

APPENDIX B

TIME-CRITICAL REMOVAL ACTIONS AND VOLUNTARY REMOVAL ACTIONS COMPLETED IN THE OU 3 STUDY AREA

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ACRONYMS AND ABBREVIATIONS

Agreement	June 2, 2006, Settlement Agreement
ASAO	Administrative Settlement Agreement and Order on Consent for Removal Action
CCT	Confederated Tribes of the Colville Reservation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DU	decision unit
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
HHRA	Final Human Health Risk Assessment: Upper Columbia River Site (USEPA 2021)
IC	incremental composite
IVBA	in vitro bioaccessibility
PSWP	property-specific work plan
RBA	relative bioavailability
RI/FS	remedial investigation and feasibility study
RSS DU	residential soil study decision unit
SATES	soil amendment technology evaluation study
Site	Upper Columbia River site
SU	sampling unit
TAI	Teck American Incorporated
TAL	target analyte list
TCRA	time-critical removal action
UCR	Upper Columbia River
VRA	voluntary removal action

UNITS OF MEASURE

amsl	above mean sea level
bgs	below ground surface
in.	inch(es)
µm	micrometer(s)
mg/kg	milligram(s) per kilogram
mm	millimeter(s)

1 INTRODUCTION

The Upper Columbia River site (UCR Site or Site¹) is located wholly within Washington State and includes approximately 150 river miles of the Columbia River, extending from the U.S.-Canada border to the Grand Coulee Dam and surrounding uplands. The upland portion of the Site includes terrestrial areas that are above the full-pool elevation of the Columbia River (1,290 feet amsl). Soils of upland areas adjacent to the Columbia River may have elevated metals concentrations due to deposition of air particulates originating from historical smelter stack and fugitive emissions from the Trail Facility north of the Site near Trail, British Columbia—now owned and operated by Teck Metals Ltd.—and the former Le Roi/Northport Smelter that was in Northport, Washington, as well as other anthropogenic and geogenic sources characteristic of this area.

A remedial investigation and feasibility study (RI/FS) for the Site is being conducted according to the June 2, 2006, Settlement Agreement (the Agreement) (USEPA 2006) and consistent with the National Contingency Plan (40 CFR Part 300). The "Parties" to the Agreement are the United States (on behalf of the U.S. Environmental Protection Agency [EPA]), Teck Metals Ltd. (formerly known as Teck Cominco Metals Ltd.), and Teck American Incorporated (TAI; formerly known as Teck Cominco American Incorporated).

In 2012, the Washington State Department of Ecology (Ecology) sampled surface and subsurface soil on undisturbed lands near the U.S.-Canada border and found levels of metals, including lead and arsenic, that were likely above background concentrations (Ecology 2013). As part of the RI/FS, TAI conducted soil sampling in upland areas of the Site and funded EPA's collection of soil samples on certain residential properties and tribal allotments. TAI completed the upland soil sampling in 2014 (TAI 2015), and EPA completed the residential soil sampling that same year (USEPA 2016a). TAI conducted additional residential soil sampling in 2016 (TAI 2017).

¹ As per the June 2, 2006, settlement agreement for implementation of remedial investigation and feasibility study (RI/FS) at the Upper Columbia River site (referred to herein as the UCR Site or Site), the Site consists of the areal extent of hazardous substances contamination within the United States in or adjacent to the Upper Columbia River, including the Franklin D. Roosevelt Lake, from the U.S.-Canada border downstream to the Grand Coulee Dam, and all suitable areas in proximity to such contamination necessary for implementation of the response actions (RI/FS) described therein.

1.1 REMOVAL ACTIONS COMPLETED BY TAI AT UPLAND PROPERTIES

TAI voluntarily² performed time-critical removal actions (TCRAs) at select residential properties and one tribal allotment in 2015 and voluntary removal actions (VRAs) at certain residential properties in 2017 and 2018, where EPA-determined action levels were exceeded. A summary of TCRAs and VRAs is provided in the Final Human Health Risk Assessment: Upper Columbia River Site (USEPA 2021) (HHRA); however, a full discussion of the TCRAs and VRAs completed by TAI has not been previously documented.

The purpose of this appendix is to provide a detailed and complete summary of the sampling, TCRAs, and VRAs that were completed. This information is provided in Section 2.

1.2 REMOVAL ACTIONS COMPLETED BY EPA IN NORTHPORT

While not described in detail in this appendix, removal actions have also been completed by EPA for the Le Roi/Northport Smelter site and nearby properties in Northport, Washington. From 1993 to 2004, EPA conducted a preliminary assessment, site inspections, and a removal site evaluation to characterize contamination at the Le Roi/Northport Smelter and identify residential and commercial properties in Northport

² The Site is the subject of a separate, ongoing lawsuit by the Confederated Tribes of the Colville Reservation (CCT) and the State of Washington against Teck Metals Ltd. under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Relevant for the upland portion of the Site, the U.S. Court of Appeals for the Ninth Circuit unanimously held in 2016 that Teck Metals Ltd. is not liable under CERCLA for aerial emissions of metals from the Trail Facility in British Columbia insofar as they may have deposited in the United States. Particularly, such emissions do not constitute “disposal” under the statute (*Pakootas v. Teck Cominco Metals Ltd.*, 830 F.3d 975, 9th Cir. 2016). “Disposal” is defined in CERCLA by cross-reference to the Resource Conservation and Recovery Act, which defines the term as the “discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters” (42 U.S.C. § 6903). The Ninth Circuit relied on two prior decisions in which the court determined that 1) diesel particulate emissions did not constitute disposal because disposal first requires the solid or hazardous waste be placed into or on land or water and thereafter emitted into the air, and 2) passive migration is not disposal under CERCLA. *Pakootas*, 830 F.3d at 983-86 (citing *Ctr. for Cmty. Action & Envtl. Justice v. BNSF Rwy. Co.*, 764 F.3d 1019 [9th Cir. 2014]; *Carson Harbor Vill., Ltd. v. Unocal Corp.*, 270 F.3d 863 [9th Cir. 2001]). Accordingly, “disposal” for purposes of establishing arranger liability under CERCLA must be caused by the result of human intervention rather than passive processes. This decision by the Ninth Circuit is final, and all appeal options were exhausted or waived.

for a removal action. Based on the results, sampled properties were identified for removal or containment actions if either 1) soil lead concentrations were greater than 1,000 mg/kg or soil arsenic concentrations were greater than 230 mg/kg; or 2) soil lead concentrations were 700 to 1,000 mg/kg or soil arsenic concentrations were 101 to 230 mg/kg and children were present. EPA conducted a soil removal action on the Le Roi/Northport Smelter property and 29 residential properties in Northport in 2004 (USEPA 2005).

In 2019, EPA performed a removal site evaluation of properties in Northport that contained soil lead concentrations near or above 700 mg/kg during the 2003/2004 removal evaluations but where no removal action was taken previously. The 2019 removal site evaluation was completed to support a TCRA in Northport at the same removal action level (700 mg/kg) that was used for TCRAs completed by TAI in 2015. Based on EPA's removal site evaluation completed in 2019, 16 residential properties and common use areas were identified for cleanup. Cleanup activities at 15 residential properties and common use areas were completed by EPA in August and September 2020 (USEPA 2020), while 1 residential property owner declined to participate in the 2020 removal action. In 2021, EPA conducted a follow-on removal site evaluation at 43 properties that had not been sampled previously in Northport. The criteria for a TCRA (i.e., lead concentrations in soil near or above the action level of 700 mg/kg) were met at 16 of the properties. These properties include residential properties and a common use area (USEPA 2022). Removal actions at these 15 properties were completed in 2022, while 1 residential property owner declined to participate in the 2022 removal action (USEPA 2023).

2 TCRA AND VRA CHRONOLOGY

2.1 EPA 2014 RESIDENTIAL SOIL STUDY

EPA conducted surface soil sampling activities from August 18 through October 3, 2014 (USEPA 2016a). Per the Final Quality Assurance Project Plan, Upper Columbia River Residential Soil Study (USEPA 2014), the objective of EPA's 2014 Residential Soil Study was to generate analytical data from surface soil samples to be used to refine exposure estimates for residents in the northernmost reaches of the Columbia River valley. Soil sampling was conducted at 235 residential soil study decision units (RSS DUs) within 74 residential properties in the study area during the field effort, including 17 DUs on six tribal allotments of the Confederated Tribes of the Colville Reservation (CCT). The selection of the RSS DUs for sampling was intended to provide information on the potential health risks to individuals in the residential soil study area and to provide targeted information for risk management and/or cleanup decisions for specific RSS DUs. The size of the exposure area for assessing human health risk was assumed to be the same as the DU sampled. The locations, extent, and sampling depths for each DU for each property were determined based on property-specific information (e.g., paved areas, unpaved areas) and extensive interviews with property owners during field reconnaissance activities conducted in spring 2014 (Appendix A in USEPA 2016a). DU types sampled during the study and the associated typical sample depths were as follows:

- House, agriculture, dripline, play area, and "other—not specified"³ DUs – sample depth 0 to 1 in. bgs
- Garden DUs (both vegetable and ornamental) – sample depth 0 to 12 in. bgs
- Animal activity area DUs and CCT tribal allotment DUs – sample depth 0 to 3 in. bgs
- Beach DUs – sample depth 0 to 6 in. bgs.

³ "Distinct play areas, driplines, gardens, beaches, agricultural areas, and animal pens/riding areas were delineated as separate DUs" and other frequently used areas were delineated as "other—not specified" (USEPA 2016a).

Sampling performed at RSS DUs included collection of incremental composite (IC) samples that consisted of 30 increments or subsamples located within the boundaries of each RSS DU, as well as various discrete grab samples. Details on sample collection are provided in the data summary report (USEPA 2016a). The IC and discrete soil samples were air dried, homogenized, and sieved into the appropriate fraction ($< 150 \mu\text{m}$ for soil and $< 250 \mu\text{m}$ for beach sand) for subsampling (IC samples only), digestion, and analysis (USEPA 2016a). All soil samples were analyzed for target analyte list (TAL) metals (except mercury). In vitro bioaccessibility (IVBA) testing for lead and arsenic was also conducted on a subset of IC samples. IVBA data for lead (or arsenic) provide an estimate of the Site-specific oral relative bioavailability (RBA) for lead (or arsenic) in soil.

2.2 2015 REMOVAL SITE EVALUATION, EPA ACTION MEMORANDUM, AND CONSENT ORDER

In May 2015, the EPA Region 10 Removal Program conducted a removal site evaluation based on the results of the 2014 Residential Soil Study. During this removal site evaluation, EPA prepared for the proposed removal action by documenting the condition and layout of each property designated for cleanup and coordinating with each of the property owners. At some of the properties, EPA either extended the size of some DUs or added new DUs based on additional observations of property use and interviews with the property owners that indicated areas of the property with a high likelihood of human exposure to contaminated soil. EPA also collected and analyzed soil samples from the original DUs to better delineate the horizontal and vertical extent of contamination and to assist in removal planning (i.e., measuring quantities and depths of contaminated soil for logistics, disposal, and cost estimating). Based on the May 2015 removal site evaluation and soil sampling, EPA prepared property-specific work plans (PSWPs) (USEPA 2015) for each property identified for a removal action.

On August 6, 2015, EPA issued an Action Memorandum providing a TCRA action level of 700 mg/kg and a cleanup level of 250 mg/kg or less for lead (Attachment to USEPA 2015). Seventeen properties, including 14 residential properties and three tribal allotments, which contained RBA-adjusted lead at concentrations near or above the TCRA action level, were identified for action. The three tribal allotments where RBA-adjusted soil lead concentrations exceeded action levels were not included in the planned removal action at the request of CCT. Alternative removal or soil remediation techniques were evaluated in the Soil Amendment Technology Evaluation Study (SATES), as discussed later in this section.

On August 11, 2015, TAI and EPA entered into an Administrative Settlement Agreement and Order on Consent for Removal Action (ASAOC) (USEPA 2015). Under the ASAOC, TAI voluntarily agreed to conduct removal actions in accordance with the PSWPs for the 14 residential properties identified in the 2015 TCRA Memorandum. TAI also voluntarily agreed to conduct removal actions at two DUs on Tribal Allotment 151-H 195 with RBA-adjusted lead levels below the 700 mg/kg action level. Tribal Allotment 151-H 195 (parcel number [REDACTED]) was sampled during the 2014 Residential Soil Study as DU 412. As part of the removal site evaluation, three new DUs were identified at this property: TA-195-A, TA-195-B, and TA-195-C. Removal actions were identified for DUs TA-195-A and TA-195-B, but not for TA-195-C.⁴ The PSWP for TA-195-A/TA-195-B/TA-195-C identified that removal activities for TA-195-C “are not planned for this decision unit at this time. This decision unit may be addressed in a future removal or under the remedial program” (USEPA 2015).

In total, the ASAOC identified that TCRAs would be performed at 27 DUs at 14 properties and 2 DUs at Tribal Allotment 151-H 195. Table B-1 provides a summary of the properties and associated DUs identified in the ASAOC.

The three tribal allotments (DUs 258, 401, and 441) with RBA-adjusted soil lead concentrations above 700 mg/kg that were not included in the planned removal action at the request of CCT are in relatively undisturbed forest areas, and soil removal and the associated land disturbance was not desirable. These DUs were used for the SATES evaluation conducted by TAI, as directed by EPA Region 10, in collaboration with the EPA Office of Research and Development, and in consultation with the SATES Technical Team that includes members of the CCT, the Spokane Tribe of Indians, Ecology, and other entities. The background, purpose, and description of this project and the participants are detailed in the SATES work plan (TAI 2017a) and the SATES work plan addendum (TAI 2017b). The objective was to identify and field test a soil amendment technology or technologies that could feasibly reduce the long-term potential for human exposure to lead in shallow soils in the UCR Site area (USEPA 2016b).

⁴ Section III. 8.x. of the 2015 ASAOC states: “‘Tribal Allotment 151-H 195’ shall mean a tribal allotment described in a Workplan, but not in the Action Memorandum. Tribal Allotment 151-H 195 is also referred to as Tribal Allotment H-195. Two of the three decision units in Tribal Allotment 151-H 195 are being addressed by this removal action and are referred to as TA-195-A and TA-195-B. TAI has agreed to conduct removal actions on these decision units notwithstanding the fact that the lead levels are below the action level established by the Action Memorandum.” DUs TA-195-A and TA-195-B are within 2014 Residential Soil Study DU 412.

2.3 2015 ASAOC AND TCRA

The TCRAs described in the 2015 ASAOC were performed by TAI with EPA oversight from August to November 2015 at 25 DUs located at 13 of the 14 privately owned properties listed in the ASAOC and 2 DUs at Tribal Allotment 151-H 195 (Table B-1). Lead-contaminated soil was cleaned up to below 250 mg/kg during the 2015 TCRA. One private property owner (parcel number [REDACTED], associated DUs 170 and 1030) declined to participate in the TCRA, and one property owner (parcel number [REDACTED]) declined to have a TCRA completed at one of the DUs on their property (DU 1021).⁵ In addition, a removal action was completed at one DU not listed in the ASAOC (DU 20, parcel number [REDACTED], RBA-adjusted soil lead concentration 72 mg/kg) concurrently with the TCRA being completed for DU 18 at the same property.

All removal work was performed with oversight by an archaeologist and/or a cultural resource monitor representative from CCT. The archaeologist and/or cultural resource monitor inspected the areas to be excavated and the soil removed from the ground for the presence of cultural resources, as described in the project-specific Cultural Resources Coordination Plan.

The actions were performed by excavating soil to a depth of 6 in. bgs and then analyzing the underlying soil using x-ray fluorescence to identify areas with lead and/or arsenic above project-specific cleanup levels that required additional excavation. Soil was excavated to a maximum depth of 12 in. bgs, with the exception of garden DUs. Garden DUs were excavated to a maximum depth of 24 in. bgs to account for tilling or mixing of shallow soil with deeper soil for gardening activities. Confirmation samples were taken to verify cleanup. Prior to backfilling, a geotextile fabric was placed over soil with concentrations exceeding cleanup levels at 12 in. bgs. The excavations were backfilled with EPA-approved material of the property owner's choice (e.g., pit run, sand, and/or topsoil) and compacted.

⁵ EPA's HHRA reports DU 1021 as having a TCRA completed, whereas the final TCRA completion report (TAI 2016a) documents that the property owner declined to have the TCRA completed. TAI has informed EPA of this discrepancy.

Prior to use, potential sources of backfill material were sampled and analyzed for TAL metals, pesticides, herbicides, volatile organic compounds, semivolatile organic compounds, and polychlorinated biphenyls. Analytical results were compared to the state of Washington Model Toxics Control Act Method A cleanup levels, and any sources of backfill material that exceeded those cleanup levels were not used. Agronomic testing was also performed for topsoil backfill material to confirm it would be suitable to support growth of general landscaping, including sod, grass seed, or garden plants. Detailed excavation procedures are described in Section 4.7.3 of the final TCRA completion report (TAI 2016a).

Excavated soil was transported and stockpiled at two staging (lay-down) areas, where it was sampled for analytical testing. Following receipt of acceptable analytical results, the excavated soil was disposed of at an offsite landfill. The lay-down areas (identified as DUs LDA-1 and LDA-2) were established at two contiguous parcels and were managed as DUs upon Site demobilization, i.e., the lay-down area DUs were cleaned up and sampled to confirm that the soil lead concentrations in the areas that were cleaned up were below 250 mg/kg.

The TCRAs completed in 2015 are documented in the final TCRA completion report (TAI 2016a) and in property-specific removal completion reports that were prepared by TAI and provided to the property owners and EPA. Table B-1 identifies the DUs and properties where TCRAs were performed in 2015. In total, TCRAs were performed at 29 DUs, which included the following:

- Sixteen DUs that were sampled during the 2014 Residential Soil Study
- Two DUs that were part of one DU sampled during the 2014 Residential Soil Study⁶
- Nine DUs that were added during the 2015 removal site assessment
- Two DUs that were used as lay-down areas and managed as TCRA DUs upon demobilization.

⁶ Removal actions were completed in 2015 at CCT tribal allotment DUs TA-195-A and TA-195-B; these DUs were part of DU 412 that was sampled during the 2014 Residential Soil Study.

2.4 TAI 2016 RESIDENTIAL SOIL STUDY

The 2016 Residential Soil Study conducted by TAI extended the southern boundary of EPA's 2014 Residential Soil Study, excluding Northport, where the Le Roi/Northport Smelter was located.⁷ Soil sampling was conducted in August and September 2016. Consistent with the 2014 Residential Soil Study, the purpose of the 2016 study (TAI 2016b) was to collect data to support refinement of exposure estimates for residents to support the HHRA. Samples were collected from a total of 452 RSS DUs at 144 properties. The 2016 study included 7 residential beach DUs and 19 DUs at eight undeveloped CCT tribal allotments. Residential DU classifications and the associated sampling depths were the same as for the 2014 Residential Soil Study.

Sampling completed during the 2016 Residential Soil Study included collection of 30-point IC samples at each DU plus discrete grab samples. Details on the numbers and types of samples collected are provided in the data summary report (TAI 2017c).

Soil samples were homogenized, weighed, air dried, and passed through a No. 10 sieve (< 2 mm) at the laboratory, and the < 2-mm-size fraction was weighed and then passed through either a No. 60 or No. 100 sieve to isolate the target particle size of < 250 µm for beach DUs and < 149 µm for non-beach DUs, respectively. All soil samples were analyzed for TAL metals (excluding mercury). IVBA analysis of lead and arsenic in soil was also conducted on a subset of IC samples from DUs where the lead or arsenic concentration was greater than or equal to 100 or 20 mg/kg, respectively.

2.5 2017 ASAOC AND VRA

The sample results from the 2016 Residential Soil Study indicated RBA-adjusted soil lead concentrations on six residential properties exceeding 600 mg/kg.⁸ TAI volunteered to

⁷ Per an August 11, 2015, letter from Laura Buelow (EPA) to Kris McCaig (TAI), EPA revised the scope of its March 5, 2015, directive to TAI to conduct additional residential sampling by specifying that, "The 2016 sampling zone will not include the area depicted in the map as 'Northport Exclusion Area Inset.'"

⁸ The 2017 ASAOC did not provide a reference or basis for the 600 mg/kg VRA action level. The VRA action level was established in a June 14, 2017, letter from Laura Buelow (EPA Project Manager) to Kris McCaig (TAI) resolving two disputes raised by TAI. These disputes related to EPA's December 8, 2016, directive to TAI to fund EPA to conduct terrestrial plant sampling and tissue analysis and EPA's July 22, 2016, Level of Effort for Assessment and Estimations of Upland Soils (background study). The June 14, 2017, dispute resolution agreement letter states, "While not directly related to the dispute, as discussed during the informal dispute resolution, TAI has also voluntarily agreed to conduct removal actions at four upland residential properties, sampled in 2016, that have measured lead concentrations above 600 ppm."

perform removal actions at four of the six properties to ensure the protection of public health, welfare, or the environment at those properties. These four properties included a total of eight DUs, which were remediated as per a September 27, 2017, ASAO (USEPA 2017) for the completion of a VRA (2017 ASAO).

Two of the DUs included in the 2017 ASAO (DUs 170 and 1030 on parcel number [REDACTED]) were included in the list of DUs for TCRA in 2015; however, the property owner elected to forgo removal action in 2015 as part of the TCRA, then later elected to have removal actions completed at these DUs as part of the VRA. TAI and EPA agreed to work collaboratively to conduct expedited removal actions at the properties for which the owners elected to have the removal action completed. Upon discussion with the property owners, EPA determined that the contaminated soil at the properties would be excavated to a predetermined depth of 6 in. bgs or until the underlying soil was below the cleanup levels (250 mg/kg for lead and 20 mg/kg for arsenic).

VRAs were completed in October 2017 for DUs 140-H1 and 140-O2 (parcel number [REDACTED]) and DU 180-H2 (parcel number [REDACTED]).

In spring 2018, the property owner of parcel number [REDACTED] requested that TAI sample additional areas (new DUs 203-O3, 203-O4, and 203-O5). In May 2018, IC sampling was conducted to refine soil removal strategies and characterize areal distribution of arsenic and lead in soil across DUs on two properties. This included DUs 1030 and 170 (parcel number [REDACTED]) and DUs 203-H1, 203-O3, 203-O4, and 203-O5 (parcel number [REDACTED]). Each DU was divided into approximately equal-sized sampling units (SUs), which were sampled using the IC sampling method. Based on the sampling results, all of DU 170 and only SU 1030-SU-A from DU 1030 were identified for a VRA on parcel number [REDACTED], and an additional two DUs (DUs 203-O3 and 203-O4) were identified for a VRA on parcel number [REDACTED].

VRAs were completed in summer 2018 at DUs 170 and 1030-SU-A (parcel number [REDACTED]) and in August and September 2018 at DU 109-H1 (parcel number [REDACTED]) and DUs 203-H1, 203-O1, 203-O3, and 203-O4 (parcel number [REDACTED]).⁹

⁹ At the request of the same property owner, and because the backfill placed in 2015 was inadequate for gardening, the topsoil backfill placed in the garden area during the 2015 TCRA at DU KNI-D (parcel number [REDACTED]) was removed and replaced. The topsoil that was removed from the garden area was used as backfill in DU 203-O3.

The VRAs were performed using the same procedures as the TCRAs completed in 2015. Completion of the VRAs was documented in a VRA completion report (TAI 2019) and in property-specific removal completion reports that were prepared by TAI and provided to the property owners and EPA.

Table B-2 identifies the DUs and associated parcel numbers where VRAs were completed in 2017 and 2018. In total, VRAs were completed at 10 DUs, which included the following:

- Six DUs that were sampled during the 2016 Residential Soil Study
- Two DUs that were sampled during the 2014 Residential Soil Study¹⁰
- Two DUs that were not sampled in either the 2014 or 2016 Residential Soil Studies but were added during VRA planning.¹¹

¹⁰ As noted earlier in this section, DU 1030 was divided into approximately equal-sized sampling units (SUs)—1030-SU-A, SU-B, SU-C, and SU-D—and sampled using the IC sampling method. SU 1030-SU-A had soil lead concentrations above the VRA action level, and a removal action was completed. The three remaining SUs had soil lead concentrations below the action level and were not subject to VRAs. The HHRA indicated that a VRA was done in all of DU 1030 (and associated area). TAI has informed EPA of this discrepancy (TAI 2021).

¹¹ As noted earlier in this section, three new DUs—203-O3, 203-O4, and 203-O5—were added and sampled in May 2018. Two of the three DUs (203-O3 and 203-O4) had soil lead concentrations above the VRA action level of 600 mg/kg, so VRAs were performed in these DUs; however, DU 203-O5 results were below the VRA action level, and no VRA was performed. Information for DU 203-O5 was missing from the HHRA. TAI has informed EPA of this discrepancy (TAI 2021).

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TABLES

Table B-1. Properties and Associated DUs Where a TCRA Was Completed

DU	Sampled in 2014 Residential Soil Study?	Sampled in 2015 Removal Site Evaluation?	CCT Tribal Allotment?	DU Type	Total Soil Lead Concentration (mg/kg)	RBA-Adjusted Soil Lead Concentration (mg/kg)	Identified for TCRA in ASAOC?	TCRA Completed in 2015?	Notes
Parcel Number [REDACTED]									
7	yes	yes	no	play area	935	1,053	yes	yes	
HIC-A ^a	no	yes	no	other—not specified	ns	ns	yes	yes	These DUs were added during the removal action, either as decided by EPA or requested by the property owner.
HIC-B ^a	no	yes	no	other—not specified	ns	ns	yes	yes	
Parcel Number [REDACTED]									
18	yes	yes	no	house	723	652	yes	yes	
20	yes	no	no	garden	68	72	no	yes	A removal action was completed at DU 20 concurrently with the TCRA completed at DU 18.
Parcel Number [REDACTED]									
35	yes	yes	no	house	954	1,165	yes	yes	
35PA	yes	yes	no	play area	1,303	1,341	yes	yes	
39	yes	yes	no	agriculture	605	706	yes	yes	
Parcel Number [REDACTED]									
40	yes	yes	no	house	568	661	yes	yes	
Parcel Number [REDACTED]									
49	yes	yes	no	house	1,430	1,629	yes	yes	
Parcel Number [REDACTED]									
109	yes	yes	no	house	1,034	667	yes	yes	
Parcel Number [REDACTED]									
151	yes	yes	no	house	847	992	yes	yes	
Parcel Number [REDACTED]									
194	yes	yes	no	house	689	733	yes	yes	
1021	yes	yes	no	house	1,357	1,448	yes	no	Prior to the start of removal activities, DU 1021 was removed from the list of DUs designated for removal action at the request of the property owner.
HUB	no	yes	no	other—not specified	ns	ns	yes	yes	This DU was added during the removal action, either as decided by EPA or requested by the property owner.
Parcel Number [REDACTED]									
201G	yes	yes	no	garden	632	692	yes	yes	
Parcel Number [REDACTED]									
203	yes	yes	no	house	868	897	yes	yes	
DEA-A ^a	no	yes	no	other—not specified	ns	ns	yes	yes	These DUs were added during the removal action, either as decided by EPA or requested by the property owner.
DEA-B ^a	no	yes	no	other—not specified	ns	ns	yes	yes	
DEA-C ^a	no	yes	no	other—not specified	ns	ns	yes	yes	
Parcel Number [REDACTED]									
218	yes	yes	no	house	756	984	yes	yes	
ROY ^a	no	yes	no	other—not specified	ns	ns	yes	yes	This DU was added during the removal action, either as decided by EPA or requested by the property owner.
Parcel Number [REDACTED]									
319M	yes	yes	no	house	861	998	yes	yes	
Parcel Number [REDACTED]									
196	yes	no	no	house	1,790	1,936	no	no	DU 196 was expanded and renamed KNI-A/B during the 2015 prerule assessment.
KNI-A/B	no	yes	no	house	ns	ns	yes	yes	
KNI-C ^a	no	yes	no	other—not specified	ns	ns	yes	yes	These DUs were added during the removal action, either as decided by EPA or requested by the property owner.
KNI-D ^a	no	yes	no	other—not specified	ns	ns	yes	yes	

Table B-1. Properties and Associated DUs Where a TCRA Was Completed

DU	Sampled in 2014 Residential Soil Study?	Sampled in 2015 Removal Site Evaluation?	CCT Tribal Allotment?	DU Type	Total Soil Lead Concentration (mg/kg)	RBA-Adjusted Soil Lead Concentration (mg/kg)	Identified for TCRA in ASAOC?	TCRA Completed in 2015?	Notes
Parcel Number [REDACTED]	(Tribal Allotment 151-H 195)								
412	yes	no	yes	other—not specified	503	594	no	no	As part of the 2015 removal site evaluation, three new DUs were identified at this property: TA-195A, TA-195B, and TA-195C. The PSWP for TA-195-A/TA-195-B/TA-195-C identified that removal activities for TA-195-C “are not planned for this decision unit at this time. This decision unit may be addressed in a future removal or under the remedial program” (USEPA 2015).
TA-195-A	no	yes	yes	other—not specified	ns	ns	yes	yes	
TA-195-B	no	yes	yes	other—not specified	ns	ns	yes	yes	
Parcel Number [REDACTED]									
170	yes	yes	no	house	1,177	1,102	yes	no	Prior to the start of 2015 removal activities, DUs 170 and 1030 were removed from the list of DUs at the request of the property owner.
1030	yes	yes	no	other—not specified	742	817	yes	no	
Parcel Numbers [REDACTED] and [REDACTED]									
LDA-1	no	no	no	other	ns	ns	no	yes	Lay-down areas for construction were managed as two separate DUs and cleaned up after TCRAs were completed.
LDA-2	no	no	no	other	ns	ns	no	yes	
Tribal Allotment 151-H 193									
258	yes	no	yes	other—not specified	678	768	no ^b	no	Removal action was deferred for this DU; SATES was conducted at this DU.
Tribal Allotment 151-H 196									
401	yes	no	yes	other—not specified	1,120	1,100	no ^b	no	Removal action was deferred for this DU; SATES was conducted at this DU.
Tribal Allotment 151-H 197									
441	yes	no	yes	other—not specified	624	738	no ^b	no	Removal action was deferred for this DU; SATES was conducted at this DU.
Total DUs with TCRAs:								29	

Notes:
^a Decision unit (DU) is included in this table but not included in the Final Human Health Risk Assessment: Upper Columbia River Site (USEPA 2021) (HHRA). TAI has informed EPA of this discrepancy.
^b Paragraph 14 of the 2015 ASAOC specified "Based on communication with the Tribes, the three tribal allotments at which lead was found to exceed 700 ppm are not being addressed through this TCRA to allow time to further evaluate removal alternatives."
ASAOC - Administrative Settlement Agreement and Order on Consent for Removal Action
CCT - Confederated Tribes of the Colville Reservation
ns - not sampled
RBA - relative bioavailability
SATES - Soil Amendment Technology Evaluation Study
TCRA - time-critical removal action

Table B-2. Properties and Associated DUs Where a VRA Was Completed

DU	Sampled in 2016 Residential Soil Study?	Sampled in 2018?	DU Type ^a	Total Soil Lead Concentration (mg/kg)	RBA-Adjusted Soil Lead Concentration (mg/kg)	VRA Completed in 2017?	VRA Completed in 2018?	Notes
Parcel Number [REDACTED]								
140-H1	yes	no	house	723	770	yes	no	
140-O2	yes	no	other areas	917	977	yes	no	
170	no ^d	no	house	1,177	1,102	no	yes	Prior to the start of 2015 removal activities, DU 170 was removed from the list of DUs identified for a TCRA at the request of the property owner, but it was added back to the list of 2018 VRAs at the request of the property owner.
1030 ^b	no ^d	no	other—not specified	742	817	no	no	Prior to the start of 2015 removal activities, DU 1030 was removed from the list of DUs identified for a TCRA at the request of the property owner, but it was added back to the list of 2018 VRAs at the request of the property owner. In 2018, per EPA approval, TAI divided DU 1030 into four SUs (1030-SU-A, 1030-SU-B, 1030-SU-C, and 1030-SU-D) and performed IC sampling. Results were such that only 1030-SU-A was above the VRA action level and TAI received approval from EPA to only do a VRA at this SU.
1030-SU-A ^b	no	yes	other—not specified	835	ns	no	yes	
1030-SU-B ^b	no	yes	other—not specified	530	ns	no	no	
1030-SU-C ^b	no	yes	other—not specified	430	ns	no	no	
1030-SU-D ^b	no	yes	other—not specified	510	ns	no	no	
Parcel Number [REDACTED]								
180-H2	yes	no	house	637	678	yes	no	
Parcel Number [REDACTED]								
109-H1	yes	no	house	707	753	no	yes	
Parcel Number [REDACTED]								
203-H1	yes	no	house	855	911	no	yes	
203-O1	yes	no	other areas	1,390	1,480	no	yes	
203-O3 ^c	no	yes	other areas	1,500 (average)	ns	no	yes	This DU was added during the removal action, either as decided by EPA or requested by the property owner. In 2018, per EPA approval, TAI divided DU 203-O3 into four SUs (203-O3-A, -B, -C, and -D) and performed IC sampling. Results were such that all four SUs were above the VRA action level; therefore, TAI conducted a VRA on the entire DU 203-O3.
203-O4 ^c	no	yes	other areas	1,150 (average)	ns	no	yes	This DU was added during the removal action, either as decided by EPA or requested by the property owner. In 2018, per EPA approval, TAI divided DU 203-O4 into two SUs (203-O4-A and -B) and performed IC sampling. Results were such that both SUs were above the VRA action level; therefore, TAI conducted a VRA on the entire DU 203-O4.
203-O5 ^c	no	yes	other areas	487 (average)	ns	no	no	This DU was added during the removal action, either as decided by EPA or requested by the property owner. In 2018, per EPA approval, TAI divided DU 203-O5 into three SUs (203-O5-A, -B, and -C) and performed IC sampling. Results were such that all SUs were below the VRA action level; therefore, TAI did not conduct a VRA at DU 203-O5.
Total DUs with VRAs:							10	

Notes:

- ^a The 2014 Residential Soil Study uses the term "other—not specified" for other frequently used areas on a property, while the 2016 Residential Soil Study uses the same definition but refers to those decision units (DUs) as "other areas."
- ^b DU 1030 was divided into approximately equal-sized sampling units (SUs), 1030-SU-A, -SU-B, -SU-C, and -SU-D, and sampled using incremental composite (IC) sampling methods. 1030-SU-A had soil lead concentrations above the voluntary removal action (VRA) action level of 600 mg/kg and had a removal action completed. The three remaining DUs had concentrations below the action level and were not subject to VRAs. The Final Human Health Risk Assessment: Upper Columbia River Site (USEPA 2021) (HHRA) may have reported the full DU 1030 (and associated area) as having a VRA completed, potentially omitting the remaining SUs (and associated data). TAI has informed EPA of this discrepancy.
- ^c Three new DUs, 203-O3, 203-O4, and 203-O5, were added and sampled in May 2018. Two of the three DUs (203-O3 and 203-O4) had soil lead concentrations above the VRA action level of 600 mg/kg and had VRAs performed; however, DU 203-O5 results were below the VRA action level and no VRA was performed. The HHRA included DUs 203-O3 and 203-O4 but not DU 203-O5. TAI has informed EPA of this discrepancy.
- ^d DUs 170 and 1030 (parcel number [REDACTED]) were sampled during the 2014 Residential Soil Study.
- ns - not sampled
- RBA - relative bioavailability
- TCRA - time-critical removal action