UPPER COLUMBIA RIVER

FINAL

Field Reconnaissance Plan Upper Columbia River Site Residential Soil Study

Prepared for

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ACRONYMS AND ABBREVIATIONS

ССТ	Colville Confederated Tribes
CSM	conceptual site model
DU	decision unit
EPA	U.S. Environmental Protection Agency
FRP	field reconnaissance plan
FSP	field sampling plan
GPS	global positioning system
HHRA	human health risk assessment
IC	incremental composite
IC IVBA	incremental composite in vitro bioaccessibility assay
-	•
IVBA	in vitro bioaccessibility assay
IVBA QAPP	in vitro bioaccessibility assay quality assurance project plan
IVBA QAPP RI/FS	in vitro bioaccessibility assay quality assurance project plan remedial investigation and feasibility study
IVBA QAPP RI/FS SOP	in vitro bioaccessibility assay quality assurance project plan remedial investigation and feasibility study standard operating procedure

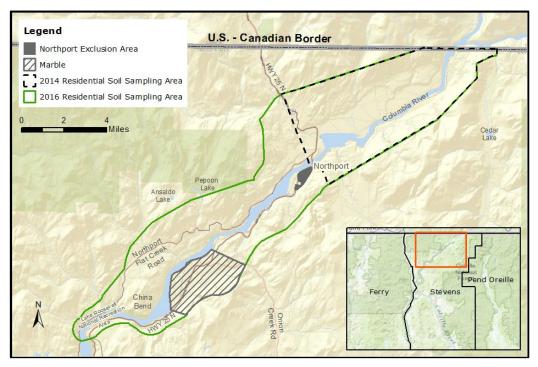
UNITS OF MEASURE

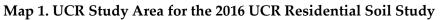
bgs

below ground surface

1 INTRODUCTION

This document presents the revised field reconnaissance plan for the Upper Columbia River (UCR) Residential Soil Study. The 2016 UCR Residential Soil Study is a follow-up investigation to the 2014 UCR Residential Soil Study, which was led by the U.S. Environmental Protection Agency (EPA). In 2015, EPA directed Teck American Incorporated (TAI) to conduct further study of UCR residential soils within and beyond the 2014 residential soils study boundary. The current study (hereafter, the 2016 UCR Residential Soil Study) is being led by TAI and extends the southern boundary of EPA's 2014 residential soil study to approximately the intersection of Williams Lake Road and Highway 25 on the east side of the river (UCR Study Area, Map 1). The 2016 UCR Residential Soil Study represents one of the tasks that will be completed as part of the UCR remedial investigation and feasibility study (RI/FS). The RI/FS is being conducted under a Settlement Agreement between TAI and EPA.





Consistent with the prior study, the objective of the 2016 UCR Residential Soil Study is to collect data to support refinement of exposure estimates for residents of the UCR Study Area to support the human health risk assessment (HHRA). Surface soils will be collected from rural residential properties not previously sampled within the UCR Study Area. TAI sent letters to property owners within the UCR Study Area requesting access for field

reconnaissance and sampling activities on January 11, 2016 for this study. Participation of property owners in the study is voluntary.

The field efforts for this study consist of a field reconnaissance phase and a field sampling phase. The reconnaissance phase will occur in the spring of 2016 and consist of visiting each property where landowners agreed to participate in the study. The purpose of the field reconnaissance phase is to observe land use and property features and to interview the landowner or resident to determine the locations for sampling decision units (DUs). Soil sampling will be focused on residential property locations where there is a high potential for exposure by residents, especially young children, based on activities determined from interviews and site visits. Young children and gardeners are most likely to be exposed to metals in soil via ingestion of fine soil particles that adhere to skin. The field sampling phase will occur in the summer and fall of 2016 and consist of collecting incremental composite (IC) soil samples at the DUs established from the reconnaissance for each property. Discrete core soil samples will also be collected at a subset of DUs. Soil samples collected during the 2016 UCR Residential Soil Study will be analyzed for target analyte list (TAL) metals (except mercury).¹ Some samples will also be submitted for in vitro bioaccessibility assay (IVBA) analysis of lead and arsenic in soil.²

1.1 PURPOSE AND OBJECTIVES

The purpose of this field reconnaissance plan (FRP) is to document the approach and field procedures to execute field reconnaissance activities. The primary data required from the field reconnaissance efforts are selection, refinement, and documentation of the DU boundaries and land use types at the properties where access for field planning and sampling has been granted. The rationale and decision logic for selecting the number, size, and sample depth for DUs at the properties are described in the Residential Soil Study Quality Assurance Project Plan, Upper Columbia River, Washington State, Addendum No. 1 (QAPP Addendum; Ramboll Environ 2016). Property-specific details, including the locations and sizes of the residential sampling DUs will be determined through implementation of this FRP. Data obtained during field reconnaissance will be used to

¹ TAL metals include aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc. Project action limits are listed in the Residential Soil Study Quality Assurance Project Plan (QAPP) Addendum No. 1, Worksheet #15, and are based on risk-based concentrations for residential soil summarized in Attachment D to the QAPP addendum.

² Bioaccessibility testing will be performed at a frequency of 20 percent of DUs where one or more IC samples have a lead and/or arsenic concentration greater than 100 or 20 milligrams per kilogram (mg/kg), respectively.

finalize the field sampling plan (FSP) and QAPP Addendum for the Residential Soil Study, including development of a table and property-specific sampling maps identifying DU types and boundaries, as well as planned sample types, numbers, and depths at each property.

1.2 DOCUMENT ORGANIZATION

This FRP has been developed as a stand-alone document; however, it relies upon and references project-specific details described in the QAPP Addendum.

In addition to this introduction, the FRP includes the following sections and attachments:

- **Section 2** presents the field reconnaissance tasks and data collection procedures
- Section 3 describes how the field data will be compiled and reported once the field reconnaissance (fieldwork) is completed
- Attachment 1 provides DU sampling design templates (also included as Attachment G to the QAPP Addendum)
- Attachment 2 provides copies of study-related flyers and an example notice of property visit given to each property owner
- Attachment 3 provides the project-specific field forms for the field reconnaissance
- Attachment 4 provides the standard operating procedure (SOP) for general use of the type of global positioning system (GPS) units that will be used to record DU boundaries.

2 FIELD RECONNAISSANCE APPROACH

This section describes field reconnaissance tasks, schedule, rationale, decision logic and criteria, and field data collection procedures.

2.1 TASKS

The field reconnaissance tasks include the following data collection activities for the properties being sampled:

- Review property information and communicate with property owners or residents prior to site visit
- Interview owner or resident and walk site
- Document site use
- Generate diagrams or sketches of property, site features, and establish DUs
- Obtain GPS coordinates to delineate DU boundaries
- Obtain digital photographs of each DU.

2.2 SCHEDULE

Field reconnaissance is scheduled for April 25 through May 4, 2016 and May 9 through 18, 2016. Additional reconnaissance may be conducted during summer 2016.

2.3 FIELD RECONNAISSANCE RATIONALE AND DECISION LOGIC

The following sections describe the rationale and decision logic for how properties were selected for inclusion in the 2016 UCR Residential Soil Study and the selection criteria used to establish the number, size, and locations for DUs on a given property.

2.3.1 Selection of Residential Soil Sample Properties

In January 2016, TAI distributed project information to owners of residential property and tribal allotment located within the UCR Study Area and requested permission to conduct field planning and sampling activities. Information and access forms were also distributed by the Colville Confederated Tribes (CCT) to members living on tribal allotments in the UCR Study Area. Property owners who did not respond or declined sampling during the residential soil study conducted by EPA in 2014 were also contacted. Sampling is voluntary

and landowners and tribal members who agreed to allow TAI and its representatives to conduct field planning and sampling activities constitute the 'master list' of residential³ properties, which TAI maintains and updates as appropriate given new or corrected information for each property and owner. Properties included in the master list will be visited during the field reconnaissance event to complete interviews of the property owners, verify land use, and establish the DUs.

2.3.2 Selection Criteria for the Number and Size of Decision Units

The sampling design for residential properties has been developed in consideration of the conceptual site model (CSM) for residential soil. The presence of metals in residential soil may be due to both regional and localized sources. Regional sources may include ambient air constituents, current and historic mining and smelting operations, municipal point and non-point sources, agricultural non-point sources, and erosion from naturally occurring mineralized zones. Localized sources may include imported fill and hardscape materials, agricultural chemicals, fuels and oils, vehicle and metal wastes, treated wood, lead-based paint, refuse, burn piles, and lead shot. In contrast to undeveloped lands, the distribution of metals in residential soil is likely to be more varied spatially due to the increased potential for soil disturbance that occurs with development of a property for residential use (e.g., grading, mixing, etc.) and with use of such a property after development (e.g., landscaping, gardening, livestock maintenance, etc.).

A DU is defined as the smallest area about which a risk-based decision will be made. For this study, each of the target properties will be visited to establish the DUs based on areas expected to have high potential use, including intermittently accessed areas that may include children's play areas, gardens, camping areas, discrete animal pens and riding areas, and other areas identified by the resident. The size and presence of features that may influence exposure, including the presence of potential anthropogenic contaminant sources,⁴ will also be considered in establishing DUs.

³ For the purposes of this study, non-residential properties used for camping or where residences are planned are included in the master list of residential properties. Among these, for each DU identified for sampling, specific use as residential, planned residential, recreational, or other will be documented as part of field reconnaissance data collection efforts.

⁴ For the current study, such areas will be carefully documented during the field reconnaissance. As with roadways and railways, sampling buffers will be designated around such sources to exclude collection of sample increments from those areas when located within an established DU boundary.

Attachment 1 provides examples of templates that will be used as guides for establishing property-specific sampling designs. The template that is determined to be best suited to the characteristics of a given property based on responses to interview questions and reconnaissance observations will be used as a starting point for the property-specific sampling design and will be modified as necessary to accommodate the features and layout of the property.

Each residential property will have a minimum of one DU that encompasses up to 1 acre immediately surrounding the residence⁵. Dripline DUs will not be established at a property unless there is a concern regarding lead-based paint on large, painted structures, such as a residence or barn. Properties that include additional areas larger than 1 acre may be further divided into 5-acre DUs depending on how the owner or resident uses the area. Distinct play areas, gardens, and intermittently accessed areas (e.g., camping areas) will be treated as separate DUs. Example scenarios are provided below:

- **Example A.** A property that includes 6 acres of land, a child's play area, and a vegetable garden would have up to five DUs: one DU for up to 1 acre surrounding the residence, one DU for the dripline around the residence if there is a concern regarding lead-based paint, one DU for the garden, one DU for the play area, and one DU for the remaining portion of the property where use is indicated.
- **Example B.** A 2-acre property without a child's play area and/or garden area would have up to three DUs: one DU for up to 1 acre surrounding the house, one DU for the dripline if there is a concern regarding lead-based paint, and one DU for the remaining acreage of the property where use is indicated.
- **Example C.** A property used for camping and without a play and/or garden area would have one DU for up to 1 acre surrounding the campsite.

2.3.3 Selection Criteria for Establishing Soil Sample Depths

The sampling (and exposure) medium is surface soil. Soil sample depths for each DU will depend upon the land use type determined by responses to interview questions and observations during field reconnaissance. Generic sample depths from the QAPP Addendum are listed in Table 1 below. However, the individual sampling design for each

⁵ Note: For non-residential properties used for camping or where residences are planned, the DU will encompass up to 1 acre immediately surrounding the area planned for future residential development or where the highest camping use occurs.

property or DU may specify different depths than those listed below based on site-specific conditions, such as deeper tilling or presence of fill.

Land Use or DU Type	Sample Depth (inches below ground surface [bgs])
House area and play area	0 to 1
Animal activity area or other, not-specified areas where soil disturbance occurs	0 to 3
Beaches	0 to 6
Gardens	0 to 12ª

^a Gardens will be sampled to the depth that gardens are tilled based on information from the property owner, typically to 12 inches bgs.

2.4 FIELD RECONNAISSANCE DATA COLLECTION PROCEDURES

The sections below provide details for field data collection based on the decision logic presented in Section 2.3.

2.4.1 Equipment and Supplies

The following planning documents will be needed and will accompany the field team to support the field reconnaissance data collection activities:

- The Draft QAPP Addendum (including all attachments and worksheets, except those to be completed after the field reconnaissance activities have concluded)
- This FRP (including attachments listed herein and extra field data forms)
- Electronic versions of property information and maps
- Site information packets for each property (each packet will contain hard copies of property-specific information, including copies of signed access agreements, aerial photographs with preliminary DU sketches, telephone call notes, driving directions, and worksheets to be completed during the site visit)
- Blank access agreements (for additional properties to sample or for access to properties)
- Copies of study-related flyers previously distributed to UCR Study Area property owners and forms for use in providing notice of a property visit to each owner (Attachment 2)
- The Field Contractor's project-specific health and safety plan.

The following equipment and supplies will be needed to perform the field reconnaissance and data collection:

- Mapping equipment including pens, cloth measuring tapes, measuring wheels, magnifying glass (to examine soil surfaces), and pin-flags
- GPS unit with sub-meter accuracy (programmable unit such as Trimble GeoXT or GeoXH; note, based on the 2014 residential soil study, an external backpack antenna may be needed for better satellite reception)
- Digital camera (with replacement batteries and memory card capable of 200+ photographs per day)
- Mobile telephone
- 2-way radios
- Dry-erase white boards and markers (approximately 2 feet by 3 feet in size).

2.4.2 Field Data Forms

Project-specific field reconnaissance field data forms have been developed and are provided in Attachment 3. The field data forms provide a systematic and structured template to assist with field documentation, and require entry of the following data fields:

- Property address, parcel number, and property number
- Names of TAI, EPA, and Field Contractor representatives on-site and the name of the individual to contact if there is a question about the completed field data form
- Date and time
- Results of owner interview and site walk
- Diagrams and sketches of property, features, and DUs
- GPS coordinates.

Field data collection protocols for populating the project-specific field forms and sketches are discussed further below.

2.4.3 Locating Properties, Owner Interview, and Site Walk

Prior to mobilizing field reconnaissance teams to each property, TAI or their representative will contact the property owner or resident by telephone at least 1 week prior to the planned field reconnaissance event to schedule the site visit. During this telephone call, TAI or their representative will seek to record the property owner's or resident's preliminary responses

to interview questions provided in Worksheet #1 of Attachment 3. Responses obtained from the interview will be used to inform development of property maps that include the types of DUs and tentative DU locations specific to that property. Information included on the preliminary property maps will be confirmed and updated during the field reconnaissance visit.

The first step in the field reconnaissance will be to locate and visit each property, interview the owner or resident or confirm responses to the prior telephone interview (if conducted), and then walk the property to assess key features (such as property size, land use types, play areas, gardens, etc.). Worksheet #2 and #3 of Attachment 3 summarize information to be recorded during the site visit. If the property owner or resident has not been interviewed prior to the site visit, and the owner, resident, or representative is not present during the site visit, an attempt will be made to complete the interview (Worksheet #2) by telephone following the site visit.

The site information packet for each property will include the property address and driving directions. The field team leader will use this information and the schedule to determine the sequence of site visits for a given day. Access coordinates for a single point, where the property meets the main road, will be loaded in KML (or other) format compatible with Google Maps, Google Earth, or other portable navigation application to facilitate visits.

The interview process for each landowner will be structured and elicit or confirm responses to questions about property use, size, and household information. The Field Contractor's representative will be responsible for recording and updating the landowner's or resident's responses to each question on the field data form. Following the interview, the field team will assess the property features to determine the number and types of DUs based on consideration of potential localized sources and resident-specific land use. Land use features may include:

- Current or planned residential structure areas, recreational vehicle pads, and camping areas
- Driveway areas, septic tanks, outhouses, water wells (or other water sources)
- Gardens, lawns, manicured landscaping, or any similar modified landscape
- Child play areas, sandboxes, horseshoe pits, or other similar areas
- Trash or firewood burning areas, debris piles, and equipment storage areas
- Decking, fencing, and other treated wood features

- Natural vegetation that blends into surroundings, including areas lacking landscaping features or that are generally unaltered
- Areas that appear to have been excavated or filled (for example, berms, ditches, borrow areas)
- Areas where imported fill and/or soil amendments and treatments have been applied
- Planned outdoor space set aside for the display, cultivation, and enjoyment of plants and other natural features.

2.4.4 Diagrams and Sketches of Property and Decision Units

In conjunction with the interview and site walk, the field team will sketch key features and DUs on the aerial photograph of the property or in a field notebook. The following steps help to guide the sketch and develop the DUs:

- 1) Label the sketch with the property address, parcel number, date, and name of field team member preparing the sketch.
- 2) Include a north arrow on the sketch and orient features accordingly.
- 3) Illustrate or label property boundary, current or planned residence (house), detached buildings (if applicable, such as garage, shed, barn, etc.), driveways, parking areas, roads and intersections, and any other distinguishing site features. Although the sketch does not have to be true to scale, include the approximate dimensions of key features. Include notes where an aerial photograph does not agree with observed conditions and structures noted during the site walk.
- 4) Locate and illustrate areas such as fire pits or burn areas, equipment and debris storage, water wells, utilities, septic systems, outhouses, decks, fences, and other surface and subsurface features as evidenced using visual (non-invasive) methods. For example, trash burning areas can be distinguished by the presence of burned pieces of debris in surface soil; non-invasive examination can be aided by use of a magnifying glass to view soil constituents.
- 5) Identify the general boundaries of the DUs based on visual examination of land use and interview responses. To the extent possible, DUs will be constructed as polygons that best fit the land use area.
- 6) Place pin-flags or survey flagging tape to mark the corners or outline of each DU (pin-flags are temporarily placed to assist with the final sketch, GPS surveying, and photographs, and will be removed after reconnaissance efforts are completed at

each property). The property sketch will then be updated illustrating the boundary of each DU, as well as the type of land use. Label each DU with an assigned unique reference identification (ID) using the following convention: "Study Location-DU Type" where

- a. Study Location = unique 3-digit property number assigned to each property
- b. DU Type = H for house, A for agriculture, P for play area, G for garden, D for dripline, N for animal activity area, B for beach, and O for other (if more than one DU of same type at a given property, letter code followed by number, e.g., G1, G2, etc.).
- 7) Review the sketch with the field team and the property owner or resident and make corrections, as necessary. Some property owners may wish to initial or sign-off on the sketch.

2.4.5 Survey Decision Unit Boundaries

This section describes the protocol to obtain mapping-grade survey GPS coordinates from the corners or waypoints along the outline of each DU, and assumes that the outline or corners of each DU for a given property have previously been marked with pin-flags or flagging during the site walk and sketch development (described above). Attachment 4 describes a general operating procedure for using a GPS unit to locate DU boundaries. Detailed operating procedures and procedures for verifying the accuracy and quality of GPS readings are provided in the operations manual for the specific GPS unit selected for use by the Field Contractor. The field team leader shall be experienced with operating the GPS units used during field reconnaissance and familiar with these procedures prior to obtaining field coordinates for this study.

The following steps describe the process to obtain and document GPS coordinates along the boundary of each DU:

- For a given DU, the geographic waypoints along the outline of the DU will be surveyed to obtain latitude (north-south position) and longitude (east-west position). Latitude-longitude coordinates will be consistently obtained and recorded in decimal degrees. For each DU, a unique coordinate labeling system will be systematically applied and uploaded to the GPS unit.
- 2) For data recovery in the event of GPS memory failure or other technical issues, at least four positional coordinates will also be manually recorded on the field data form (Attachment 3, Worksheet #3) for each DU. If the DU is irregularly shaped, the positional coordinates recorded should include all corners or bends that define the

DU shape. Each positional coordinate will be recorded with a labeling convention as follows: "Study Location-DU Type-Number" where

- a. Study Location = unique 3-digit property number assigned to each property
- b. DU Type = H for house, A for agriculture, P for play area, G for garden, D for dripline, N for animal activity area, B for beach, and O for other (if more than one DU of same type at a given property, letter code followed by number, e.g., G1, G2, etc.)
- c. Number = 1 through 4 (or more).

The Field Contractor's field team leader shall save GPS coordinates from waypoints onto the GPS unit while standing over the pin-flag. As backup documentation, a minimum of four positional coordinates that define the boundary of the DU will be manually recorded onto the field forms (Attachment 3, Worksheet #3).

- 3) At the conclusion of each field day, the Field Contractor will download the recorded GPS data files from the GPS unit onto a field laptop computer. After download, the GPS data file and related IDs with coordinates will be cross-checked for completeness against the field data form (Attachment 3, Worksheet #3). Thus, triplicate DU survey data will be obtained, including electronic raw data files on the GPS unit, backup files on the field laptop computer, and manual hardcopy records on the field data forms.
- 4) At the conclusion of each week, all electronic GPS data and electronically recorded field data forms will be downloaded to a secure file location and made available to the office-based project team for review. Reviewed data will then be uploaded to the project database.

In some cases, a DU may not be readily accessible during field reconnaissance due to impediments that prevent adequate or safe access to the area by field personnel (e.g., the presence of wildlife or other hazardous conditions). If, during the reconnaissance of the DU, the conditions are deemed unsafe for field personnel or prevent adequate access for delineating the DU, the information will be recorded and used to decide whether to relocate that DU.

In other cases where satellite reception is consistently inadequate and impedes the use of a GPS unit in waypoint navigation and positioning, no GPS survey coordinates will be recorded in the field for these DUs. Instead, the size and location of the DU will be assessed by field personnel using a field map; any recommended alterations will be hand drawn onto the field map and noted in the field notes. DU boundaries will be drawn in the field

based on professional judgment and observed conditions (such as triangulated positions ascertained by using multiple bearings and distances measured from known fixed points such as buildings or roads). Once the measured boundaries are uploaded to and interpreted by a geo-referenced database, the DU location coordinates can be calculated. If no alterations are needed, the field notes will be updated to indicate that field GPS coordinates were not collected for the DU and that the size and location of the DU was not altered.

2.4.6 Photographs

Representative geo-tagged digital photographs of each DU will be obtained by the Field Contractor as the final step of the field reconnaissance. The following steps shall be followed to obtain, label, and manage digital photographs:

- 1) Take field photographs with a quality digital camera (at least 5 megapixels) that is capable of efficient download and archiving onto a field laptop as secondary backup.
- 2) For each DU, take at least one representative photograph. For consistency, the view of the picture shall be scaled to illustrate the DU boundary (if possible) and primary land use type. Several pictures may be needed for large DUs.
- 3) For each photograph (or series of photographs), document the location onto the aerial photograph or field sketch. In addition, use the dry-erase whiteboard to identify and label the DU on the photographs with a unique ID as follows: "Study Location-DU Type-P#" where
 - a. Study Location = unique 3-digit property number assigned to each property
 - b. DU Type = H for house, A for agriculture, P for play area, G for garden, D for dripline, N for animal activity area, B for beach, and O for other (if more than one DU of same type at a given property, letter code followed by number, e.g., G1, G2, etc.)
 - c. P# = unique picture number in sequence to match field location and field form.
- 4) Remove pin-flags and survey flagging.
- 5) At the conclusion of each day, download all the digital photographs onto the dedicated field computer and (if not done in the field) label each digital file (electronic photograph) as described in Step 3 above.
- 6) At the conclusion of each week, download all digital photographs to a secure file location to allow for review by the office-based project team. Next, upload the reviewed data to the project database.

3 DATA COMPILATION AND REPORTING

This section describes the data compilation and reporting of the field reconnaissance data that will be used to finalize the FSP.

3.1 DATA COMPILATION

The Field Contractor will lead the effort for compilation of the field reconnaissance data. The following bullets outline the general procedures to compile the field reconnaissance data:

- Hardcopies of the field data sheets, marked-up aerial photographs, and other notes for each property will be assembled into a project notebook and organized into the same sequence as the master list. A cross-check for completeness between the master list and the field data sheets will be done to ensure a complete set of hardcopy data. Missing information will be reconstructed from field notes and photographs as feasible.
- The GPS coordinate data will be compiled to update information for each property within the master database (in Microsoft Access). Each record will include fields for unique reference IDs, positional IDs, and related survey coordinates in latitude and longitude; an example of the fields defining the positional IDs for a DU is provided in Table 2.

DU ID for Type	Position al ID	Latitude	Longitude	Description
078-H	078-H-1	North-south position	East-west position	House DU – position 1 for unique property ID 078
078-H	078-H-2	ű	ű	House DU - position 2 for unique property ID 078
078-H	078-H-3	ű	ű	House DU – position 3 for unique property ID 078
078-H	078-H-4	ű	ű	House DU – position 4 for unique property ID 078

Table 2. Examples of DU positional IDs

• GPS waypoint files will be downloaded, checked for completeness, and compared to the positional IDs for each DU to check for transcription errors. If there are discrepancies, coordinates from the GPS will be used to update the coordinates for the positional IDs. The GPS waypoint files will then be converted to the geographic information system (GIS) coordinate system and used to update or replace the preliminary DU GIS shape files.

• Digital file IDs for photographs will be cross-checked against the master list for completeness; any extra or duplicate photographs will be purged (removed) from the active and dedicated project folder. The finished digital folder will be a sequence of files (electronic photographs) that illustrate each DU to assist field staff with locating and setting up the sampling grid for the field sampling effort.

3.2 **REPORTING**

Reporting of reconnaissance field data will be concise and include the following:

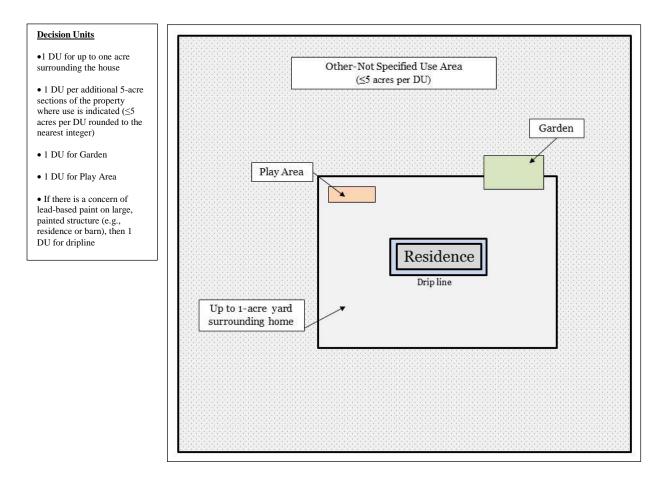
- A brief narrative description of the field reconnaissance activities that document when the work was completed, how it was conducted (or deviations from plan), and the number of sites visited
- Updated residential property master list that identifies available electronic and hardcopy data for each property
- GIS-prepared maps (aerial photograph as base map) showing proposed DUs at each property, including DU labels
- Copies of field data forms with collected data (such as responses to interviews, sketches, and reference IDs)
- Electronic copies of the entire report, including native files used to generate the report (such as survey data in Excel format, digital photographs, etc.).

ATTACHMENT 1

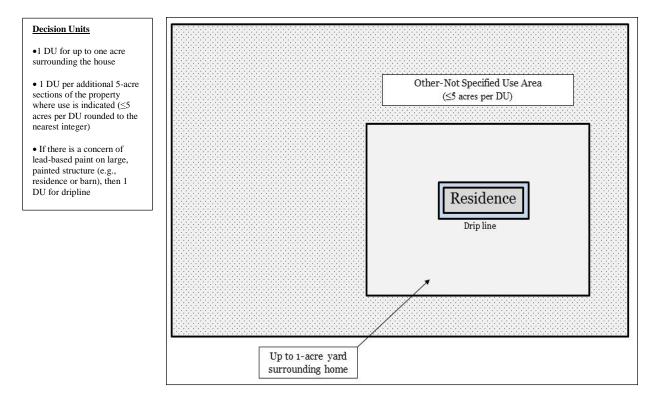
SAMPLING DESIGN TEMPLATES

Residential Property				
Template A	Template B	Template C	Template D	<u>Template E</u>
• Property: > 5 acres	• Property: > 5 acres	• Property: < 5 acres	• Property: < 5 acres	• Property: > 5 acres
• Play and/or Garden Area Present	• Play and/or Garden Area NOT Present	• Play and/or Garden Area Present	• Play and/or Garden Area NOT Present	• Play and/or Garden Area Present
Decision Units	Decision Units	Decision Units	Decision Units	Decision Units
• 1 DU for up to one acre surrounding the house	• 1 DU for up to one acre surrounding the house	• 1 DU for up to one acre surrounding the house	• 1 DU for up to one acre surrounding the house	• 1 DU for up to one acre surrounding the house
 1 DU per additional 5- acre sections of the property where use is indicated (≤5 acres per DU rounded to the nearest integer) 1 DU for Garden 1 DU for Play Area If there is a concern of lead-based paint on large, painted structure (e.g., residence or barn), then 1 DU for dripline 	 1 DU per additional 5- acre sections of the property where use is indicated (≤5 acres per DU rounded to the nearest integer) If there is a concern of lead-based paint on large, painted structure (e.g., residence or barn), then 1 DU for dripline 	 1 DU for the remaining acreage of the property where use is indicated 1 DU for Garden 1 DU for Play Area If there is a concern of lead-based paint on large, painted structure (e.g., residence or barn), then 1 DU for dripline 	 1 DU for the remaining acreage of the property where use is indicated If there is a concern of lead-based paint on large, painted structure (e.g., residence or barn), then 1 DU for dripline 	 1 DU per additional 5- acre sections of the property where use is indicated (≤5 acres per DU rounded to the nearest integer) If there is a concern of lead-based paint on large, painted structure (e.g., residence or barn), then 1 DU for dripline

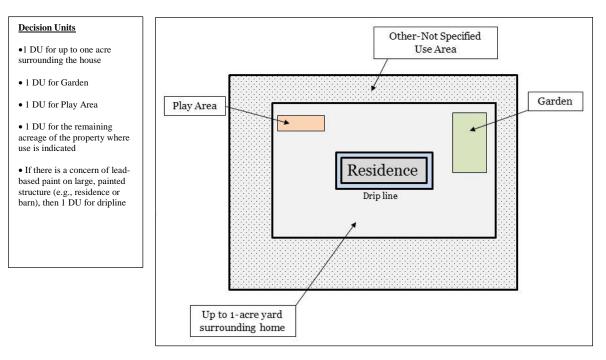
Template A



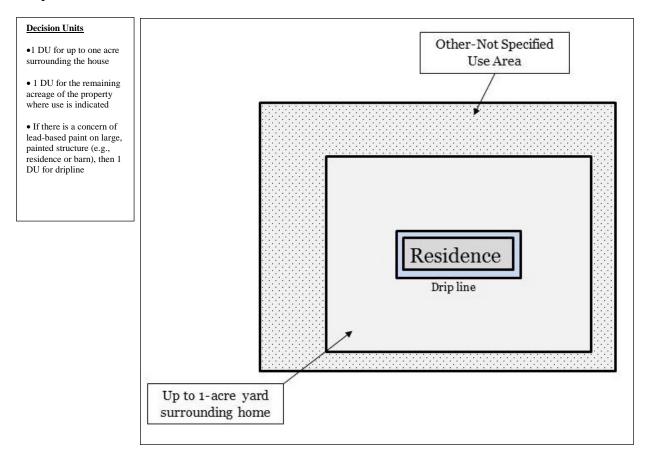
Template B



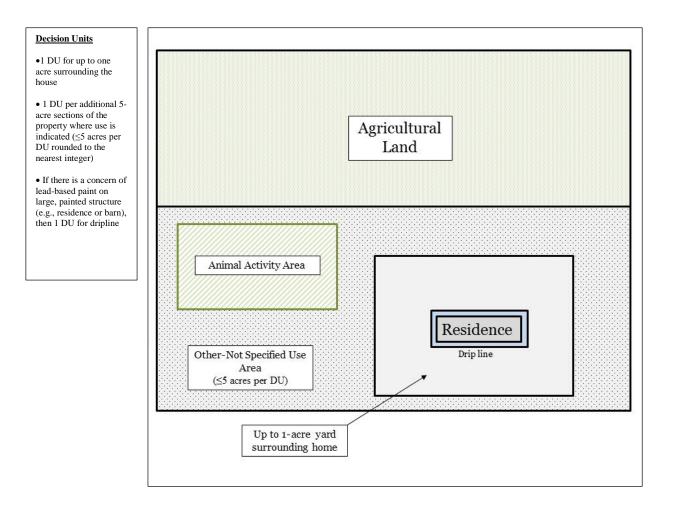
Template C



Template D



Template E



ATTACHMENT 2

STUDY-RELATED FLYERS AND EXAMPLE PROPERTY VISIT NOTICE



The National Historic Preservation Act is the centerpiece of federal legislation protecting cultural resources. The U.S. Environmental Protection Agency has responsibilities under NHPA to consider how its undertakings would affect historic properties. As defined in the NHPA, "historic properties" include archaeological resources, historic-period structures, and traditional cultural places listed in or determined eligible for listing in the National Register of Historic Places. To meet the NHPA requirements, EPA must ensure that sampling and other activities at the Upper Columbia River Site would avoid, minimize, or mitigate any adverse effects to historic properties.

Cultural Monitor duties during soil sampling

A cultural monitor will be present on-site during soil sampling. At each sampling location:

- The sampling crew will collect and place each individual soil sample in a plastic zip closure bag.
- The cultural monitor will visually examine the soil to determine if artifacts are present or if other deposits are present that are likely to be cultural in origin.
- If nothing of cultural significance is found, the soil collected can be submitted for analysis in accordance with the sampling plan.
- If artifacts or likely archaeological deposits are present, the cultural monitor will record the location of the items and photograph the items in place prior to covering with soil, to help provide information on their origin. The artifacts or archaeological materials along with all the soil that was removed from the hole will be placed back in the hole. A different location will be sought to fulfill that sample location.
- Field notes and any photos taken by the Cultural Monitors are labeled "Confidential" and submitted to the professional archaeologist who will prepare the confidential Cultural Resources Monitoring Report. The Cultural Resources Monitoring Report is submitted to and maintained confidential by EPA, Teck American Incorporated (TAI), Washington State Department of Archaeology and Historic Preservation, the Colville Confederated Tribes History/Archaeology Program, the Spokane Tribe Archaeology Program, and National Park Service Archaeology Program.

If leaving discovered artifacts in place would jeopardize their integrity due to erosion or collection by unauthorized individuals, they may be moved to an area on the property away from the immediate sampling area and reburied.

Frequently Asked Questions:

If an artifact is found on my property and recorded in a database, will that information affect my ability to make improvements to my property?

While archaeological resources are a protected resource that government agencies need to factor into their decision making during the permitting process, typically, archaeological resources can be avoided, protected or excavated if necessary. If you are making improvements to your property and will be disturbing artifacts, a permit would be required to alter, excavate or remove the artifact(s).

Will information associated with any artifacts found on my property be kept confidential?

Yes. Information about any artifacts found on your property during field activities will be kept confidential by Cultural Monitors, EPA, TAI and all contractors working on the Upper Columbia River Site. The Washington State Department of Archaeology and Historic Preservation maintains the database of artifact locations.

- Learn more about the National Historic Preservation Act: <u>http://www.achp.gov/overview.html</u>
- Contact your local/county planning division for additional information on permitting.
- ▶ TAI maintains a great deal of current information on the study at their website: http://www.ucr-rifs.com



Region 10

1200 Sixth Avenue, Suite 900, ETPA-202-4 Seattle, Washington 98101-3140

January 2016



Learn more on the Web

Upper Columbia River study information http://www.ucr-rifs.com

National Historic Preservation Act http://www.achp.gov/overview.html





The EPA is asking you to volunteer for free soil sampling of your residential property

The U.S. Environmental Protection Agency is studying metals contamination in the Columbia River and surrounding upland areas from the U.S./Canada border to the Grand Coulee Dam. This Upper Columbia River study is called a Remedial Investigation and Feasibility Study.

In 2014, the EPA sampled soil at 74 residential properties along the Columbia River valley between Northport and the border. We sampled to determine if people could be exposed to lead and arsenic in the soil, as well as other metals, at levels that could cause health concerns. We found elevated lead and arsenic levels at many properties. This past summer we conducted soil removal and replacement with clean soil or other cover materials at 14 properties.

2016 additional residential soil sampling

Because of the elevated lead and arsenic in residential soil found during the 2014 study, the EPA is expanding the residential soil sampling program.

- We are again offering soil sampling to those residential property owners in the original 2014 study area who declined, were unaware of, or did not respond to the first request.
- In addition, we are expanding the sampling area downstream of Northport to China Bend.
- Within this expanded study area is the more densely populated community of Marble. A portion of the Marble residences will be identified for sampling in 2016.
- The town of Northport is excluded from this round of sampling. Northport underwent a soil sampling and removal program by EPA in 2004.

The soil results will be used for the Upper Columbia River Remedial Investigation and Feasibility Study human health risk assessment. EPA will oversee the 2016 sampling work performed by Teck American Incorporated (TAI).

Access Agreements and sampling

Enclosed with TAI's letter is an access agreement form. We need your signature on this form to allow us to access your property for this study. We encourage eligible property owners to participate in this free study of residential soil.

If you grant access, a representative from TAI will call you to schedule a visit to your property in the spring of 2016. TAI, EPA, and our representatives will work with you to determine the best locations to take soil samples. Soil sampling will be targeted towards areas where exposure to soil seems likely. These locations likely include places close to your home, children's play areas, livestock areas, or gardens. We are especially interested in the locations where children are most likely to be exposed to soil. We encourage property owners to meet with us at the property in person, but it is not required. If you are not able to meet in person, a representative will talk with you over the phone about how you use your property to identify the areas to sample.

We will prepare a sampling plan for your property based on our visit. We will share it with you for your comments and suggestions before it is finalized. After the sampling plan is agreed upon, the EPA will oversee TAI's contractors sampling your soil, accompanied by cultural monitors as required by the National Historic Preservation Act. We encourage property owners to be present, but it is not required. We expect to sample in the summer and fall of 2016 and expect to mail results in the winter or early spring of 2017. We may or may not find lead or arsenic in your soil above a level of concern. Follow up actions, if needed, will depend on the results of your soil samples and will be developed with your consent.



For More Information

For more information, or to request soil testing of your property, call:

Project Managers:

- Laura Buelow (buelow.laura@epa.gov) 509-376-5466 or toll free at 1-800-424-4372 ext. 65466
- Dustan Bott (bott.dustan@epa.gov) 206-553-5502 or toll-free at 1-800-424-4372 ext. 5502

Community Involvement Coordinator:

Kay Morrison (morrison.kay@epa.gov) 206-553-8321 or toll-free 1-800-424-4372 ext. 8321
 TDD or TTY users, please call 1-800-877-8339 and give the operator Kay's phone number.

To learn more about the Upper Columbia River Remedial Investigation and Feasibility Study:

- EPA's Upper Columbia River Study web site: <u>http://go.usa.gov/Z3eh</u>
- TAI maintains a great deal of current information on the study at their website: http://www.ucr-rifs.com
- To learn more about the Washington Department of Ecology's efforts, go to http://go.usa.gov/cRczJ or http://go.usa.gov/cRczJ or http://go.usa.gov/cRczJ
- The Washington Department of Ecology provides helpful tips on how to protect your family from lead and arsenic in the soil: http://go.usa.gov/Z3GR



1200 Sixth Avenue, Suite 900, ETPA-202-4 Seattle, Washington 98101-3140 January 2016

Region 10

Upper Columbia River Residential Soil Study Notice of Site Visit and Field Reconnaissance

Teck American Incorporated (TAI) and U.S. Environmental Protection Agency (EPA) representatives visited your property as part of the Residential Soil Study being conducted at the Upper Columbia River Site.

roperty Number/Address:	
Date:	
ime:	
Al Representatives:	
PA Representatives:	
lotes:	

While we were here, we verified land use to identify areas where we plan to sample soil.

What Happens Next?

Information we collected during this visit will be used to finalize the study plans. We expect soil samples will be collected in late summer to early fall of 2016 after EPA has approved the final study plans.

If you have any questions, please call:

- TAI Project Coordinator, Kris McCaig at 1-509-623-4501, or
- EPA representatives:
 - Kay Morrison at 1-800-424-4372 ex. 8321 or
 - o Laura Buelow at 1-800-424-4372 ex. 65466

ATTACHMENT 3

FIELD DATA FORMS

Worksheet #1- Owner/Resident Scheduling Call and Preliminary Interview

Date and Time:				
Parcel Number:				
Property Number:				
Property Address:				
Name of Owner or Resident:				
(or their Representative)				
TAI Representative:				
Owner/Resident Questions and TAI Representative Responses:				

TAI Questions and Owner/Resident Responses:

1 How is this property used? For example, is it a full-time residence, part-time residence, rental?

2 Do children 6 years or younger **live at** or **regularly visit** the property? [Interviewer to circle the bolded text that applies to response]

3 If children live at or regularly visit this property, where do they spend most of their time? (Note the presence of a swing set, sandbox, etc.)

4 For adults who live at or regularly visit this property, where do they spend most of their time? (Note the presence of a camping/picnic area, fire ring, recreation/play area, etc.)

5 Aside from the residence and the area immediately surrounding it, what are the land uses (e.g., shooting range, hunting, timber harvesting, ATV or ORV trails) for other areas of this property where you spend most of your time?

TAI Questions and Owner/Resident Responses (continued):

6 If there are any stables, riding areas, animal pens on this property, please describe where each is located relative to the residence?

7 If you maintain a produce garden or orchard on this property, please describe where each is located relative to the residence? (Note all gardens even those not currently being tilled.)

8 If you maintain a flower garden or other landscaped area on this property, please describe where each is located relative to the residence?

9 If you forage for wild berries, fiddleheads, etc. on this property, please describe where you forage relative to the residence?

10 Are you aware of any fill material on this property? For example, soil that was brought to the property during construction of the house or other structures, or during the installation of water lines, etc. If yes, please describe which areas of the property relative to the residence?

TAI Questions and Owner/Resident Responses (continued):

11 If fill material has been applied to this property, do you know the source of this material?

12 Are any soil amendments (e.g., fertilizer, herbicides, etc.) applied to soil on any portion of this property and, if so, what types?

13 Was the residential structure (and/or any other large structures) on this property constructed before 1978? If so, when was each last painted?

14 Are you aware of any underground items on this property such as fuel oil tanks, septic tanks/fields, etc.?

Worksheet #2- Owner/Resident Interview and Preliminary Site Walk

Date and Time:				
Parcel Number:				
Property Number:				
Property Address:				
Name of Owner or Resident: (or their Representative)				
Field Team Member Names (** indicates interviewer):				

Owner/Resident Questions and TAI Representative Responses:

Worksheet #2- Owner/Resident Interview and Preliminary Site Walk

TAI Questions and Owner/Resident Responses:

- 1 How is this property used? For example, is it a full-time residence, part-time residence, rental?
- 2 Do children 6 years or younger **live at** or **regularly visit** the property? [Interviewer to circle the bolded text that applies to response]
- 3 If children live at or regularly visit this property, where do they spend most of their time? (Note the presence of a swing set, sandbox, etc.) [Interviewer to record DU number(s) and corner coordinates¹ for indicated area(s)]
- 4 For adults who live at or regularly visit this property, where do they spend most of their time? [Interviewer to record DU number(s) and corner coordinates¹ for indicated area(s)]
- **5** Aside from the residence and the area immediately surrounding it, what are the land uses (e.g., shooting range, hunting, timber harvesting, ATV or ORV trails) for other areas of this property where you spend most of your time? [Interviewer to record DU number(s) and corner coordinates¹ for indicated area(s)]
- 6 If there are any stables, riding areas, animal pens on this property, please indicate where each is located on this property map? [Interviewer to record DU number(s) and corner coordinates¹ for indicated area(s)]

¹ If the DU is irregularly shaped, the positional coordinates recorded should include all corners or bends that define the DU shape.

Worksheet #2- Owner/Resident Interview and Preliminary Site Walk

TAI Questions and Owner/Resident Responses (continued):

- 7 If you maintain a produce garden or orchard on this property, please indicate where each is located on this property map? [Interviewer to record DU number(s) and corner coordinates² for indicated area(s)]
- 8 If you maintain a flower garden or other landscaped area on this property, please indicate where each is located on this property map? [Interviewer to record DU number(s) and corner coordinates² for indicated area(s)]
- **9** If you forage for wild berries, fiddleheads, etc. on this property, please indicate where you forage on this property map? [Interviewer to record DU number(s) and corner coordinates² for indicated area(s)]
- **10** Are you aware of any fill material on this property? For example, soil that was brought to the property during construction of the house or other structures, or during the installation of water lines, etc. If yes, please indicate which areas of the property on this property map? [Interviewer to record DU number(s) and corner coordinates² for indicated area(s)]
- 11 If fill material has been applied to this property, do you know the source of this material?

² If the DU is irregularly shaped, the positional coordinates recorded should include all corners or bends that define the DU shape.

Worksheet #2- Owner/Resident Interview and Preliminary Site Walk

TAI Questions and Owner/Resident Responses (continued):

- **12** Are any soil amendments (e.g., fertilizer, herbicides, etc.) applied to soil on any portion of this property and, if so, what types? [Interviewer to record DU number(s) and corner coordinates³ for indicated area(s)]
- **13** Was the residential structure (and/or any other large structures) on this property constructed before 1978? If so, when was each last painted?
- **14** Are you aware of any underground items on this property such as fuel oil tanks, septic tanks/fields, etc.?

³ If the DU is irregularly shaped, the positional coordinates recorded should include all corners or bends that define the DU shape.

Worksheet #3- Decision Unit Survey Coordinates (obtained via hand-held GPS unit)

Property Number:

Instructions: document GPS coordinates for at least 4 positions in each DU (mark positions on sketch).

DU) Reference ID (XXX-DU		
e Depth:		
es - four waypoint position	s in Latitude and Longitud	de (decimal degrees):
Latitude:	Longitude:	Positional ID (XXX-DU Type-Number):
DU) Reference ID (XXX-DU	Type):	
e Depth:		
es - four waypoint position	s in Latitude and Longitud	de (decimal degrees):
Latitude:	Longitude:	Positional ID (XXX-DU Type-Number):
DU) Reference ID (XXX-DU	Type):	
e Depth:		
	s in Latitude and Longitud	de (decimal degrees):
Latitude:		Positional ID (XXX-DU Type-Number):
	e Depth: es - four waypoint position Latitude: DU) Reference ID (XXX-DU e Depth: es - four waypoint position Latitude: DU) Reference ID (XXX-DU es - four waypoint position CU) Reference ID (XXX-DU	es - four waypoint positions in Latitude and Longitude: Latitude: Latitude: Longitude: Latitude: Latitude: Latitude: Latitude: Latitude: Latitude: Latitude: Longit

Worksheet #3- Decision Unit Survey Coordinates (obtained via hand-held GPS unit)

Property Number (continued):

Instructions: document GPS coordinates for at least 4 positions in each DU (mark positions on sketch).

Decision Unit	(DU) Reference ID (XXX-DU		
DU Type:			
Planned Samp	ole Depth:		
GPS Coordina	tes - four waypoint positior	ns in Latitude and Longitu	de (decimal degrees):
	Latitude:	Longitude:	Positional ID (XXX-DU Type-Number):
1			
2			
3			
4			
Decision Unit	(DU) Reference ID (XXX-DU	Туре):	
DU Type:			
Planned Samp	ole Depth:		
GPS Coordina	tes - four waypoint positior	s in Latitude and Longitu	de (decimal degrees):
	Latitude:	Longitude:	Positional ID (XXX-DU Type-Number):
1			
2			
3			
4			
Decision Unit	(DU) Reference ID (XXX-DU	Туре):	
DU Type:			
Planned Samp	ole Depth:		
GPS Coordina	tes - four waypoint positior	s in Latitude and Longitu	de (decimal degrees):
	Latitude:	Longitude:	Positional ID (XXX-DU Type-Number):
1			
2			
3			
4			
4	L	1	

ATTACHMENT 4

STANDARD OPERATING PROCEDURE FOR USE OF GLOBAL POSITIONING SYSTEM UNIT

STANDARD OPERATING PROCEDURE

USE OF GLOBAL POSITIONING SYSTEM UNIT

Scope and Applicability

This standard operating procedure (SOP) is specific to the Residential Soil Study being conducted for Teck American Incorporated in the northern portion of the Upper Columbia River site in northeastern Washington. This SOP describes general procedures related to use of a global positioning system (GPS) unit for locating decision unit boundaries during the Residential Soil Study field reconnaissance phase. Accurate station positioning is required to ensure quality and consistency in sample collection and data analysis. Station positioning must be both absolutely accurate in that it correctly defines a position by latitude and longitude, and relatively accurate in that the position must be repeatable. The methods described in this SOP are usable for any handheld GPS unit; however, consult the owner's manual for any GPS unit used to support this SOP.

Equipment and Materials

The following is a list of equipment and materials needed by the field sampling team:

- Hand-held GPS unit (e.g., Trimble GeoXH)
- Spare batteries
- Charging unit.

A GPS hardware system, such as a Trimble GeoXH GPS (or equivalent device) will be used. The standard projection method to be used during field activities is the horizontal datum of World Geodetic System of 1984 (WGS 1984).

Positioning System Verification

GPS does not require any calibration because all signal propagation is controlled by the United States government (the Department of Defense for satellite signals, and the U.S. Coast Guard and U.S. Forest Service for differential corrections). Verification of the accuracy of the GPS requires that coordinates be known for one (or more) horizontal control points within the study area. The GPS position reading at any given station can then be compared to the known control point. GPS accuracy will be verified at the beginning or at the end of each field day by logging the location of known reference points.

Procedures and Guidelines

The protocol to obtain mapping-grade survey GPS coordinates from the corners or waypoints along the outline of each decision unit (DU) is detailed in Section 2.4.5 of the Field Reconnaissance Plan, and assumes that the outline or corners of each DU for a given property have previously been marked with pin-flags or flagging during the site walk and sketch development. The GPS unit and batteries will be charged when not in use.