   A mortar round – likely inert (blue in color)

   8.3. How were they reported?
   Range Control (Greg Johnson) was notified.
   8.4. How was the item disposed of?
   Greg marked the location/item with a safety flag and notified the remediation crew.

9. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training? **I do not currently have any information regarding this event; however, I can likely find out who coordinated the training.**

Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Chris Callahan	**Special Agent/Senior Team Leader**	**FBI**	**cacallahan@fbi.gov**

Date Submitted: **12/4/2024**

Note: Ecology accepted the response entries which added in Microsoft word "Track Changes" and highlighted responses in **Bold** to distinguish from questionnaire on 12/12/2024

Periodic Review: County Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

The County is responsible for certain ongoing requirements following the cleanup activities. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. **Have site specific operation and maintenance plans been prepared for any activities you conduct or supervise at the property?**
    - Yes. Operation and maintenance (O&M) plans are in place for activities, including site access, UXO management, CITA fence inspections, and routine maintenance of infrastructure. These plans were informed by the extensive knowledge of past site managers, particularly Greg Johnson, who was instrumental in ensuring safety protocols during his tenure.
    - O&M plans include specific procedures for anomaly avoidance during ground disturbance, proper storage and disposal of hazardous materials, and timelines for recurring inspections. While much of this is documented, there has been a knowledge gap since Greg's departure, necessitating the county's reliance on available training records and ongoing personnel development.
2. **What is the process for training current users of the site (contractors, maintenance workers and law enforcement) about site hazards?**
    - The process includes mandatory hazard briefings for all site users. These briefings cover the location and risks associated with UXO, procedures for anomaly avoidance, and compliance with site-specific safety requirements.
    - Contractors and law enforcement undergo specific orientation on restricted areas like the CITA and its fencing. While training is conducted regularly, there has been inconsistency in record-keeping due to staff transitions.
3. **Please describe who has access to the property and procedures for securing the property?**
    - Access is strictly limited to authorized personnel, including county staff, contractors, and law enforcement agencies like the FBI, which operates the shooting range.
    - Security measures include locked gates, perimeter fencing, and posted signage warning of hazardous conditions. After Greg Johnson's departure, the county has struggled with maintaining consistent access controls due to the lack of UXO-trained staff.
4. **Ongoing requirements following cleanup include maintaining the Central Impact Target Area (CITA) fences? Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?**
    - The responsibility falls under the county's operational team, with quarterly inspections conducted by designated staff. Maintenance involves clearing vegetation, repairing damage, and ensuring signage is visible and intact. Documentation is maintained digitally but may have gaps due to prior administrative transitions.

5. **Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints or solvents) at the property?**
    - No known spills have been reported in recent years. Historical activities, particularly during Greg Johnson's tenure, included stringent checks to prevent such incidents.
6. **Are chemicals or other hazardous materials stored at the Property? If yes:**
    - **Please list the materials and approximate quantities.**
        - Limited quantities of fuels, lubricants, and cleaning agents are stored for maintenance equipment.
    - **Please describe how and where these materials are stored?**
        - Stored in a designated shed with spill containment measures in place.
    - **Please describe how these materials used?**
        - Used for routine site maintenance, including vehicles and small equipment.
7. **Are you aware of any use of the property for firearm or explosives use outside of the active shooting range (FBI range) and the close quarter training area at the Camp Bonneville encampment?**
    - No unauthorized use has been observed or reported. All firearm and explosives activities are confined to designated areas.
8. **Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?**
    - Yes, munitions have been found occasionally during site inspections, particularly in areas with historical military activity. These discoveries underscore the importance of UXO training and anomaly avoidance practices.
9. **If munitions or explosives were discovered:**
    - **Where were these items discovered?**
        - Primarily within the CITA and restricted zones.
    - **What item was discovered?**
        - Items included unexploded artillery shells and small ordnance.
    - **How were they reported?**
        - Reported immediately to county officials and UXO-certified personnel for assessment.
    - **How was the item disposed of?**
        - Disposed of by certified UXO technicians following approved protocols.
10. **Are munitions stored on the property?**
    - **If yes, where are munitions stored and by which agency?**
        - No munitions are stored on-site.
11. **Ongoing requirements of the completed cleanups include a permit notification program for construction, maintenance and other activities that require ground disturbance.**
    - **What activities requiring ground disturbance are you aware of occurring?**
        - Fence repairs, road grading, and trail maintenance.
    - **Were permits issued or a similar review process followed?**
        - Yes, permits were reviewed for compliance with environmental and safety requirements.

- **Were safety measures (e.g., unexploded ordinance (UXO) technician performing approved anomaly avoidance practices) required for any of the soil disturbing activities?**
    - Yes, all activities required oversight by UXO technicians, ensuring safe practices.

12. **Ongoing requirements following cleanup include a Camp Bonneville education program to inform site visitors about potential hazards. Please describe this program and whether records of completion are available for review?**
    - The program includes mandatory safety briefings, informational pamphlets, and prominently placed warning signs. Training records are maintained, though gaps exist due to staffing changes.
13. **Have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)?**

    Wildfire History at Camp Bonneville

    - **1902 Yacolt Burn**:
        - Burned 238,000 acres across Clark, Cowlitz, and Skamania counties, destroying nearly all original forests and many homesteads at Camp Bonneville.
    - **1929 Dole Valley Fire**:
        - Burned 2,088 acres within Camp Bonneville.
    - **1938 1st Livingston Mountain Fire**:
        - Burned 1,220 acres.
    - **1951 2nd Livingston Mountain Fire**:
        - Burned 1,400 acres.
    - **1970 North Fork Lacamas Creek Fire**:
        - Burned 160 acres.

    Fire Management Highlights

    - Fire suppression emphasizes safety due to unexploded ordnance (UXO) risks. The Department of Natural Resources (DNR) coordinates suppression.
    - Prevention includes thinning, pruning, controlled burns, and firebreaks to reduce wildfire risks.

LOCATION SPECIFIC QUESTIONS

1. **Buildings 4475 and T-1932 are required to have signage posted permanently on or in each building identifying the potential environmental contamination associated with each building.**
    a. **Who is responsible for maintaining this requirement?**
        - County maintenance personnel oversee signage maintenance.
    b. **Has maintenance of this signage been required? If yes, how is maintenance documented?**
        - Records are kept in the county's facility management system.
2. **At Remedial Action Unit 1, annual reports are required on the restrictive covenant, as described in the July 2004 Cleanup Action Plan (CAP)? Please provide a summary of the process for annual reports.**
    - Do not know

3. **Soil caps were constructed in 2017 on the valley floor at two former ranges (RAU 2A-16 and RAU 2A-21). Have any additional cleanup actions or maintenance actions been undertaken for these caps that were completed in 2017?**
    - No additional cleanup actions have been undertaken,
4. **Have the soil caps been inspected for erosion or damage since completion in 2017? Are records of the cap inspections available?**
    - Do not know
5. **Ongoing requirements following cleanup include maintaining the CITA fences. Who is responsible for inspections and maintenance? Describe the process and timeline for completing inspections. Are maintenance documentation records available?**
    - Maintenance is performed by county staff.
6. **Ongoing requirements following cleanup include annual surface inspections within the CITA for MEC. Have these inspections been completed? Are inspection records available?**
    - Do not know
7. **Ongoing requirements following cleanup include surface inspections within the CITA for MEC following significant rain events. Have these inspections been completed? Are inspection records available?**
    - Do not know
8. **Ongoing requirements following cleanup include installing signage. Has the installation of road and trail signs been scheduled for the redevelopment phase of the project, as described in the cleanup action plan (CAP)?**
    - Do not know
9. **Ongoing requirements following cleanup state that the County must maintain two Level I UXO technician certifications. Have park personnel received this training? If yes, please provide documentation. If no, please provide details when this training will be completed.**
    - Currently, one technician is in training. Plans are being developed to certify additional personnel.
10. **Has signage been installed at the target areas and firing points identified in the 2010 CAP?**
    - Do not know

Questionnaire Documentation Form

Name	Hunter Decker
Title/Position	Clark County Forester / Natural Resources Specialist III
Department	Public Works - Lands - Forestry
Email Contact	Hunter.Decker@clark.wa.gov
Years Affiliated	8

Periodic Review: DNR Heli-Tact Interview Questions
Camp Bonneville Periodic Review

Clark County is preparing required documentation for the Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Part of the Periodic Review process is to interview current users of the property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the preparer provide their name, role, and contact information in case follow-up questions are needed.

SITEWIDE QUESTIONS

1. Please describe your agency's use of the property, areas of use, and annual duration of use.
    a. Staging for local Wildland Fire response for quick reaction. 5 months a year
2. Which of your agency representatives has access to the property and procedures for securing the property?
    a. Local Helicopter Manager, Aircrew, and Pilots. Management
3. Does your agency have any site-specific operation and maintenance plans related to the activities you conduct or supervise at the property?
    a. Clean after self.
4. Does your agency have a process for training your personnel about site hazards?
    a. Base briefing for all crews prior to use, reviewed by the management.
5. Does your agency conduct any active fueling while using the property?
    a. Yes. If Wildfire is close may use hot refuel of helicopter. Fuel Vehicles and Drivers are HAZMAT/DOT approved with a closed circuit refuel system. Truck is equipped with spill kits and deadman shutoff when refueling. DNR SOP covers any fuel spills as reportable IAW EPA/DNR/Ecology guidelines. No open port fueling is allowed.
6. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?
    a. No
7. Does your agency store fuels, chemicals, or other hazardous materials stored at the Property? If yes:
    a. Please list the materials and approximate quantities.
        i. Jet Fuel in Fuel Truck & Helicopter. Fuel Truck 1,250 gallons, Helicopter 204.5 gallons.
        ii. Spare helicopter oil in fuel truck
    b. Please describe how and where these materials are stored?
        i. On fuel truck & helicopter
    c. Please describe how these materials used.
        i. Used when needed (Oil) or refueling of helicopter
8. During your agency's use of the property, have any fires occurred at the Property requiring mitigation? If so, please provide details including date, fire area, types of materials used to extinguish (water or foam)?

a. No

Questionnaire Documentation Form

Name	Dave Ritchie
Title/Position	Aviation – Assistant Division Manager
Department	Wildland Fire Management WA ST DNR
Email Contact	Dave.ritchie@dnr.wa.gov
Years Affiliated	9

Camp Bonneville Periodic Review
Periodic Review: < Law Enforcement AGENCY> Questionnaire

Clark County is preparing required documentation for Washington State Department of Ecology for a Periodic Review of the Camp Bonneville Cleanup Site (WAC 173-340-420). More information about the site and cleanup is available on Ecology's website: https://apps.ecology.wa.gov/cleanupsearch/site/11670.

Your agency has been identified as using the Camp Bonneville property. Please complete this questionnaire, if you are unable to answer a question, please state "Do not know". Ecology requests that the staff members assisting with the questionnaire provide their name, agency role, and contact information in case follow up questions are needed.

QUESTIONNAIRE

1. What activities does your agency conduct at the site and what do those activities entail?

   Training is use of robots and other Bomb Squad training for the Metro Explosive Disposal Unit.

2. How frequently does your agency use the property?

   About 4-5 days a year.

3. Does your agency have any training activities, firearm use, or explosives use outside of the active shooting range (FBI Range) and the close quarter training area at the Camp Bonneville encampment?

   Not currently. Any energetic tool use, ie firearm etc is confined to the range. In the past, we utilized other areas of the camp for non-energetic training, such as driving robots. Although we haven't used any areas outside of range for quite some time, the ability to use those areas for non-energetic training is important to our training mission.

   If Yes:
   3.1. What do those activities entail?

   3.2. Where have these activities taken place?

   3.3. When or how frequently do these activities take place?

4. Are munitions, including small arms ammunition, stored by your agency on the property?

   No

   If yes:
   4.1. where are munitions stored and how are they secured?

5. Does your agency store any hazardous or potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?

No

6. Are you aware of any spills, releases, or potential releases of potentially hazardous materials (e.g. fuels, motor oil, pesticides, paints, or solvents) at the property?

   No

7. Has your agency performed any firefighting activities associated with your agency's use of the Property?

   No

8. Are you aware of any munitions or explosives identified at the property outside of remedial cleanup activities?

   No

   If munitions or explosives were discovered:

   8.1. Where were these items discovered?

   8.2. What item was discovered?

   8.3. How were they reported?

   8.4. How was the item disposed of?

9. In September 2012, an Improvised Explosive Familiarization training was scheduled at Camp Bonneville conducted by the Portland Metro Explosives Unit and led by the FBI. Do you have any information related to this training or a contact for anyone who attended or helped lead the training?

   No.

Questionnaire Documentation Form

Name	Title/Position	Organization	Contact
Jim DeFrain	Supervisor	MEDU	503-823-2089

Date Submitted: 1/28/25

Appendix C
Photograph Log

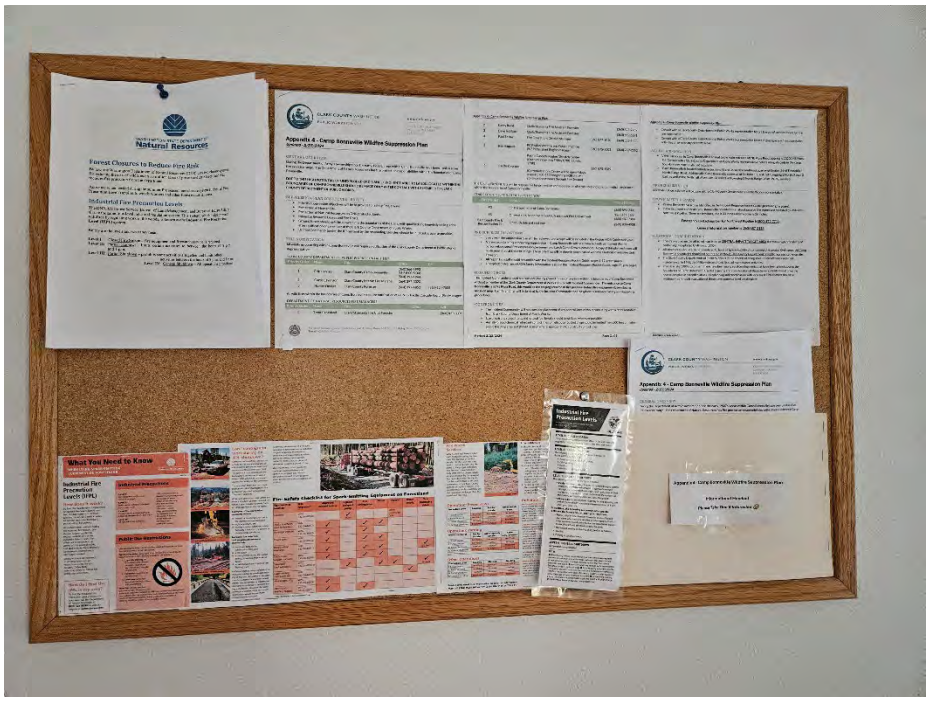


Photo 1. Bulletin board at Camp Bonneville headquarters with Operations and Maintenance (O&M) manuals

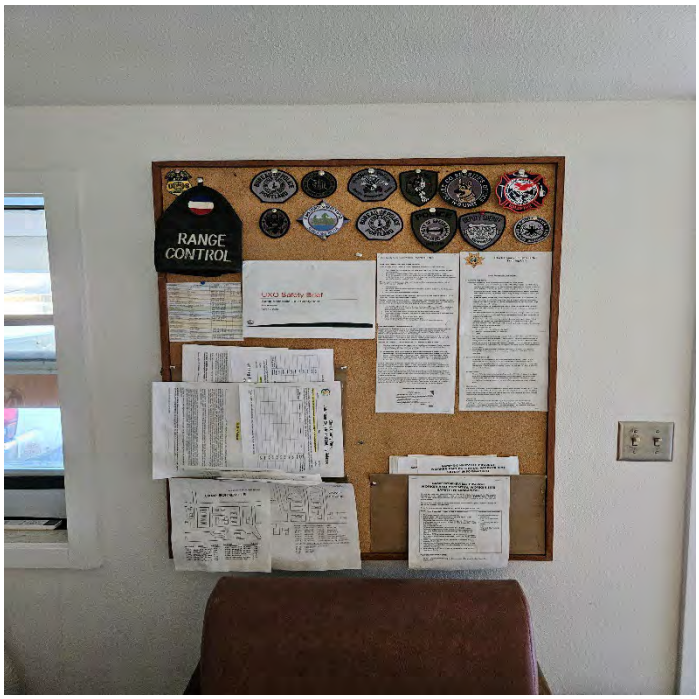


Photo 2. Bulletin board at Camp Bonneville headquarters with O&M manuals

Photo 3. Five-strand barbed wire at Central Impact Target Area (CITA) expansion.

Photo 4. Five-strand barbed wire at CITA expansion.

Photo 5. Typical downed tree impact.

Photo 6. CITA entrance.

Photo 7. Typical downed tree impact.

Photo 8. Four-strand barbed wire at the northwestern area of the property.

Photo 9. Fence maintenance underway.

Photo 10. Building 4475 maintenance pit area signage.

Photo 11. Building 4475 maintenance pit area signage.

Photo 12. Building 4475 maintenance pit area signage.

Photo 13. Building T-1932 aboveground storage tank (AST) signage.

Photo 14. Building T-1932 AST signage.

Photo 15. Building T-1932 AST signage.

Photo 16. RAU-2A-16 soil cap area.

Photo 17. RAU-2A-16 soil cap area: tire ruts observed.

Photo 18. RAU-2A-16 soil cap area: bank erosion 4.5 feet from soil cap.

Photo 19. RAU-2A-16 soil cap area: bank erosion 4.5 feet from soil cap.

Photo 20. RAU-2A-21 soil cap area.

Photo 21. RAU-2A-21 soil cap area.

Photo 22. Eastern sewage lagoon view, facing southeast.

Photo 23. Eastern sewage lagoon view, facing southwest.

Photo 24. Evidence of a burrowing mammal in the lagoon.

Photo 25. Breach in the western sewage lagoon.

Photo 26. Drainage from the western sewage lagoon breach.

Photo 27. Drainage from the lagoon breach.

Photo 28. Drainage from the lagoon breach reaches the access road.

Photo 29. Drainage from the lagoon breach reaches the access road.

Photo 30. Northern area of the eastern sewage lagoon.

Photo 31. Soil mounding outside the south side of the sewage lagoons.

Photo 32. Soil mounding outside the south side of the sewage lagoons.

Photo 33. GPS location of a trail associated with Crossover Road.

Photo 34. View of a trail associated with Crossover Road.

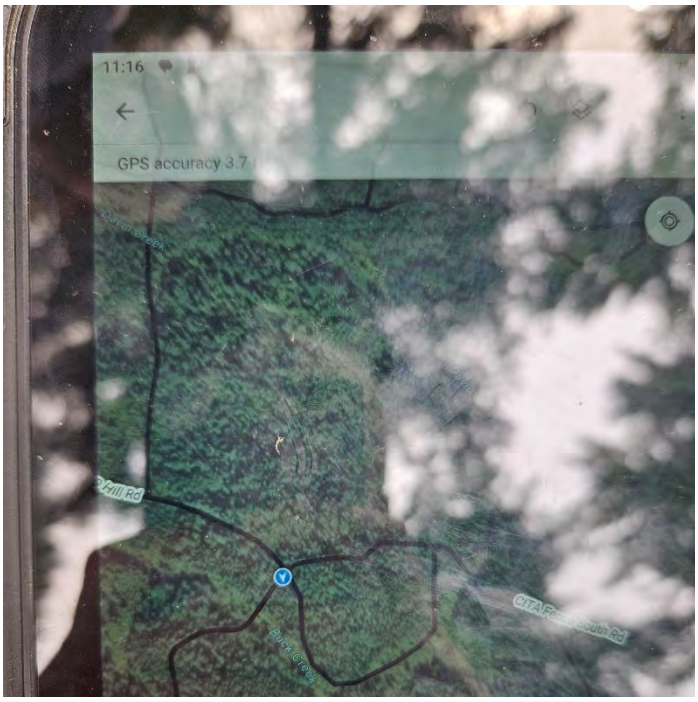


Photo 35. GPS location of the western end of the trail associated with CITA Fence South Road.

Photo 36. View of the western end of the trail associated with CITA Fence South Road.

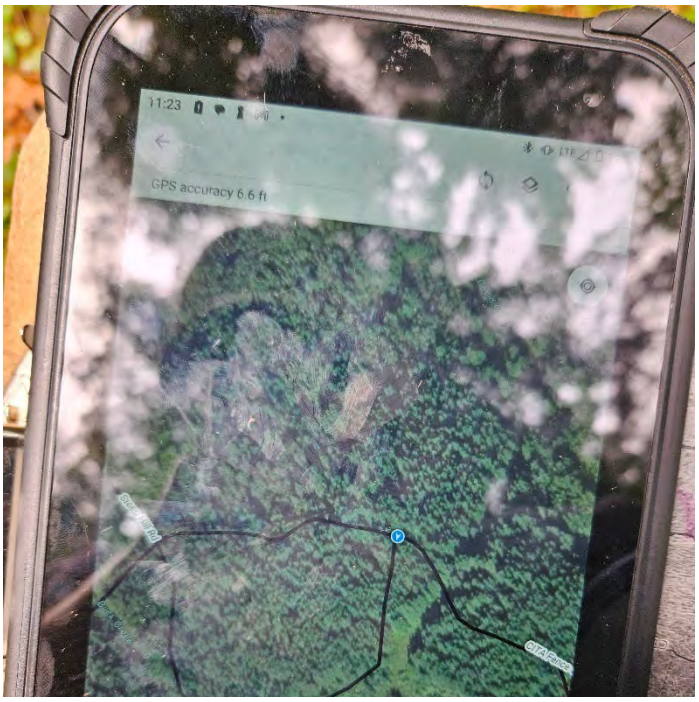


Photo 37. GPS location of the eastern end of the trail associated with CITA Fence South Road.

Photo 38. View of the eastern end of the trail associated with CITA Fence South Road.

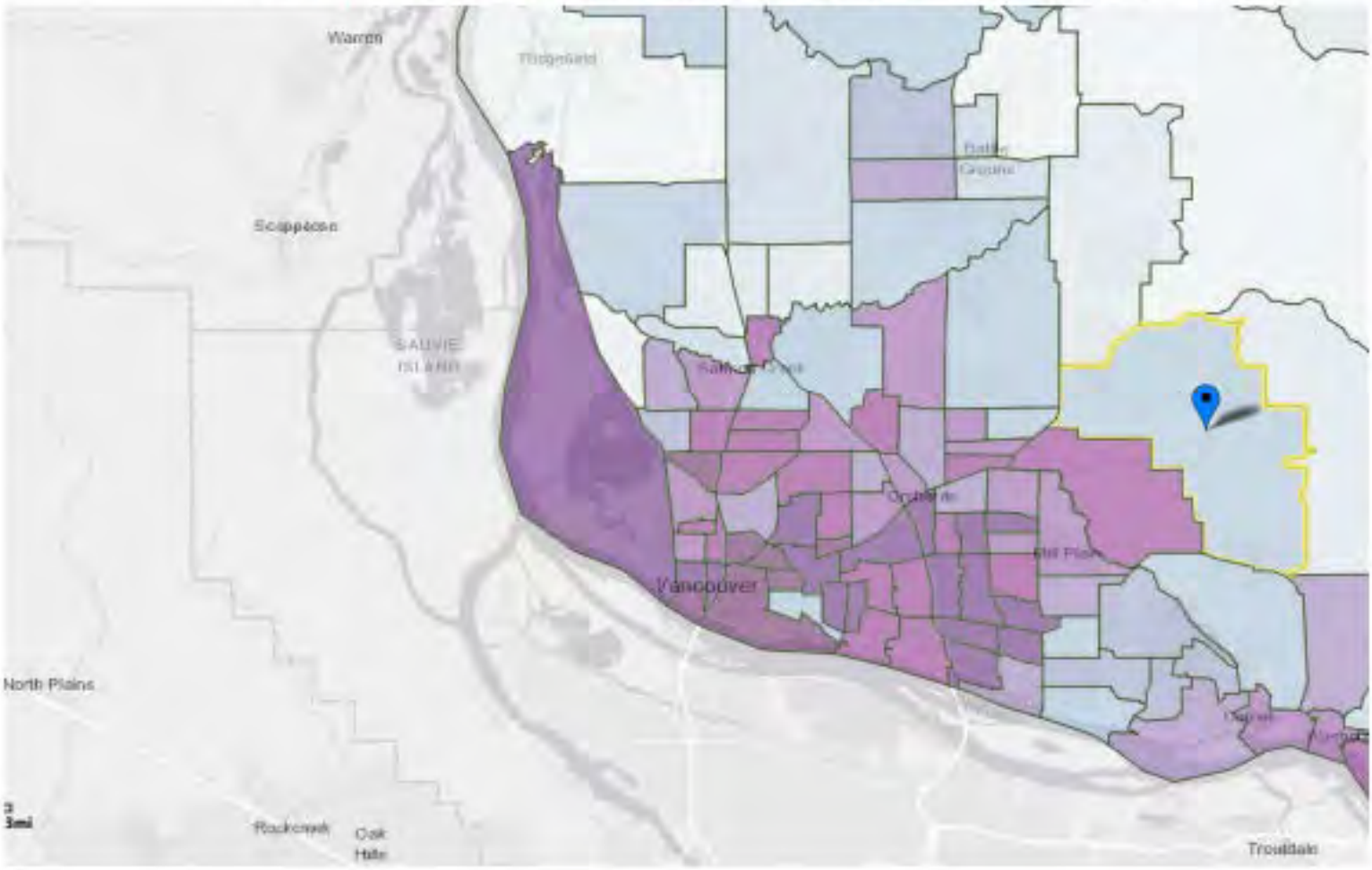
Appendix D
Vulnerable Population Log

Washington State Department of Health

Selection: Environmental Health Disparities V 2.0 **Date: 01/10/2025 at 1:29 PM**

Environmental Exposures, Environmental Effects, Socioeconomic Factors, Sensitive Populations

Legend: (High) 10 9 8 7 6 5 4 3 2 1 **(Low)**



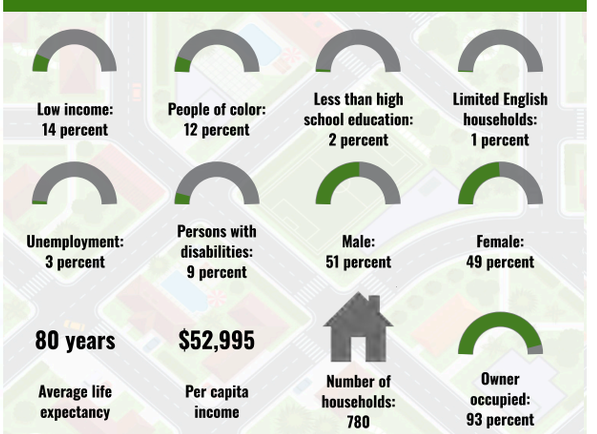
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

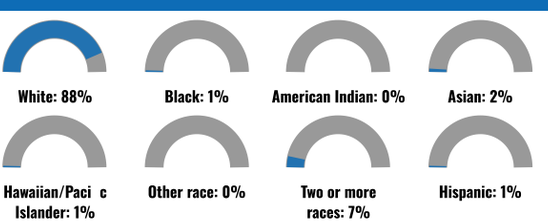
Camp B

2 miles Ring Centered at 45.686947,-122.424045
Population: 2,341
Area in square miles: 12.56

COMMUNITY INFORMATION



BREAKDOWN BY RACE



BREAKDOWN BY AGE

LIMITED ENGLISH SPEAKING BREAKDOWN

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2018-2022. Life expectancy data comes from the Centers for Disease Control.

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	88%
Spanish	1%
French, Haitian, or Cajun	2%
German or other West Germanic	1%
Russian, Polish, or Other Slavic	2%
Other Indo-European	5%
Total Non-English	12%

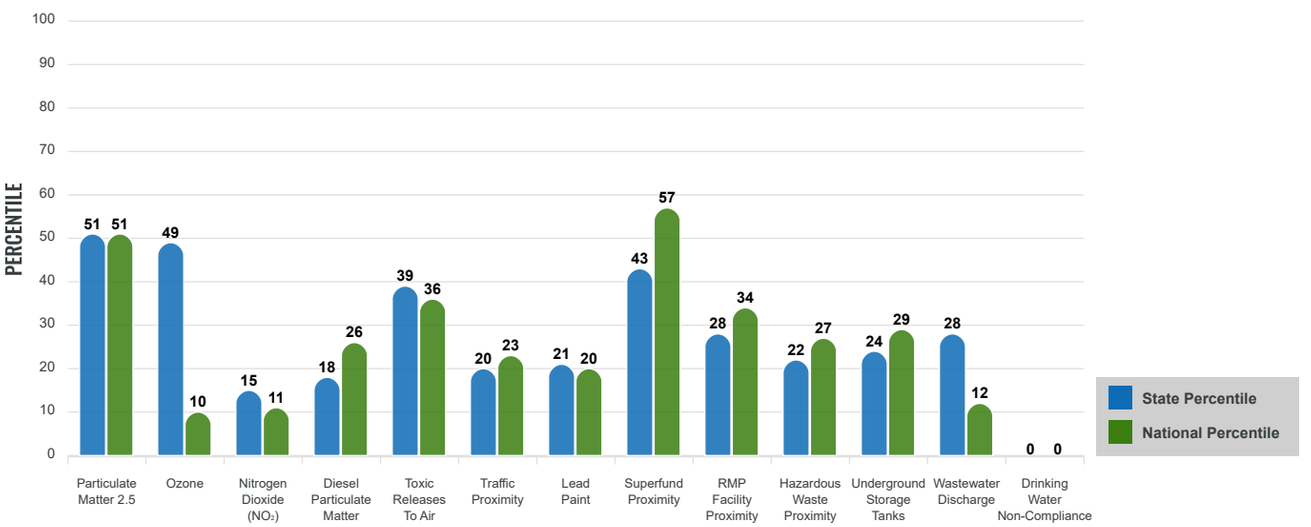
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

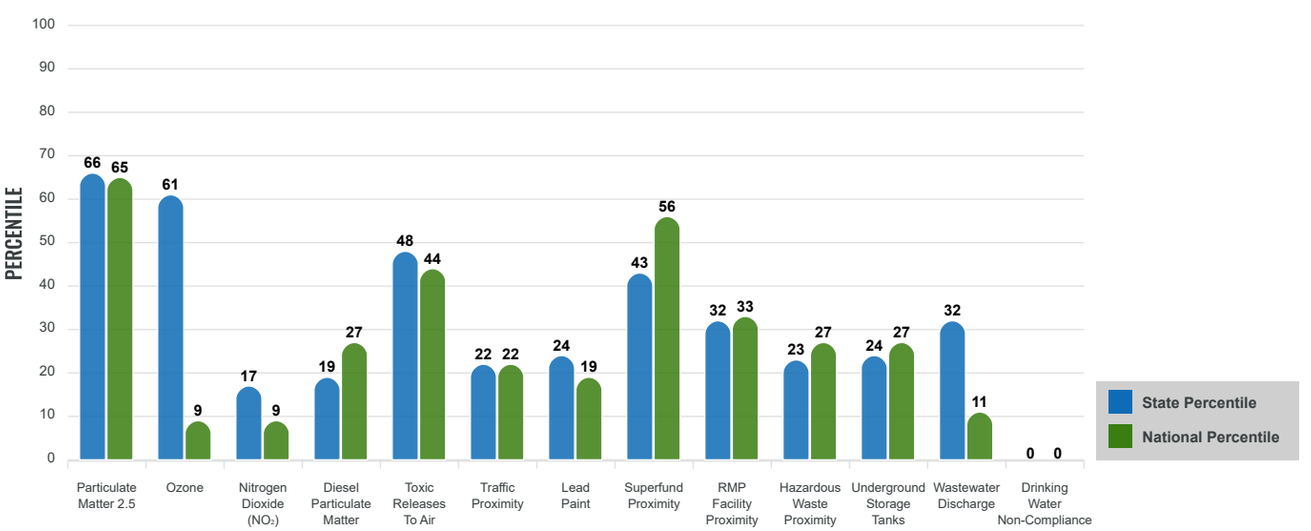
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low income, percent persons with disabilities, percent less than high school education, percent limited English speaking, and percent low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



Report for 2 miles Ring Centered at 45.686947,-122.424045

Report produced January 8, 2025 using EJScreen Version 2.3

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
ENVIRONMENTAL BURDEN INDICATORS					
Particulate Matter 2.5 ($\mu g/m^3$)	13.6	9.51	94	8.45	96
Ozone (ppb)	53.6	51.8	84	61.8	14
Nitrogen Dioxide (NO_2) (ppbv)	3.8	6.3	17	7.8	13
Diesel Particulate Matter ($\mu g/m^3$)	0.12	0.256	25	0.191	36
Toxic Releases to Air (toxicity-weighted concentration)	1,000	1,800	59	4,600	60
Traffic Proximity (daily traffic count/distance to road)	330,000	1,200,000	27	1,700,000	32
Lead Paint (% Pre-1960 Housing)	0.043	0.23	29	0.3	25
Superfund Proximity (site count/km distance)	0.055	0.53	42	0.39	56
RMP Facility Proximity (facility count/km distance)	0.15	0.51	35	0.57	39
Hazardous Waste Proximity (facility count/km distance)	0.59	2.9	28	3.5	36
Underground Storage Tanks (count/km^2)	0.12	6.1	29	3.6	34
Wastewater Discharge (toxicity-weighted concentration/m distance)	1.3	300	63	700000	23
Drinking Water Non-Compliance (points)	0	1	0	2.2	0
SOCIOECONOMIC INDICATORS					
Demographic Index USA	0.52	N/A	N/A	1.34	15
Supplemental Demographic Index USA	1	N/A	N/A	1.64	16
Demographic Index State	0.69	1.47	14	N/A	N/A
Supplemental Demographic Index State	0.85	1.37	21	N/A	N/A
People of Color	12%	33%	15	40%	25
Low Income	14%	23%	35	30%	26
Unemployment Rate	3%	5%	43	6%	43
Limited English Speaking Households	1%	4%	53	5%	60
Less Than High School Education	2%	8%	27	11%	21
Under Age 5	2%	5%	18	5%	21
Over Age 64	20%	17%	66	18%	64

*Diesel particulate matter index is from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 3
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within de ned area:

Schools 0
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment ..... No
Impaired Waters ..... Yes

Selected location contains American Indian Reservation Lands* ..... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community ..... No
Selected location contains an EPA IRA disadvantaged community ..... No

Report for 2 miles Ring Centered at 45.686947,-122.424045

Report produced January 8, 2025 using EJScreen Version 2.3

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	17%	18%	38	20%	28
Heart Disease	4.8	4.8	50	5.8	30
Asthma	10.8	10.9	46	10.3	69
Cancer	7.4	6.5	71	6.4	70
Persons with Disabilities	9%	13.4%	23	13.7%	23

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	8%	11%	63	12%	59
Wildfire Risk	0%	12%	0	14%	0

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	3%	8%	35	13%	23
Lack of Health Insurance	2%	6%	12	9%	12
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access Burden	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

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