



**HERITAGE
RESEARCH**
ASSOCIATES, INC.

ARCHAEOLOGY
AND HISTORY

July 24, 2023

RESPONSE TO PAUL SOLIMANO, WILLAMETTE CULTURAL
RESOURCES ASSOCIATES, LTD.

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Reviewed by Rick Minor, Robert R. Musil, and Albert C. Oetting
HERITAGE RESEARCH ASSOCIATES, INC.

Introduction

Heritage Research Associates, Inc (Heritage) prepared an Archeological Survey of the Proposed Portland Water Bureau Bull Run Water Treatment Plant Project (Heritage Survey). Heritage Research also prepared the Inadvertent Discovery Plan for Cultural Resources for the Project (Exhibit G.3).

Heritage also reviewed public testimony related to archeological resources, including the Review of Archeological Investigations for the Carpenter Lane Project prepared by Paul Solimano (Exhibit H.32). Heritage takes seriously the assertions made by archaeologist Paul Solimano and two local property owners about undocumented archaeological resources in the Portland Water Bureau's (Water Bureau) Bull Run Filtration Project Area. The concerns raised by Mr. Solimano appear to be based on the statements of a current property owner and the son of a former property owner, and on a review of photographs of artifact collections. It does not appear that Mr. Solimano conducted a personal inspection of the artifacts included in the photos or the project area. The Heritage team has made a number of trips to the project area for archaeological survey, discovery probing, and monitoring of exploratory geotechnical excavations. Heritage also inspected the photographs referenced in Mr. Solimano's memo.

Involvement of Local Landowners

While our archaeological team did not directly assume responsibility for asking residents about local artifact finds (something rarely done for various reasons), the Water Bureau instituted public outreach for the Bull Run Filtration Project in 2019 with a series of public meetings and various contacts with local residents intended to elicit comments on a wide range of topics, including archaeology.

It is unfortunate that information on local artifact collections was not shared until the July 2023 hearing in an adversarial setting. Such information would have assisted in our investigations, although it is unlikely that the outcome would have been significantly altered for the reasons given below. In acknowledgment of the importance of this information, we are revising our final report to include the two property owner statements with supporting photographs so that future researchers

in the area will be aware of the collections and the nature of the artifacts represented. The updated Heritage Survey is attached to this memo as Attachment A.

Ms. Annell Carlson's Statement

The Carlson family has lived in the area since 1905 and now owns nine tax lots of approximately 60 acres that are part of their family nursery business. The Finished Water (FW) Pipeline from the proposed water filtration plant will pass by their farm but will not affect any of their tax lots, nor will it be a visual impact as the pipes will be buried. Ms. Carlson offered one sentence in her statement regarding archaeological finds on the Carlson property:

Throughout the decades of farming, the family consistently found Native American artifacts on their property as they worked the land for berry farming (Annell Carlson, 06/14/2023).

Two photographs of framed artifacts that were included with her statement give the dates of collection as 1905-1960, raising the question as to how frequently (and exactly where) artifacts have been found for the past almost 120 years. Forty-seven artifacts appear to be included in these two frames, representing the 55-year period indicated on the caption.

While it is certainly feasible that some of these items could have been found around any of the three houses or other outbuildings currently within the tax lots of the Carlson Nursery, the statement given indicates that the finds occurred as they “worked the land for berry farming.” The nature of berry farming brings workers in close proximity to the surface of the ground, greatly increasing the opportunity to notice and collect items. It would seem likely that artifacts would more frequently occur on the Carlson tax lots closer to the Middle Fork of Beaver Creek that flows 1,300 feet (a quarter mile) west of the proposed FW Pipeline (Figure 1).

The placement of the FW Pipeline within the existing road right-of-way is a measure taken by the Water Bureau to minimize potential impacts to undisturbed areas. However, because of the concern raised by Ms. Carlson, a section of pipeline trenching approximately 1,000 feet along Altman Road from its intersection with SE Lusted Road has been added to the archaeological monitoring plan for construction as a specific precautionary measure. A Monitoring Plan that identifies and addresses the artifact information presented during the land use hearing is attached to this memo as Attachment B. This document is in draft form pending review by the Oregon State Historic Preservation Office (SHPO) and consultation with other parties under the Section 106 compliance process.

Mr. Arden Meyer's Statement

Mr. Arden Meyer's grandparents, Fred and Anna, settled on property north of Carpenter Lane (35075 SE Carpenter Lane) in 1921 when their son Ernest was 16. Ernest (Arden's father) ultimately owned a number of parcels north of Carpenter Lane with his wife Virginia, including land north of Dodge Park Blvd at the headwaters of Beaver Creek.

Ernest also owned a 37-acre parcel (referred to by the family as “the 40 acres”) that is now the east portion of the proposed filtration facility. According to the Multnomah County assessor’s records, the Meyers sold the 37-acre parcel to the City of Portland in 1975, and it has remained in agricultural use since that time, most recently for growing nursery stock. During these last 48 years, it appears that none of the tenants working this parcel have reported finding archaeological materials to the Water Bureau as the owner of the property or to the State Historic Preservation Office (SHPO).

In addition, the Meyer family appears to have owned a 10-acre parcel southeast of the filtration parcel, along the terrace above the Sandy River canyon (Arden Meyer, 02/28/2023, Figure 2). In all, it appears that the Meyer family owned at least 80 acres in the immediate vicinity of the filtration parcel until Ernest Meyer sold his holdings.

Mr. Meyer’s statement is of interest archaeologically for at least two reasons:

1. He describes the initial clearing of land, a process that no doubt applied to much of the previously forested land now in cultivation in the broader project vicinity, not just for the 37 acres in the filtration parcel. This ground clearing, while necessary to remove what had likely been old growth Douglas-fir in the late 1800s in order to expand open space for farming, created a great deal of disturbance (up to 5 feet in depth) by dynamiting and pulling stumps and roots from the ground:

When the Meyer family purchased their properties in Multnomah Co in the 1930s, a majority of 80 acres to the south of the previous Bull Run railroad (present day SE Dodge Park Blvd) were “stump-land”, including the ~40 acre property currently owned by the Portland Water Bureau.... [W]hen he [Arden] was 6 years old, his dad used dynamite to help remove the tree stumps and roots. Following dynamiting, Arden and his sibling used tractors to pull stumps and roots from the property, which took approximately 4 years. Arden remembers the stumps and roots were up to 5 ft deep—as he remembers standing in the holes. Following removal of the stumps and roots, Ernest tilled and plowed 10-12 inches of the topsoil to level the 40 acres and about 10-15 acres to the southwest of that property (Arden Meyer, 02/28/2023).

2. The report of artifacts shared by Mr. Meyer are of definite interest to archaeologists. Mention had been made in 1971 by an archaeologist working at a site more than two miles from the project area of artifacts collected by local farmers (Woodward 1972), but these collections were not documented. The artifacts shown in the photographs accompanying Mr. Meyer’s statement are reportedly from Ernest Meyer’s 80 acres. The artifacts shown in the statement were arranged in a display, titled “Ho Ho Kam,” for which the senior Mr. Meyer prepared a typed description of the collection as well as a list of what appears to be 34 items that were worthy of individual mention. Most of the smaller chipped stone artifacts (approximately 160 items) are arranged within a circular display with the artifacts arranged symmetrically. Cobble tools and other larger or non-stone items

(as well as perhaps items that may have been collected after the central display was completed) are displayed on shelves on either side and below the wheel of artifacts.

Ernest Meyer notes on his typescript that the display was constructed in the early 1970s:

Most of the Indian artifacts were collected from 1930 to 1970, during 40 years of farming 80 acres.... (from Arden Meyer, 02/28/2023, Figure 2).

A list of “exceptions” includes items from Colorado, the Wallow (Wallowa?) Mountains, Washington, Oregon coast, Arizona, Hawaii, New Mexico, East Lake (Oregon), Willamette River, and Mexico. A few items are listed post-dating 1970, and from the dates included the list appears to have been prepared after 1986.

Of local interest are items 5 and 6, described as “rock weapons, #5 was picked up in the yard of the Methodist church in Boring, OR. #6 found on the ‘40’ acre field when clearing land.”

Because this list consistently refers to individual items, it would appear that #6—an item “found on the ‘40’ acre field”—was likely a cobble tool, not the entire display of approximately 160 chipped stone items (Figures 4a-4g), as asserted by the younger Mr. Meyer. It may, in fact, be the cobble tool illustrated in Figure 5 in Mr. Meyer’s statement. Although a #6 does not appear on this artifact in the photo, the label affixed to the cobble corresponds to the location on the typed list:

I picked up this Indian artifact when disking a field on the ‘40’. It is worthy of a place among the artifacts displayed in Ho Ho Kam (from Arden Meyer, 02/28/2023, Figure 5).

We would disagree with Mr. Arden Meyer that his father, who was apparently the sole collector and organizer of this artifact collection according to his typed list, intended to source all the chipped stone items in the display to the one tax lot that is now part of the proposed filtration parcel, rather than to his multiple holdings of 80 acres as he indicated in the introduction to his list. While it is likely that many of these artifacts came from the former 80-acre holdings of Mr. Ernest Meyer, it appears that only one cobble tool was specifically provenienced to the “40” parcel. It would appear from the geographic range of holdings in the Meyer 80 acres that parcels other than the “40” would be more likely to contain artifacts due to their closer proximity to water, particularly the parcels near the headwaters of Beaver Creek. Unfortunately, Ernest Meyer, who would be the most reliable source for information about his finds in the collection, passed away in 2005.

As with the concern raised by Ms. Carlson, close monitoring of initial ground clearing in the eastern parcel formerly belonging to the senior Mr. Meyer has been added to the archaeological monitoring plan for construction as a specific precautionary measure.

Geoarchaeological Study

Mr. Solimano recommends that a “more robust identification effort should include a geoarchaeological study to establish the history of landform development (including natural and man-made alterations to the landscape) and assess the potential for buried archaeological materials at the filtration plant and along the Pipeline routes.”

A separate geoarchaeological study is not warranted because the geologic and geomorphic contexts of the project area are known.

The Kelso Slope, the landscape in which the new filtration facility will be constructed, is an upland setting characterized by shallow soil (Hogenson and Foxworthy 1965). The principal soil is Cazadero silty clay loam. This soil was initially described as forming in mixed old alluvium (Gerig 1985:149;) or in mixed alluvium with loess and volcanic ash (Green 1983:31-33) with a surface layer (A horizon) of very dark brown silty clay loam 16 inches (40 cm) thick. An updated description indicates that Cazadero silty clay loam has a surface layer (A horizon) typically 12 inches (30 cm) thick and that this soil formed in colluvium rather than alluvium (National Cooperative Soil Survey 2022).

Colluvium and landslide deposits mantle the steep slope along the northeastern edge of the Water Bureau project area. This colluvium consists of weathered Springwater Formation soil that has been eroded off the slope (Bednarz 2020:2). The deeply weathered Springwater Formation, which underlies the project site to a depth of approximately 190 feet, is estimated to be of early Pleistocene age. In the 2020 borehole logs, the soil immediately below the surface is identified as Weathered Springwater Formation, estimated to have been deposited between about 35,000 and 2 million years ago, predating human occupation. Elsewhere referred to as Residual Soil, this soil consists of soft to very stiff red-brown or orange-brown clay or silt in project borings (Bednarz 2020:5)

The lands within the Water Bureau project area were formerly forested and later became farmland. The modifications to the landscape associated with levelling the land for agriculture were described by Arden Meyer, who (as previously quoted above) referred to the family property as “stump land,” recalling that his dad Ernest

....used dynamite to help remove the tree stumps and roots. Following dynamiting, Arden and his siblings used tractors to pull stumps and roots from the property which took approximately 4 years. Arden remembers the stumps and roots were up to 5 ft deep – as he remembers standing in the holes. Following removal of the stumps and roots, Ernest tilled and plowed 10-12 inches of the top soil to level the 40 acres and about 10-15 acres to the southwest of that property (from Arden Meyer, 02/28/202),.

The implication of leveling the land for agriculture is that, aside from stream-side settings, any subtle microenvironments that might have attracted Native peoples in the prehistoric past are no longer identifiable. As well, the shallow depth of the A Horizon, in which cultural materials may potentially be present, essentially correlates with the plowzone

within which sediments have been thoroughly churned over decades of plowing, including some mixing with sediments from the underlying B Horizon.

The implication of the very shallow nature of Cazadero silty clay loam is that archaeological evidence is best identified on the surface, although artifacts may be present within the plow zone. Buried archaeological deposits below the plow zone are not expected in the filtration project area. This inference is consistent with the results of previous archaeological investigations which indicate that cultural materials at sites on the Kelso Slope occur in surface or near-surface plowzone contexts (Woodward 1974). At the Geertz Site, the best-known locality on the Kelso Slope where investigations have been reported, cultural materials were limited to within 20 inches (50 cm) of the surface (Woodward 1972). Although fire-cracked rock from campfires was present, no intact cultural features were encountered during the excavations due to impacts from stump removal and plowing. With the exception of the Geertz Site, which was interpreted as an upland base camp, archaeological evidence from the Kelso Slope reflects transitory activity in temporary seasonal camps, probably associated with trails, rather than more permanent settlements.

Utility of Subsurface Probing

Because of the shallowness of the soils in this area (12 inches), intensive surface survey with good soil visibility is the best method for identifying archaeological sites and materials. All archaeological sites previously discovered in the area have been visible on the ground surface in farmed fields. The effectiveness of surface inspections is underscored by the artifacts collected to date by local property owners, primarily through the tending of berries and other plants that require being in very close proximity to the exposed soil.

As Mr. Arden Meyer states in his letter:

Ernest continued to uncover similar artifacts as he farmed for raspberries and blueberries over the years. Arden says that his dad gained “an eye” for noticing artifacts and he would keep ones that were “perfect” looking and intact, leaving behind broken pieces (from Arden Meyer, 02/28/2023).

The Oregon State Historic Preservation Office (SHPO) Archaeology Guidelines recommends:

In areas of high probability and low visibility, subsurface probes should always be used to assess the potential of buried significant archaeological sites. When heavy ground cover (e.g., pasture or forest) precludes normal visibility of either artifacts or features, some method (e.g., shovel tests, rakes, surface scrapes) must be used to ensure that there is a reasonable opportunity for the surface and/or subsurface deposits to be exposed (the interval for this exposure should be \leq 20 meters) (SHPO Oregon Archaeology Guidelines 2023:46).

In the case of the filtration parcel, the broad, featureless, gently sloping terrain unmarked by water sources is not considered high probability. While Johnson Creek flows near the southwest corner of the filtration facility site, the creek is located too far from the proposed filtration facility disturbance boundary to make the area that would be disturbed by construction activities an area likely for camping, particularly compared to other portions of Johnson Creek nearby, including the confluence less than a quarter mile downstream. In addition, visibility in the cultivated fields was very good during the archaeological survey, greatly enhancing the likelihood of identifying archaeological indicators.

Excavation of probes (as suggested by Mr. Solimano) is best used in areas likely to contain subsurface deposits. The higher the concentration of cultural materials, the more likely a site will be identified through probing. From a sampling standpoint, the excavation of 30-cm round probes at 20-meter intervals only samples 0.018% of a 20x20-meter area (65 feet square), which is a very tiny sample. If, consistent with the statements by Mr. Meyer, the project vicinity were characterized by diffuse, sparse artifact scatters, probing (or augering) would be inefficient, costly, and likely unsuccessful. Instead, larger exposures of the ground surface are needed.

Conclusions

We disagree with Mr. Solimano on the following:

1. Second-hand reports of artifact finds made 50 years or more without regard to specific provenience do not constitute sufficient evidence of a site in a specific location. Neither report contains a first-hand account of where sites are specifically located, and critical review suggests that neither property owner can source the artifacts to a specific location smaller than family holdings (60 and 80 acres), the majority of which are outside the project area. In both cases, the family acreage includes at least one source of water some distance from the project area that would be much more likely to have attracted Native peoples than parcels closer to the filtration project area.
2. Two reports of artifact finds in an area of several square miles does not make the entire area, including the Water Bureau's filtration project area, a high probability area for archaeological resources. The absence of a reliable water source, particularly within the filtration facility disturbance area, reduces the likelihood of sustained activity or occupation by Native peoples.
3. These generalized reports of artifact finds are in conflict with the results of an intensive survey of cultivated fields with good surface visibility by experienced archaeologists.
4. Given the shallowness of the soils in the area, as well as the original land clearing and the subsequent plowing/tilling of these fields over many decades, shovel or auger probes are unlikely to be effective in locating archaeological materials.
5. Mr. Solimano asserts that "archaeological monitoring of construction activities is not a substitute for earlier resource identification. Monitoring should only occur when other

identification efforts have been exhausted or are not possible.” Previous archaeological investigations have been conducted in the project area (Musil and Oetting 2021) More importantly, Mr. Solimano is incorrect in asserting that monitoring should be conducted only as a last resort. Monitoring by archaeologists is a legitimate and valuable part of the archaeologist’s toolkit for discovering archaeological sites, and is particularly appropriate in areas undergoing construction. Field methods must be adapted to the particular depositional setting under investigation. Given the shallow soils in the area, and the wide dispersal of artifacts reportedly found by landowners over acres of farmland, larger exposures of the ground surface are needed, such as the exposures that will be provided by ground clearing for construction of the Filtration Project.

For the reasons outlined above, Heritage has recommended a program of monitoring by archaeologists with close observation of ground exposures during the initial ground clearing activities when construction commences. Artifacts were previously collected in the project vicinity when the ground was churned by plowing and tilling of the soil for agricultural purposes. Further finds of artifacts, with possible discovery of precontact sites if present, will likely require ground disturbance on a similar scale, as carried out during earth-moving associated with construction.

To date, evidence of sustained activity by Native peoples on the Kelso Slope is relatively sparse. It should be remembered that much human activity often leaves little or no footprint. Given the extent of the archaeological investigations so far undertaken, it seems likely that the area through which the Facility and Pipelines pass primarily reflects upland travel by small groups of Native peoples for the purposes of hunting, gathering of seasonal foods, or passing from one drainage to another. Maintaining access to water, which is not available in the filtration project area, is an important requirement for travel through mountainous terrain.

Rather than sites occupied for various lengths of time, local collections of artifacts may represent a series of isolates somehow lost over thousands of years of traveling or hunting in the forest. In this regard, flaked stone debris and fire-cracked rock characteristically found at campsites (e.g., as at the Geertz Site), have not yet been identified in the project area vicinity. More can undoubtedly be learned about early use of the Kelso Slope, but key discoveries about precontact Native American activity will likely be made outside the Water Bureau’s Bull Run Filtration Project Area.

References Cited

Bednarz, Susan

2020 Geology and Geotechnical Information Review. Attachment A in Bull Run Filtration Projects: Preliminary Geotechnical Assessment Report. Report by Lacamas Consulting to the Portland Water Bureau.

Carlson, Annell

2023 Annell Carlson Interview 06/14/2023.

Gerig, Allen J.

1983 *Soil Survey of Clackamas County Area, Oregon*. Natural Resources Conservation Service.

Green, George L.

1983 *Soil Survey of Multnomah County, Oregon*. Natural Resources Conservation Service.

Hogenson, C. M., and B. L. Foxworthy

1965 *Groundwater in the East Portland Area, Oregon*. US Geological Survey Water Supply Paper 1793. US Government Printing Office, Washington, DC.

Meyer, Arden

2023 Arden Meyer Interview 02/28/2023.

Musil, Robert R. and Albert C. Oetting

2021 Archaeological Survey of the Proposed Portland Water Bureau Bull Run Water Treatment Plant Project, Gresham Vicinity, Clackamas and Multnomah Counties, Oregon. Report to Brown and Caldwell and the Portland Water Bureau, City of Portland. Heritage Research Associates Report 470, Eugene. SHPO Report #32146.

National Cooperative Soil Survey

2022 Official Series Description - Cazadero Series –USDA. Electronic document soilseries.sc.egov.usda.gov/OSD_Docs/C/CAZADERO.html (accessed July 2023).

Solimano, Paul

2023 Review of Archaeological Investigations for the Carpenter Lane Project. Willamette Cultural Resources Associates, Ltd. Letter of June 28, 2023, to Carrie Richter, Bateman Seidel Miner Blomgren Chellis & Gram, P.C.

State Historic Preservation Office (SHPO)

2023 Guidelines for Conducting Field Archaeology in Oregon. <https://www.oregon.gov/oprd/OH/Documents/FieldGuidelines.pdf>. November 2013 (Minor Revision January 2016, 2023 Placeholder).

Woodward, John A.

1972 The Geertz Site: An Early Campsite in Western Oregon. *Tebiwa* 15(2):55-62.

1974 *Salmon, Slaves, and Grizzly Bears: The Prehistoric Antecedents and Ethnohistory of Clackamas Indian Culture*. Unpublished PhD Dissertation, Department of Anthropology, University of Oregon, Eugene.

Qualifications of Heritage Research Associates, Inc.

Heritage Research Associates (Heritage) is an Oregon-based corporation specializing in cultural resource studies in the Pacific Northwest. Since 1980, Heritage has developed extensive experience in conducting a broad range of studies and preparing deliverables to meet federal Section 106 as well as state compliance requirements. The firm has held multi-year, on-call cultural resources services contracts with a variety of clients, including U.S. Army Corps of Engineers (Portland District), Oregon Department of Transportation (ODOT), Oregon State Office of the Bureau of Land Management (BLM), U.S. Fish & Wildlife Service, Bureau of Reclamation (Northwest Region), Bonneville Power Administration, Portland General Electric Company, Eugene Water & Electric Board, City of Portland Bureau of Environmental Services, Oregon Military Department (OMD), and PacifiCorp. Our clients have also included various agencies and firms such as the US Forest Service, US Army Corps of Engineers (Seattle District), US Sprint, US West, and the Federal Highway Administration (FHWA).

Among research undertaken throughout Oregon over the years, several recent projects can be pointed out as bringing experience to the current study for the Water Bureau's Bull Run Filtration Project. In 2007, Heritage prepared a Cultural Resources Management Plan (CRMP) for the Water Bureau's Habitat Conservation Plan for the Bull Run and Sandy watersheds. Currently, Heritage has prepared a Historic Properties Management Plan (HPMP) for the Water Bureau's Bull Run Water Supply System and Portland Hydroelectric Project in the Bull Run watershed east of the filtration plant project.

Heritage has also provided cultural resources services to Portland General Electric (PGE) for over 20 years, gaining substantial knowledge and expertise in the archaeology of the Cascade foothills and uplands on the east and southeast margins of the Portland Basin. Archaeological studies were conducted for the federal FERC license surrender of the nearby PGE Bull Run Hydroelectric Project, relicensing of the PGE Clackamas River Hydroelectric Project, and relicensing of the PGE Willamette Falls Hydroelectric Project. These archaeological investigations included background research for the Project vicinity, surface archaeological survey of the entire FERC-defined Areas of Potential Effect (APEs), subsurface discovery probe excavations at high probability and/or low visibility locations, test excavations at identified archaeological sites for NRHP significance evaluation, preparation of final technical reports, and preparation of Historic Property Management Plans (HPMP) for managing Clackamas River and Willamette Falls cultural resources.

Heritage also compiled and analyzed existing Bureau of Land Management (BLM) archaeological site data (2500 cultural resource sites and 700 isolated finds) using a Geographic Information Systems (GIS) framework. Site distributions were examined in conjunction with other data sets by basin and sub-basin to shed light on precontact and historical settlement-subsistence patterns. Included in this study were chapters on site distributions in the Clackamas and Lower Columbia–Sandy sub-basins that provide a context for understanding the archaeological record in the current Water Bureau Project vicinity. Familiarity with the area has also been gained from studies along Johnson Creek, in Gresham, and along the Sandy River, for government agencies and private firms and land owners over the years.

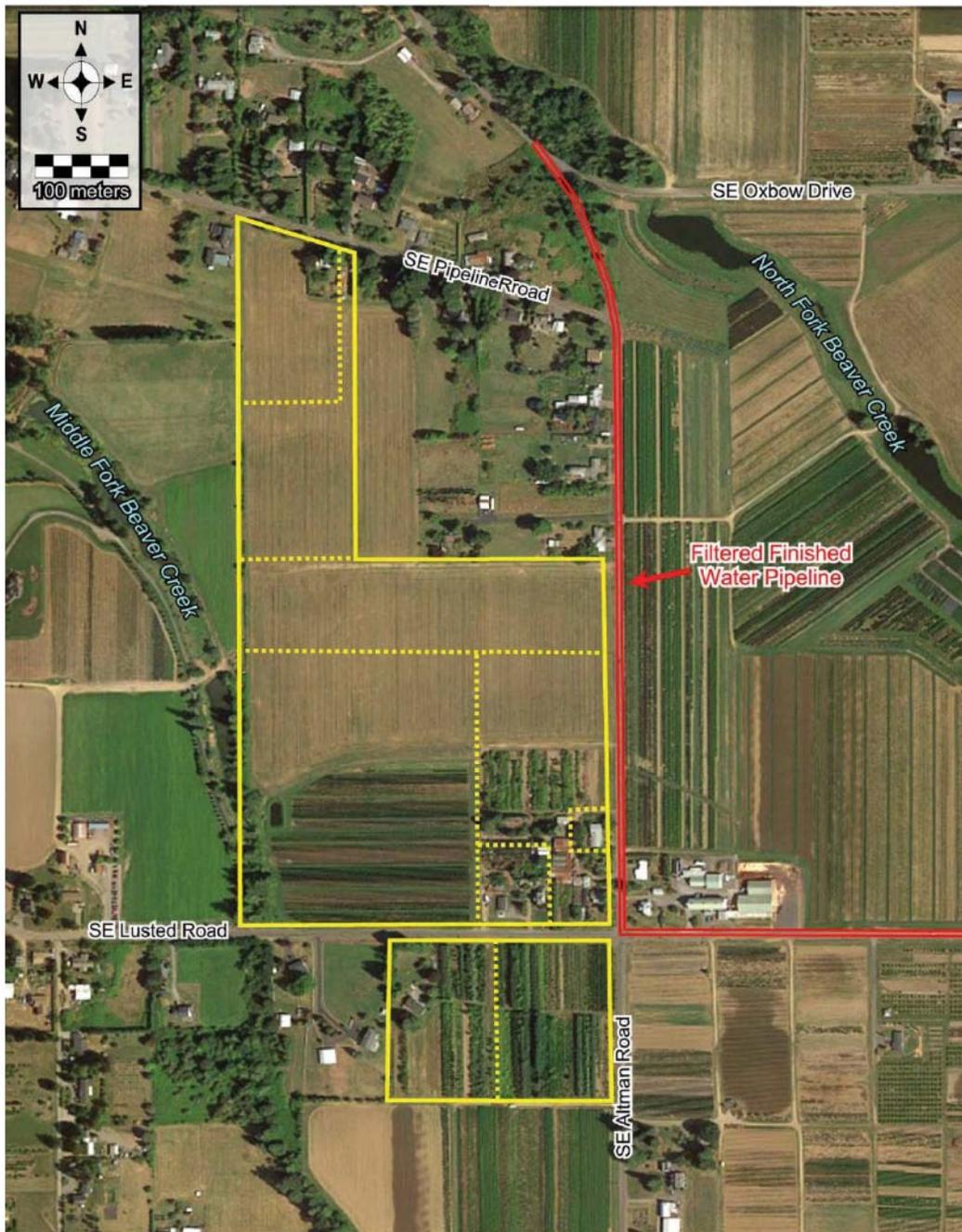


Figure 1. Current aerial showing the location of the Carlson family's 60 acres (yellow parcels) in relation to the FW Pipeline (red line).

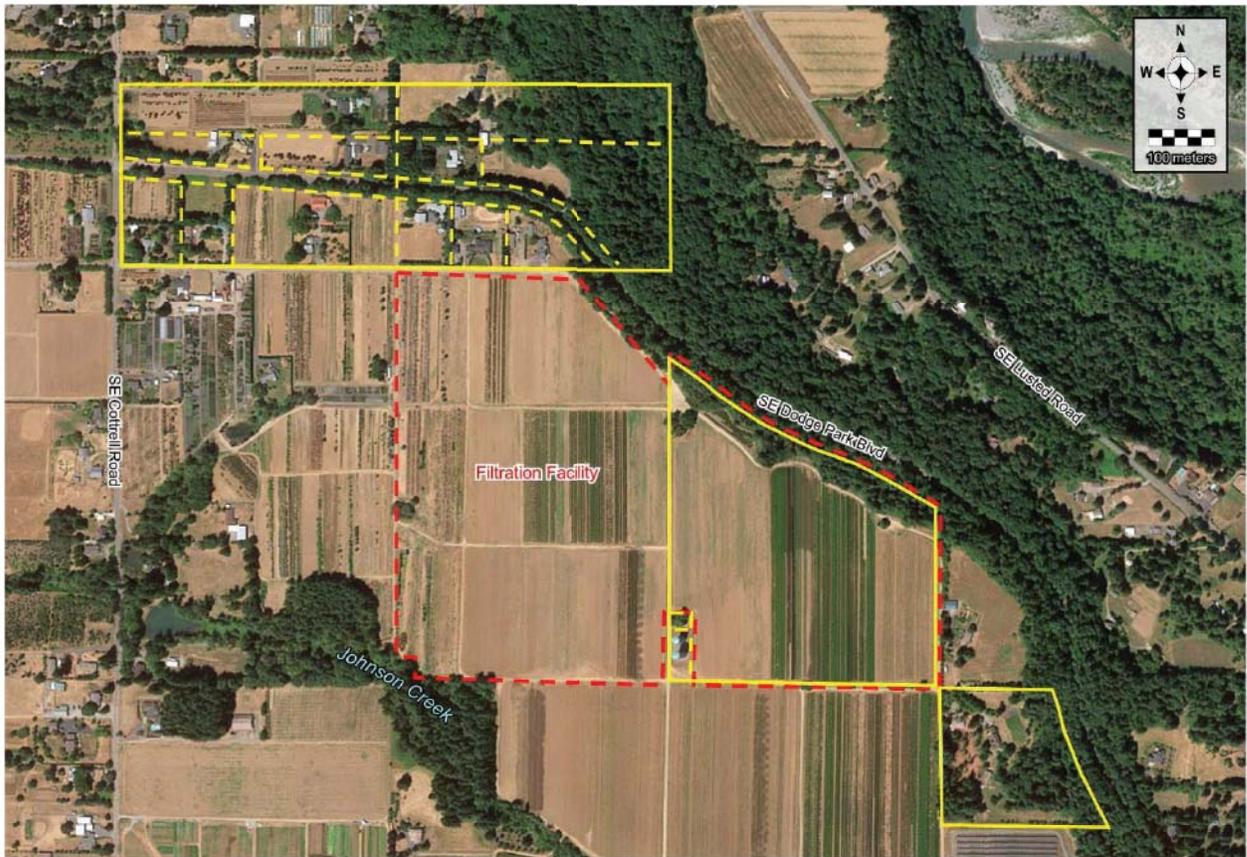
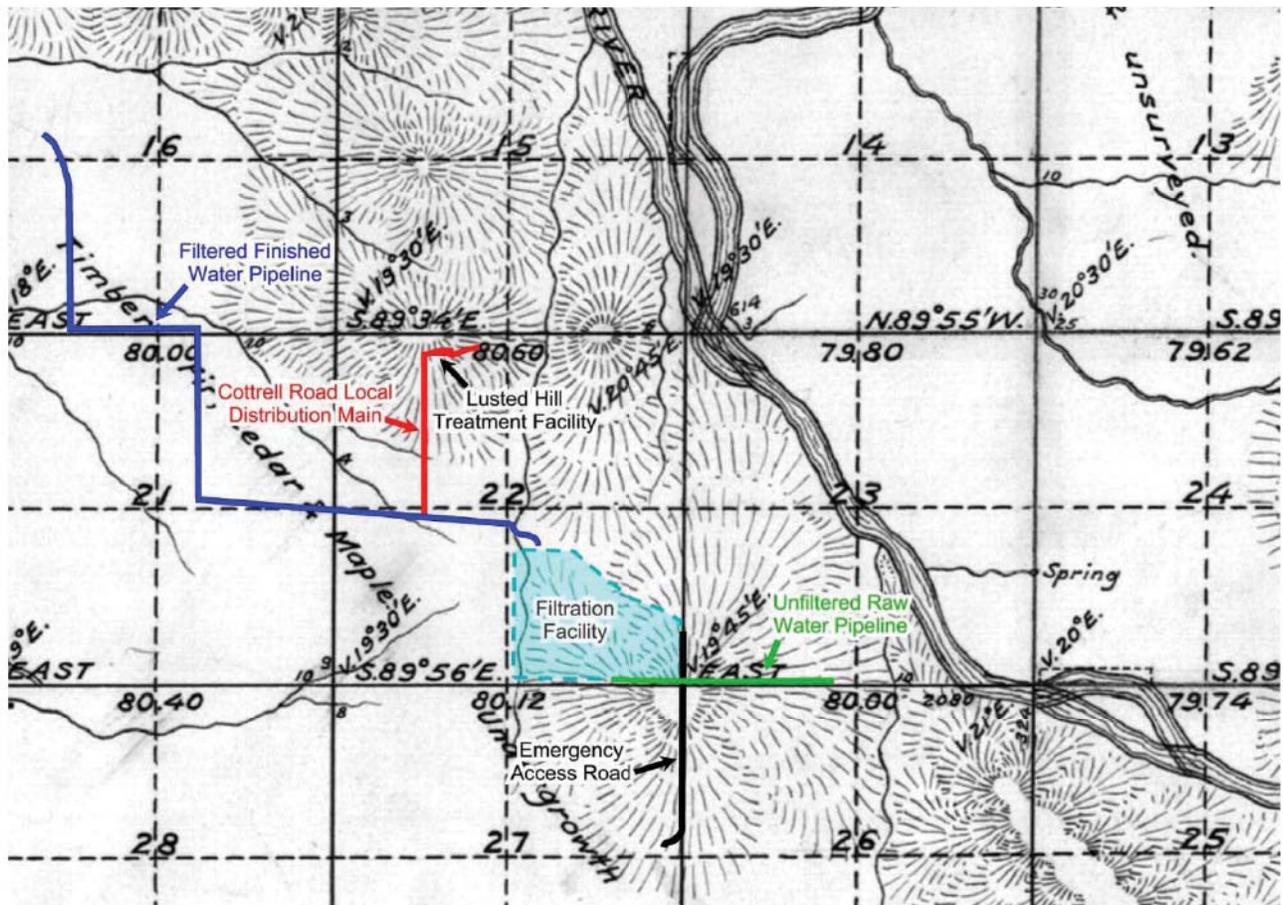


Figure 2. Current aerial showing showing the location of Ernest Meyer's 80 acres (yellow parcels) in relation to the Facility (red dashed parcel).

REDACTED

Portland Water Bureau Bull Run Water Treatment Plant Project: Supplemental Archaeological Investigations and Project Update

Robert R. Musil
Albert C. Oetting
Kathryn A. Toepel
Rick Minor



This version of the report has been redacted to protect
the location of archaeological resources under ORS 192.345(11).

**Portland Water Bureau
Bull Run Water Treatment Plant Project:
Supplemental Archaeological Investigations
and Project Update**

by

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EXECUTIVE SUMMARY

Portland Water Bureau is nearing the end of a multi-year planning process for development of a new water treatment facility to filter and treat water from the Bull Run watershed in eastern Clackamas and Multnomah counties. Archaeological investigations for the filtration facility and pipeline alternatives were previously undertaken between 2019 and 2021. Since completion of the initial archaeological report, project planning for the pipeline routes and emergency access has been finalized. The present report presents the results of a supplemental archaeological survey at the existing Lusted Hill Treatment Facility and the excavation of discovery probes along a section of the raw water pipeline route between the proposed Filtration Facility and SE Lusted Road.

Archaeological investigations in connection with the new water treatment plant have been undertaken to determine whether precontact or historical archaeological sites are present that may meet eligibility requirements for inclusion in the National Register of Historic Places (NRHP). These investigations assist in compliance with Oregon state laws and local land use laws requiring identification of archaeological resources and protection of resources meeting NRHP criteria and also assist in meeting federal cultural resource compliance requirements under Section 106 of the National Historical Preservation Act of 1966 (as amended).

The new filtration facility is located on the Kelso Slope, an upland setting characterized by shallow soil where archaeological sites are almost always identified by cultural materials on the surface. Previous investigations indicate that excavation of discovery probes is not a productive method of identifying archaeological evidence on the Kelso Slope, where cultural materials tend to be sparse and dispersed, and the surface and near-surface soil has been churned and mixed by the blasting and pulling of stumps, agricultural tilling, and the close working of fields by farmers over the past 100 years.

Archaeological surveys, using 20-m transect intervals, examined the proposed Facility location covering approximately 95 acres of agricultural land on the top of a broad rolling bluff west of the Sandy River. Several raw water and finished water pipeline alternative routes in existing public rights-of-way (ROW) and on private land were also surveyed, covering about 18 acres. To date, no archaeological resources have been identified within the project APE. The current findings are summarized as follows:

- No precontact Native American cultural materials were found in the Facility area or in the surveyed pipeline alternative routes. The absence of a reliable water source, particularly within the filtration parcel, reduces the likelihood of sustained activity or occupation by Native peoples.

- A historical farmstead area with remnant barn foundation was found in the Facility area; this former farmstead was removed between 1975 and 1980 and is of insufficient age to be considered an archaeological resource.
- The surface exposure in open farm fields that was available during the survey increases the visibility of archaeological materials (including buried materials that have been brought to the surface by plowing) and, in turn, improves the reliability of the survey results.
- Given the shallowness of the soils in the area, as well as the original land clearing and the subsequent plowing/tilling of these fields over many decades, shovel or auger probes are unlikely to be effective in locating archaeological materials.

A program of monitoring by archaeologists with close observation of ground exposures is recommended during the initial ground clearing activities when construction commences. Given the shallow soil, and the wide dispersal of artifacts reportedly found by landowners over acres of farmland, large exposures of the ground surface are needed to locate any cultural materials in the project area, such as the exposures that will be provided by ground clearing for construction of the Filtration Project.

The need for monitoring, as well as further archaeological discovery measures (exposures or excavations by mechanical or manual means), should continue to be reassessed as new information becomes available. In the meantime, all ground-disturbing project activities should be conducted under an inadvertent discovery protocol (IDP) prepared in advance for implementation by the construction team. The Water Bureau has finalized an IDP and shared it with tribes and Oregon SHPO, is developing contractor IDP training prior to construction, and has committed to IDP implementation during construction. The IDP ensures that, if archaeological resources are encountered, all ground disturbance in the vicinity will be halted immediately in accordance with state and federal laws.

ACKNOWLEDGEMENTS

Heritage Research Associates, Inc. (Heritage) conducted the archaeological survey of the Water Bureau's Bull Run Filtration Facility location and pipeline alternatives under a contract with Brown and Caldwell, Portland, Oregon. Heritage archaeologists Robert Musil, PhD, RPA, and Albert Oetting, PhD, RPA, served as Principal Investigators for this project, directing all fieldwork, summarizing the recorded data, and preparing project reports. The latter phase of work reported here, consisting of supplementary survey and discovery probing, was directed by Robert Musil in February 2023, who also prepared much of this report. The report was reviewed and expanded through discussion with Albert Oetting, Rick Minor, PhD, RPA, and Kathryn Toepel, PhD, RPA, and Project Manager for Heritage.

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1. INTRODUCTION

Portland Water Bureau (Water Bureau) is nearing the end of a multi-year planning process for the development of a new water treatment plant to filter and treat water from the Bull Run watershed in eastern Clackamas and Multnomah counties. Brown and Caldwell is working with the Water Bureau to conduct environmental studies for this project. The Filtration Project (Projects) will include the Bun Run Filtration Facility Project (Facility) on the bluff top west of the Sandy River canyon. The Bull Run Filtration Pipelines Project (Pipelines) will route incoming unfiltered raw water (RW) and outgoing filtered finished drinking water (FW) pipelines for the new facility to connect to the existing Water Bureau infrastructure. Project construction will involve federal funding through the Environmental Protection Agency.

Heritage Research Associates, Inc. (Heritage) was contracted by Brown and Caldwell to conduct cultural resources studies for both project components. Results of an archaeological investigation for the Facility and Pipeline alternatives undertaken by Heritage between 2019 and 2021 have been previously reported (see Musil and Oetting 2021). That report includes background context for the area and the results of surface pedestrian archaeological survey of the Facility parcel, access alternatives, and ten alternative pipeline routes within the existing public right-of-way (ROW) and on private land. The 2021 report presents results of all surveyed areas, with a focus on the chosen preferred alternatives which include FW Alt 3 and FW Alt 5, as well as RW Alt 1/1A.

Since completion of the initial project report, project planning for the pipeline routes and emergency access has been finalized (Figure 1). The present report presents the results of a supplemental archaeological survey at the existing Lusted Hill Treatment Facility and the excavation of discovery probes along a section of the raw water pipeline between the proposed Facility and SE Lusted Road.

The survey and discovery probing were undertaken to determine if precontact or historical archaeological sites that are listed in or may be eligible for inclusion in the National Register of Historic Places (NRHP) are present within the Area of Potential Effect (APE) for this project. This survey assists with compliance of Oregon State and local land use laws requiring identification and protection of significant resources, defined as those eligible for the NRHP. This investigation also assists in meeting federal cultural resources compliance requirements under Section 106 of the National Historical Preservation Act (NHPA) of 1966 (as amended).

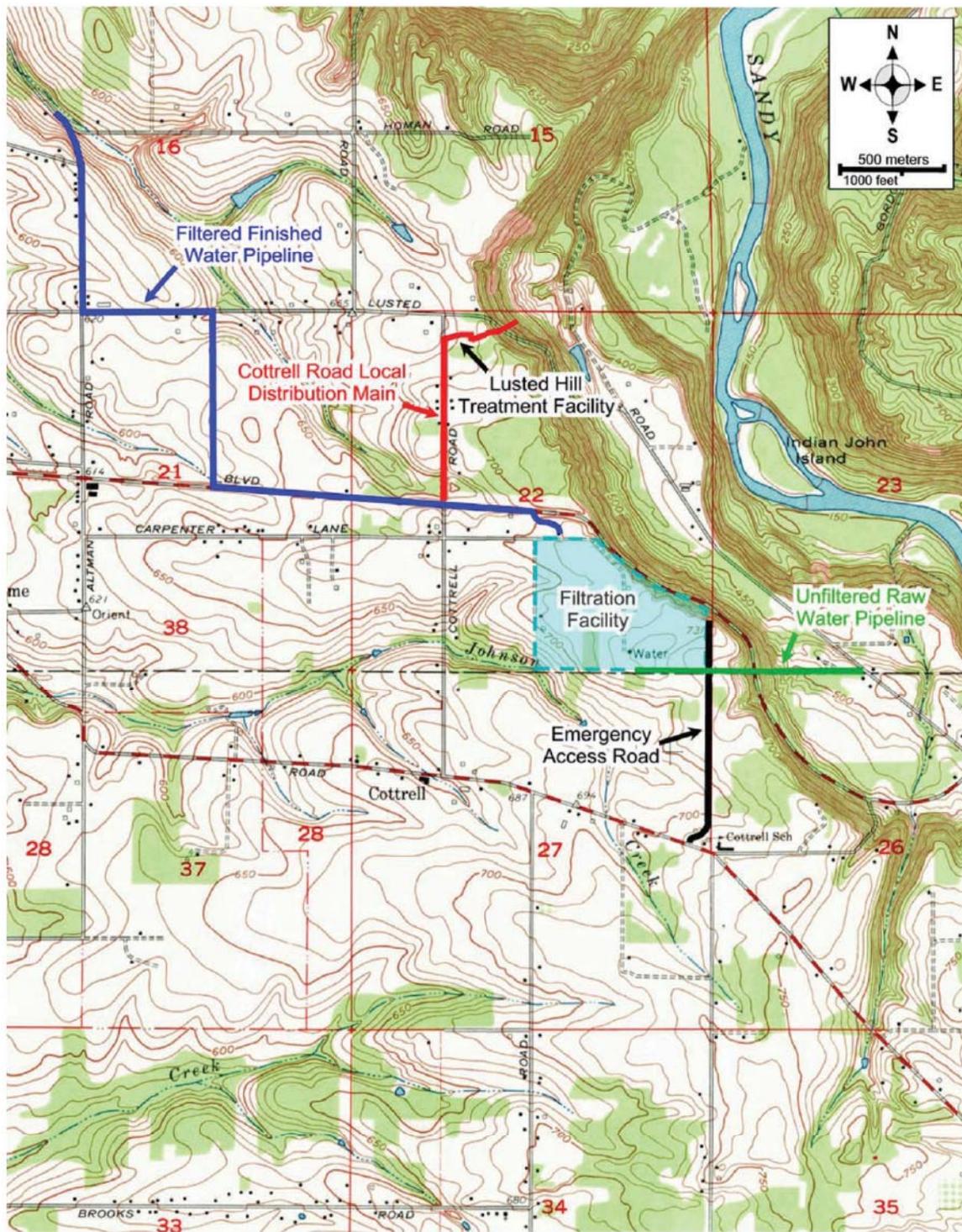


Figure 1. Location of the Bull Run Filtration Facility parcel (blue shading), RW pipeline (green line), FW pipeline (dark blue line), the Cottrell Road local distribution main (red line) to the existing Lusted Hill Treatment Facility, and the proposed emergency access road (black line) (USGS Sandy, Oregon 7.5' quadrangle, 1961, photorevised 1985).

2. PROJECT DESCRIPTION

The Facility parcel, access road, and the Cottrell Road Transmission Main ([CRTM] sometimes referred to as the Lusted Road Distribution Main) are located in T1S, R4E, Section 22 (Willamette Meridian). The unfiltered RW pipeline is along the section line between sections 22, 23, 26, and 27. The filtered FW pipeline is within sections 16, 21, and 22. The proposed emergency access is situated in section 27 (Figure 1). The project as currently designed includes the following components (Figures 1 and 2). Descriptions of each of these components are described below:

- Planned Filtration Facility
- Raw Water (RW) Pipeline
- Finished Water (FW) Pipeline
- Local Distribution Main (Cottrell Road Transmission Main or CRTM)
- Proposed Emergency Access (SE Bluff Road)

Planned Filtration Facility

The Facility is being designed to remove *Cryptosporidium* and other microorganisms from the raw water source to meet Oregon Health Authority (OHA) requirements. The Facility will also include corrosion control measures to reduce lead corrosion in premise plumbing. The Facility will be located within an approximately 95-acre parcel of agricultural land currently used to grow nursery plants, on top of the bluffs forming the west side of the Sandy River canyon (Figure 1).

Raw Water (RW) Pipeline

The unfiltered RW pipelines will run from existing water conduits along SE Lusted Road on a mid-slope bench on the canyon side west of the Sandy River to the Facility. Five RW pipeline alternatives (RW Alt 1/1A-6) were initially considered, entering the Facility parcel from the south, east, or northeast. The subsequent chosen alignment is RW1/1A. The pipeline will be installed via boring along a majority of this route.

The proposed section of the RW pipeline between the proposed Facility and SE Lusted Road is located about 670 meters (2200 feet) to the northwest of the intersection of SE Lusted Road with SE Dodge Park Boulevard. This section of pipeline will be installed in an open-cut trench that will extend roughly 320 meters (1050 feet) to the west where it will connect to a trenchless section that will tunnel under SE Dodge Park Boulevard and connect to the new Facility situated on the higher bluff. This section of pipeline is located in the S $\frac{1}{2}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ in Section 23, T1S, R4E, W.M. Elevations along this section of pipeline range from 150-155 meters (500-515 feet) in elevation.

Finished Water (FW) Pipeline

Five FW alternative routes were initially explored, with the chosen alternative being FW Alt 5. The FW pipeline will run north and west from the Facility parcel to connect to the existing water conduit. The pipeline route will cross under 35227 SE Carpenter, go west on SE Dodge Park Boulevard, then run north along a graveled farm road to SE Lusted Road. The single pipeline will branch into three pipelines which will turn west onto SE Lusted Road. At SE Altman Road one connection to the existing system will be made; two pipelines will head north to SE Pipeline Road and SE Oxbow Drive where the remaining connections will be made. The pipe for the FW route will be installed using trenchless methods across 35227 SE Carpenter then and installed via open trenching for the remainder of the alignments. Pipelines are primarily being constructed in the right-of-way; excavations will impact private property only on Water Bureau owned property or where easements are being negotiated.

Cottrell Road Transmission Main (CRTM)

As part of the Pipelines construction, the CRTM (a local transmission main) will be installed along SE Cottrell Road to connect the new FW pipeline from the Facility on the south to an existing main on the north. The CRTM will pass through the existing Lusted Hill Treatment Facility, and will allow the Water Bureau to continue to supply these existing customers with water. The current Lusted Hill Treatment Facility is located just south of the intersection of SE Lusted Road with SE Cottrell Road on top of Lusted Hill. The treatment facility lies within a forested parcel, with the entrance road to the facility located on the east side of SE Cottrell Road about 150 meters (490 feet) south of the intersection. The treatment facility is situated in the NW¹/₄ NE¹/₄ NW¹/₄ of Section 22, T1S, R4E, W.M. at an elevation of 200 meters (670 feet) (Figure 1).

The CRTM will connect to the 66-inch FW pipelines along the southern right-of-way of SE Dodge Park Boulevard, then extend north within the western right-of-way of SE Cottrell Road. The first segment of CRTM will be installed using open cut trenching across SE Dodge Park Boulevard, followed by trenchless installation to minimize the impact to vegetation across a sensitive environmental zone (Water Resources Zone of Significant Environmental Concern or SEC-WR). Boring will also help to reduce impacts to traffic and residential driveways. Auger boring will be used to install the pipe beneath the SEC-WR, and horizontal directional drilling will be used to install the pipe farther north of the SEC-WR near the southern property boundary of the Lusted Hill Treatment Facility. The route will move to the east side of SE Cottrell Road about 2,000 feet (600 meters) north of SE Dodge Park Boulevard, extending north about 500 feet to the northwest side of the Lusted Hill Treatment Facility.

Much of the remainder of the route to connect to the existing main will be trenchless with a short section of less than 200 feet to be trenched in order to connect to an existing 12-inch Chlorinated Water Supply (CWS) pipeline that is part of the existing main (Laney and Phelps 2022). This open-cut trench section is covered by pavement and gravel and has been heavily disturbed by construction of a road and a few small buildings.

Proposed Emergency Access (SE Bluff Road)

Three alternative access routes (SE Carpenter Access, SE Dodge Park Access, and SE Bluff Access) were initially surveyed for the project. The current proposed emergency access is the SE Bluff Access, which connects to the east end of SE Carpenter Lane and runs south along the section line to SE Bluff Road.

Geotechnical Studies

The Projects are in the East Portland Basin on a regional landform identified as the Kelso Slope, described as “a dissected northwestward-sloping surface” that is bounded on the west by the entrenched Sandy River Canyon, on the south and southwest by the Clackamas River, on the east by the Boring Hills, and on the north by bluffs just south of Gresham (Hogenson and Foxworthy 1965:9). The general west to northwest slope of the region is due to synclinal downwarping of the East Portland Basin, evident in underlying geologic levels from deposition of the Columbia River Basalt in the Miocene through development of the Troutdale Formation in the Pliocene (Hogenson and Foxworthy 1965:19-23).

A preliminary geologic profile developed for the project area and vicinity identified (1) colluvium and landslide deposits, (2) Estacada Formation terrace deposits (underlying Sandy River terrace east of the project site), (3) Springwater Formation soil units, (4) Boring Lava, and (5) Troutdale Formation (Bednarz 2020). The colluvium consists of weathered Springwater Formation soil. The landslide deposits are limited to eight small earth flows or combined rock and earth flows that have been mapped along the slope below the project area. In borehole profiles from 2020 the surficial colluvial deposits are described in borehole and test pit profiles as medium stiff, moist red brown, elastic silt. A previous report that the surface soil is windblown silt (Quaternary Loess) is incorrect. No windblown silt was identified during analysis of the 2019 and 2020 borehole samples, and windblown silt deposits do not appear to be present in the PWB project area (Bednarz 2020:2).

The Facility is generally underlain by Springwater Formation with various weathering stages to a depth of approximately 190 feet. Geotechnical boreholes and test pits dug in 2020 primarily focused on establishing the engineering properties of Springwater Formation soil units as they are most relevant to the design and construction of the Facility. In the 2020 borehole logs, the soil immediately below the surface is identified as Weathered Springwater Formation. Elsewhere referred to as Residual Soil, this soil consists of soft to very stiff red-brown or orange-brown clay or silt in project borings (Bednarz 2020:5) The Springwater Formation is composed of fluvial conglomerate of cobble gravel or boulder cobble gravel estimated to be of early Pleistocene to Pliocene age, estimated to have been deposited between about 35,000 and 2 million years ago, predating human occupation. The Boring Lava and the Troutdale Formation are not expected to be encountered within excavations for the PWB project (Bednarz 2020:3).

3. CULTURAL BACKGROUND

A detailed and comprehensive overview of the archaeology, ethnography, and history of the Portland Basin is presented in the earlier report for this project. The previous report also describes the results of the archaeological survey undertaken by Heritage between 2019 and 2021 for the Projects (Musil and Oetting 2021).

Prior to Euro-American settlement of the Portland Basin and Lower Columbia River Valley, the area was populated by numerous Native American groups speaking closely related languages and dialects of the Chinookan language family (Hajda 1984; Silverstein 1990). The mouth and lower reaches of the Sandy River appear to have been used by Chinookan groups speaking dialects of the Multnomah and Kiksht languages (French and French 1998; Silverstein 1990).

The archaeological site and project records on file at the Oregon State Historic Preservation Office (SHPO) were consulted using the SHPO on-line Oregon Archaeological Records Remote Access (OARRA) system. These records were reviewed for the earlier 2021 report to identify previous cultural resources investigations that have been conducted and archaeological sites that are recorded in the Projects vicinity (Musil and Oetting 2021).

These records were again examined for this report, but no additional sites or cultural resources surveys have been recorded in the study area since the 2021 research was conducted. As reviewed previously for the Projects area, twelve archaeological investigations on file at the Oregon SHPO, in addition to these projects, have been conducted within about one mile of the Facility parcel and the various Pipeline routes (Musil and Oetting 2021). The previous studies include a general archaeological overview for the Portland Basin (Ames 1994), two studies associated with Water Bureau Bull Run water conduit improvement projects (Buchanan and Fagan 2008; McDaniel 2005), two for Bonneville Power Administration (BPA) transmission line projects (Oliver and Schmidt 2011; Roulette and Harris 2014), three for projects at Oxbow Regional Park on the Sandy River (Chapman et al. 2016; Musil and Oetting 2017; Windler 2017), three examining cultural resources for the PGE Bull Run Hydroelectric Project (French et al. 2000; Oetting 1999, 2003), and one for a PGE telecommunications cell tower (Goodwin 2018).

The two Water Bureau conduit projects are nearest to the current project. No archaeological materials were found in either investigation. Likewise, no cultural materials were found in the BPA projects, the PGE telecommunications project, and in two of the Oxbow Regional Park surveys.

[REDACTED]

[REDACTED]

4. ADDITIONAL ARCHAEOLOGICAL INVESTIGATIONS

Previous Investigations in the Project Area

Three separate phases of archaeological surface survey were conducted by Heritage between 2019 and 2021 for the Projects. The surveys included the proposed Facility parcel as well as the alignments of five FW and six RW Pipeline alternatives. Heritage's 2021 report presented the results for all the surveyed pipeline alignments during the first two phases, and then focused on the preferred alternatives that were designated as FW Alt 3 and FW Alt 5, and RW Alt 1/1A during the third phase.

In addition to the pedestrian surveys, an archaeologist from Heritage also joined a field crew from AAI Consulting (AAI), which was excavating soil probes at 200-foot (60-m) intervals and taking soil samples for hazardous materials analysis (Musil and Oetting 2021). Additional survey along with archaeological monitoring of the AAI excavations was undertaken at that time.

No evidence of precontact or historical artifacts or deposits was observed on the ground surface during the pedestrian survey undertaken at the proposed Facility, along any of the alternative Pipeline alignments, within any of the three potential emergency access routes, or in the sediments examined from the soil probes excavated by AAI.

Supplemental Survey and Probing

As project planning progressed, additional archaeological investigations were conducted along both the CRTM and along the unfiltered RW pipeline route. Investigations were conducted by a field crew from Heritage directed by Robert R. Musil in February 2023.

CRTM

A surface survey of the north end of the proposed CRTM alignment was conducted within the Lusted Hill Treatment Facility at the north end of SE Cottrell Road. The north section of the proposed pipeline alignment within the Lusted Hill Treatment Facility will be mostly a trenchless installation that will extend from the proposed CRTM at the west end of the treatment facility at SE Cottrell Road (Figure 2). At its south end, the CRTM will connect with the proposed FW pipeline in SE Dodge Park Boulevard. The CRTM will then run north to the Lusted Hill Treatment Facility along the west side of SE Cottrell Road, crossing to the east side as it nears the Lusted Hill Treatment Facility (Figure 3).



Figure 2. Location of the proposed Bull Run treatment facility showing the location of the various project components, including the Facility parcel (blue shading), the RW pipeline (green line), FW water pipeline (dark blue line), the Cottrell Road local transmission main (light blue line) to the existing Lusted Hill Treatment Facility, and the emergency access (grey dots) (from <https://www.portland.gov/ater/bullruntreatment/filtration/about>).

About midway north within the treatment facility parcel along the east side of SE Cottrell Road, a section of open-cut trench will angle to the east, connecting with a trenchless section. This short section continues to the east for about 35 meters before making a 90-degree turn south to connect to an Interim Corrosion Control Project (ICCP) Valve Vault, before extending east to an existing main. This extension will pass through a previously disturbed alignment as a trenchless installation adjacent to an existing 12-inch CWS pipeline. This 12-inch CWS pipeline was a trenchless installation undertaken in 2022 using a Horizontal Direction Drill from the top of Lusted Hill to the bottom where it connects to an existing main that runs along SE Lusted Road (Laney and Phelps 2022).

The survey along the planned open-cut trench section confirmed that this area is covered by pavement and gravel and has been heavily disturbed by existing pipelines as well as the previous construction of buildings and other structures associated with the treatment facility complex. No cultural materials were observed during the survey along the proposed pipeline route around the treatment facility.

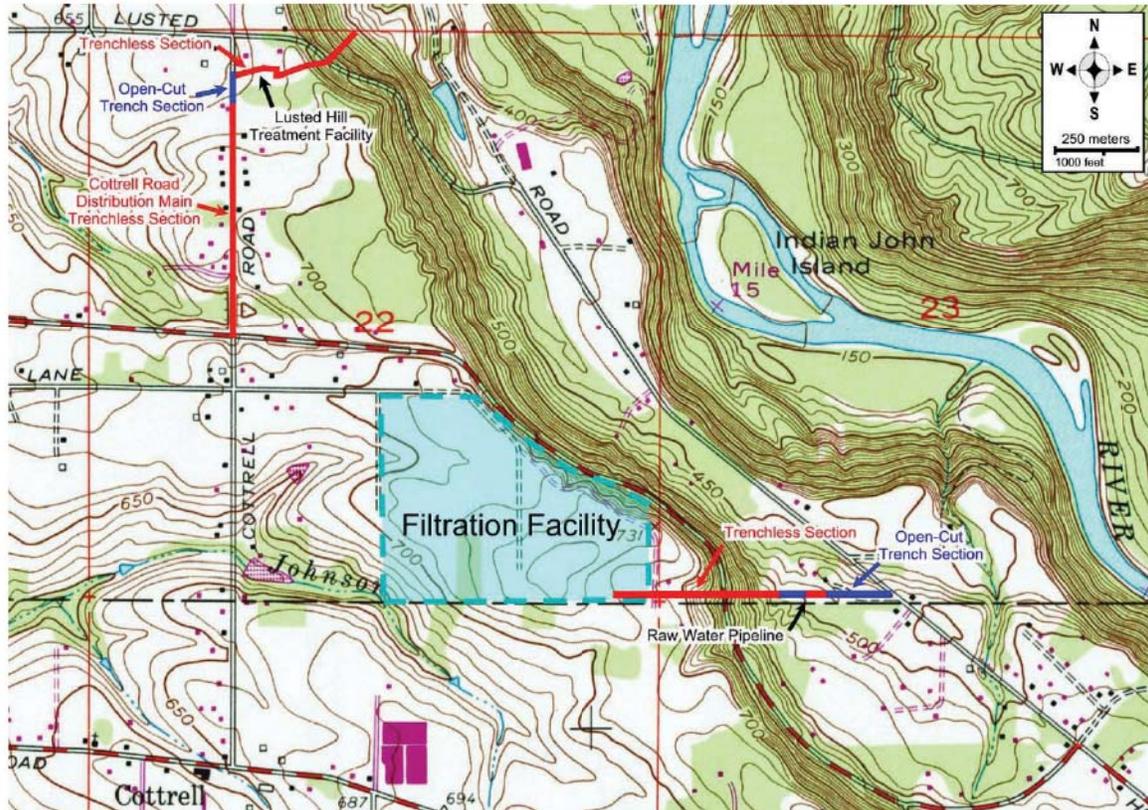


Figure 3. Location of supplemental archaeological investigations for CRTM (at north end of Cottrell Road) and the SE Lusted Road RW pipeline route (east of Facility) (USGS Sandy, Oregon 7.5' quadrangle, 1961, photorevised 1985).

RW Pipeline

The chosen alternative for the RW pipeline was originally designated as RW Alt 1A. It is situated between SE Lusted Road and the trenchless section that will tunnel into the slope under SE Dodge Park Boulevard to connect to the Facility on top of the higher terrace. This section of pipeline is located on the first terrace at about 220 feet above the Sandy River and 220 feet lower than the Facility situated on the higher second terrace. The easternmost section of this pipeline parallels a gravel driveway west to a small pond (Figure 4). This portion of the alignment consists of a level grass-covered area that had been planted to small trees, with the trees harvested approximately two to three years ago. This section of pipeline will be installed in an open-cut trench (Figure 3).

The next 60 meters (190 feet) of pipeline will be bored (trenchless) under the pond and come out next to a single-lane dirt road that parallels a line of trees west of the pond. From the west end of this short trenchless section under the pond the pipeline will again be placed in an open-cut trench and will continue to the west for about 110 meters (360 feet) to a connection with a trenchless section that will head uphill, tunneling under SE

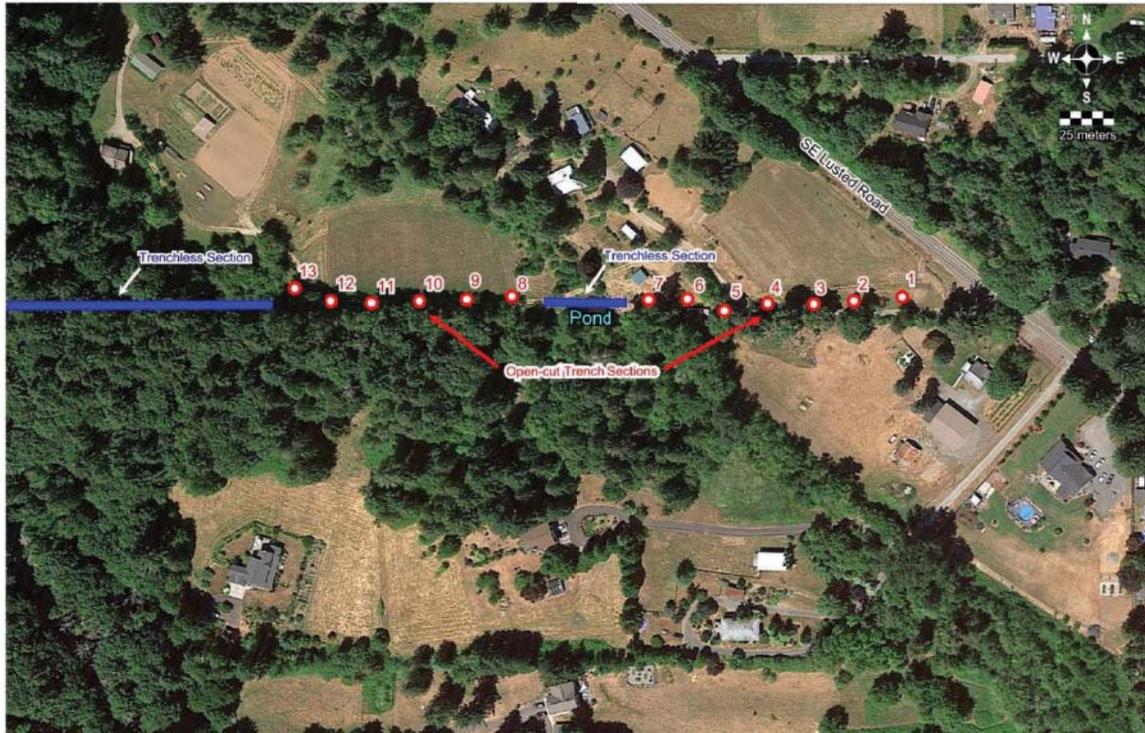


Figure 4. Location of shovel probes along the open-cut trench pipeline sections and the trenchless pipeline sections of the proposed RW pipeline between SE Lusted Road and the Facility (adapted from a July 24, 2021, Google Earth aerial photograph).



Figure 5. View to the southwest of excavations at Shovel Probe 9 along the RW route in 2023.

Dodge Park Boulevard and connecting to the Facility. This section of open-cut pipeline consists of a grass field that slopes gradually uphill to the west.

The 320-meter (1050-foot) section of open-cut pipeline between SE Lusted Road and the Facility was originally surveyed in 2020 (Figure 4) and was surveyed again in 2023. No artifacts were observed on the ground surface during either of the surveys. In addition to the surface survey, a total of thirteen 30-cm-diameter discovery probes were also placed along the alignment of the open-cut trench to determine if subsurface cultural materials were present. The discovery probes were spaced at approximately 20-m intervals along the proposed pipeline route, except for the 60-m-long (200-foot) gap where the pipeline will tunnel under a small pond (Figure 4).

The sediments removed from the shovel probes were screened using 3-mm ($\frac{1}{8}$ -inch) wire mesh, and all probes were excavated to a depth of 50 cm below the ground surface (Figure 5). All probes were backfilled immediately upon completion. The sediments encountered in the probes consisted of dark brown silty clay loam that extended to depths of 30-40 cm (12-16 inches) below the ground surface before transitioning to medium reddish brown silty clay. No cultural materials or indicators of buried cultural deposits were observed during the excavation of the shovel probes.

5. ARCHAEOLOGICAL RESOURCES ON THE KELSO SLOPE

To provide a broader context beyond the one-mile immediate study area, the proposed Facility is located on the Kelso Slope, an upland setting characterized by shallow soil (Hogenson and Foxworthy 1965). The principal soil, Cazadero silty clay loam, was initially described as a surface layer (A horizon) of very dark brown silty clay loam 16 inches (40 cm) thick. A more recent description indicates that the surface layer (A horizon) is typically 12 inches (30 cm) thick (National Cooperative Soil Survey 2022). The discrepancy in thickness between the earlier and later descriptions suggests that this soil is becoming thinner over time, possibly due to logging of the forest formerly present and transition to farmland.

Current USGS maps depict most of the watercourses on the Kelso Slope as intermittent, but earlier USGS maps (e.g., Boring 1940, Sandy 1954) show these streams as perennial, with only the uppermost tributaries as intermittent. This suggests that flows in these streams may have been higher when the region was forested prior to Euro-American settlement and regional farming development (Ellis et al. 1991:76; Woodward 1972:55).

These streams also exhibit an interesting drainage pattern due to the synclinal sloping. Although the Sandy River Canyon is immediately to the east, nearly all streams on the Kelso Slope flow west or northwest. Only one stream shown on USGS topographic maps (labeled Bear Creek on earlier maps) flows directly to the Sandy River, through a deep draw in the bluffs (route of SE Bear Creek Lane) across the terrace traversed by Herrick Road and then down to the river. All other named streams and their tributaries flow west or northwest, away from the Sandy. Johnson Creek runs west downslope and around the north base of the Boring Hills to join the Willamette River in the City of Milwaukie. Beaver Creek with its tributary Kelly Creek flows northwest then north and does join the Sandy River, but 8 miles north in Troutdale where the Sandy emerges onto the Columbia River floodplain. South of Johnson Creek, Deep Creek and its tributaries Doane Creek, Noyer Creek, and Tickle Creek flow west into the Clackamas River.

Known Archaeological Resources

Few professional archaeological investigations have been conducted in the Kelso Slope region, the earliest being research conducted by John Woodward (1972, 1974). Woodward excavated and analyzed materials recovered from the Geertz Site (35CL1), located [REDACTED] miles southwest of the current project area. Artifacts, including flake stone tools and flake debitage, were collected from the surface over an area of 5 acres. Controlled excavations of nearly 50 m³ recovered additional cultural materials to a maximum depth of 50 cm. No living floors or other cultural features were encountered. Overall, over 2,000 pieces of lithic debitage, one red ochre nodule, and 318 formed stone tools were recovered, including 37 foliate-shaped

Cascade projectile points and numerous Cascade point fragments (Woodward 1972:56-58). Based on the points and overall artifact assemblage, Woodward interpreted the site as a hunting and game processing camp used during the early part of the Archaic Stage perhaps 6,000-8,000 years ago.

Woodward also examined “numerous” artifact collections of private landowners in the area but did not fully document these collections (Woodward 1974:9-12). He did not provide locations but observed that these were surface assemblages generally found on knolls or hillsides near springs or small streams, and that they were generally flaked stone assemblages containing Cascade-type foliate points, some large side-notched and broad stemmed points, and other flaked stone tools, but that narrow-necked and triangular arrow points were rare. Ground stone implements were likewise uncommon. Woodward (1974:11) stated that the Kelso Slope sites did not have buried stratified deposits since they were typically in “erosional, rather than depositional” settings, although this statement was not further discussed.

Only eight precontact archaeological sites have been formally recorded at the Oregon SHPO in the Kelso Slope region, all in the southern half of the area.

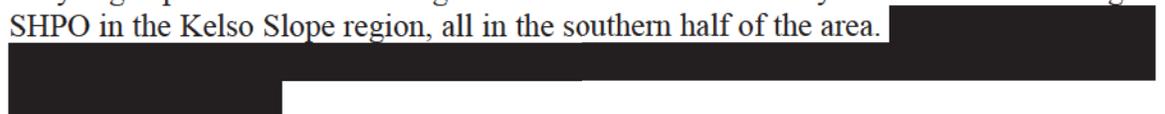


Table 1. Archaeological Sites Recorded on the Kelso Slope.

Site #	Discovery	Size	Setting	Water source	Estimated Age	Assemblage
35CL1 (Geertz)	Surface scatter/ excavation	5 acres	creek bank	[REDACTED] <20 m	6000-8000 BP	Site excavated (50 m ³); 2000+ flakes, 1 red ochre nodule, 318 tools inc. 37 Cascade projectile points (ppt), bifaces, scrapers, drills, cores, used flakes, choppers, cobble tools
35CL117	Surface scatter	134x109 m (3.5 acres)	low stream terrace	[REDACTED] <20 m	Unknown	15-20 artifacts observed on surface: flakes, cores, cobble tools, fire-cracked rock. No excavation
35CL118	Surface scatter	182x152 m (7 acres)	high stream terrace	[REDACTED] <20 m	6000-8000 BP	50+ artifacts observed on surface: 35-45 flakes, tip & midsection of Cascade ppt., 2+ bifaces & fragments, cobble chopper. No excavation
35CL119	Surface scatter	121x99 m (3 acres)	stream terrace	[REDACTED] 50 m	6000-8000 BP	20-30 artifacts observed on surface: flakes, bifaces, cores, cobble tools, 2 complete & 1 tip Cascade ppts. No excavation
35CL120	Surface scatter	251x60 m (4 acres)	low knoll between streams	[REDACTED] <20 m	6000-8000 BP, 500-2500 BP	Artifacts observed on surface, not enumerated: flakes, bifaces, cores, cobble tools, 2 Cascade ppts, 1 side-notched ppt, 1 basal-notched ppt (arrow pt). No excavation
35CL121	Surface scatter	25x1 m	trench in field	[REDACTED] 1 m	unknown	Not a site; isolated find of 2 chert flakes. No excavation
35CL132	Surface scatter/ excavation	170x100 m (4 acres)	base of hill/upper edge of stream terrace	[REDACTED] 300 m	6000-8000 BP	18 artifacts observed on surface: 11 flakes, 6 cores, 1 Cascade ppt. Excavated 2.3 m ³ , recovered 15 flakes
35CL265	Subsurface probes	40x60 m (0.6 acre)	head of draw [REDACTED]	[REDACTED] 100 m	unknown	No artifacts on surface within project area. Excavated 1.5 m ³ , recovered 98 flakes, 4 tools




Discovery of Archaeological Resources

Researchers for the Sunrise Corridor study analyzed existing information on ethnographic use of the region, recorded and reported archaeological resources, and environmental data to develop criteria for identifying areas likely to contain archaeological sites (Ellis et al. 1991: Appendix B), expanding on Woodward's observation that sites tended to be on knolls or hillsides near water (Woodward 1974:9). High, medium, and low probability zones were defined (Ellis et al. 1991:17). High probability was assigned to banks and terraces near streams, springs, and wetlands (no specific distance limit provided) as well as to the base of hills or lower hillslopes transitioning between ecological zones. Broad upland flats or gently rolling terrain away from water sources were assigned medium probability. Permanent wetlands with standing water and steep-sided stream canyon walls and floors were designated low probability. This analysis also found that upland area use was likely highest in the early Archaic and that use declined in the middle and late portions of the Archaic as groups focused more and more on the Clackamas River floodplain.

This probability zone model was successful. The Sunrise Corridor sample survey examined 96% of the high probability zones in their project area, 36% of the medium probability zones, and 9% of the low probability (Ellis et al. 1991:74). As discussed above, five precontact sites were recorded during this survey and all were found in high probability locations on banks or terraces near water sources. One site locale was initially mapped as low probability due to an adjacent steep-sided stream canyon, but the setting was not as severe as suggested by the topographic map when observed in the field. No Clackamas floodplain sites were recorded, but three of the five upland sites contained temporally diagnostic Cascade projectile points indicating use during the Early Archaic, as suggested by the probability model.

Woodward's understanding was that most sites in the region were surface or near-surface manifestations, with only shallow cultural deposits. The excavations at the Geertz Site, 35CL132, and 35CL265 support this belief; no artifacts were found below 60 cm and all or most artifacts at the latter two sites were in the upper 30 cm. Given that much of the

Kelso Slope land is in agricultural use, such shallow cultural deposits have likely been disturbed by plowing and other agricultural practices. At the Geertz Site, the upper soil stratum (A) was interpreted as the disturbed plow zone, extending 25-38 cm deep (Woodward 1972:56). The plow zone at 35CL132 may extend to 50 cm given the depth of modern trash found in some units. Likewise, trash in the units at 35CL265 to depths of at least 40 cm provides an estimate for the plow zone at this site.

The subsurface cultural deposits at these three sites appear to be rather sparse, although at 35CL132 this may be a function of restrictions on where the units could be placed (in a single line paralleling the road). Overall subsurface artifact density was quite low at all three sites: only 7 items/m³ at 35CL132, 68 items/m³ at 35CL265, and just 46 items/m³ at the Geertz Site. Subsurface density was difficult to ascertain for the Geertz Site, since the debitage was listed in the report only as “over 2,000” items and no division between surface and subsurface items was provided (Woodward 1972). Combining all the cited artifacts (2,319) as subsurface yields the density figure of 46 items/m³.

The ability to discover archaeological sites is dependent on several factors, principally the abundance, clustering, obtrusiveness, and visibility of the artifacts and features (if any) comprising the site (Chartkoff and Chartkoff 1980; Schiffer et al. 1978). Abundance, clustering, and obtrusiveness are characteristics of the archaeological assemblage, while visibility is a function of the surrounding environment (Oetting 1992:120-121).

- Abundance is the number of artifacts at a site or number of sites in an area.
- Clustering refers the density of items (or sites) in a particular area or volume.
- Obtrusiveness is a measure of the degree to which specific archaeological materials or sites can be detected by a particular discovery technique.
- Visibility is self-explanatory, referring to environmental factors which may obscure archaeological materials in a particular locale.

Small lithic scatters with low artifact densities are less obtrusive to surface pedestrian surveys than are scatters with larger surface areas (more likely to be encountered in multiple transects and for a larger proportion of a transect) and/or higher artifacts densities (more artifacts to observe) (Oetting 1992:120). Poor surface visibility may obscure artifacts/sites regardless of their abundance, clustering, and obtrusiveness. In subsurface testing, small, low density deposits are again less likely to be detected than larger or higher density deposits. Surface visibility is not as much of an issue in testing (unless dense vegetation limits where excavation units can be placed), but soil conditions and past ground disturbance may cause visibility problems in subsurface units.

The recorded sites on the Kelso Slope and the additional locales visited by Woodward reflect these discoverability factors. The recorded sites (except 35CL265) have surface artifact scatters of 20 or more items with both flakes and tools, surface areas generally exceeding 3 acres (Table 1), and surface visibility conditions were reasonably good during the surveys. The Sunrise Corridor survey employed 15-m transect intervals, so the sites were encountered by multiple transects, increasing their obtrusiveness. The presence

of larger artifacts such as the Cascade projectile points and other tools and tool fragments probably also increased site obtrusiveness through their larger size, distinctive shapes, and perhaps raw material types and/or colors.

Although Woodward does not describe how the locales he visited were found, the “private surface collections from Kelso Slope fields” (Woodward 1974:10) were undoubtedly gathered by individuals plowing or otherwise working in their agricultural fields and picking up artifacts exposed by these disturbances. Plowing or discing fields disturbs the context of archaeological materials but also makes the artifacts and sites more obtrusive and visible by exposing materials on a mineral ground surface. However, yearly plowing and continued selective collection of artifacts (usually complete and/or fragmentary tools or larger flakes and other artifacts) works to decrease the structure and obtrusiveness of these sites over time, as the plowing/discing continues to disturb site context (generally decreasing clustering) and as more and more artifacts are removed (decreasing abundance and clustering).

These observations are applicable to the Facility area. All of the land for the filtration plant has been under cultivation for decades, and most of the pipelines and roads will cross or border agricultural fields. The field survey of these parcels and lines was conducted under good surface visibility conditions by experienced professional archaeologists (Musil and Oetting 2021). If the sites recorded during the Sunrise Corridor survey are typical of most Kelso Slope precontact archaeological sites, it is reasonable to assume that surface evidence of such sites, if present, would have been discovered during the pedestrian survey of the project area. However, if sites in the project area were disturbed by many years of plowing, discing, and other ground disturbing agricultural practices, and if the contents of those sites were systematically removed by collectors over those many years, the likelihood of archaeological discovery by surface survey would be substantially diminished. Unfortunately, finding such diminished sites through subsurface probing would be even more difficult due to low artifact abundance and decreased clustering.

6. ASSESSMENT OF RESULTS

The Facility parcel is on the bluff top above the west side of the Sandy River canyon on the Kelso Slope, part of a broad tableland that forms the eastern side of the Portland Basin. Most of the Kelso Slope is underlain by fairly thick clayey soil that is relatively impermeable (Hogenson and Foxworthy 1965:9). This slightly rolling Kelso Slope is drained by numerous creeks which flow to the west and northwest, including Johnson Creek which is outside the Facility parcel to the southwest. Much of this area has been farmed since the mid- to late nineteenth century.

Before cultivation, native vegetation in the area was mixed conifer-deciduous forest, part of the temperate coniferous forests found across the Pacific Northwest (Franklin and Dymess 1973). Vegetation likely included Douglas fir, red alder, bigleaf maple, with some western red cedar, western hazel, and willow, and an understory of vine maple, brackenfern, and a variety of berries and grasses. The 1855 GLO cadastral survey map specifically identifies “timber of fir. Cedar, maple, undergrowth, vine maple, [and] hazel” on the slopes south and west of the project area (Figure 6).

The principal soil in the area, Cazadero silty clay loam, is a relatively thin layer of very dark brown silty clay loam about 12 to 16 inches (30 to 40 cm) thick of weathered and eroded soil derived from the underlying Springwater Formation. In other words, the project area is not a depositional setting where sediments have increased in thickness over time. The shallow soil on the project area has been churned and mixed by plowing and tilling over the last century.

The above summary of the soil and vegetation describes the environmental setting in which activity by Native peoples potentially left archaeological resources before modification of the landscape by Euro-Americans. The various project components are reviewed below, along with a summary of the investigations conducted for each section of the project.

Planned Filtration Facility

As presented in the previous project report (Musil and Oetting 2021:23-27, 41-42), the archaeological survey of the Facility parcel consisted of a pedestrian survey of approximately 95 acres by two archaeologists walking parallel transects north and south across the property. At the time of survey, the project area was located in a working plant nursery situated on gently rolling ground (Figure 7). The individual survey transects were spaced 20 meters apart and oriented along the rows of plantings. In addition to rows of saplings, there were also several wider sections of the field between the rows that had been recently disked, providing extensive areas of soil visibility (Figure 8). Ground

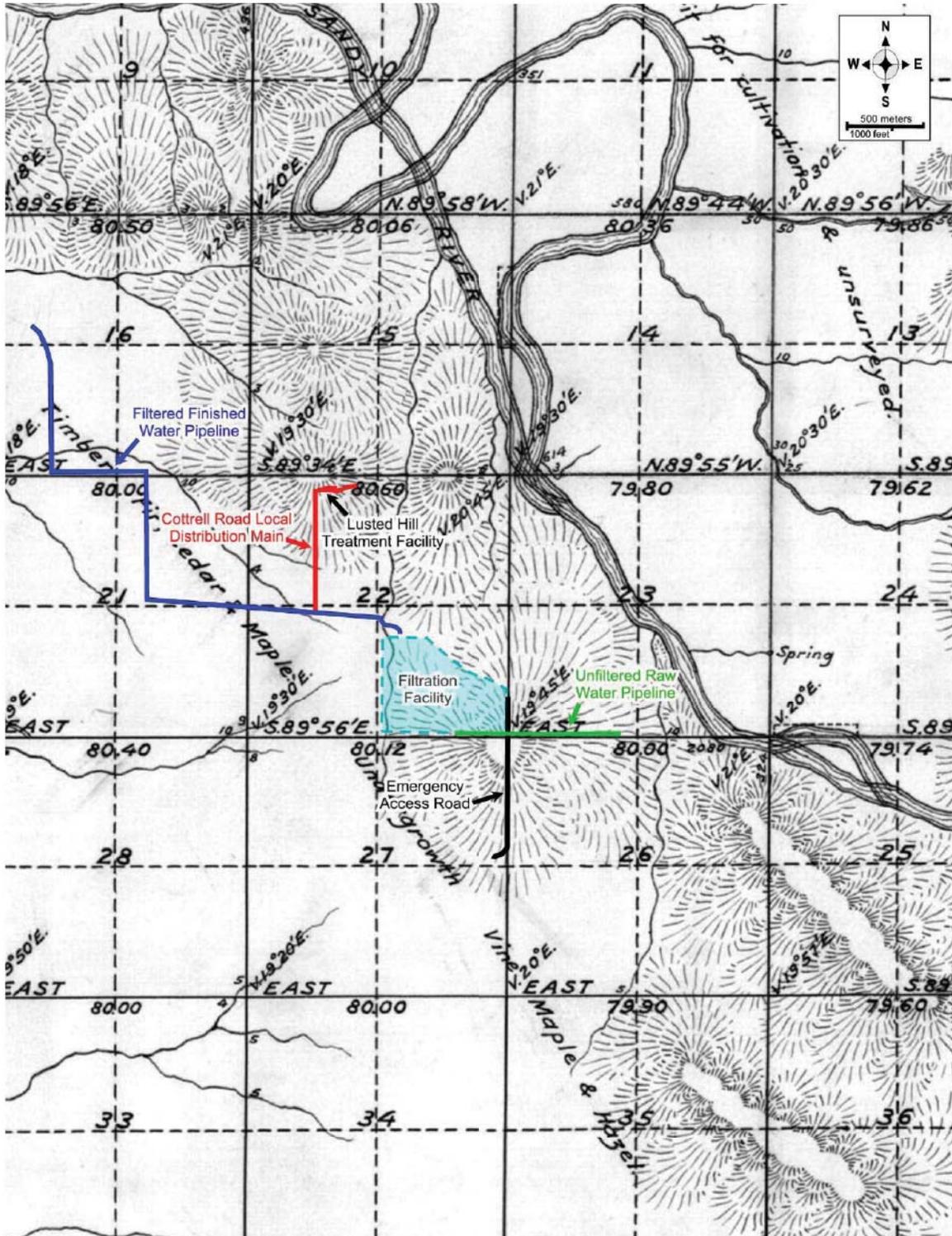


Figure 6. Excerpt of the GLO cadastral survey plat for T1S, R4E (GLO 1855) showing the proposed location of the Bull Run Facility parcel (blue shading), RW pipeline (green line), FW pipeline (dark blue line), the Cottrell Road local distribution main (red line) to the existing Lusted Hill Treatment Facility, and the proposed emergency access road (black line).

visibility was present in all areas of the Facility parcel, averaging from 20% up to 100% (Figure 9).

The pedestrian survey undertaken for this project did not result in the discovery of any evidence of archaeological materials or deposits. Given the shallow soils and lack of deposition, the surface setting of previously identified sites in the region, and because there were large areas of bare ground consistently exposed across the property that provided good to excellent ground visibility due to tilling—which also brings buried materials to the surface—no additional subsurface probing within the Facility parcel was deemed necessary.

Although no archaeological materials were found during the survey of the Facility parcel, indications of an earlier farmstead were found on the property. A small concrete foundation—too small to be a building foundation but most likely associated with a small barn or outbuilding—was observed near a line of mature holly trees that are shown on early aerial photographs from the mid-1950s. The buildings were removed between 1975 and 1980; the removal was so thorough that no associated artifacts were found in the general vicinity of the former structures despite the good ground visibility. Because the structures were removed less than 50 years ago, this locale is not considered an archaeological resource by the Oregon SHPO.



Figure 7. View to the north of the rows of cut saplings and intervening grassy furrows that covered most of the Facility parcel at the time of survey.



Figure 8. View to the north of a large strip of bare ground in the center of the Facility parcel.



Figure 9. View to the north of filled ground between rows of mature bushes along the eastern edge of the Facility parcel.

RW Pipeline

The RW pipeline will run from an existing water conduit along SE Lusted Road on a mid-slope bench on the canyon side west of the Sandy River to the Facility, a steep rise of approximately 200 feet. Much of the lower easternmost 320 meters (1050 feet) of this route will be trenched for the pipeline installation, but the remainder of the route will be a trenchless section that will tunnel under SE Dodge Park Boulevard and connect to the proposed Facility on the higher bluff.

An initial survey of this RW alignment was reported in the earlier study for this project (Musil and Oetting 2021:31-36), covering the route west of SE Lusted Road to the beginning point for the planned trenchless section of the RW route (this section will be bored 100 feet below surface). The proposed pipeline route at this location runs along or parallel to a gravel/dirt road.

The survey consisted of a pedestrian survey of the 200-foot-wide (60-meter) easement that extends about 1000 feet (300 meters) west of SE Lusted Road (Figure 10). The easement consisted of grass and mulch-covered ground along both sides of the road next to a recently tilled field and garden. The dirt portion of the road was a muddy track that provided good (50%) ground visibility in the tire tracks, but the grass- and mulch-covered areas along the road provided lesser (10%) ground visibility. The recently tilled field and garden provided 100% ground visibility.

In addition to the initial survey in 2020, the 320-meter section of open-cut pipeline between SE Lusted Road and the Facility was surveyed again in 2023. As reported above, thirteen 30-cm-diameter discovery probes were also placed along the alignment of the open-cut trench to determine if subsurface cultural materials were present. The discovery probes were spaced at approximately 20-m (65-foot) intervals along the proposed pipeline route, except for the 60-m-long (200-foot) gap where the pipeline will tunnel under a small pond (Figure 3). No cultural materials or indicators of buried cultural deposits were observed during either of the surveys or during the excavation of the shovel probes.

FW Pipeline

The FW pipeline will run north and west from the Facility parcel to connect to the existing water conduit. The FW pipeline route will go west on SE Dodge Park Boulevard, then run along a graveled farm road (Figure 11) to the north to SE Lusted Road where the route will turn west again. At SE Altman Road, the pipeline will head north to SE Oxbow Drive where it will connect to the existing system. The FW pipe will be installed via trenching, and all pipe adjacent to existing roadways will be confined to the existing right-of-way.

The results of archaeological investigations along the final route for the FW pipeline (FW Alt 5) have been presented in the earlier project report (Musil and Oetting 2021:27-31).



Figure 10. View to the west of the location of the proposed open-cut trench RW pipeline alignment along the gravel driveway to the west of SE Lusted Road (showing ground exposures in April 2021).



Figure 11. View to the south of the excavation of one of the AAI soil probes along FW Alt 5.

Publicly owned rights-of-way along roadways were surveyed for this route in March 2019. The privately owned sections of FW Alt 5 were surveyed in April 2020.

The surveys included inspection of ditches at the edges of the rights-of-way. Ground visibility along these roadways was obscured in many places by lawns and grass fields, with bare ground visible in those sections that were adjacent to farmed fields. Sections of farmed fields were observed along SE Lusted Road, SE Dodge Park Boulevard, and SE Altman Road where ground visibility averaged around 25%, but much of the proposed pipeline alignments consisted of lawns or grass fields where ground visibility was closer to 5%.

In April of 2020, an archaeological survey of FW Alt 5 was conducted on privately-owned land between SE Dodge Park Boulevard and SE Lusted Road that had not been previously surveyed earlier in March 2019 due to pending owner consent. The proposed pipeline will run along a graveled farm road situated along the dividing line between three tax lots. The survey consisted of a pedestrian survey of the 200-foot-wide (60-meter) easement that extends for about 0.5 miles (800 m) between the two roadways. The north half of the alignment on the east side of the gravel road was not surveyed due to a lack of landowner permission, but coverage of the west side is considered to have provided a reliable and sizable sample of the landform.

The easement along the rest of the alignment consisted of fields planted to small trees interspersed with recently tilled fields. The areas planted to trees were cultivated and provided very good (50-75%) ground visibility along the rows of trees, with the newly tilled fields providing 100% visibility. AAI excavated several soil probes at 200-foot intervals along this section of the alignment as well (Figure 11), which were monitored by an archaeologist, providing additional sediment exposures for inspection. No archaeological materials or other indicators of precontact or historical use were encountered along any of the FW alternatives.

Cottrell Road Transmission Main (CRTM)

This local distribution main will extend north from the intersection of SE Dodge Park Boulevard with SE Cottrell Road to the Lusted Hill Treatment Facility. This pipe will connect the new FW pipeline from the Facility on the south to the existing local distribution main in SE Lusted Road on the north by passing through the existing Lusted Hill Treatment Facility. The pipeline will connect to the 66-inch pipelines along the southern right-of-way of SE Dodge Park Road and extend north for about 2,000 feet (600 meters) within the western right-of-way of SE Cottrell Road. The first segment of CRTM pipeline will be installed using open cut trenching across SE Dodge Park Boulevard, followed by trenchless installation to minimize the impact to vegetation, traffic, and residential driveways. The route will move to the east side of SE Cottrell Road about 2,000 feet north of SE Dodge Park Boulevard, extending north about 500 feet (150 meters) to the north side of the Lusted Hill Treatment Facility.



Figure 12. View to the north of the farm road between the tilled field and the line of trees and brush along the northern portion of the SE Bluff Access.

In the spring of 2019, a field crew from Heritage surveyed both sides of SE Cottrell Road from SE Lusted Road south to SE Dodge Park Boulevard along what has now become the proposed alignment of the CRTM. This survey of SE Cottrell Road was undertaken as part of the initial archaeological survey of proposed alternative alignments for the six incoming RW and five outgoing FW pipelines associated with the Projects. Ground visibility within the right-of-way of SE Cottrell Road was obscured along the roadway by driveways, lawns, trees, hedges and other decorative plants. No archaeological materials or other indicators of precontact or historical use were encountered during the survey along SE Cottrell Road. The vast majority of this pipeline route will be installed via boring.

Because access to the Lusted Hill Treatment Facility was not available at the time of the 2019 survey, this area was surveyed in 2023 as described above in this report. Much of the remainder of the route within the treatment facility will be trenchless with a short section of less than 200 feet (60 meters) to be trenched in order to connect to an existing local distribution main in SE Lusted Road (Laney and Phelps 2022). Archaeological survey showed this planned open-cut trench section to be covered by pavement and gravel, heavily disturbed by construction of a road and a few small buildings. Because of the subsurface disturbances and ground covering, this section was not amenable to discovery probing.

Proposed Emergency Access (SE Bluff Road)

The current proposed emergency access is the SE Bluff Access, which connects to the east end of SE Carpenter Lane and runs south along the section line to SE Bluff Road. This alignment was surveyed for archaeological resources in 2021 and is described in the earlier project report (Musil and Oetting 2021:38-40). This route currently consists of an unimproved dirt road that is used to access adjoining agricultural fields. The west side of the access alignment consists entirely of tilled agricultural fields, with most fields planted to small saplings. Along some sections of the unimproved road, there is a narrow strip of mowed grass between the dirt road and the tilled field, but tilled fields directly border the dirt road along most of this route (Figures 12-14). Ground visibility approached 100% in most locations within the tilled fields.

No precontact or historical archaeological materials were observed during the survey of any of the access alternatives, and because of the excellent ground visibility, no additional discovery measures were recommended. The only items observed were small bits of recent debris associated with farming activities and roadside traffic.



Figure 13. View to the north of the narrow strip of grass between the farm road and the tilled field along the SE Bluff Access alignment (note solar farm to the right).



Figure 14. View to the southwest of the dirt driveway through the abandoned farmstead at the southern end of the SE Bluff Access.

7. SUMMARY AND RECOMMENDATIONS

Heritage archaeologists conducted supplementary investigations in February 2023, including a pedestrian archaeological survey along the proposed new alignment of a pipeline located within the existing Lusted Hill Treatment Facility, as well as a re-survey and excavation of 13 discovery probes along a section of the proposed RW pipeline route that was originally designated as RW Alt 1/1A. These two surveys are the latest phase of fieldwork for the overall cultural resources investigations that have been undertaken by Heritage since 2019 for the planning phase of the Water Bureau's Facility and Pipelines projects.

Field methods, including intensive survey, discovery probing, and monitoring of soil probes excavated by AAI, and archaeological results are summarized above in Sections 4 and 6. No evidence of precontact or historical artifacts or deposits was observed on the ground surface during the pedestrian survey along any of the alternative pipeline alignments or within the Facility parcel. Similarly, no archaeological indicators were noted in the backdirt of the soil probes excavated by AAI and monitored by Heritage.

As outlined in Section 3, previous archaeological surveys within one mile of the project area have identified only one site, a location where sandbags were placed on the Sandy River floodplain by the U. S. Army Corps of Engineers in 1965 as riprap walls for riverbank protection following floods in 1964 (35MU275). No precontact archaeological sites have been found within one mile of the project area, likely due in part to the fact that most of the land is in private ownership and has not been previously surveyed by archaeologists.

Looking farther afield, the closest area where archaeological resources have been found [REDACTED] miles southwest of the current project. There, evidence of precontact activity is found in the form of "numerous surface or near-surface prehistoric lithic assemblages located on knolls or hillsides near springs or small streams" (Woodward 1974:9) and on banks and terraces near streams (Ellis et al. 1991). The extent to which knolls, springs, and small streams that may have attracted Native people were once present in the present project area is difficult to assess given the extensive modification of the landscape from agricultural activities.

To date, archaeological investigations have sampled a broad portion of the tableland that included a substantial amount of open farmed fields, where ground visibility is greatly enhanced by agricultural activities. Despite good surface visibility in a large portion of the APE, no precontact Native American cultural materials were found in the Facility area, along the access alternatives, or within any of the surveyed pipeline routes.

The surface exposure in open farm fields that was available during the surveys increases the visibility of archaeological materials (including any buried materials that have been brought to the surface by plowing) and, in turn, enhances the reliability of the survey results. As elsewhere on the Kelso Slope, the topsoil (A Horizon) within the project area is a shallow layer of silty clay loam, and it is in this deposit that cultural materials, if present, are most likely to occur.

Limitations of Probe Excavations for Site Discovery

A review of subsurface discovery probe investigations in the Kelso Slope vicinity finds that, with one exception, probing has been less successful at locating unknown archaeological sites than the associated surface surveys (Table 2). The exception is precontact site 35CL265 discussed above, where probes yielded lithic artifacts in an area thought to have high potential but with poor surface visibility (Oetting 1999, 2003).

In the other 11 archaeological investigations employing discovery probing conducted within about 8 miles of the current PWB project area (Fortin et al. 2019 excavated probes in two separate areas), surface surveys for two projects had identified historical or multi-component sites on the surface (Fortin et al. 2019) or were aware that a historical farm had been in the immediate area (O’Grady 2016), and subsurface probes found similar historical archaeological materials at or near these surface locations. For the other projects, probes were excavated in areas of high probability near water sources, generally in conditions of poor ground surface visibility. Only one investigation found subsurface cultural materials, and these were limited to three precontact isolated finds of one to four flakes (Sarjeant et al. 2021). The other eight projects all resulted in negative findings (Adams et al. 2018; Becker and Butler 2013; Becker and Roulette 2005; Buchanan and Fagan 2008; Chapman et al. 2005; Fortin et al. 2019; Oetting 2005b; Windler 2017).

Archaeological sites on the Kelso Slope are almost always identified by the presence of cultural materials on the surface. The results of previous investigations indicate that excavation of discovery probes is not a productive method of identifying evidence of precontact and historic activity and occupation on the Kelso Slope. In settings characterized by shallow soils, where any archaeological evidence present will be sparse and dispersed, excavation of 30-cm-diameter holes in the ground amounts to little more than pinpricks on the landscape.¹

Recommended Strategy for Site Discovery

Monitoring by archaeologists is a legitimate and valuable part of the archaeologist’s toolkit for discovering archaeological sites and is particularly appropriate in areas

¹ Excavation of probes is best used in areas likely to contain subsurface deposits. The higher the concentration of cultural materials, the more likely a site will be identified through probing. From a sampling standpoint, the excavation of 30-cm round probes at 20-meter intervals only samples 0.018% of a 20x20-meter area, which is a very tiny sample. If the project vicinity is characterized by diffuse, sparse artifact scatters, probing (or augering) would be inefficient, costly, and likely unsuccessful.

Table 2. Discovery probe excavations conducted in the Kelso Slope vicinity.

Project	Visibility	Likelihood	Probes/ Acreage	Findings	Report
PGE Bull Run Project	0-5%	High: [REDACTED]	23 probes/ 2 acres	Positive: 98 flakes & 4 tools (site 35CL265)	Oetting 1999, 2003 (SHPO #17039 & #18627)
SE 282 nd at SE Stone Rd, Gresham vicinity	low	High: [REDACTED]	2 probes/ 1.7 acres	Negative	Chapman et al. 2005 (SHPO #19889)
Pearl-Troutdale overhead fiber optic (3 tower locations between Clackamas River & Sandy River)	Poor at most towers	Probed due to poor visibility	11 probes at 3 towers/ 9 acres	Negative at all three towers	Becker and Roulette 2005 (SHPO #19975)
Ten Eyck Rd Bridge @ Sandy River	<5%	High: [REDACTED]	10 probes/ 3 acres	Negative	Oetting 2005a, 2005b (SHPO #19963 & #20310)
Sandy River conduit replacement, Dodge Park	Not stated	High: [REDACTED]	18 probes/ 10 acres	Negative	Buchanan and Fagan 2008 (SHPO #21825)
Douglas Ridge Rifle Club Range	0-5%	High: [REDACTED]	20 probes/ 0.4 acre	Negative	Becker and Butler 2013 (SHPO #26107)
US26: SE 282 nd , Gresham vicinity	Poor but % not specified	On historical farm probed due to poor visibility; unnamed spring/creek on property	36 probes/ 2.5 acres	Historical items @ historical farm (35CL408)	O'Grady 2016, O'Grady and Ruiz 2017 (SHPO #28011 & #29470)
Oxbow Regional Park restoration	Varied, 0-50%	High: [REDACTED]	8 probes/ 10 acres	Negative probes; historical 35MU275 on surface	Windler 2017 (SHPO #29245)
267 th & SE Anderson Rd, Gresham vicinity	5-30%	High: [REDACTED]	5 probes/ 1.2 acres	Negative	Adams et al. 2018 (SHPO #30169)
Bull Run River Bridge	2 multi-component sites found during surface survey [REDACTED]	High: [REDACTED]	15 probes [REDACTED]	[REDACTED]	Fortin et al. 2019 (SHPO #30774)
Bell St @ SE 362 nd , Sandy	0-5%	High: [REDACTED]	46 probes/ 16.1 acres	3 isolates	Sarjeant et al. 2021 (SHPO #32689)

undergoing construction. Field methods must be adapted to the particular depositional setting under investigation. Given the shallow soils in the area, and the wide dispersal of artifacts reportedly found by landowners over acres of farmland, larger exposures of the ground surface are needed, such as the exposures that will be provided by ground clearing for construction of the Filtration Projects.

For these reasons, Heritage recommends a program of monitoring by archaeologists with close observation of ground exposures during the initial ground clearing activities when construction commences. Artifacts were reportedly previously collected in the project area vicinity when the ground was churned by plowing and tilling of the soil for agricultural purposes. Further finds of artifacts, with possible discovery of precontact sites if present, will likely require ground disturbance on a similar scale, as carried out during earth-moving associated with construction.

Although no archaeological resources have yet been identified within the Projects boundaries, several areas of potential archaeological concern have been defined to help project personnel be alert to the possibility of encountering archaeological materials. It should be understood that archaeological patterning has likely been greatly obscured or eliminated over the past 100 years of blasting and pulling stumps, agricultural tilling, and the close working of fields by farmers. Artifacts within shallow soil become significantly dispersed with each decade that a field has been plowed and tilled, and much of the project area has been in cultivation for nearly a century or longer. Repeated dispersal of artifacts in shallow soil raises serious questions about the structural or stratigraphic integrity of any cultural deposits in the project area (Schiffer 1987; Cowan and Odell 1990; Yorston et al. 1990; Schott 1995; Becher 1996).

Areas of potential archaeological concern (Figure 15) have been identified in three categories for the Projects area where monitoring of initial ground clearing is recommended (areas where the upper soil stratum [plowzone] has been previously removed by road or other construction are already removed from consideration):

Water sources. Because the terrain in the Projects vicinity is broad and relatively featureless, it is likely that early travelers through the area would have stayed in close proximity to reliable water sources. Significant effort was made by the Water Bureau to locate and design the Projects to avoid or mitigate impacts to sensitive environmental zones, including water and wetlands, to the extent possible, so there are relatively few locations where construction activities will intersect or come in next proximity with water sources. Five locations have been identified (Figure 15) where water may have been a resource in past centuries:

1. While Johnson Creek is outside the boundary of the Facility parcel, a small portion of its associated environmental protection zone (SEC-WR) occupies a small area of the southwest corner of the parcel. While archaeological monitoring would be recommended for any area within 50 meters (approximately 160 feet) of the course of the creek itself, that area will be wholly within the SEC-WR set-aside for this parcel (designated a “no work” zone) and will not be disturbed by construction.

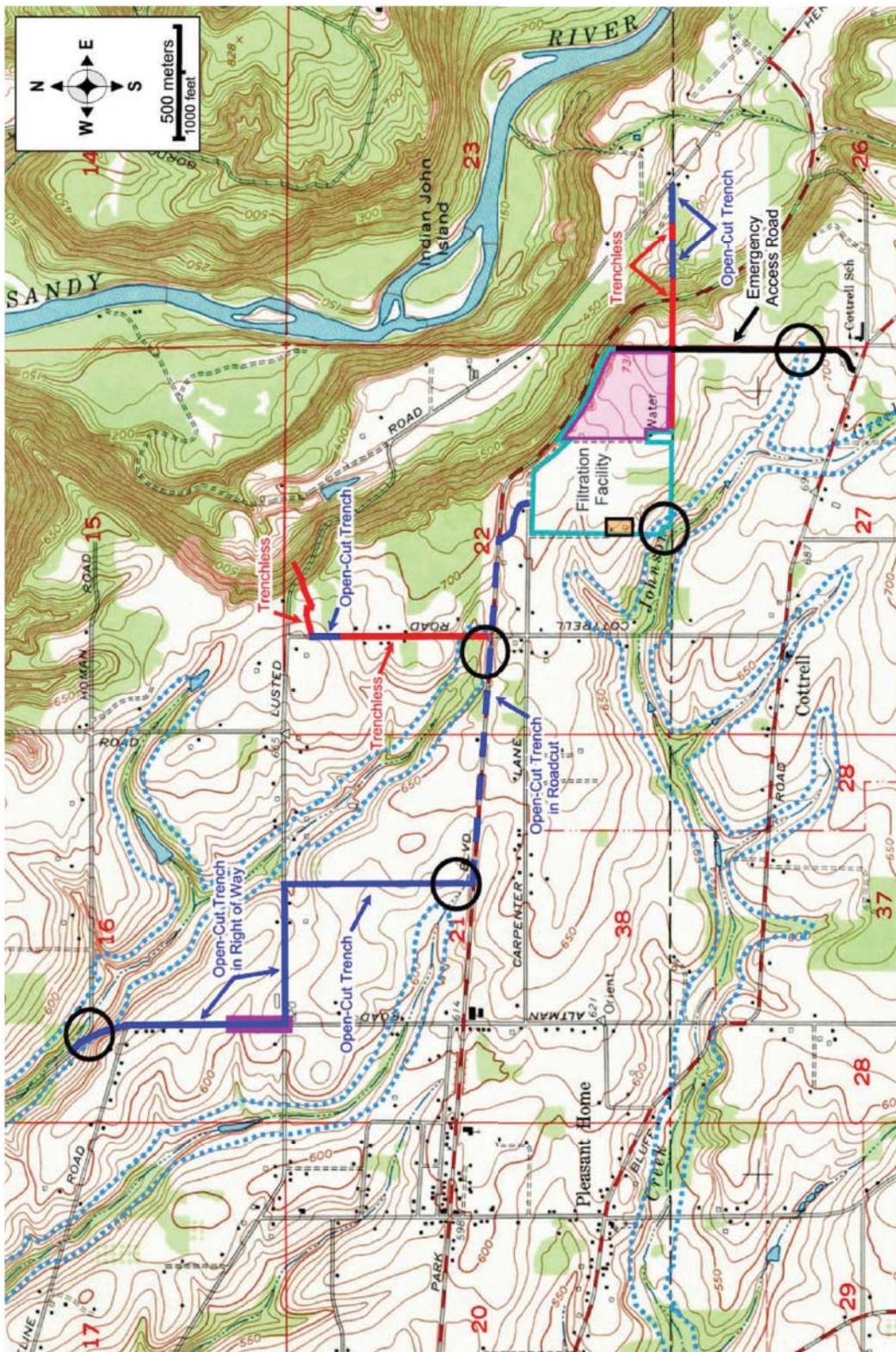


Figure 15. Location of areas of archaeological potential identified for monitoring during initial ground disturbance or for other pre-construction examination: (1) pipeline segments and facility corner near SEC-WR zones (black circles), (2) proximity to historical farmstead (orange rectangle), and (3) areas (fuchsia highlight) of reported artifact finds 50+ years ago. Proposed Bull Run treatment facility includes the Filtration Facility parcel (blue-green outline), showing pipeline trenching locations (blue line), areas of road ROW that are in roadcut (dashed dark blue line), and trenchless (bored) pipeline sections (red).

Three areas have been identified along the FW pipeline within road rights-of-way.

2. Pipe along Cottrell Road through the SEC-WR zone at the head of the North Fork Beaver Creek will be bored well below the surface to avoid impacts and will not require monitoring. The section along SE Dodge Park Road is within a road cut and will likely not require monitoring.

3. The section of FW pipe that will turn north across a field from SE Dodge Park Road passes near the SEC-WR zone for the Middle Fork Beaver Creek. It is recommended that monitoring be conducted if any portion of this area is within 50 meters of the channel of this creek.

4. At the north end of the FW pipe corridor, the alignment comes back into proximity to the North Fork Beaver Creek. Monitoring again is recommended within 50 m of the water course, unless previous construction has removed the upper soil stratum where artifacts would most likely be found.

A fifth area was identified along the Emergency Access Road:

5. A drainage to Johnson Creek is located along the Emergency Access Road (SE Bluff Road) south of the Facility. Monitoring is recommended within 50 meters on either side of the drainage unless no excavation will be conducted.

Historical features. The only historical feature identified during the project survey was a historical farmstead area with remnant barn foundation in the Facility area. This former farmstead was removed between 1975 and 1980 and any structural remains associated with the buildings are of insufficient age to be considered an archaeological resource by the Oregon SHPO. Although the buildings and associated debris had been removed prior to archaeological survey, there is the possibility that below-ground features (such as a privy or a well) may be encountered. Monitoring is recommended within 30 meters (100 feet) of the former house location where such features are likely to be located. An archaeological monitor experienced in identifying such features, as well as in identifying diagnostic artifacts that may be found in association, should be employed for this particular location.

Areas of reported artifact finds. Two property owners have provided information that an earlier generation of family members collected Native American artifacts from within or near portions of the project area. While the information is not location-specific, two areas have been added to the areas of concern in response to these claims.

1. The eastern portion of the Facility parcel will be monitored during initial ground clearing, providing another opportunity to look closely at the ground surface. This parcel appears to be some distance from water sources, and no evidence of sustained archaeological occupation or other early evidence was identified during the project survey. The construction in this parcel may occur in phases over the course of several years. The artifact collection of the former owner, Ernest Meyer, appears to contain some

items that may be from this parcel. The collection was made while farming on holdings of 80 acres from the 1930s to 1970 (see Appendix B).

2. A 300-meter (1,000-ft) section from the corner of SE Lusted Road and SE Altman Road fronting the Carlson Nursery will be monitored during initial ground disturbance, as the Carlson family has a collection of artifacts from 1905-1960 from their property holdings of about 60 acres to the west (see Appendix B).

Monitoring Process

SHPO carefully outlines measures to be considered and/or included in developing a monitoring plan for construction (SHPO 2023:102-111), including the following outline of activities (SHPO 2023:104). Archaeological monitoring requires the presence of an on-site archaeological monitor during the earth moving portions of a project:

- Monitoring involves close scrutiny of newly exposed soils in order to identify potentially significant cultural resources.
- The archaeological monitor keeps detailed field notes and takes photographs throughout the earth-moving activities.
- If the monitor detects artifacts or archaeological features that may be significant, they will stop work in the area.
- When a discovery is made, construction activities will usually be placed on hold until the reviewing agency, in consultation with the archaeological monitor, determines the find's significance. Such determinations need to seek SHPO concurrence and to determine what further actions need to be taken before work can proceed.
- In cases where a site is determined significant, further archaeological work, such as Phase II Testing or Phase III Data Recovery, may be required.
- Effective monitoring is provided when the archaeological monitor knows the resources of a given area and can assess whether discoveries require further consultation.
- All assessments regarding the National Register significance of a find must be made by an archaeologist who meets the Secretary of the Interior's (SOI) Standards for an Archaeologist (36CFR§61, Appendix A).

Qualifications

Work under this monitoring plan will be carried out by or under the direct supervision of a person meeting at a minimum the *Secretary of the Interior's Professional Qualifications Standards* for archeology (36 CFR Part 61). The on-site archaeological monitor does not have to be SOI-qualified but must have immediate access to a supervising SOI-qualified archaeologist. Specific qualification requirements for archaeological monitors and for supervising archaeological field monitors, including archaeological field experience in the geographic region, are detailed by SHPO (2023:105-105).

Monitoring Guidelines

The Oregon SHPO (2023:109-110) outlines basic steps to follow in the event cultural resources or human remains are encountered during monitoring.

If cultural resources are encountered:

- Halt any construction work that may impact the cultural remains. Redirect construction activities to another area if possible. Place a 10-meter buffer around the discovery.
- Consult with the lead agency and SHPO regarding the significance of the discovery and further action to be taken. If a site is discovered during monitoring and it cannot be avoided, evaluation of the discovery under the terms of a state archaeological permit will be required before work can commence in the area of the find.
- Follow agency and SHPO recommendations regarding documentation and data recovery of the material.

If human remains are encountered:

- Halt any construction work that may impact the human remains. Redirect construction activities to another area if possible.
- Contact the Oregon State Police, lead agency, SHPO, Commission on Indian Services, and appropriate tribes (see notification guidance set forth in the IDP for this project).
- The services of a physical anthropologist may be needed to provide some analysis of the remains to determine ethnicity.
- On non-federal public land, state burial laws (ORS 97.740) must be followed if human remains are found. SHPO will coordinate with appropriate tribes and State Historic Cemetery Commission as appropriate. Consult Oregon Tribal position paper on Treatment of Human Remains Discovered Inadvertently or Through Criminal Investigation on Private and Public, State Owned Lands in Oregon (<http://egov.oregon.gov/OPRD/HCD/ARCH/docs>) so tribal concerns over impacts to and relocation of discovered human remains can be considered.

This archaeological monitoring plan will be reviewed on an annual basis, and more frequently if needed, to adjust for the findings made to date by the archaeological monitors. Monitoring areas or efforts may be expanded or otherwise revised if there is justification for such modifications. It is intended that this work plan will evolve as more information becomes available.

Concluding Remarks

Archaeological surveys, using 20-m transect intervals, examined the proposed Facility location covering approximately 95 acres of agricultural land on the top of a broad rolling bluff west of the Sandy River. Several raw water and finished water pipeline alternative

routes in existing public rights-of-way (ROW) and on private land were also surveyed, covering about 18 acres. The current findings are summarized as follows:

- No precontact Native American cultural materials were found in the Facility area or in the surveyed pipeline alternative routes. The absence of a reliable water source, particularly within the filtration parcel, reduces the likelihood of sustained activity or occupation by Native peoples.
- A historical farmstead area with remnant barn foundation was found in the Facility area; this former farmstead was removed between 1975 and 1980 and is of insufficient age to be considered an archaeological resource.
- The surface exposure in open farm fields that was available during the survey increases the visibility of archaeological materials (including buried materials that have been brought to the surface by plowing) and, in turn, improves the reliability of the survey results.
- Given the shallowness of the soils in the area, as well as the original land clearing and the subsequent plowing/tilling of these fields over many decades, shovel or auger probes are unlikely to be effective in locating archaeological materials.
- All ground disturbing construction activities should be conducted under the terms of an Inadvertent Discovery Protocol (IDP); the Water Bureau has finalized an IDP and shared it with tribes and Oregon SHPO, is developing contractor IDP training prior to construction, and has committed to IDP implementation during construction.

In addition to an IDP, Heritage has recommended a program of monitoring by archaeologists with close observation of ground exposures during the initial ground clearing activities when construction commences. An archaeological monitoring approach has been developed to more closely inspect several areas of potential archaeological concern, including (1) several areas near water resources, (2) the vicinity of the historical farmstead, and (3) two locales where archaeological finds from 50 to 120 years ago have recently been reported. Artifacts were previously collected in the project vicinity when the ground was churned by plowing and tilling of the soil for agricultural purposes. Further finds of artifacts, with possible discovery of precontact sites if present, will likely require ground disturbance on a similar scale, as carried out during earth-moving associated with construction. Although no known or potential archaeological resources are currently anticipated to be impacted, the Water Bureau has allocated resources to perform periodic inspections and monitoring as warranted under the monitoring plan developed for this project.

To date, evidence of sustained activity by Native peoples on the Kelso Slope is relatively sparse. It should be remembered that much human activity often leaves little or no footprint. Given the extent of the archaeological investigations so far undertaken, it seems likely that the area through which the filtration parcel and pipelines pass primarily reflects upland travel by small groups of Native peoples for the purposes of hunting, gathering of seasonal foods, or passing from one drainage to another. Maintaining access to water, which is not available in the Facility area, is an important requirement for travel through upland terrain.

Rather than sites occupied for various lengths of time, local collections of artifacts may represent a series of isolates somehow lost over thousands of years of traveling or hunting in the forest. In this regard, flaked stone debris and fire-cracked rock characteristically found at campsites (e.g., as at the Geertz Site), have not yet been identified in the project area vicinity. More can undoubtedly be learned about early use of the Kelso Slope, but key discoveries about precontact Native American activity will likely be made outside the area of the Bull Run Filtration Projects.

REFERENCES CITED

- Adams, Ron L., Andrea Blaser, and Judith A. Chapman
 2018 *Cultural Resource Survey of the SE 267th Avenue and SE Anderson Road Culvert Replacement Project, Multnomah County, Oregon*. Report by Archaeological Investigations Northwest, Portland, OR, to Harper Houf Peterson Righellis, Inc., Portland, OR. Archaeological Investigations Northwest Report No. 4062. Oregon SHPO Report #30169.
- Ames, Kenneth M.
 1994 *Archaeological Context Statement, Portland Basin*. Portland State University, Wapato Valley Archaeological Project Report No. 4.
- Baxter, Paul W.
 2019 *Pedestrian Survey, Subsurface Reconnaissance and Evaluation of Site 35CL132 in Advance of the OR212: SE Richey Rd.-US26 Section Project*. Report by University of Oregon Museum of Natural and Cultural History, Eugene, OR to Oregon Department of Transportation, Salem, OR. Museum Report No. 2019-002. Oregon SHPO Report #30213.
- Becher, Matthew E.
 1996 Plowzones: What Are They Good For? *The Grapevine Newsletter* 6(2):5-7.
- Becker, Anisa, and Stephanie Butler
 2013 *Douglas Ridge Rifle Club Range Improvements Project, Eagle Creek, Clackamas County, Oregon*. Report by URS Corporation, Portland, OR, to Douglas Ridge Rifle Club, Eagle Creek, OR. SHPO Report #26107.
- Becker, Thomas E., Bill R. Roulette
 2005 *Results of an Archaeological Survey Conducted as Part of the Pearl-Troutdale Fiber Optic Project, Clackamas County, Oregon*. Report by Applied Archaeological Research, Portland, OR, to Bonneville Power Administration, Portland, OR. Applied Archaeological Research Report 492. SHPO Report #19975.
- Bednarz, Susan
 2020 Geology and Geotechnical Information Review. Attachment A in *Bull Run Filtration Projects: Preliminary Geotechnical Assessment Report*. Report by Lacamas Consulting to the Portland Water Bureau.
- Bowden, Brad
 1992 Site Record Form for 35CL132. On file at Oregon State Historic Preservation Office, Salem, OR.
- Buchanan, Kelsey W., and John L. Fagan
 2008 *Archaeological Survey of the Sandy River Conduit Relocation Project Near Sandy, Clackamas County, Oregon*. Report by Archaeological Investigations Northwest, Inc.,

to ESA Adolfson and Portland Water Bureau, Portland, OR. Report No. 2124. Oregon SHPO Report #21825.

Chapman, Judith A., Nicholas J. Smits, Elizabeth J. O'Brien, and Jo Reese

2005 *Cultural Resource Baseline Report for the SE 282nd Avenue @ SE Stone Road Improvement Project*. Report by Archaeological Investigations Northwest, Portland, OR, to Multnomah County, Portland, OR. Archaeological Investigations Northwest Report No. 1471. Oregon SHPO Report #19889.

Chapman, Judith A., Elizabeth J. O'Brien, and Ron L. Adams

2016 *Cultural Resources Survey of the Oxbow Regional Park Project, Multnomah County, Oregon*. Report by Archaeological Investigations Northwest, Inc., Portland, OR, to Metro, Portland. Archaeological Investigations Report No. 3483. Oregon SHPO Report #27409.

Chartkoff, Joseph L., and Kerry K. Chartkoff

1980 *The Discovery of Archaeological Sites, A Review of Methods and Techniques*. USDA Forest Service, PSW Grant No. 35, Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.

Cowan, Frank L., and George H. Odell

1990 More on Estimating Tillage Effects: Reply to Dunnell and Yorston. *American Antiquity* 55(3):598-605.

Ellis, David V., Robert Burnett, and Jo Reese

1991 *Cultural Resource Evaluation of the Proposed Sunrise Corridor Project, Clackamas County, Oregon*. Report by Archaeological Investigations Northwest, Portland, OR, to Dames & Moore and Oregon Department of Transportation, Salem, OR. Archaeological Investigations Northwest Report No. 17. Oregon SHPO Report #12832.

Fortin, Louis W., Judith A. Chapman, and John L. Fagan

2019 *Phase I Archaeological Investigations for the Bull Run River Bridge Replacement Project, Clackamas County, Oregon*. Report by Archaeological Investigations Northwest, Portland, OR, to Quincy Engineering, Inc., Salem, OR. Archaeological Investigations Northwest Report No. 4258. Oregon SHPO Report #30774.

Franklin, Jerry F., and C. T. Dyrness

1973 *Natural Vegetation of Oregon and Washington*. USDA Forest Service General Technical Paper PNW-8. Portland, OR.

French, David H., and Kathrine S. French

1998 Wasco, Wishram, and Cascades. In *Handbook of North American Indians, Volume 12: Plateau*, edited by Deward Walker Jr., pp. 360-377. Smithsonian Institution, Washington, D.C.

French, Kathrine S., Yvonne Hajda, and David V. Ellis

2000 *Bull Run Hydroelectric Project (FERC No. 477) Literature Review for Identification of Traditional Cultural Properties*. Report by Archaeological Investigations Northwest, Inc., to Portland General Electric Company, Portland, OR. Letter Report No. 347. Oregon SHPO Report #17038.

Gerig, Allen J.

- 1983 *Soil Survey of Clackamas County Area, Oregon*. Natural Resources Conservation Service.

GLO (General Land Office)

- 1855 Cadastral Survey Plat, T1S, R4E, Willamette Meridian. University of Oregon Knight Library, electronic document, <http://libweb.uoregon.edu/map/GIS/Data/Oregon/GLO>, accessed March 2019.

Goodwin, Matt F.

- 2018 *Archaeological Survey for Proposed PGE Dunn's Corner Telecommunications Facility, Clackamas County, Oregon, Technical Memorandum*. Report by Willamette Cultural Resources Associates, Ltd., Portland, OR, to Black Mountain Consulting, Portland, OR. WillametteCRA Report No. 17-132. Oregon SHPO Report #29740.

Green, George L.

- 1983 *Soil Survey of Multnomah County, Oregon*. Natural Resources Conservation Service.

Hajda, Yvonne P.

- 1984 *Regional Social Organization in the Greater Lower Columbia, 1792-1830*. Unpublished PhD Dissertation, Department of Anthropology, University of Washington.

Hogenson, C. M., and B. L. Foxworthy

- 1965 *Groundwater in the East Portland Area, Oregon*. US Geological Survey Water Supply Paper 1793. US Government Printing Office, Washington, DC.

Laney, Travis, and Brad Phelps

- 2022 Cottrell Road Transmission Main (Backfeed Line) Alignment Revision. Technical Memorandum prepared for the Portland Water Bureau. City of Portland by Jacobs Engineering, Portland.

McDaniel, Sarah

- 2005 *Archaeological Resources Survey Report: Bull Run Water System Seismic Upgrade--Diack's and Sester's Ponds Conduit Replacement Project, Multnomah County, Oregon*. Report by URS Corporation, Portland, OR, to U. S. Department of Homeland Security, Bothell, WA. Oregon SHPO Report #20312.

Musil, Robert R., and Albert C. Oetting

- 2017 *Archaeological Survey of the Oxbow-PWB Restoration Project, Oxbow Regional Park, Multnomah County, Oregon*. Report by Heritage Research Associates, Inc., Eugene, OR, to Portland Water Bureau, Portland, OR. Heritage Research Associates Letter Report 17-3. Oregon SHPO Report #28797.

- 2021 *Archaeological Survey of the Proposed Portland Water Bureau Bull Run Water Treatment Plant Project, Gresham Vicinity, Clackamas and Multnomah Counties, Oregon*. Report to Brown and Caldwell and the Portland Water Bureau, City of Portland. Heritage Research Associates Report 470, Eugene. SHPO Report #32146.

Oetting, Albert C.

- 1992 A Review of Forested Survey Approaches. In *An Inventory Strategy Plan for BLM Lands in the Oregon Coast Range*, by Kathryn A. Toepel and Albert C. Oetting, pp.115-125. Report by Heritage Research Associates, Inc., Eugene, OR, to USDI Bureau of Land Management, Portland, OR. Heritage Research Associates Report No. 135. Oregon SHPO Report #13629.

Oetting, Albert C.

- 1999 *Archaeological Investigations for the Portland General Electric Bull Run Hydroelectric Project, Clackamas County, Oregon*. Report by Heritage Research Associates, Inc., Eugene, OR, to Portland General Electric Company, Portland, OR. Heritage Research Associates Report No. 227. Oregon SHPO Report #17039.

- 2003 *Evaluation of Three Archaeological Sites in the Portland General Electric Bull Run Hydroelectric Project (FERC No. 466)*. Report by Heritage Research Associates, Inc., Eugene, OR, to Portland General Electric Company, Portland, OR. Heritage Research Associates Report No. 254. Oregon SHPO Report #18627.

Oetting, Albert C.

- 2005a *Cultural Resources Survey of the Ten Eyck Road Bridge (Revenue Bridge) over the Sandy River, Clackamas County, Oregon*. Report by Heritage Research Associates, Inc., Eugene, OR, to W&H Pacific, Portland, OR. Heritage Research Associates Letter Report 05-38. SHPO Report #19963.

- 2005b *Site Discovery Probing at the Ten Eyck Road Bridge (Revenue Bridge) over the Sandy River, Clackamas County, Oregon*. Report by Heritage Research Associates, Inc., Eugene, OR, to W&H Pacific, Portland, OR. Heritage Research Associates Letter Report 05-65. SHPO Report #20310.

O'Grady, Patrick

- 2016 *US26: SE 282nd Avenue Overcrossing Archaeological Survey and Subsurface Reconnaissance Project*. Report by University of Oregon Museum of Natural and Cultural History, Eugene, OR to Oregon Department of Transportation, Salem, OR. Museum Report No. 2016-014. Oregon SHPO Report #28011.

O'Grady, Patrick, and Christopher Ruiz

- 2017 *US26: SE 282nd Avenue Overcrossing 2017 Subsurface Reconnaissance and Testing Project, Clackamas County*. Report by University of Oregon Museum of Natural and Cultural History, Eugene, OR to Oregon Department of Transportation, Salem, OR. Museum Report No. 2017-054. Oregon SHPO Report #29470.

Oliver, Liz, and Sunshine Schmidt

- 2011 *A Cultural Resource Survey of Three Locations on the Ostrander-Wautoma No. 1 Lines*. Report by Bonneville Power Administration, Portland, OR. Oregon SHPO Report #24087.

OSHPO (Oregon State Historic Preservation Office)

- 2023 *Guidelines for Conducting Field Archaeology in Oregon*. Oregon State Historic Preservation Office, Oregon Parks and Recreation Department, Salem, OR. Electronic

document,
http://www.oregon.gov/oprd/HCD/ARCH/docs/final_field_guidelines%202013.pdf.
 Accessed July 2023.

Roulette, Bill R., and Lucille E. Harris

2014 *Results of a Cultural Resources Survey of BPA's Wautoma-Ostrander No. 1 Transmission Line Upgrade Project, Benton, Yakima, Klickitat, and Skamania Counties, Washington, and Clackamas and Multnomah Counties, Oregon*. Report by Applied Archaeological Research, Inc., Portland, OR, to Bonneville Power Administration, Portland, OR. Applied Archaeological Research, Inc., Report No. 1217. Oregon SHPO Report #26263.

Sarjeant, Carmen, Allison Geary, Andrea Blaser, and Terry Ozbun

2021 *Cultural Resources Survey for the Bell Street and 362nd Avenue Extension Project, Clackamas County, Oregon*. Report by Archaeological Investigations Northwest, Portland, OR, to Harper Houf Peterson Righellis, Inc., Portland, OR. Archaeological Investigations Northwest Report No. 4429. Oregon SHPO Report #32689.

Schiffer, Michael B.

1987 *Formation Processes of the Archaeological Record*. University of New Mexico Press, Albuquerque, NM.

Schiffer, Michael B., Alan P. Sullivan, Timothy C. Klinger

1978 The Design of Archaeological Surveys. *World Archaeology* 10(1):1-10.

Schott, Michael J.

1995 Reliability of Archaeological Records on Cultivated Surfaces: A Michigan Case Study. *Journal of Field Archaeology* 22:475-490.

Silverstein, Michael

1990 Chinookans of the Lower Columbia. In *Handbook of North American Indians, Volume 7: Northwest Coast*, edited by Wayne Suttles, pp. 533-546. Smithsonian Institution, Washington, D.C.

Windler, Zach

2017 *Cultural Resource Investigations for the Oxbow Restoration Project, Multnomah County, Oregon*. Report by Historical Research Associates, Inc., Portland, OR, to Metro, Portland, OR. Oregon SHPO Report #29245.

Woodward, John A.

1972 The Geertz Site: An Early Campsite in Western Oregon. *Tehiwa* 15(2):55-62.

1974 *Salmon, Slaves, and Grizzly Bears: The Prehistoric Antecedents and Ethnohistory of Clackamas Indian Culture*. Unpublished PhD Dissertation, Department of Anthropology, University of Oregon, Eugene.

Yorston, Ronald M., V.L. Gaffney, and P.J. Reynolds

1990 Simulation of Artefact Movement Due to Cultivation. *Journal of Archaeological Science* 17:67-83.

APPENDIX A:

**LOCATIONS OF ALL SURVEYED ALTERNATIVES
FOR THE BULL RUN FILTRATION PROJECTS**

APPENDIX B:

**PROPERTY OWNER COLLECTIONS
IN THE VICINITY OF THE
BULL RUN FILTRATION PROJECTS**

Appendix B:
Property Owner Collections
in the Vicinity of the Bull Run Filtration Projects

The Portland Water Bureau instituted public outreach for the Bull Run Filtration Project in 2019 with a series of public meetings and various contacts with local residents intended to elicit comments on a wide range of topics, including archaeology. Archaeological information on local artifact collections was not shared until the July 2023 land use hearing as part of an argument against the proposed Filtration Project. One current property owner as well as the son of a former owner came forward with photographs of collections made by their families in earlier decades, between 50 to nearly 120 years ago.

Their statements and supporting photographs are included in this appendix in acknowledgment of the importance of this information, so that future researchers in the area will be aware of the collections and the nature of the artifacts represented.

Ms. Annell Carlson's Statement

The Carlson family has lived in the area since 1905 and now owns nine tax lots of approximately 60 acres that are part of their family nursery business. The finished water pipeline from the proposed water filtration plant will pass by their farm but will not affect any of their tax lots, nor will it be a visual impact as the pipes will be buried. Ms. Carlson, who records indicate was born in 1934, offered a sentence in her statement regarding archaeological finds on the Carlson property:

Throughout the decades of farming, the family consistently found Native American artifacts on their property as they worked the land for berry farming (Annell Carlson, 06/14/2023).

Two photographs of framed artifacts that were included with her statement give the dates of collection as 1905-1960, raising the question as to how frequently (and exactly where) artifacts have been found for the past almost 120 years. Forty-seven artifacts appear to be included in these two frames, representing the 55-year period indicated on the caption.

While it is certainly feasible that some of these items could have been found around any of the three houses or other outbuildings currently within the tax lots of the Carlson Nursery, the statement given indicates that the finds occurred as they “worked the land for berry farming.” The nature of berry farming brings workers in close proximity to the surface of the ground, greatly increasing the opportunity to notice and collect items. It

would seem likely that artifacts would more frequently occur on the Carlson nursery fields closer to the Middle Fork of Beaver Creek that flows 1,300 feet (a quarter mile) west of the proposed pipeline (Figure B-1).

The placement of the pipeline within the existing road right-of-way is a measure taken by PWB to minimize potential impacts to undisturbed areas. However, because of the concern raised by Ms. Carlson, a section of pipeline trenching approximately 1,000 feet along Altman Road from its intersection with SE Lusted Road has been added to the archaeological monitoring plan for construction as a specific precautionary measure.

Mr. Arden Meyer's Statement

Mr. Arden Meyer's grandparents, Fred and Anna, settled on property north of Carpenter Lane (35075 SE Carpenter Lane) in 1921 when their son Ernest was about 15. Ernest (Arden's father) ultimately owned a number of parcels north of Carpenter Lane with his wife Virginia, including land north of Dodge Park Boulevard at the headwaters of Beaver Creek. Ernest also owned a 37-acre parcel (referred to by the family as "the 40 acres") that is now the east portion of the proposed filtration facility. According to the Multnomah County assessor's records, Ernest and Virginia Meyer sold the 37-acre parcel to the City of Portland in 1975, and it has remained in agricultural use since that time, most recently for growing nursery stock. During these last 48 years, none of the tenants working this parcel have reported finding archaeological materials.

In addition, the Meyer family appears to have owned a 10-acre parcel southeast of the filtration parcel, along the terrace above the Sandy River canyon (Arden Meyer, 02/28/2023, Figure 1). In all, it appears that the Meyer family owned at least 80 acres in the immediate vicinity of the filtration parcel (Figure B-2) until Ernest Meyer sold his holdings.

Mr. Meyer's statement is of interest archaeologically for at least two reasons:

1. He describes the initial clearing of land, a process that no doubt applied to much of the forested land now in cultivation in the broader project vicinity, not just for the 37 acres in the filtration parcel. This ground clearing, while necessary to remove what had likely been old growth Douglas-fir in the late 1800s in order to expand open space for farming, created a great deal of disturbance (up to 5 feet in depth) by dynamiting and pulling stumps and roots from the ground:

When the Meyer family purchased their properties in Multnomah Co in the 1930s, a majority of 80 acres to the south of the previous Bull Run railroad (present day SE Dodge Park Blvd) were "stump-land", including the ~40 acre property currently owned by the Portland Water Bureau.... [W]hen he [Arden] was 6 years old, his dad used dynamite to help remove the tree stumps and roots. Following dynamiting, Arden and his sibling used tractors to pull stumps and roots from the property, which took approximately 4 years. Arden remembers the stumps and roots were up to

5 ft deep—as he remembers standing in the holes. Following removal of the stumps and roots, Ernest tilled and plowed 10-12 inches of the topsoil to level the 40 acres and about 10-15 acres to the southwest of that property (Arden Meyer, 02/28/2023).

2. The report of artifacts shared by Mr. Meyer is of definite interest to archaeologists. Mention had been made in 1971 by an archaeologist working at a site more than two miles from the project area of artifacts collected by local farmers (Woodward 1972), but these collections were not documented. The artifacts shown in the photographs accompanying Mr. Meyer’s statement are reportedly from Ernest Meyer’s 80 acres. The artifacts shown in the statement were arranged in a display, titled “Ho Ho Kam,” for which the senior Mr. Meyer prepared a typed description of the collection as well as a list of what appears to be 34 items that were worthy of individual mention. Most of the smaller chipped stone artifacts (approximately 160 items) are arranged within a circular display with the artifacts arranged symmetrically. Cobble tools and other larger or non-stone items (as well as perhaps items that may have been collected after the central display was completed) are displayed on shelves on either side and below the wheel of artifacts.

Ernest Meyer notes on his typescript that the display was constructed in the early 1970s:

Most of the Indian artifacts were collected from 1930 to 1970, during 40 years of farming 80 acres.... (from Arden Meyer, 02/28/2023, Figure 2).

A list of “exceptions” includes items from Colorado, the Wallow (Wallowa?) Mountains, Washington, Oregon coast, Arizona, Hawaii, New Mexico, East Lake (Oregon), Willamette River, and Mexico. A few items are listed post-dating 1970, and from the dates included the list appears to have been prepared after 1986.

Of local interest are items 5 and 6, described as “rock weapons, #5 was picked up in the yard of the Methodist church in Boring, OR. #6 found on the ‘40’ acre field when clearing land.”

Because this list consistently refers to individual items, it would appear that #6—an item “found on the ‘40’ acre field”—was likely a cobble tool, not the entire display of approximately 160 chipped stone items (Figures 4a-4g), as asserted by the younger Mr. Meyer. It may, in fact, be the cobble tool illustrated in Figure 5 in Mr. Meyer’s statement. Although a #6 does not appear on this artifact in the photo, the label affixed to the cobble corresponds to the location on the typed list:

I picked up this Indian artifact when disking a field on the ‘40’. It is worthy of a place among the artifacts displayed in Ho Ho Kam (from Arden Meyer, 02/28/2023, Figure 5).

We would disagree with Mr. Arden Meyer that his father, who was apparently the sole collector and organizer of this artifact collection according to his typed list, intended to

source all the chipped stone items in the display to the one tax lot that is now part of the proposed filtration parcel, rather than to his multiple holdings of 80 acres as he indicated in the introduction to his list. While it is likely that many of these artifacts came from the former 80-acre holdings of Mr. Ernest Meyer, it appears that only one cobble tool was specifically provenienced to the "40" parcel. It would appear from the geographic range of holdings in the Meyer 80 acres that parcels other than the "40" would be more likely to contain artifacts due to their closer proximity to water, particularly the parcels near the headwaters of Beaver Creek. Unfortunately, Ernest Meyer, who would be the most reliable source for information about his finds in the collection, was born in 1906 and passed away in 2005. His son Arden was born about 1935 according to the 1940 U.S. Federal Census so would have been about 88 years of age at the time this statement was provided. Information is lost with each subsequent generation, and specific locations which are most helpful to an archaeologist are often among the information soonest lost.

As with the concern raised by Ms. Carlson, close monitoring of initial ground clearing in the eastern parcel formerly belonging to the senior Mr. Meyer has been added to the archaeological monitoring plan for construction as a specific precautionary measure.

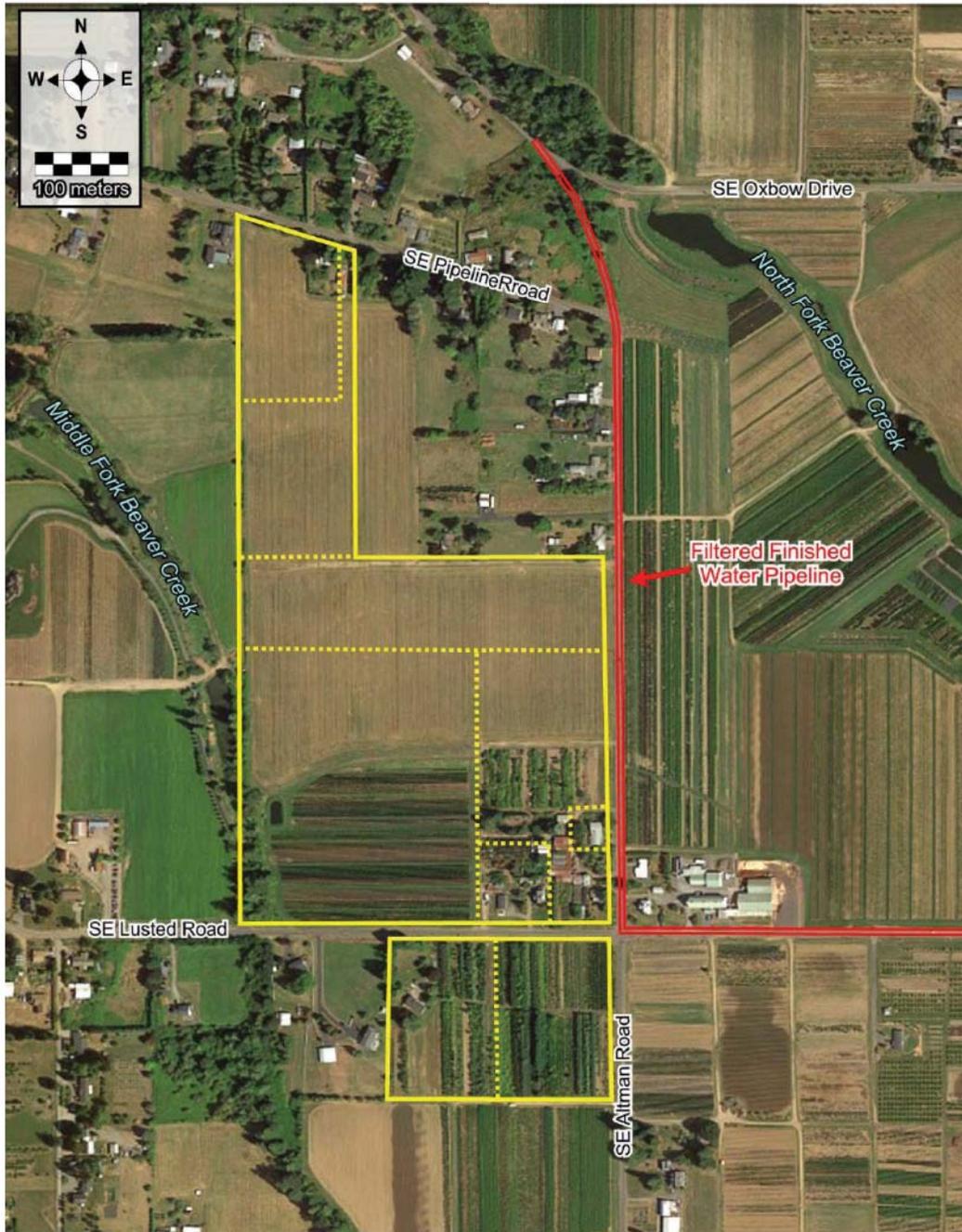


Figure B-1. Current aerial showing the location of the Carlson family's 60 acres (yellow parcels) in relation to the filtered FW pipeline (red line).

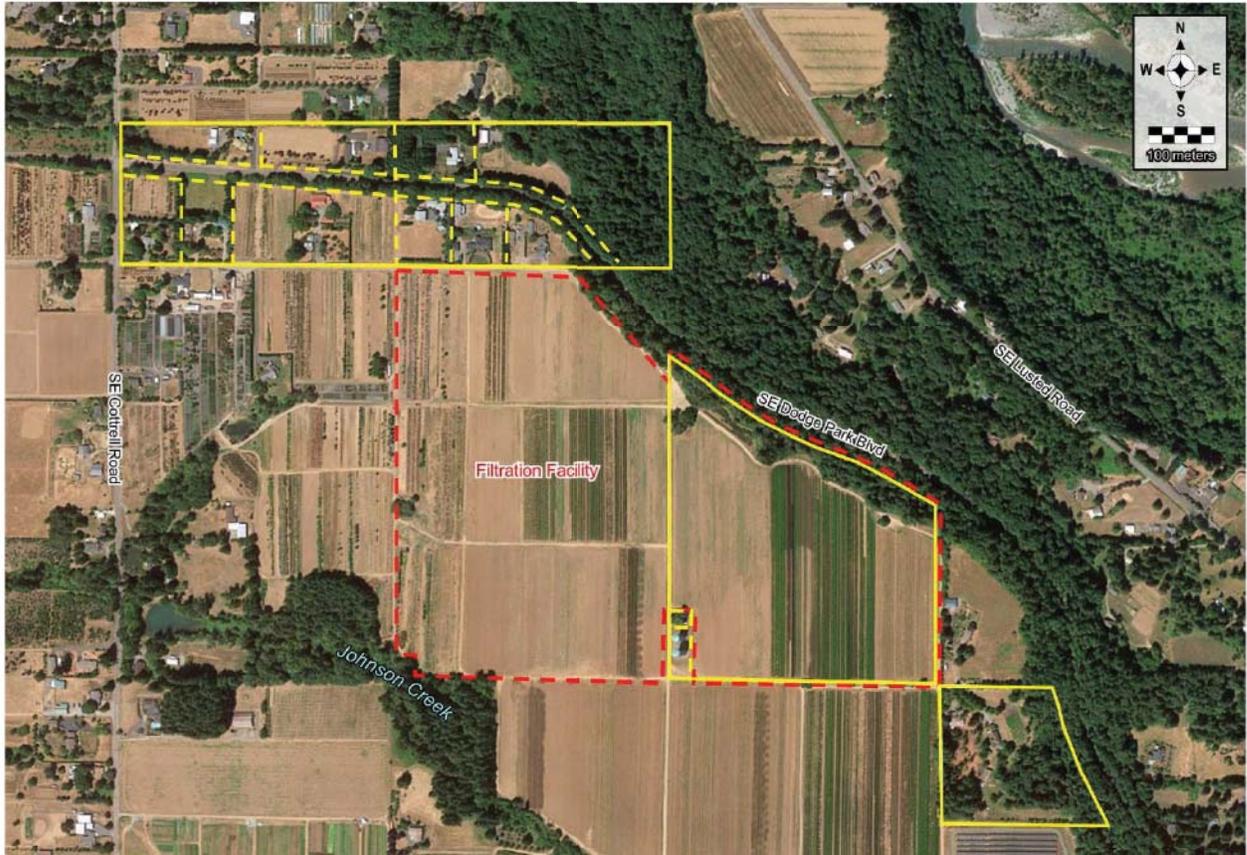


Figure B-2. Current aerial showing the location of Ernest Meyer's 80 acres (yellow parcels) in relation to the Filtration Facility (red dashed parcel).

Annell Carlson Interview 06/14/2023
Interview conducted by Patricia Fiedler
Present During Interview: Annell Carlson, Patricia Fiedler

The Carlson Farm (now Carlson Nursery, Inc) is located at 32627 SE Lusted Rd, Gresham OR 97080. The finished water pipeline from the proposed water filtration plant is planned to run in front of Carlson Nursery.

Annell Carlson's family has owned this property since 1905. Four generations have farmed this property. The property was purchased in 1905 by Gustaf and Mathilda Carlson and later owned by Harry Carlson (Second Generation), Bob and Annell Carlson (3rd generation), and Jim Carlson (4th generation). Annell lives in the home she and Bob built in the 1960s. Her son Jim is the fourth generation farmer and lives in the original home.

The Carlson Farm was originally 40 acres. In September 2005, the Carlson Farm/Nursery was recognized as a Century Farm. It didn't farm nursery stock until the 1950's. Throughout the decades of farming, the family consistently found Native American artifacts on their property as they worked the land for berry farming.

A Century of Farming

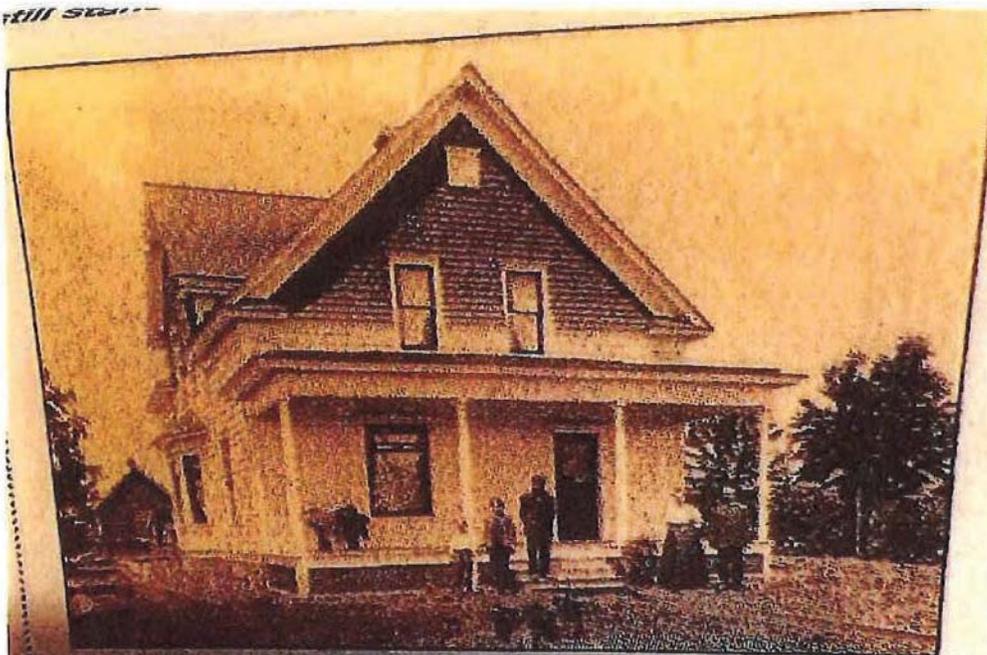
Three generations of Carlsons celebrate nursery's milestone



STAFF PHOTO BY CAROLE ARCHER

Above: Bob Carlson sits on a 1945 tractor with his family, from left to right, granddaughters, Karen, 12, Kalle, 9, daughter-in-law Susan Carlson, wife Annell Carlson, grand-daughter Kristen, 5, and son, Jim Carlson, on the 40 acres the family has owned and operated since 1905. Below: The original Carlson farmhouse still stands on the property (contributed photo).

Picture of the Bob Carlson family on the front page of the Gresham Outlook.



took over the farm. This year, the third, fourth and fifth generations — Robert (Bob) Carlson,

Carlson farmhouse built in 1960.



Artifacts gathered from the Carlson Farm property between 1905 and 1960.



Artifacts gathered from the Carlson Farm property between 1905 and 1960. Photo is an aerial view of the Carlson Farm.



Artifacts gathered from the Carlson Farm property between 1905 and 1960. Photos show construction of the farmhouse to be completed in 1960.

Arden Meyer Interview 02/28/2023

Arden Meyer Review of Draft Interview 06/01/2023

Interview conducted by Lauren Courter, Paul Willis

Present During Interview: Doug & Pat Meyer, Arden Meyer

When the Meyer family purchased their properties in Multnomah Co in the 1930s, a majority of 80 acres to the south of the previous Bull Run railroad (present day SE Dodge Park Blvd) were “stump-land”, including the ~40 acre property currently owned by the Portland Water Bureau (Figure 1). Ernest Meyer and Fred Meyer, Arden’s father and grandfather, respectively, owned property to the north of the previous Bull Run railroad, a single property on SE Carpenter Lane, and a ten acre parcel to the south bordering Johnson Creek in Clackamas County. Ernest Meyer owned other properties south of the Bull Run railroad, as shown in Figure 1. The following account largely relates to the ~40 acre parcel currently owned by the Portland Water Bureau.

Arden is Ernest’s son and when he was 6 years old, his dad used dynamite to help remove the tree stumps and roots. Following dynamiting, Arden and his sibling used tractors to pull stumps and roots from the property, which took approximately 4 years. Arden remembers the stumps and roots were up to 5 ft deep – as he remembers standing in the holes. Following removal of the stumps and roots, Ernest tilled and plowed 10-12 inches of the top soil to level the 40 acres and about 10-15 acres to the southwest of that property. As Ernest worked the soil, he started to uncover Native American artifacts. These artifacts included arrowheads, bowls, and “tomahawks”. Ernest continued to uncover similar artifacts as he farmed for raspberries and blueberries over the years. Arden says that his dad gained “an eye” for noticing artifacts and he would keep ones that were “perfect” looking and intact; leaving behind broken pieces. Ernest kept a display of the artifacts he collected (see photos).

Dr. Brown bought the Meyer’s 40 acres , who eventually sold it to the City of Portland in the 1970s.

Photos

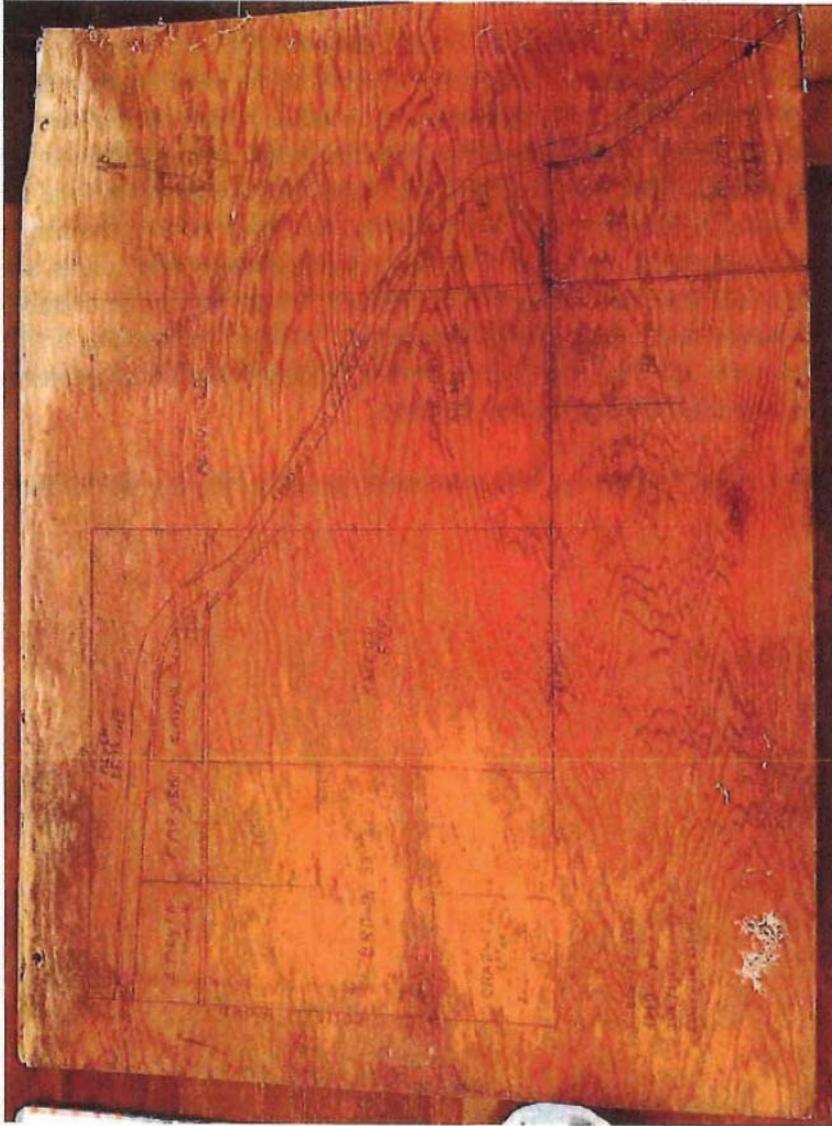


Figure 1. Hand-drawn map of properties owned by the Meyer, McDonald, Brown, Ruegg, Craswell, Colson, and Beers families at SE Cottrell and SE Carpenter Lane. The previous Bull Run railway (now SE Dodge Park Blvd) to the north and the Multnomah-Clackamas county line to the south. Map was created in the 1940s by Ernest Meyer, owner of the Meyer properties shown. The previous 57 acre Ruegg and 37 acre Meyer properties make up the majority of the current Portland Water Bureau property designated for the proposed Bull Run water filtration project.

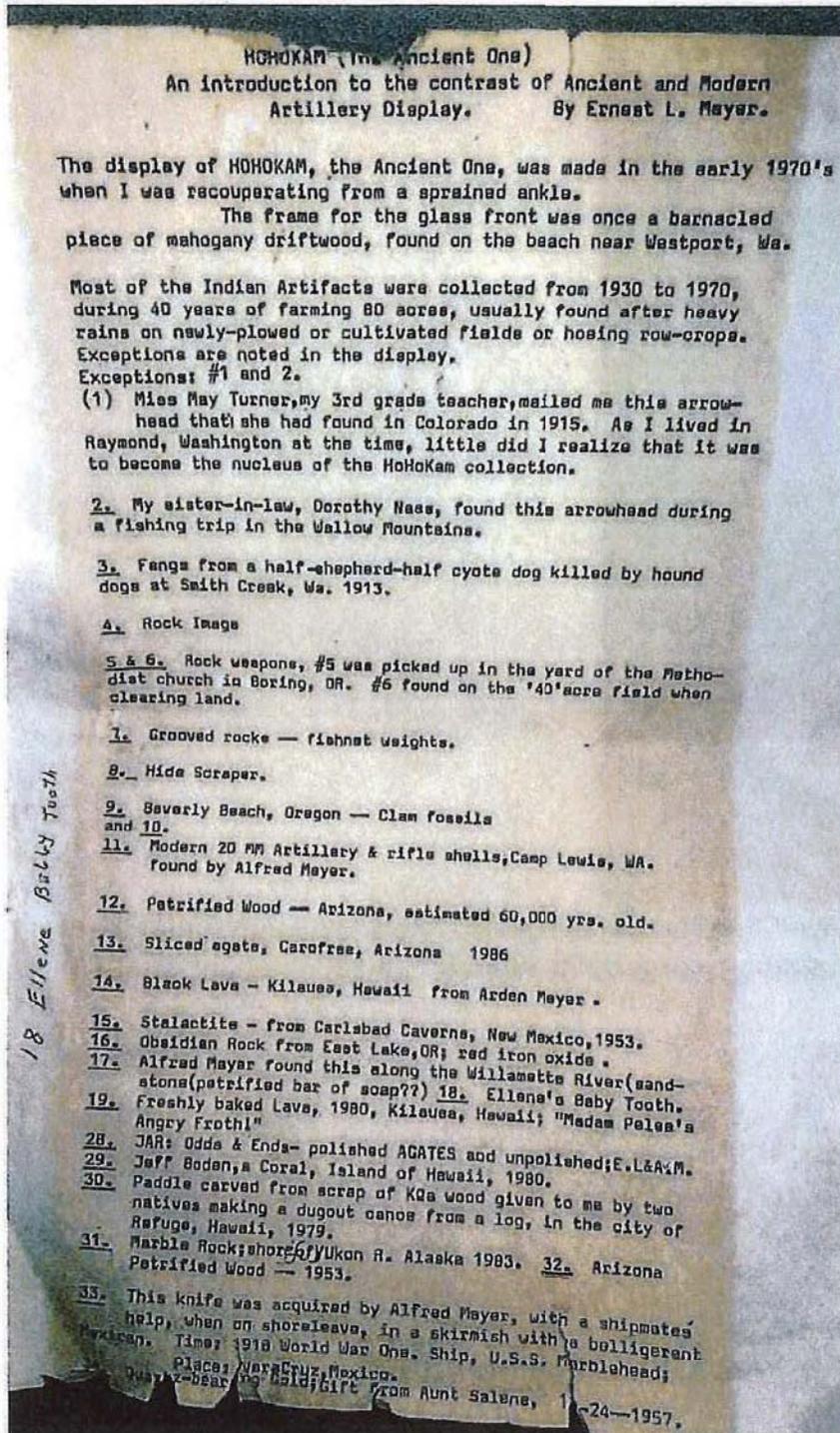


Figure 2. Ernest Meyer's account of his artifact display. Artifacts were gathered from around the country. Items #5 and 6 were rock weapons gathered from the present-day ~40 acres owned by the Portland Water Bureau.



Figure 3. Inventory #5 on Ernest Meyer's artifact list in Figure 2. Rock weapon found on the grounds of the Methodist church in Boring, corner of SE Bluff Rd and SE Pleasant Home Rd.



Figure 4a. Inventory #6 on Ernest Meyer's artifact list in Figure 2. Arrowheads found on the current Portland Water Bureau property. Ernest found these artifacts while plowing, tilling, and farming the ~40 acres between 1930s and 1970s.



Figure 4b. Inventory #6 on Ernest Meyer's artifact list in Figure 2. Arrowheads found on the current Portland Water Bureau property. Ernest found these artifacts while plowing, tilling, and farming the ~40 acres between 1930s and 1970s.



Figure 4c. Inventory #6 on Ernest Meyer's artifact list in Figure 2. Arrowheads found on the current Portland Water Bureau property. Ernest found these artifacts while plowing, tilling, and farming the ~40 acres between 1930s and 1970s. Artifacts denoted by "1" and "2" were not found on the property.



Figure 4d. Inventory #6 on Ernest Meyer's artifact list in Figure 2. Arrowheads found on the current Portland Water Bureau property. Ernest found these artifacts while plowing, tilling, and farming the ~40 acres between 1930s and 1970s.



Figure 4e. Inventory #6 on Ernest Meyer's artifact list in Figure 2. Arrowheads found on the current Portland Water Bureau property. Ernest found these artifacts while plowing, tilling, and farming the ~40 acres between 1930s and 1970s.



Figure 4f. Inventory #6 on Ernest Meyer's artifact list in Figure 2. Arrowheads found on the current Portland Water Bureau property. Ernest found these artifacts while plowing, tilling, and farming the ~40 acres between 1930s and 1970s.



Figure 4g. Inventory #6 on Ernest Meyer's artifact list in Figure 2. Arrowheads found on the current Portland Water Bureau property. Ernest found these artifacts while plowing, tilling, and farming the ~40 acres between 1930s and 1970s.

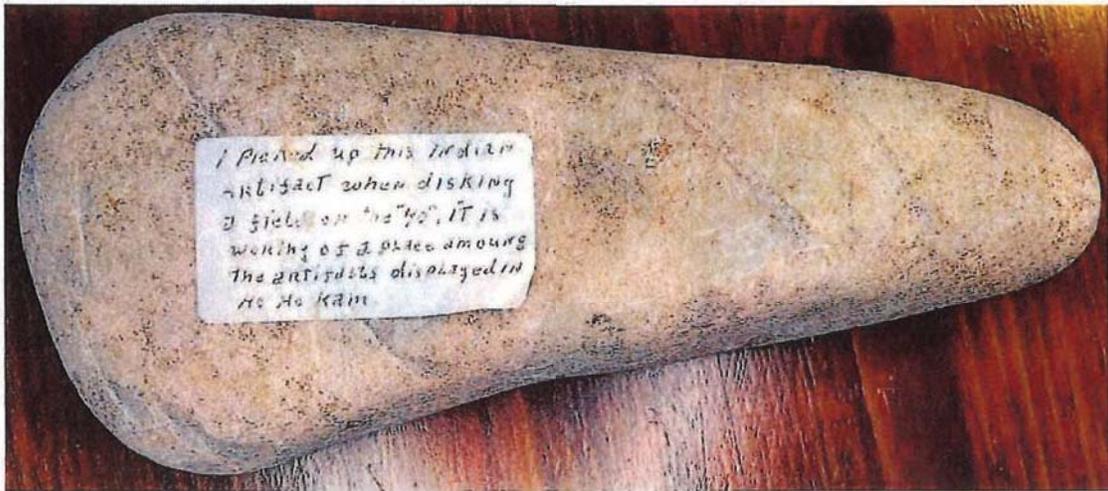


Figure 5. Artifact found on the current Portland Water Bureau property. Ernest found this while "discing" the ~40 acre farmland between 1930s and 1970s.

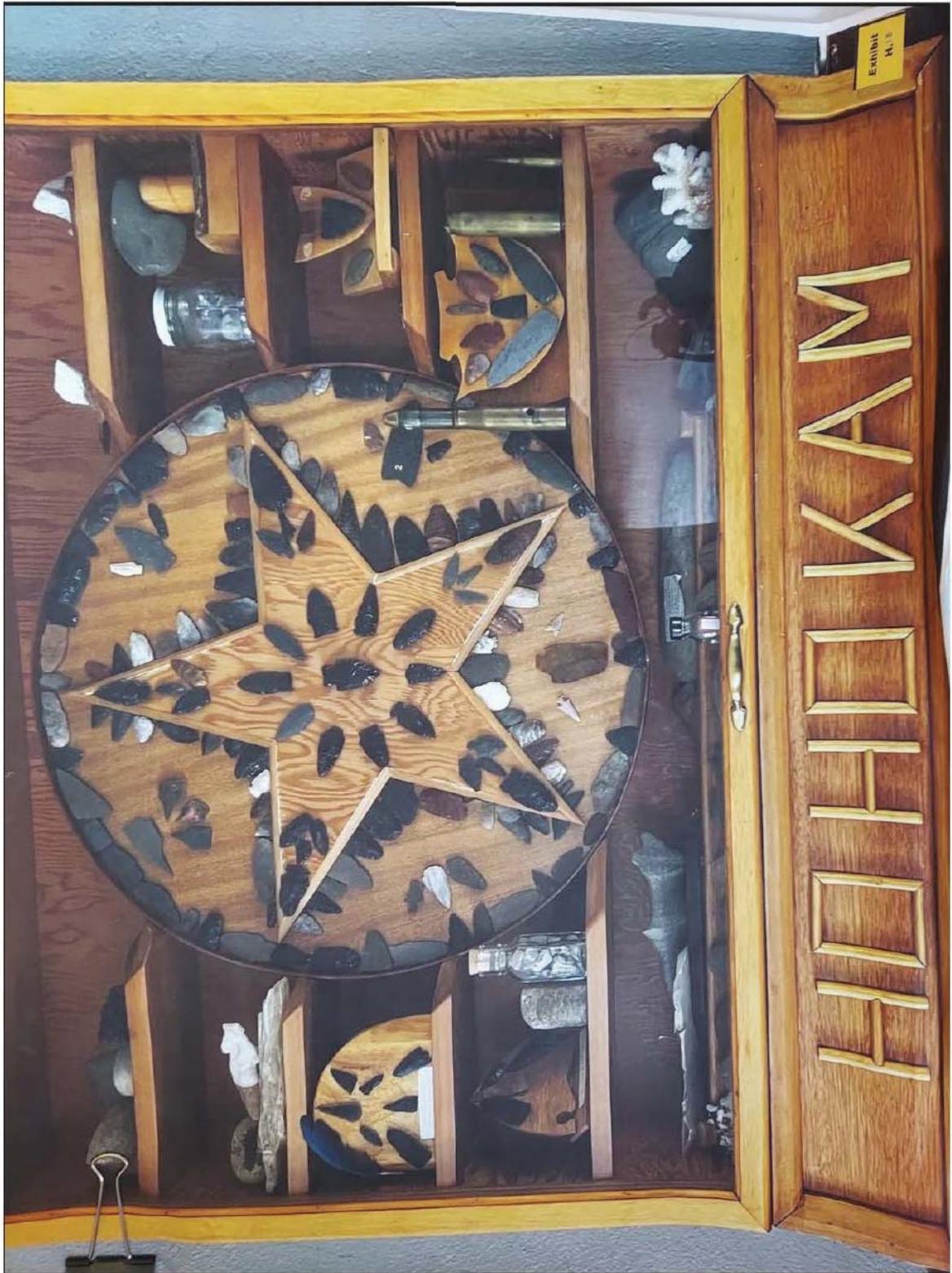


Exhibit H.18

ATTACHMENT B

DRAFT

ARCHAEOLOGICAL MONITORING PLAN FOR CONSTRUCTION OF THE PORTLAND WATER BUREAU BULL RUN FILTRATION PROJECT

July 2023

Purpose

The purpose of this archaeological monitoring plan is to describe the general procedures that are to be followed during the monitoring of initial ground-disturbing construction activities, as well as to outline the protocol for coordination in the event cultural resources are inadvertently discovered. Archaeological monitors are present on site to observe ground disturbing activities as construction proceeds.

Archaeological construction monitoring is most often implemented when there appears to be some potential to encounter buried cultural resources or a probability to encounter human remains. In most cases monitoring by archaeologists is recommended when a ground-disturbing project is planned in or near recorded archaeological sites. In the case of the current project, the likelihood of encountering buried archaeological deposits is considered low due to the shallow and cultivated nature of the soil, and the absence of archaeological indicators observed during an intensive pedestrian survey of the project area during a time of good surface visibility. As a precautionary measure, a monitoring plan has been developed to focus on certain areas that may have potential for containing archaeological materials that may become visible during ground-disturbing construction of the Bull Run Filtration Project.

Project Description

Portland Water Bureau is nearing the end of a multi-year planning process for the development of a new water treatment plant to filter and treat water from the Bull Run watershed in eastern Clackamas and Multnomah counties. The Filtration Project (Project) will include the Bull Run Filtration Facility Project (Facility) on the bluff top west of the Sandy River canyon. The Bull Run Filtration Pipelines Project (Pipelines) will route incoming raw (unfiltered) water and outgoing finished (filtered) drinking water pipelines for the new facility to connect to the existing Water Bureau infrastructure (Figure 1). Project construction will be a multi-year effort involving federal funding through the Environmental Protection Agency. The Facility is required to be in operation by September 2027.

The Area of Potential Effect (APE) for the Facility parcel and the Cottrell Road local distribution main are located in T1S, R4E, Section 22 (Willamette Meridian). The

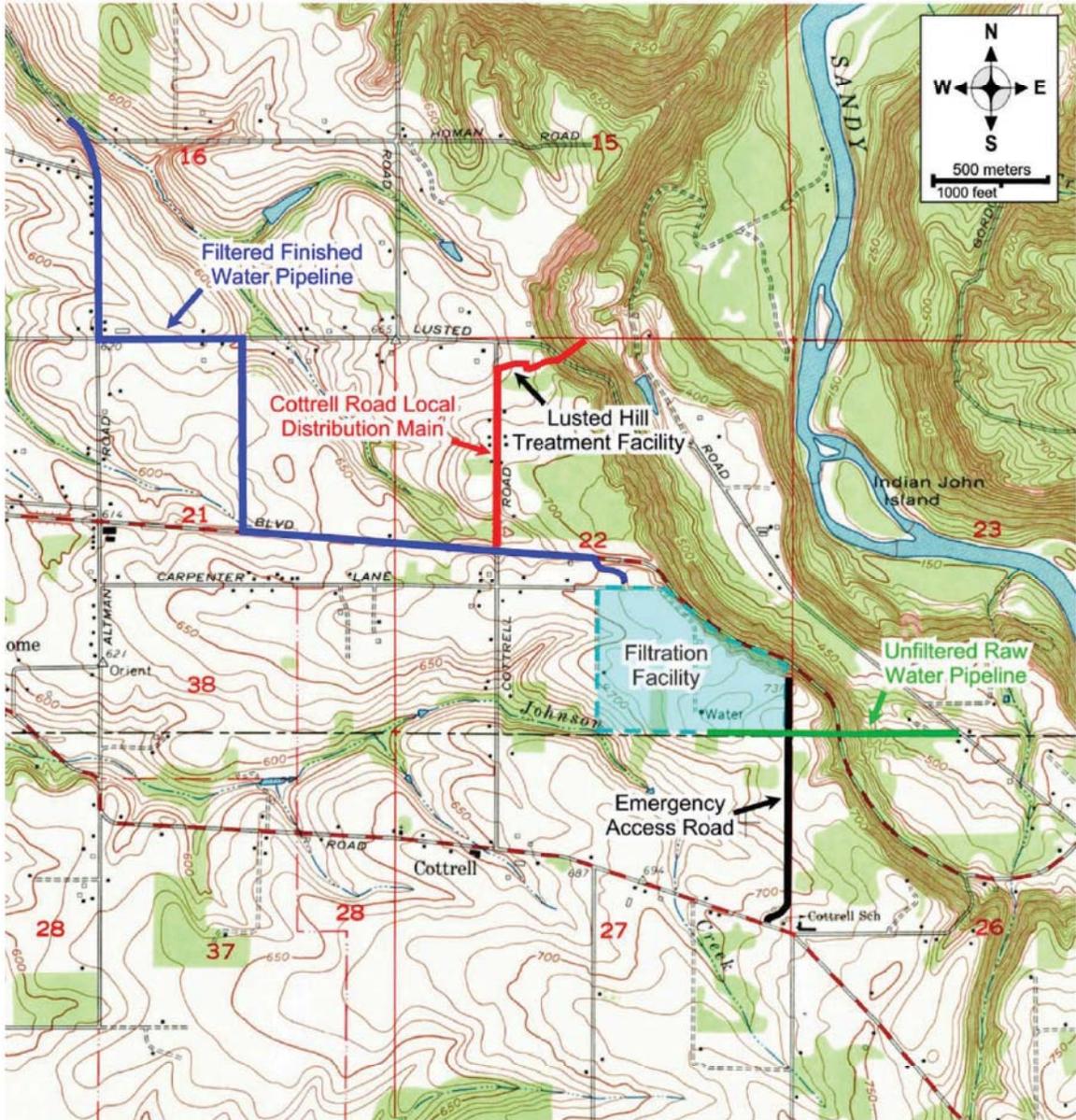


Figure 1. Location of the Bull Run Filtration Facility parcel (blue shading), RW pipeline (green line), FW pipeline (blue line), the Cottrell Road local distribution main (red line) to the existing Lusted Hill Treatment Facility, and the proposed emergency access road (black line) (USGS Sandy, Oregon 7.5' quadrangle, 1961, photorevised 1985).



Figure 2. Location of the proposed Bull Run treatment facility showing the location of the various project components, including the Filtration Facility parcel (blue shading), the unfiltered raw water pipeline (green line), filtered finished water pipeline (dark blue line), the Cottrell Road local transmission main (light blue line) to the existing Lusted Hill Treatment Facility, and the emergency access (grey dots) (from <https://www.portland.gov/ater/bullruntreatment/filtration/about>).

unfiltered water pipeline is along the section line between sections 22, 23, 26, and 27. The filtered water pipeline is within sections 16, 21, and 22. The proposed emergency access is situated in section 27 (Figure 1).

The Project as currently designed includes the following components (Figures 1 and 2).

Planned Filtration Facility. The Facility is being designed to remove *Cryptosporidium* and other microorganisms from the raw water source to meet Oregon Health Authority (OHA) requirements and will be located within an approximately 95-acre parcel of agricultural land currently used to grow nursery plants, on top of the bluffs forming the west side of the Sandy River canyon.

Unfiltered Water Pipeline (RW). The RW pipeline will run from an existing water conduit along SE Lusted Rd on a mid-slope bench on the canyon side west of the Sandy River to the Facility. The pipeline will be installed via boring along the majority of this route.

Filtered Water Pipeline (FW). The finished water pipeline will run north and west from the Facility parcel to connect to the existing water conduit. The pipe for the filtered water route will be installed via trenching, and all pipe construction adjacent to existing roadways will be confined to the existing right-of-way.

Cottrell Road Transmission Main (CRTM). This local distribution main will consist of a pipeline along SE Cottrell Road that will connect the new filtered water pipeline from the Filtration Facility on the south to the existing Lusted Road Distribution Main (LRDM) on the north by passing through the existing Lusted Hill Treatment Facility, in order to upgrade the water quality for the LRDM customers. A great majority of this line will be installed by boring to avoid sensitive environmental zones.

Proposed Emergency Access (SE Bluff Road). The current proposed emergency access is the SE Bluff Access, which connects to the east end of SE Carpenter Lane and runs south along the section line to SE Bluff Road.

Factors Affecting Site Formation, Integrity, and Discovery

The Kelso Slope, the landscape in which the new filtration facility will be constructed, is an upland setting characterized by shallow soil (Hogenson and Foxworthy 1965). The principal soil is Cazadero silty clay loam. This soil was initially described as forming in mixed old alluvium (Gerig 1985:149;) or in mixed alluvium with loess and volcanic ash (Green 1983:31-33) with a surface layer (A horizon) of very dark brown silty clay loam 16 inches (40 cm) thick. An updated description indicates that Cazadero silty clay loam has a surface layer (A horizon) typically 12 inches (30 cm) thick and that this soil formed in colluvium rather than alluvium (National Cooperative Soil Survey 2022).

Colluvium and landslide deposits mantle the steep slope along the northeastern edge of the PWB project area. This colluvium consists of weathered Springwater Formation soil that has been eroded off the slope (Bednarz 2020:2). The deeply weathered Springwater Formation, which underlies the project site to a depth of approximately 190 feet, is estimated to be of early Pleistocene age. In the 2020 borehole logs, the soil immediately below the surface is identified as Weathered Springwater Formation, estimated to have been deposited between about 35,000 and 2 million years ago, predating human occupation. Elsewhere referred to as Residual Soil, this soil consists of soft to very stiff red-brown or orange-brown clay or silt in project borings (Bednarz 2020:5)

The lands within the PWB project area were formerly forested and later became farmland. The modifications to the landscape associated with levelling the land for agriculture were described by Arden Meyer, who referred to the family property as “stump land,” recalling that his dad Ernest:

....used dynamite to help remove the tree stumps and roots. Following dynamiting, Arden and his siblings used tractors to pull stumps and roots from the property which took approximately 4 years. Arden remembers the stumps and roots were up to 5 ft deep – as he remembers standing in the holes. Following removal of the stumps and roots, Ernest tilled and plowed 10-12 inches of the top soil to level the 40 acres and about 10-15 acres to the southwest of that property (from Arden Meyer, 02/28/202).

The implication of leveling the land for agriculture is that, aside from stream-side settings, any subtle microenvironments that might have attracted Native peoples in the prehistoric past are no longer identifiable. As well, the shallow depth of the A Horizon, in which cultural materials may potentially be present, essentially correlates with the plowzone within which sediments have been thoroughly churned over decades of plowing, including some mixing with sediments from the underlying B Horizon.

The implication of the very shallow nature of Cazadero silty clay loam (<30-40 cm) is that archaeological evidence is best identified on the surface, although artifacts may be present within the plow zone. Buried archaeological deposits below the plow zone are not expected in the Bull Run Filtration Project. This inference is consistent with the results of previous archaeological investigations which indicate that cultural materials at sites on the Kelso Slope occur in surface or near-surface plowzone contexts (Woodward 1974; see Musil et al. 2023 for a review of previous investigations on the Kelso Slope).

At the Geertz Site, the best-known locality on the Kelso Slope where investigations have been reported, cultural materials were limited to within 20 inches (50 cm) of the surface (Woodward 1972). Although fire-cracked rock from campfires was present, no intact cultural features were encountered during the excavations due to impacts from stump removal and plowing. With the exception of the Geertz Site, which was interpreted as an upland base camp, archaeological evidence from the Kelso Slope reflects transitory activity in temporary seasonal camps, probably associated with trails, rather than more permanent settlements.

Because of the shallowness of the soils on the Kelso Slope, intensive surface survey in areas with good soil visibility is the best method for identifying archaeological sites and materials. All archaeological sites previously discovered in the area have been visible on the ground surface in farmed fields. The effectiveness of surface inspections is underscored by the artifacts collected to date by local property owners, primarily through the tending of berries and other plants that require being in very close proximity to the exposed soil.

As Mr. Arden Meyer states in his interview:

Ernest continued to uncover similar artifacts as he farmed for raspberries and blueberries over the years. Arden says that his dad gained “an eye” for noticing artifacts and he would keep ones that were “perfect” looking and intact, leaving behind broken pieces (from Arden Meyer, 02/28/2023).

Results of survey, discovery probing, and monitoring of ground testing by environmental and engineering teams in the PWB project area have so far been negative (Musil and Oetting 2021; Musil et al. 2023). Visibility in the cultivated fields was very good during the survey, greatly enhancing the likelihood of identifying archaeological indicators. In the case of the filtration parcel, the broad, featureless, gently sloping terrain unmarked by water sources is not considered to have a high probability of containing archaeological resources, an assessment which is consistent with the survey results.

Excavation of discovery probes in an effort to locate archaeological evidence is not a viable option in the PWB project area. Probes (30-cm-diameter) sample only a very small percent of the soil in a given area; their excavation for site discovery may be successful in areas likely to contain subsurface cultural deposits.¹ The higher the concentration of cultural materials, the more likely a site will be identified through probing. The discovery probes that have been excavated in the PWB project area so far have been negative.

Monitoring by archaeologists during mechanical stripping and excavation is a legitimate and valuable part of the archaeologist's toolkit for discovering archaeological sites and is particularly appropriate in areas undergoing construction (Carmichael et al. 2003:58-60). Experienced archaeologists know that archaeological field methods must be adapted to the particular depositional setting under investigation. Although there have been two reports of artifacts found in the project vicinity, it is not known whether they were associated with other materials in a site setting, or whether these were tools that were dropped in an isolated fashion over thousands of years as individuals and small groups traveled through the area. Given the shallow soils in the area, and the wide dispersal of artifacts reportedly found by landowners over acres of farmland, larger exposures of the ground surface are needed, such as the exposures that will be provided by ground clearing for construction of the Filtration Project.

Areas of Archaeological Concern

Although no archaeological resources have yet been identified within the Filtration Project boundaries, several areas of archaeological concern have been defined to help project personnel be alert to the potential of encountering archaeological materials. It should be understood that archaeological patterning has likely been greatly obscured or eliminated over the past 100 years of blasting and pulling stumps, agricultural tilling, and the close working of fields by farmers. Artifacts within shallow soil become significantly dispersed with each decade that a field has been plowed and tilled, and much of the project area has been in cultivation for nearly a century or longer. Repeated dispersal of artifacts in shallow

¹ Excavation of probes is best used in areas likely to contain subsurface deposits. The higher the concentration of cultural materials, the more likely a site will be identified through probing. From a sampling standpoint, the excavation of 30-cm round probes at 20-meter intervals only samples 0.018% of a 20x20-meter area, which is a very tiny sample. If the project vicinity is characterized by diffuse, sparse artifact scatters, probing (or augering) would be inefficient, costly, and likely unsuccessful.

soil raises serious questions about the structural or stratigraphic integrity of any cultural deposits in the project area.

Areas of archaeological concern (Figure 3) have been identified in three categories for the project area where monitoring of initial ground clearing is recommended (areas where the upper soil stratum [plowzone] has been previously removed by road or other construction are already removed from consideration):

Water sources. Because the terrain in the project vicinity is broad and relatively featureless, it is likely that early travelers through the area would have stayed in close proximity to reliable water sources. The Project location was specifically selected to avoid sensitive environmental zones, including water and wetlands, to the extent possible, so there are relatively few locations where construction activities will intersect with water sources. Five locations have been identified (Figure 3) where water may have been a resource in past centuries:

1. While Johnson Creek is outside the boundary of the Filtration Facility parcel, a small portion of its associated environmental protection zone (SEC-WR) occupied a small area of the southwest corner of the parcel. This area will be avoided by construction as a protective mechanism. While archaeological monitoring would be recommended for any area within 50 meters (approximately 160 feet) of the course of the creek itself, that area will be wholly within the SEC-WR set-aside for this parcel and will not be disturbed by construction.

Three areas near water or wetlands have been identified along the FW pipeline within road rights-of-way.

2. Pipe along Cottrell Road through the SEC-WR zone at the head of the North Fork Beaver Creek will be bored well below the surface to avoid impacts and will not require monitoring. The section along SE Dodge Park Road is within a road cut and will likely not require monitoring.

3. The section of FW pipe that will turn north across a field from SE Dodge Park Road passes near the SEC-WR zone for the Middle Fork Beaver Creek. It is recommended that monitoring be conducted if construction excavation occurs within 50 meters of the channel of this creek.

4. At the north end of the FW pipe corridor, the alignment comes back into proximity to the North Fork Beaver Creek. Monitoring again is recommended within 50 m of the water course, unless previous construction has removed the upper soil stratum where artifacts would most likely be found.

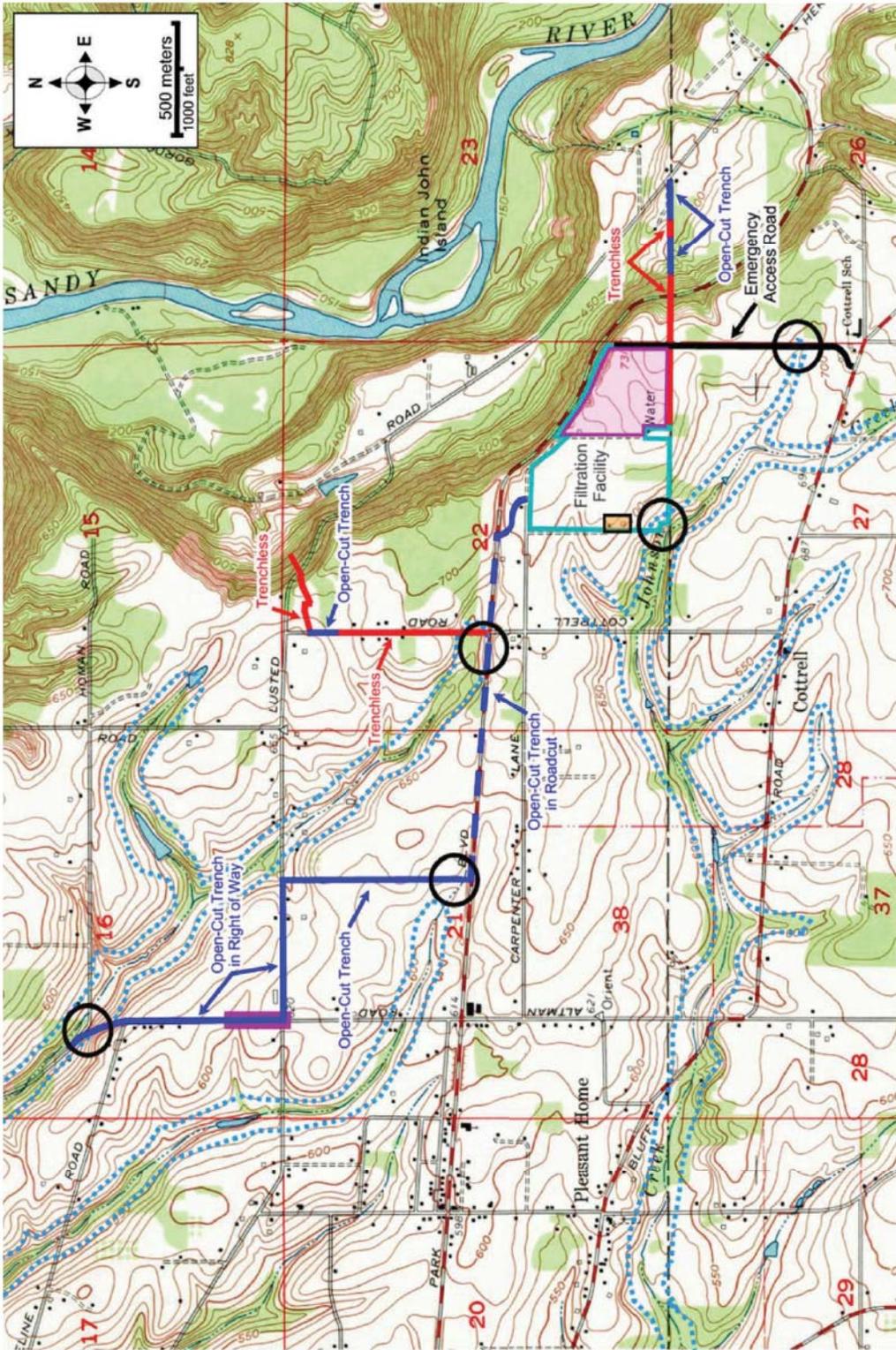


Figure 3. Location of areas of archaeological potential identified for monitoring during initial ground disturbance or for other pre-construction examination: (1) pipeline segments and facility corner near SEC-WR zones (black circles), (2) proximity to historical farmstead (orange rectangle), and (3) areas (fuchsia highlight) of reported artifact finds 50+ years ago. Proposed Bull Run treatment facility includes the Filtration Facility parcel (blue-green outline), showing pipeline trenching locations (dark blue line), areas of road ROW that are in roadcut (dashed dark blue line), and trenchless (bored) pipeline sections (red line).

A fifth area was identified along the Emergency Access Road:

5. A drainage to Johnson Creek is located along the Emergency Access Road (SE Bluff Road) south of the Filtration Facility. Monitoring is recommended within 50 meters on either side of the drainage unless no excavation will be conducted.

Historical features. The only historical feature identified during the project survey was a historical farmstead area with remnant barn foundation in the Filtration Facility area. This former farmstead was removed between 1975 and 1980 and any structural remains associated with the buildings are of insufficient age to be considered an archaeological resource by the Oregon SHPO. Although the buildings and associated debris had been removed prior to archaeological survey, there is the possibility that below-ground features (such as a privy or a well) may be encountered and monitoring is recommended within 30 meters (100 feet) of the former house location where such features are likely to be located. A monitor experienced in identifying such features, as well as diagnostic historical artifacts that may be found in association, should be employed for this particular location.

Areas of reported artifact finds. Two property owners have provided information that an earlier generation of family members collected Native American artifacts from within or near portions of the project area. While the information is not location-specific, two areas have been added to the areas of concern in response to these claims.

1. The eastern portion of the Filtration Facility parcel will be monitored during initial ground clearing, providing another opportunity to look closely at the ground surface. This parcel appears to be some distance from water sources, and no evidence of sustained archaeological occupation or other early evidence was identified during the project survey. The construction in this parcel may occur in phases over the course of several years. The artifact collection of the former owner, Ernest Meyer, appears to contain some items that may be from this parcel. The collection was made while farming on holdings of 80 acres from the 1930s to 1970.

2. A 300-meter (1,000-ft) section from the corner of SE Lusted Rd and SE Altman Road fronting the Carlson Nursery will be monitored during initial ground disturbance, as the Carlson family has a collection of artifacts from 1905-1960 from their property holdings of about 60 acres west of the pipeline alignment.

Monitoring Process

The Oregon State Historic Preservation Office (SHPO) carefully outlines measures to be considered and/or included in developing a monitoring plan for construction (SHPO 2023:102-111), including the following outline of activities (SHPO 2023:104). Archaeological monitoring requires the presence of an on-site archaeological monitor during the earth moving portions of a project:

- Monitoring involves close scrutiny of newly exposed soils in order to identify potentially significant cultural resources.
- The archaeological monitor keeps detailed field notes and takes photographs throughout the earth-moving activities.
- If the monitor detects artifacts or archaeological features that may be significant, they will stop work in the area.
- When a discovery is made, construction activities will usually be placed on hold until the reviewing agency, in consultation with the archaeological monitor, determines the find's significance. Such determinations need to seek SHPO concurrence and to determine what further actions need to be taken before work can proceed.
- In cases where a site is determined significant, further archaeological work, such as Phase II Testing or Phase III Data Recovery, may be required.
- Effective monitoring is provided when the archaeological monitor knows the resources of a given area and can assess whether discoveries require further consultation.
- All assessments regarding the National Register significance of a find must be made by an archaeologist who meets the Secretary of the Interior's (SOI) Standards for an Archaeologist (36CFR§61, Appendix A).

Qualifications

Work under this monitoring plan will be carried out by or under the direct supervision of a person meeting at a minimum the *Secretary of the Interior's Professional Qualifications Standards* for archeology (36 CFR Part 61). The on-site archaeological monitor does not have to be SOI-qualified but must have immediate access to a supervising SOI-qualified archaeologist. Specific qualification requirements for archaeological monitors and for supervising archaeological field monitors, including archaeological field experience in the geographic region, are detailed by SHPO 92023:105-105).

Communication with Construction Team

In order to be effective, there must be open communication and a clear understanding between the archaeologist and the construction excavation team prior to the beginning of fieldwork. A protocol for construction work stoppages must be developed to enable archaeologists to have time for recordation and for any necessary data recovery in the event of an inadvertent find, whether the find is made while an archaeological monitor is present or not:

The archaeological monitor shall have the authority to halt excavations to allow for closer inspection of exposed ground in the areas identified in this monitoring plan (or in subsequent revisions of this plan) in order to confirm the presence or absence of any previously unidentified cultural resources.

Before work begins on the project, the supervising archaeologist, monitoring archaeologist(s), Water Bureau representative, and construction contractor will conduct a pre-construction meeting to explain any Section 106 terms or conditions for the project and the procedures to follow if archaeological materials are found, as well as the role of the archaeological monitor. This meeting will also review the protocol for inadvertent finds as set forth in the Inadvertent Discovery Protocol (IDP) for this project, to include contact information for the notification of cultural resource discoveries.

Monitoring Reports

The archaeological monitor will provide a summary construction monitoring memo on a weekly basis for time periods when monitoring is conducted. (Given the multi-year schedule for the project, monitoring will not be required during the majority of construction.) The supervising archaeologist will provide a copy of these memos to the Water Bureau. Memos will also be provided to SHPO on a timely basis if monitoring encounters cultural material.

A summary monitoring report will be completed for each phase of construction or on an annual basis (schedule to be determined in consultation with SHPO). The summary report will include maps of the locations of areas monitored, surface features, topography, and any identified archaeological deposits or artifacts within the portion(s) of the area monitored. A description of observed soils and any disturbances will also be included.

Archaeological Permitting

An application for a State of Oregon archaeological permit will be submitted in advance of construction to enable the archaeological monitoring team to be able to collect surface artifacts and to conduct excavations to allow for the definition and assessment of cultural resources that may be encountered during construction. Specific methodologies will be outlined in the permit application for field documentation, recovery, treatment of artifacts, technical analysis of samples, curation, and preparation of reports. Work under such a permit will be conducted in coordination with SHPO and the appropriate tribes, as well as the Water Bureau and other involved agencies.

General Monitoring Guidelines

The Oregon SHPO (2023:109-110) outlines basic steps to follow in the event cultural resources or human remains are encountered during monitoring.

If cultural resources are encountered:

- Halt any construction work that may impact the cultural remains. Redirect construction activities to another area if possible. Place a 10-meter buffer around the discovery.
- Consult with the lead agency and SHPO regarding the significance of the discovery and further action to be taken. If a site is discovered during monitoring and it cannot be avoided, evaluation of the discovery under the terms of a state archaeological permit will be required before work can commence in the area of the find.
- Follow agency and SHPO recommendations regarding documentation and data recovery of the material.

If human remains are encountered:

- Halt any construction work that may impact the human remains. Redirect construction activities to another area if possible.
- Contact the Oregon State Police, lead agency, SHPO, Commission on Indian Services, and appropriate tribes (see notification guidance set forth in the IDP for this project).
- The services of a physical anthropologist may be needed to provide some analysis of the remains to determine ethnicity.
- On non-federal public land, state burial laws (ORS 97.740) must be followed if human remains are found. SHPO will coordinate with appropriate tribes and State Historic Cemetery Commission as appropriate. Consult Oregon Tribal position paper on Treatment of Human Remains Discovered Inadvertently or Through Criminal Investigation on Private and Public, State Owned Lands in Oregon (<http://egov.oregon.gov/OPRD/HCD/ARCH/docs>) so the tribal concerns over impacts to and relocation of discovered human remains can be considered.

Periodic Review

This archaeological monitoring plan will be reviewed on an annual basis, and more frequently if needed, in order to adjust for the findings made to date by the archaeological monitors. Monitoring areas or efforts may be expanded or otherwise revised if there is justification for such modifications. It is intended that this work plan will evolve as more information becomes available.

References Cited

Bednarz, Susan

*2020 *Geology and Geotechnical Information Review*. Attachment A in Bull Run Filtration Projects: Preliminary Geotechnical Assessment Report. Report by Lacamas Consulting to the Portland Water Bureau.

Carmichael, David L., Lafferty, Robert H., and Brian Leigh Molyneaux

2003 *Excavation: Archaeologist's Toolkit Volume 3*. Alta Mira Books, Walnut Creek, CA.

Gerig, Allen J.

1983 *Soil Survey of Clackamas County Area, Oregon*. Natural Resources Conservation Service.

Green, George L.

1983 *Soil Survey of Multnomah County, Oregon*. Natural Resources Conservation Service.

Hogenson, C. M., and B. L. Foxworthy

1965 *Groundwater in the East Portland Area, Oregon*. US Geological Survey Water Supply Paper 1793. US Government Printing Office, Washington, DC.

Musil, Robert R., and Albert C. Oetting

2021 *Archaeological Survey of the Proposed Portland Water Bureau Bull Run Water Treatment Plant Project, Gresham Vicinity, Clackamas and Multnomah Counties, Oregon*. Report to Brown and Caldwell and the Portland Water Bureau, City of Portland. Heritage Research Associates Report 470, Eugene. SHPO Report #32146.

Musil, Robert R., Albert C. Oetting, Kathryn Toepel, and Rick Minor

2023 *Portland Water Bureau Bull Run Water Treatment Plant Project: Supplemental Archaeological Investigations and Project Update*. Heritage Research Associates Report 478, Eugene.

National Cooperative Soil Survey

2022 *Official Series Description - Cazadero Series* –USDA. Electronic document soilseries.sc.egov.usda.gov/OSD_Docs/C/CAZADERO.html (accessed July 2023).

State Historic Preservation Office (SHPO)

2023 *Guidelines for Conducting Field Archaeology in Oregon*. <https://www.oregon.gov/oprd/OH/Documents/FieldGuidelines.pdf>. November 2013 (Minor Revision January 2016, 2023 Placeholder).

Woodward, John A.

1972 *The Geertz Site: An Early Campsite in Western Oregon*. *Tebiwa* 15(2):55-62.

1974 *Salmon, Slaves, and Grizzly Bears: The Prehistoric Antecedents and Ethnohistory of Clackamas Indian Culture*. PhD Dissertation, Department of Anthropology, University of Oregon, Eugene.