Cultural Resources Assessment for Sumner Waste Water Treatment Plant Phase 2 Expansion, Pierce County, Washington

CONTAINS CONFIDENTIAL INFORMATION – NOT FOR GENERAL DISTRIBUTION

August 28, 2013

Report Number 22018

SWCA/Northwest Archaeological Associates
Seattle, Washington

CULTURAL RESOURCES ASSESSMENT FOR SUMNER WASTE WATER TREATMENT PLANT PHASE 2 EXPANSION, PIERCE COUNTY, WASHINGTON

Report Prepared for

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By

Jessie Piper

.

August 28, 2013

Project Number 22018

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CULTURAL RESOURCES REPORT COVER SHEET

Author: Jessie Piper

Title of Report: Cultural Resoruces Assessment for the Sumner Wastewater Treatment Plant Phase 2 Expansion, Pierce County, Washington.

Date of Report: August 28, 2013

County: Pierce

Section 23, 26 Township: 30 North Range: 4 East
Quad: Puyallup, WA 1961 rev 1994; Sumner WA 1993
Acres: 8.8

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐ Yes ☒ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

DAHP Archaeological Site #:

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ABSTRACT

The City of Sumner is reviewing two alternative plans for improvements to the Sumner Wastewater Treatment Plant. SWCA Environmental Associates (formerly Northwest Archaeological Associates, Inc.)(SWCA) was retained to conduct a cultural resources assessment of the potential for impacts to historic properties in areas where ground disturbing actions are proposed for the project. The goal of the assessment was to make recommendations that will assist the City in evaluating its alternatives and complying with State Environmental Protection Act (SEPA) regulations. No historic properties were identified within the project area. Because of ethnographic and environmental data, SWCA recommends archaeological monitoring where excavation will go deep enough to encounter native surfaces in work areas in the eastern portion of the project.

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INTRODUCTION

The City of Sumner is planning improvements at the Sumner Wastewater Treatment Plant. Two alternative construction plans are being reviewed. SWCA Environmental Associates, Inc. (SWCA, (formerly Northwest Archaeological Associates, Inc.) was retained to conduct a cultural resources assessment of the potential for impacts to historic properties in areas where ground disturbing actions are proposed for the project. This report describes the cultural and environmental context, methods, and results of the assessment and makes recommendations that will assist the City in evaluating its alternatives and complying with State Environmental Protection Act (SEPA) regulations

Project Location

The Sumner Wastewater Treatment Plant (WWTP) is located in the City of Sumner in Pierce County, Washington (Township 20 North, Range 4 East, Section 23 & 26, W.M.) (Figure 1). It is situated at the confluence of the White and Puyallup rivers southwest of State Route 410. The area is bordered on the north by 63rdAvenue E, which runs southwest and east from the end of State Street on the southwest edge of Sumner.

Project Description

The City of Sumner owns and operates a secondary wastewater treatment plant that serves both the City of Sumner and the City of Bonney Lake and serves those cities and small areas of adjacent Pierce County. With future expansion in mind, the Sumner WWTP was designed to easily accommodate additional process units. The majority of the motor control equipment for the proposed process equipment was installed during the Phase 1 WWTP Expansion in 2005. Phase 2 of the Sumner WWTP Expansion as described in the *City of Sumner Final Comprehensive Facility Plan* (Kennedy Jenks, Jan 1999) and the *City of Sumner Final Comprehensive Facility Plan Amendment No. 1* (Gray & Osborne, Inc., February 2000) recommended that the WWTP treatment processes be upgraded by adding additional process units.

Phase 2 will include two alternatives for primary clarification, grit removal and primary sludge thickening. Both alternatives will be designed and included in the construction documents and the cities will select one of the alternatives after bids are opened, based on available project funding. Common elements of both alternatives include:

1. Construction of a **solid materials storage building** [30-foot x 56-foot concrete slab with ecoblock walls six feet tall on three sides] in the eastern portion of WWT site;
2. Construction of an **equipment storage building**;
3. Construction of a **third aeration basin (#3)** (33% larger than the two existing aeration basins) east of Aeration Basin No. 2;
4. Construction of a **third secondary clarifier**.

In addition to the improvements listed above, the Phase 2 **Alternative A** improvements will include (Figure 2):

5. Modifications to the existing **primary sludge pump station** piping to allow installation of a second hydrocone adjacent to the pump room;
6. Construction of a new **centrate storage tank** adjacent to the existing waste gas burner **;**
7. Construction of a new **centrate pump station**.

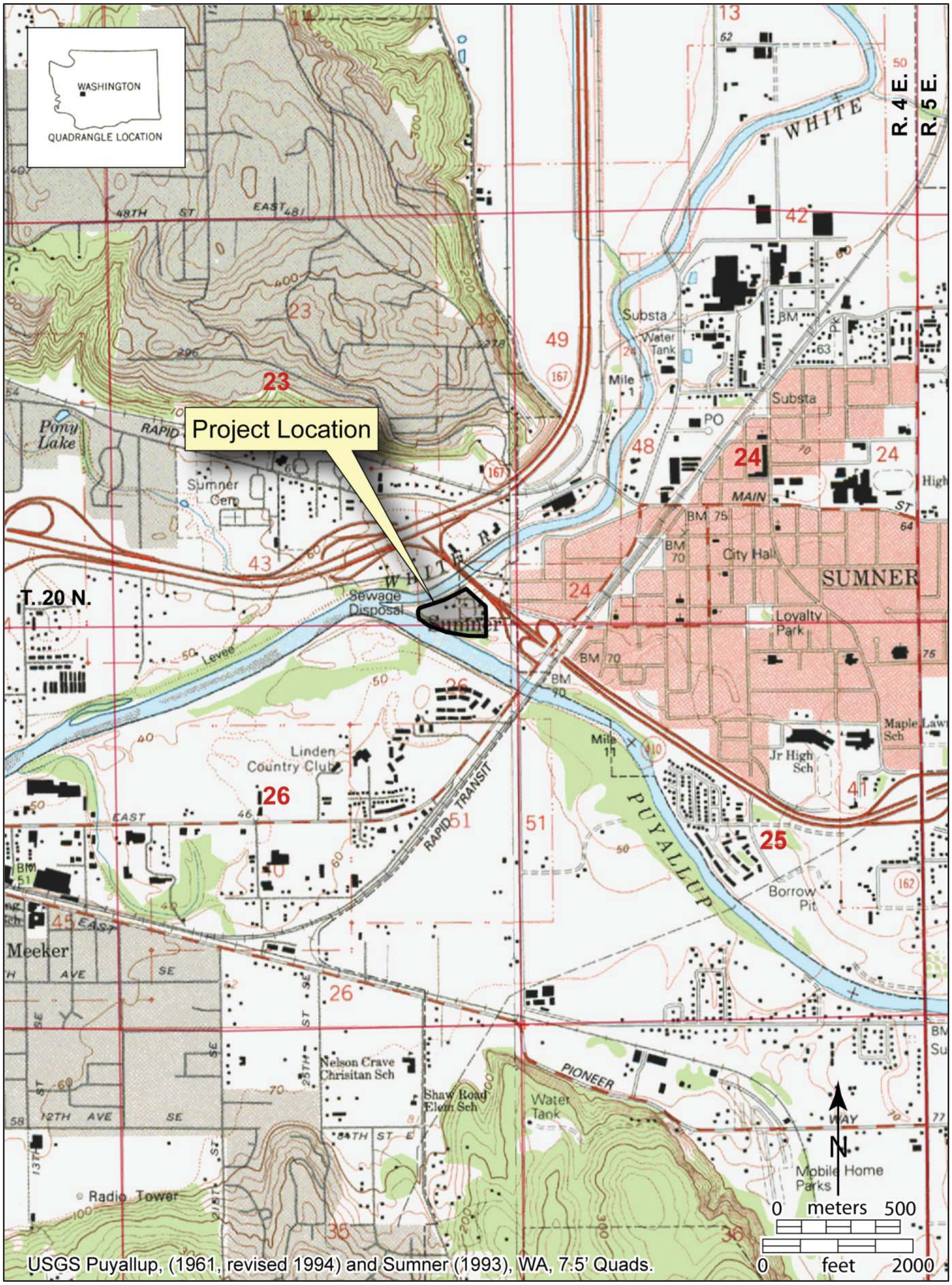

Figure 1. General location.

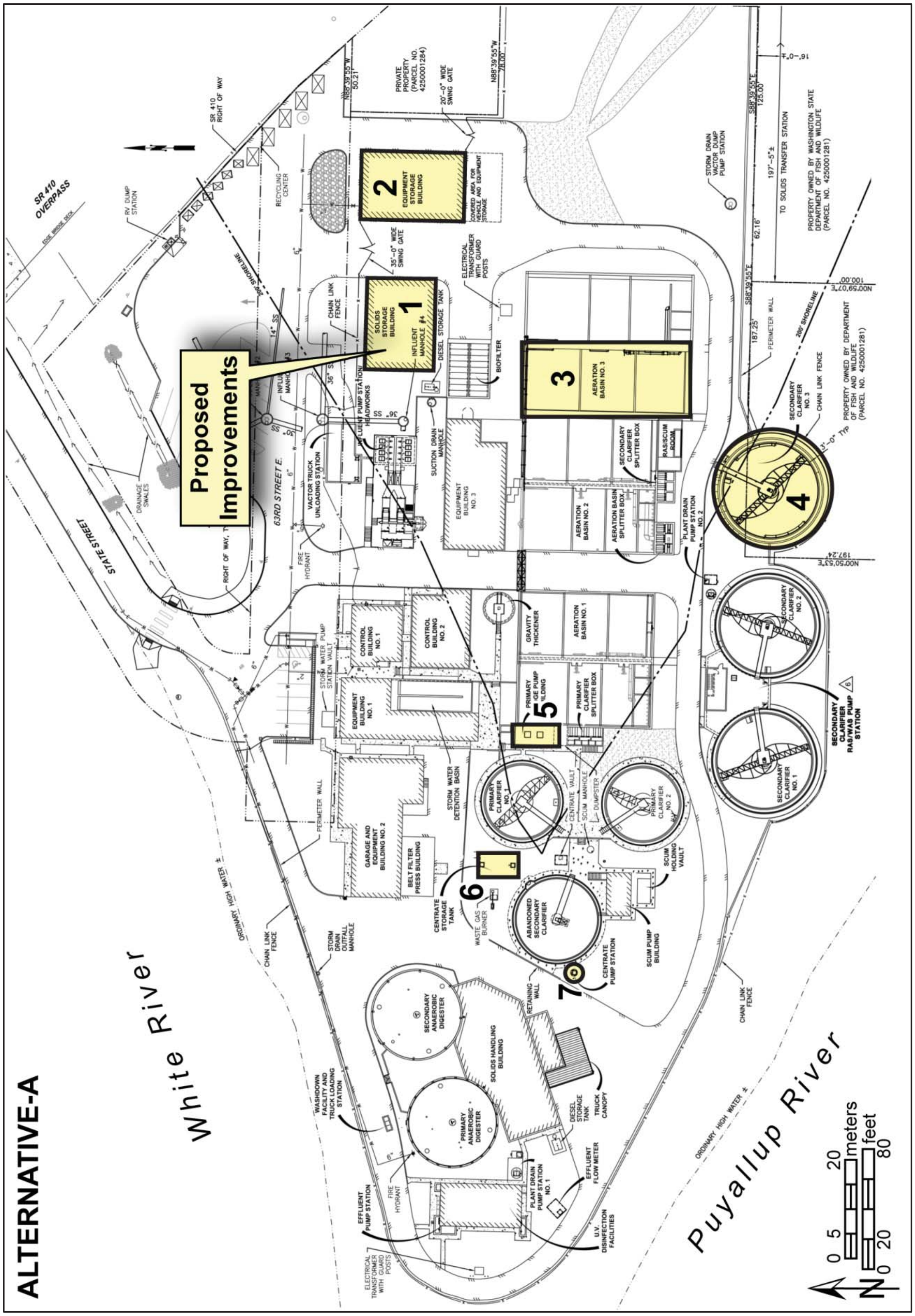

Figure 2. Alternative A – Proposed Improvements.

The Phase 2 **Alternative B** improvements will include (Figure 3):

5. Construction of a **third primary clarifier** west of and equal in size to Primary Clarifiers 1 & 2;
6. Modification of a **primary sludge pump station** to house a forth primary sludge pump;
7. Construction of a new **Grit Handling Building;**
8. Construction of an **Odor control system;**
9. Construction of a new **centrate pulp station;**
10. Construction of a new 33-foot **primary sludge gravity thickener** south of Primary Clarifier 3;
11. Installation of two new thickened-primary **sludge pumps in scum pump building.**

Other elements of the proposed project either have been completed (modifications to the effluent pump station or do not involve ground disturbance (adding two additional light modules to existing lamp banks).

Regulatory Context

The project is subject to the State Environmental Policy Act (SEPA), which requires state and local agencies to consider the environmental impacts of a proposal before making decisions. SEPA requires the project proponent to identify any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or adjacent to the site; to describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or adjacent to the site; and to describe proposed measures to reduce or control impacts to these locations if they are identified.

Section 106 of the National Historic Preservation Act (NHPA) serves as a framework for identifying, evaluating, and assessing effects to historic properties for consulting with others to find acceptable ways to avoid or mitigate adverse effects. Resources protected under Section 106 are those historical resources, archaeological sites, and traditional cultural properties (TCPs) listed, or eligible for listing, in the National Register of Historic Places (NRHP). Eligible properties must be at least 50 years old, possess integrity of physical characteristics, and meet at least one of four criteria of significance. Historic properties may include archaeological sites, buildings, structures, districts, traditional cultural properties, or objects.

Relevant Washington state laws address archaeological sites and Native American burials. The Archaeological Sites and Resources Act [RCW 27.53] prohibits knowingly excavating or disturbing prehistoric and historic archaeological sites on public or private land. The Indian Graves and Records Act [RCW 27.44] prohibits knowingly destroying American Indian graves and provides that inadvertent disturbance through construction or other activities requires reinterment under supervision of the appropriate Indian tribe. In order to prevent the looting or depredation of sites, any maps, records, or other information identifying the location of archaeological sites, historic sites, artifacts, or the site of traditional ceremonial, or social uses and activities of Indian Tribes are exempt from disclosure [RCW 42.56.300].

The purpose of this report is to aid the project in complying with the legal requirements by determining if historic properties or landmarks are within or adjacent to the project area, assessing the potential for encountering unrecorded historic properties during project construction, and recommending any additional work required to complete identification of historic properties.

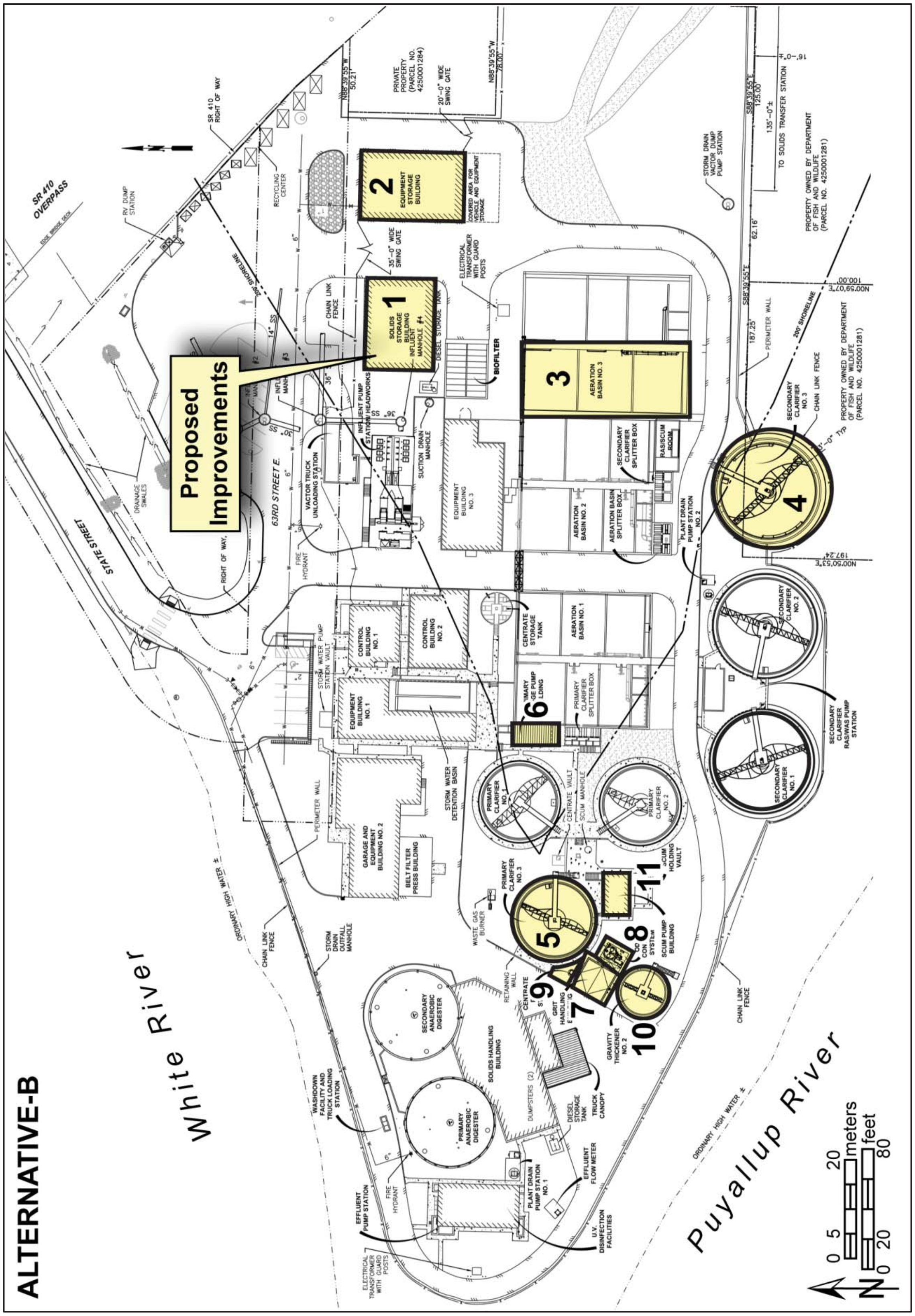

Figure 3. Alternative B –Proposed Improvements.

ENVIRONMENTAL CONTEXT

Archaeological evidence indicates that humans occupied the Pacific Northwest soon after land emerged following the last glacial retreat. Changes induced by processes such as global sea-level rise, climatic warming, earthquakes and volcanic activity continued to shape the landscape and influence the people who resided in the Puget Lowland over the next 12,000 years. These processes affected the distribution of potential resources and contributed to the creation of landforms suitable for human occupation. Some of these processes have been responsible for altering the physical character of the archaeological record itself, by selectively preserving or destroying sites that contain evidence of how people lived.

Geology, Geomorphology and Soils

The project is within the Puget Trough physiographic region (Franklin and Dyrness) within the Puyallup River Valley. Terrain in the project vicinity has been affected by repeated glacial advance and retreat during the Pleistocene. By approximately 17,000 years before present (BP), the Puget Lobe of the Cordilleran ice sheet reached as far south as Tenino, covering the Puyallup area with as much as 2,400 feet of ice for nearly 3,000 years (Porter and Swanson 1998).

About a century after reaching its maximum extent, as the final Vashon Stade of the Fraser glaciation began to recede, a series of proglacial lakes fed by meltwater from alpine glaciers formed behind the retreating mass of ice. During this period, the Puyallup River valley was occupied by Glacial Lake Puyallup, which originally drained south over the Ohop Valley spillway and eventually became part of the larger Glacial Lake Russell when the ice front reached Tacoma (Thorson 1989).

By 13,650 BP the Vashon glacier had retreated to the north of Seattle. As ice sheets retreated, the levels of proglacial lakes fell steadily and marine waters entered the lowlands. Eventually these marine embayments extended from Commencement Bay to Puyallup and from Elliot Bay to Auburn, and into what is now the Green River valley (Thorson 1989). After the glacial lakes drained and the Puget Lowland was freed from the weight of the ice and meltwater, the land began to rebound. The rate of isostatic rebound was faster than continued sea level rise in the Puget Sound. Between about 13,500 and 9000 BP, relative sea level was up to 60 meters lower than today (Dragovich et al. 1994; Dethier et al. 1995). During this period, the ancestral White, Green, and Cedar rivers established new courses in the glacial drift in an effort to reach their lowered base level.

About 5,700 BP, coastal deltas were buried when the northeastern flank of Mount Rainer collapsed, sending a massive lahar down the ancestral White River valley and spilling into the Green and Puyallup rivers. Debris from the event, referred to as the Osceola Mudflow, filled the ancient embayments over time and caused the White River to cut a new cannel north, joining the Green River (Dragovich et al. 1994).

Historic Changes

Historically, the White River joined the Green River in Auburn to form the larger White River. The White River occasionally avulsed and spilled south into the Puyallup drainage basin via the Stuck River. The White River flow shifted from the Green River to the Puyallup several times between 1892 and 1898, when a large landslide diverted the entire White River into the Stuck Valley, assisted by residents who actively encouraged permanent flow redirection. By 1900, much of the White River flow had been returned to the Green River Valley, but six years later, a log and debris jam during a flood once again diverted the White River into the Puyallup River basin (Zehfuss et al. 2003). In 1907, a committee on flooding recommended the diversion be made permanent and the White River continued to flow into the Puyallup drainage.

The WWT site is situated within about 150-200 feet of the White and Puyallup rivers and about five feet above the 200 year floodplain. The 1864 Government Land Office plat shows the project location would have been about mid-way between the historic channels of the Stuck River to the north and the Puyallup River to the south (Figure 4). The entry point of the Stuck River into the Puyallup is about 3 miles immediately west of the project location. The historic Puyallup River forms a deep, sinuous curve just south of the project location. The straightened channel now is closer, crossing at what would have been the top of the historic curve (Office of United States Surveyor General 1864). Prior to channelization, the channel shifted and sometimes formed secondary channels near the project (Figures 5 and 6).

The WWT site is relatively flat in developed portions, with the less developed eastern end sloping generally to the southwest. It has been disturbed by construction of the WWTP and subsequent improvements. Modifications include grading, filling, and formation of mounded areas. Soils in the project are sandy loam, gravel, and sand, clay, with large areas of fill in the developed area. Native soils in the western two-thirds of the project are mapped as Pilchuck fine sand, an excessively drained soil formed in unconsolidated alluvium on floodplains (NSCS 2013; Zulauf et al. 1979). The eastern one-third is identified as Pilchuck fine sandy loam, well-drained soils formed from alluvium on terraces and floodplains. Riverwash sediments are found in the floodplains south of the treatment plant (NSCS 2013; Zulauf et al. 1979).

Paleoenvironment

Vegetation and animal distributions changed significantly since the retreat of Pleistocene glaciers as plant and animal species responded to the warming environment. Warming continued into the Holocene, followed by cooler temperatures and increased precipitation extending to present times (Tsukada 1982; Whitlock 1992). The timing and nature of these changes varied within different areas but followed an overall trend.

Newly deglaciated land surfaces were initially colonized by subalpine parkland tundra vegetation and lodgepole pine, with Douglas fir, spruce, alder, and bracken fern following (Barnosky 1984). Conditions were warmer and drier in the Pacific Northwest than they are today until about 6000 BP. During this period, drought-like conditions prevailed in the summer and as a result forests were more open with prairie and parkland vegetation scattered across the landscape (Whitlock 1992). After about 8000-6000 BP, more maritime conditions developed, with cooler temperatures and increased precipitation similar to the modern climate regime. Closed forests of hemlock, western red cedar and Douglas fir became dominant by 5000 BP (Whitlock 1992).

Vegetation

The project is within the *Tsuga heterophylla* (western hemlock) vegetation zone characterized by western hemlock, Douglas fir, and western red cedar (Franklin and Dyrness 1988). When the Northern Pacific railroad conducted habitat surveys in the Puyallup River basin during the mid-1800s, they found "a mosaic of old growth coniferous forests, prairies, meandering rivers, wetlands and complex estuaries". Commercial harvest began in the Puyallup River valley in the 1850s, and by 1915 most old growth was already disappearing (Kerwin 1999:26). Numerous wild foods would have been available for Native American use, such as berries like Oregon grape, thimble berry, wild strawberry, and salal. Bulbs

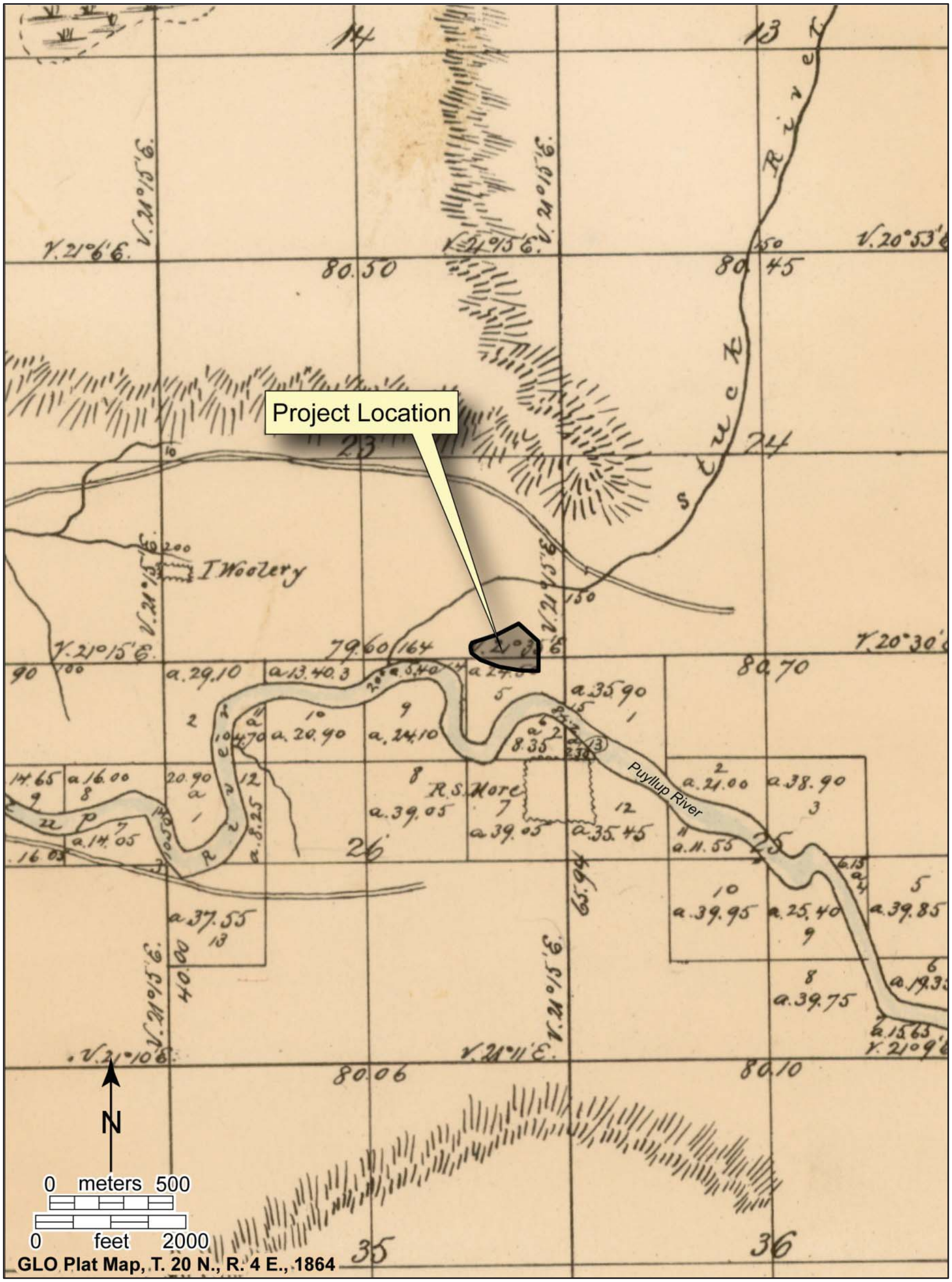

Figure 4. General Land Office plat, 1864, showing Stuck River entering Puyallup River near project area.

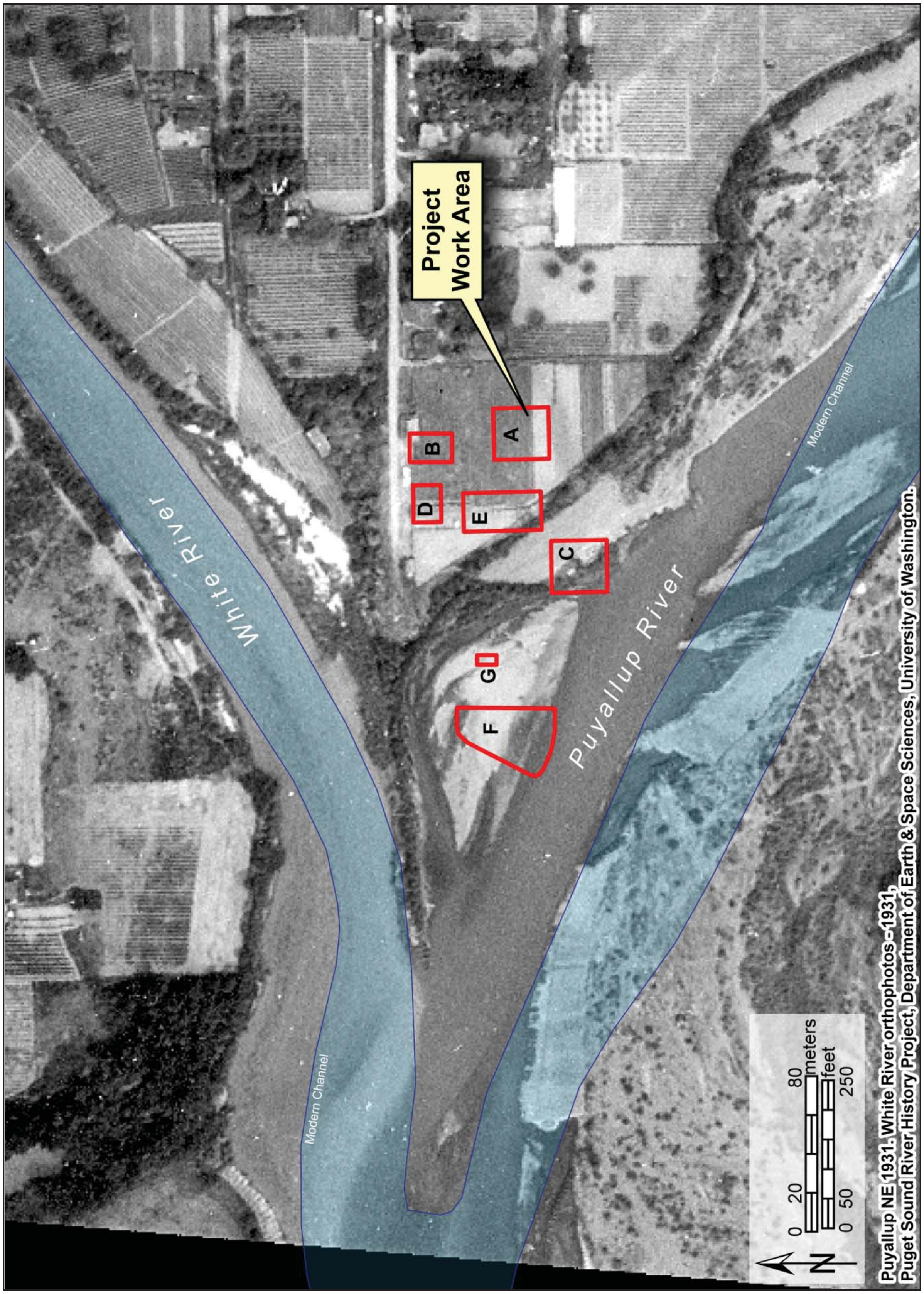

Figure 5. Aerial view of project area showing shift in river channel in 1931.

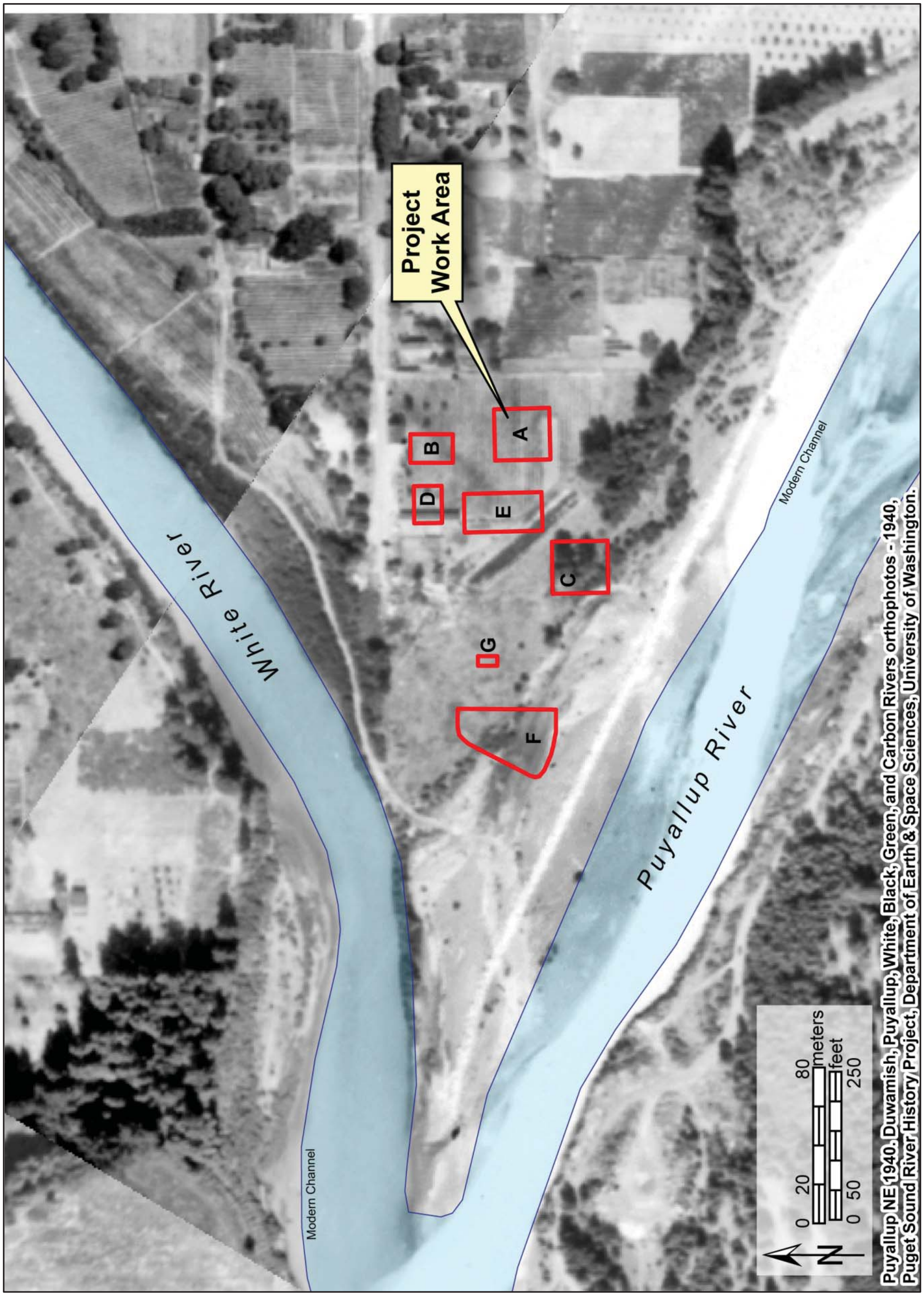

Figure 6. Aerial view of project area showing shift in river channel in 1940.

and corms from wild onion, wapato, camas, and tiger lily were found in the area, particularly on nearby prairies. The WWT parcel is surrounded today by conifer and hardwoods, with landscape fruit trees, conifers, and grass within the facility.

Fish and Wildlife

A variety of animals important to native people and early settlers were native to the project area including deer, rabbit, and black bear. Further upstream elk and mountain sheep would have been available. Fur-bearing animals such as beaver, mink, river otter, muskrat, fox, and raccoon also flourished in the riverine environment. Various species of seasonally abundant water fowl supplemented the food supply.

Salmon was the most economically important resource to both historic and prehistoric populations. There is no reliable historical record on the abundance of salmonid species in the Puyallup River basin, but historically runs of fall and spring chinook, pink, coho, chum salmon, winter steelhead and cutthroat trout were present (Kerwin 1999:15) The White River produces chinook, pink, chum, and coho as well as winter steelhead and cutthroat trout (Kerwin 1999:66).

CULTURAL RESOURCES CONTEXT

Archaeological evidence indicates that humans arrived in the Pacific Northwest over 14,000 years before present (BP), following the end of Pleistocene glaciation when the modern landscape, climate, and vegetation began to evolve in the region. Following the retreat of the continental ice sheet, other processes—geomorphic, geologic, and climatic—continued to shape the landscape. These processes have affected the distribution of resources available for human use and created landforms suitable for their occupation. They have also altered the archaeological record itself by selectively preserving or destroying sites that provide evidence of earlier lifeways.

Prehistory

The earliest evidence of human presence in Washington state comes from distinctive projectile points and stone tools believed to be associated with highly mobile Paleoindian groups adapted to hunting large fauna such as mammoth and mastodon (Martin 1973; Meltzer and Dunnell 1987). Materials from this period are rare in Washington, known from widely separated isolated finds (Meltzer and Dunnell 1987). Evidence for this adaptation includes the Manis Mastodon site near the town of Sequim where extinct bison and mastodon remains were found in possible association with cultural remains (Gustafson and Manis 1984; Kirk and Daugherty 1978). Radiocarbon dating and DNA analysis confirmed that a mastodon rib on the site was associated with the other remains and is dated to 13,800 years ago (Waters et al. 2011). Large concave, unfluted projectile point bases were recently found beneath peat radiocarbon dated from 8420 BP to 12,820 BP, at the Bear Creek Site near Redmond (Kopperl et al. 2010). Closest to the study area, a fluted point was found in a peat bog on a terrace in Maple Valley, about 20 miles northeast.

The period from about 8,000-5,000 BP is characterized by sites referred to as “Olcott” after the site type in Snohomish County and referred to in adjacent areas as “Old Cordilleran” or “Early Lithic” (Butler 1961; Fladmark 1982; Kidd 1964). The distinctive Olcott stone tool assemblage consists of large, leaf-shaped and stemmed points and cobble and flake tools, often made of heavily weathered volcanic rock like dacite or basalt. Sites are usually found inland on raised terraces where human occupation likely became established as landforms stabilized during the middle Holocene (Carlson 1990; Mattson 1971). To date, no sites with organic material that could be dated have been explored archaeologically and few have been found with recognizable features. Sites with Olcott assemblages are usually found inland on raised terraces where human occupation likely became established as landforms stabilized during the middle Holocene (Blukis Onat et. al 2000). Such positioning also provides expansive views of the surrounding landscape and may reflect the presumed emphasis on hunting large game.

Within the study area, human occupancy would date to the period following availability of suitable local landforms approximately 4400 years ago. Beginning about 5,000 BP, sites in the Puget Sound region appear to represent increased population with more complex socioeconomic organization. Ground stone and tools of bone, antler and shell associated with fishing and plant processing become more common and increasingly diversified. The developing importance of woodworking is evident in the presence of tools such as adzes, wedges, and mauls (Ames and Maschner 1999; Matson and Coupland 1995).

The period of the last 2,500 years in the Pacific Northwest is marked in coastal areas by sites and assemblages that indicate development of craft specialization and a significant concentration of wealth, both traits being representative of the “classic” Northwest Coast cultural complex known from the ethnographic period. Inland river valleys in the Puget Basin have not received as much attention from researchers, but sites in this period show increasing seasonal use of numerous different resources and environmental niches, and settlement in permanent and semi-permanent winter villages related to hunting, plant processing, and fishing on inland rivers (Ames and Maschner 1999).

Native American History

The project lies within the traditional territory of the Puyallup Indian Tribe, speakers of a dialect of southern Lushootseed who lived in villages along the shores of Puget Sound and the Puyallup River and its tributaries (Smith 1940). Foothill villages were often considered bilingual as some individuals or families spoke only Salish, while others spoke only Sahaptin dialects, however few individuals were truly bilingual. Smith (1940) reports family groups that spoke only Sahaptin as far downstream as the village *ts 'uwa cliabc*, located near the mouth of Clarks Creek, south of the current project area.

Ethnographer George Gibbs reported that the Puyallup were composed of three affiliated groups, the *Puyallupahmish*, *T'Kawkwawmish*, and *S'homamish* of the Puyallup River and Vashon Island (Gibbs 1877). In the Treaty, Gibbs entered only one name for people in the Puyallup drainage and a second for the Vashon Island people (Lane 1973:4). The *T'Kawkwawmish* were identified by ethnographer Myron Eells (1887) as living on the upper branches of the Puyallup River.

The Puyallup were closely allied with neighboring groups through intermarriage including the Nisqually to the south, and the Duwamish and upper Green and White River people (Muckleshoot) to the north. The Puyallup and their Salish neighbors also had strong ties to Sahaptin-speaking people east of the Cascade Mountains.

Based on interviews with tribal elders in the 1930s, Smith (1940) identified eleven Puyallup villages, distributed from the mouth of the Puyallup River to the confluence of the Puyallup and Carbon rivers, the lower Carbon River, along the shores of Carr Inlet, and around Gig Harbor. The project area lies near the former confluence where the Stuck River flowed into the Puyallup. The confluence was a known fishing site and village location known as *Stáx̣bc* (*Stukabsh*) from the root meaning “that which has been cut through” (Lane 1973: 17; 23; Smith 1940:10). At one time the Stuck River flowed down Wapato Creek but when the river changed its course southward, the village moved with it to its new confluence with the Puyallup River. The river's shift is associated with a mythological event where an immense animal, a whale or a beaver, "cut through" the land to reach the Sound (Lane 1973:23; Smith 1940; Waterman 2001 [1920]). Waterman (2001) and Smith (1940) recorded numerous native place names for territory along the river and its tributaries all the way to Commencement Bay.

Several known place names attest to Native American presence in the project vicinity. The confluence of Stuck River with the Puyallup River was called *StExo'-tsid*, "mouth of the Stuck". *Qwe'qwestolb*, meaning "sandy place", was the site of present town of Sumner. A depression on top of a plateau lying across the river from town of Sumner, *Teaha'bid*, may have referred to a locale where test pits were dug for snaring deer. A creek along the foot of the cliff behind the town of Sumner was called *Kobe'uqud* (Lane 1973:21).

Fishing, particularly for salmon and steelhead, played a central role in Puyallup economic life (Lane 1973:8-9). The information gathered on fishing techniques and gear (see Smith 1940) speaks to the importance of fishing, particularly for salmon and steelhead (Lane 1973:8-9, 11). In saltwater, techniques for catch included long lining, trolling, raking, spearing, harpooning, and seining. On the river, fish were taken in lift nets associated with weirs or by gaffing, falls traps, river seines, and spearing (Lane 1973:11). Smith notes that certain types of gear require cooperative efforts and that ownership, control, and use rights varied according to the nature of the gear (Lane 1973:13). For example, because of the labor required to construct them, weirs were cooperative property, but the component fishing stations were individually owned (Lane 1973:14). Specialized canoes were used for upriver and saltwater travel and fishing (Lane 1973:17)

Like other Puget Sound Salish-speaking groups, the Puyallup relied mostly on stored foods, particularly salmon, during the winter months. The winter season was also a time for making and repairing tools, clothing and other items, and engaging in religious and ceremonial activities. At the end of winter, villages split into smaller groups traveling to seasonal sites throughout their territory to fish, hunt and gather resources as they became available (Haeberlin and Gunther 1930). Hunting was a group activity undertaken throughout the valleys and foothills, however salmon provided the most important food source for both upriver and downriver villages. Fishing sites were typically located at confluences of tributary streams (Lane and Lane 1977). Fish, as well as salmon eggs, were eaten fresh or cured by a variety of techniques for later consumption or for trade east of the mountains (Lane 1973:15).

The Puyallup also gathered a variety of shellfish, which they ate fresh, boiled or steam baked. Barnacles, Chinese clippers, mussels, oysters, clams, and cockles were all eaten (Smith 1940:243). Hunting for deer, elk, black bear, beaver, and rabbit supplemented the diet. Fresh meat could be cut into strips and dried over a fire for future use. Inland people sometimes also caught smaller game that included ducks, quail and grouse (Smith 245-246).

Plant resources were gathered as they became available throughout the territory. Early spring sprouts of berry, wild celery, bull rush, and asparagus were often eaten with salmon berries (Smith 1940:251). Since they were too moist to dry, salmon and thimbleberries were eaten fresh, but elderberries, gooseberries, huckleberries, service berries, and salal could all be dried and stored in baskets for winter use. Blackberries were dried then pounded into cakes and cranberries were boiled then mashed to preserve (Smith 1940:248-249). Roots were also an important food and some kinds could be preserved for winter use. Roots of bulrush were eaten raw. Others, including fern, camas, and wapato were pit roasted. Tiger lily bulbs were roasted on hot coals. Acorns also were gathered and roasted in pits. Other foods included crabapples, hazelnuts and Oregon grape (Smith 1940:249-252).

The Puyallup were signatories of the Medicine Creek Treaty of 1854. The treaty established a reservation of 1,280 acres, later enlarged to 18,062 acres by executive orders issued in 1857 and 1873. The Puyallup Reservation was first populated by people from all but two of the eleven villages described by Smith (1940). Some people of Nisqually, Cowlitz, White River (Muckleshoot), and Steilacoom decent also lived on the reservation, possibly because their own reservations were located a considerable distance from large population centers, while the Puyallup Reservation borders the city of Tacoma, which at one time was larger than Seattle. In 1853 the Puyallup numbered 150, however the following year their number was reduced to 50, likely due to smallpox. In 1929 the base tribal roll was 344; by 1989 their enrollment had increased to nearly 8,000 (Ruby and Brown 1992).

Euroamerican History

The Naches Trail, a native trail that became a major wagon route, brought Oregon Trail settlers across the Cascades at Naches Pass. It continued along the Green and White Rivers to Buckley, Washington, following the route of the later old Buckley-Sumner Highway to near Bonney Lake southwest of Sumner (Reese 1974:1). The location at the confluence of the Puyallup River and the Stuck (now the White) River and the wealth of timber resources attracted a group of these early settlers who filed land claims in the Sumner area in 1853. Among them in the project vicinity were the families of Abram Woolery, J. W. McCarthy, Abial Morrison, and William Kincaid (Figure 7). The Woolery claim was immediately north of the current project area, with the claims of Morrison and Kincaid west of him and McCarthy to the east. Numerous other claims were founded on both sides of the Puyallup River (Office of United States Surveyor General 1865; City of Sumner/Ryan House Museum n.d.; Ryan 1988). The 1864 general land office plat shows the Stuck River entering the Puyallup River at SW corner of Section 23 in the current project area (Office of United States Surveyor General 1864). Numerous sharp curves are shown along this portion of the Puyallup River. The military road from Steilacoom to Seattle crosses the Puyallup River several miles west of the project area. An east-west road connects the Stuck River to Puyallup Indian Reservation, a large tract in the west, and numerous other small roads are located near the river.

As more Euroamerican settlers were drawn into Washington Territory, tensions between the native and white communities grew. US troops were sent to at Fort Steilacoom in 1849 to protect settlers from hostilities during disturbances with tribes (Reese 1974:11). Fort Maloney, a small blockhouse, was built on what is now Meridian Street in central Puyallup. In 1884-1855, seeking to ease tensions related to white encroachment on Indian lands, Isaac Stevens, governor of Washington Territory, concluded a series of treaties with native American groups. The Treaty of Medicine Creek was signed on in 1854 by sixty-two leaders of Western Washington tribal groups, including the Nisqually and Puyallup. Under terms of the treaty, the tribes ceded most of their lands in exchange for $32,500, designated reservations, and the permanent right of access to hunt and fish in their "usual and accustomed places". The Treaty led to establishment in of the Puyallup, and Muckleshoot reservations for peoples of the Puyallup, White and Green river valleys. Lands set aside for a planned Nisqually Reservation were converted to family allotments and other lands were condemned for the creation of Camp (later Fort) Lewis military base (Ruby and Brown 1992).

Leschi, a native with Nisqually and Yakima parents, was appointed by Gov. Stevens to represent the Nisqually and Puyallup groups at the Treaty of Medicine Creek. When Leschi travelled to Olympia with his brother to protest the terms of the treaty and in particular the quality of the lands given to the tribes, they were pursued by the territorial militia. Hostilities then escalated, along with other episodes throughout the territory, into the 1855-1856 Indian Wars. In 1855 when news reached settlers in the Puyallup Valley of an Indian uprising and the massacre of two families on the White River, the settlers fled to Fort Steilacoom for shelter. Most settlers' homes in the Puyallup River valley were burned, and

Figure 7. General Land Office plat, 1865, showing land claims in vicinity of project area.

though some never returned, William Kincaid was among those who returned to resume his life in Sumner. After leading a series of raids, Leschi was charged with the deaths of a militia colonel and pursued for over a year. During a first trial which led to a hung jury, Kincaid and another early settler, noted pioneer Ezra Meeker from Puyallup, were the only two jurors to vote for acquittal. In 1858, Leschi was tried again and executed by hanging (City of Sumner 2010; Ryan 1988).

The hostilities of the mid-1800s led to an important transportation development when in 1857 the US Congress appropriated $35,000 for construction of a military road between Fort Vancouver and Fort Bellingham (Reese 1974:10). The road, completed in 1860, followed earlier native trails and developed into a wagon route that eventually went all the way north to the Canadian border. Besides opening important supply lines between strategically-placed military installations, the road facilitated settlement and became a major state thoroughfare. The portion of the Military Road between Steilacoom and Puyallup, known locally as Byrd Mill Road, crossed the Puyallup River near central Puyallup and continued north (Reese 1974: 8, 22).

In 1883, the town of Sumner, originally called Stuck Junction, was platted on 160 acres owned by John and Nancy Kincaid, heirs of pioneer William Kincaid, and by George and Lucy Ryan, who had purchased part of the original Kincaid claim. Ryan, who raised fruit, vegetables and hops, became Sumner's first mayor in 1891. He was the owner of a saw mill, built a large section of the business district, and helped establish a railroad depot (City of Sumner/Ryan House Museum n.d.; Ryan 1988).

The agricultural potential had drawn early settlers to the Puyallup valley, and there seemed to be a marked talent for planning and marketing among the Sumner landowners. Taking advantage of their proximity to Tacoma and Seattle markets, and later the development of rail transport, Sumner farmers formed growers' cooperatives through which they were successful in capturing local, regional, and even national markets (Daffodil Valley Times and the City of Sumner n.d.). Hops, planted in Sumner area in 1865, became thriving industry throughout the White River valley. The annual harvest drew Native Americans, Chinese and Japanese laborers. Many Japanese stayed on to become landowners in lands along the White River valley. An infestation of hop lice in the mid-1990s brought region-wide decline to the industry.

Farmers in Sumner soon shifted to raising raspberries, strawberries and cherries which they marketed through a growers union. In 1893, after Sumner farmer Bill Dobson developed a technique for early forcing, rhubarb became a major crop. The Sumner Rhubarb Association, formed in 1908, carried out a strong promotion and marketing campaign that succeeded in making the town a center for rhubarb production. In the early 1900s, other local farmers began marketing flower bulbs, including iris, daffodils, and tulips. The first daffodil crop was planted in 1910 and soon the town was known for its daffodils. The first Daffodil Festival was held in Sumner in 1934 and thereafter shifted annually between Sumner and Puyallup (Daffodil Valley Times and the City of Sumner n.d.; Ryan 1988).

Patterns of land use and the local economy were influenced in the late 1800s by arrival of the railroad. Between 1873 and 1883, the northern Pacific Railroad (NPRR) completed its Pacific Division rail line between Portland and Tacoma. Its Puyallup Branch ran southeast from Tacoma through the town of Puyallup and on into the coal towns to the east in the foothills of the Cascades. When the NPRR refused to stop in Sumner because it had no depot, George Ryan built a depot and hired a station master at his own expense, effectively bringing the railroad to Sumner (City of Sumner 2010; Ryan 1988). The NPRR line soon connected with Seattle via a line from Puyallup north through the White River valley. In 1902, the Puget Sound Electric Railway completed the interurban electric line between Seattle and Tacoma, passing through the White River Valley and along the north bank of the Puyallup River. In 1909 the

Chicago, Milwaukee and St. Paul Railway completed a line from Seattle to Tacoma, and eventually ran a line south through the White River valley to Sumner, where it transferred to the NPRR right-of-way. Sumner became a railroad hub and like other small towns such as Alderton and McMillin that sprang up along the railway, it prospered with access to markets in the urban areas of both Seattle and Tacoma. The railroad also brought in industries that could take advantage of rail transport, bringing jobs and development to the valley. The northwest corner of Sumner soon began to grow with industrial use (City of Sumner 2010).

Floods on the Stuck River and White River had continually challenged landowners and homeowners within the entire Green and White river system. Citizen attempts at levee building began early on. Dams, levees, and barriers were built along the upper reaches of both the White and Green Rivers in hopes of preventing additional major flooding. Originally built by farmers who settled the area to protect their agricultural lands, the levees were modified over the years in response to flood events. But the scale of the system and the potential damage required more concerted action. In 1913, a diversion dam was built to control flooding by temporarily re-routing the White River southwest into the Stuck River and allowing the Green River to flow into the former White River channel. In 1962, the US Army Corps of Engineers constructed the Howard Hanson Dam above Palmer on the Green River for flood control, reducing flooding, permanently altering the arrangement of the White and Green Rivers, and changing the pattern of land ownership away from small holders with the shift to a higher tax base. Industrialization and commercialization increased in the valley, with development intensifying in the 1970s. Channel straightening along the Puyallup and White Rivers contributed to changes in land use.

The original SR 410 followed old wagon trails along part of its route. US Highway 410, established in 1926, went from Aberdeen all the way to Lewiston, Idaho but was decommissioned in 1967 when US Highway 12 was extended over most of the area. The remaining section of 410 was later shortened to end in Sumner. In the mid-1960s, State Route (SR) 167 was constructed between Renton and Sumner, bringing traffic through the Green River valley and replacing SR410 as the major route through the area.

Previous Research

Previous cultural resource investigations within the project area include three planning and overview studies, three road improvement projects, and two trail construction projects (Table 1). Although several of these encompassed historic resources within the town of Sumner or included windshield surveys of the roadway along the western edge of the town, no cultural resource inventory was found to have been out within the WWTP project area.

Table 1. Previous Cultural Resource Investigations Within Approximately One Mile of the Project Area.

AUTHOR	DATE	PROJECT	RELATION TO PROJECT AREA	RESULTS*
Pierce County Office of Community Development	1983	Pierce County Cultural Resource Inventory, Volume VII: Central Planning Area: Puyallup Valley	Encompasses	Historic structures
Avey and Starwich	1985	Pierce County Cultural Resource Survey: Archaeology- Phase I	Encompasses	None
Wessen and Stilson	1987	Resource Protection Planning Process, Southern Puget Sound Study Unit	Encompasses	Overview
Champman et. al.	1996	Cultural Resources Inventory of Proposed Worldcom Fiber Optic Cable Project	Adjacent	None
Shong	2003	Heritage Resources Investigations for the City of Puyallup Riverfront Trail Project-Phase 2 (SR 512 to East Main) Pierce County, Washington	0.1 mi S	None

Table 1. Previous Cultural Resource Investigations Within Approximately One Mile of the Project Area.

AUTHOR	DATE	PROJECT	RELATION TO PROJECT AREA	RESULTS*
Demuth	2005	Letter Report: Cultural Resources in the SR 167 Valley Freeway Corridor	Encompasses	Overview
Gill and Berger	2007	Cultural Resources Survey for the Shaw Road Extension Project. Pierce County, Washington	0.4 mi S	None
Hartmann	2010	Letter Report: Cultural Resources Assessment for the White River Trail (Confluence to Bridge St) Project, Sumner, Pierce County, WA	0.1 mi E	None
Kiers	2010	Cultural Resources Survey, SR 512, SR 410 and SR 167, Portland Ave. to King County Line, Flow Map Improvements, Pierce County, Washington	0.2 mi N	None

*Newly recorded cultural material identified within one mile of project area.

An ethnographic village location was known in the area on the west bank of the White River just upstream of confluence with the Puyallup. The village is said to have migrated during a heavy flood to another location near the Puyallup River. Exact location for the village is unknown. In 1996, a location near the White River- Puyallup confluence was investigated as a possible location but no prehistoric or historic-period artifacts were found (Champman et al. 1996).

Previously recorded sites within approximately one-mile of the project area (Table 2) include one pre-contact site (45PI276) north of the project location on a glacial outwash terrace overlooking the confluence of the Puyallup and White Rivers. The site is a possible plant processing site that contained numerous lithic items and earth oven features with associated fire-modified rock and calcined mammal bones, with finds between the surface and 40 cm below surface (Chatters and Kaehler 2012).

Table 2. Previously Recorded Sites Within and Near Approximately One Mile of the Project Area.

SITE NO.	COMPILER/DATE	AGE	DESCRIPTION	RELATION TO PROJECT AREA
45PI1276	Chatters and Kaehler 2012	2,000-4,000 YA	Bray Site	1.2 mi N
45PI175	Happy and Lentz 1976	1875-1885	Ryan House	0.7 mi NW
45PI891	DAHP 2013	1850	Sumner Cemetery	0.4 mi NW
45PI971	DAHP 2013	Historic	Powers Woodlawn Mausoleum and Columbarium	0.3 mi N

Three historic sites include the Sumner Cemetery with burials as early as 1850 in the Pioneer Cemetery section. The cemetery land was formerly part of the Woolery claim. A Klickitat acquaintance of the Woolery family, *Peshnekai*, was among those was laid to rest there (DAHP 2013). Adjacent to the Pioneer section of the Sumner cemetery is the Powers Woodlawn Mausoleum and Columbarium, built in 1915 (http://www.dignitymemorial.com/en-us/overview.page, accessed July 22, 2013).

The Ryan House, built by one of Sumner's earliest pioneers, is an example of a rural classical revival farmhouse built of local cedar around 1875 and modified in about 1885. Since 1926 it has been used as a community library (Happy and Lentz 1976).

EXPECTATIONS

The location of the WWTP near the confluence of the Puyallup and the former Stuck River is within the vicinity of a known Puyallup ethnographic site. A village and fishing spot west were located somewhere near the place where the former Stuck River entered the Puyallup River, about one and a half miles west of the current project. The channel of the Stuck was said to have migrated at a point in the past, causing the village to relocate, but no specific information is available to pinpoint these locations.

A 1931 aerial photograph shows that project lands were low lying, with a second channel forming along the northern side of the Puyallup River that separated the western portion of the WWTP lands from the eastern portion (Puyallup NE 1930) (Figure 5). The southern portion of Work Area F was in the river, and the southwest portion of Work Area C was in the river and the side channel. By 1940, the second channel appeared to have been filled in (Puyallup NE 1940) (Figure 6). Today with the river straightened, the historic channel is filled and the river is approximately 150 feet to the south.

Prior to channel straightening, the historic Puyallup channel and side channel would have shifted continually across lower lying areas of the project, and floods would have scoured those areas repeatedly. This channel shifting may have buried older channels and levee bars that could have been good spots for fishing or short-term camping. Though it is likely the village was on higher ground in an area less prone to repeated flooding, archaeological materials related to use of these areas could be found within less disturbed portions of the project. Archaeological materials, if present, are most likely to be lithic scatter and isolates, fire-modified rock and hearth features, and possibly associated fish or faunal remains.

METHODS

Background research on the study area included a search of the Department of Archaeology and Historic Preservation records that helped to identify previous surveys that have been completed in the vicinity of the study area and to determine the distribution of previously recorded pre-contact and historical and cultural setting of the area was conducted with materials in SWCA's library, the Seattle Public Library, and the University of Washington Libraries. A utility locate request was placed online with the Utility Notification Center to request utility marking prior to SWCA's site visit. SWCA project manager Jessie Piper later was contacted by the assigned locator and was advised that WWTP Superintendent Greg Kongslie who was familiar with utility locations within the facility should be contacted to identify onsite utilities. The crew was guided at the WWTP by staff person Anthony Vendetti who apprised them of utility locations.

Shovel probes measured 40-cm (15.7 inches [in]) in diameter and bucket augers measured 10-cm (3.94 in) in diameter. All sediment was screened through ¼-inch mesh, and information about stratigraphy and cultural contents was recorded on standard field forms. Locations of probes were plotted on field maps and recorded using a Trimble GeoExplorer hand-held GPS unit, and digital photographs of study area overviews, representative probe stratigraphy, and identified cultural resources were taken. All probes were backfilled. Daily documentation consisting of standard work records describing general conditions, geological and geomorphological setting, ground surface exposure, vegetation, and cultural resources if observed, was completed along with photo logs describing the subject matter and cardinal direction of each photograph.

RESULTS

SWCA archaeologists Kate Shantry and Eileen Heideman conducted fieldwork at the WWTP on August 2, 2013. Conditions were mostly cloudy at 60 degrees Fahrenheit. WWTP employee Anthony Vendetti guided the SWCA crew to the proposed work areas, identified utilities locations, and described which areas had been disturbed the most by previous activities. Mr. Vendetti stated that the WWTP was originally built in the 1950s, with improvements made in the 1970s and 1980s.

The field investigation focused on the less disturbed areas, checking conditions in each of the proposed work areas and excavating a total of 8 shovel probes in 4 of the 7 areas. For ease of recording and reporting, the work areas were identified by letters A-F (Figure 8). In general, the natural topography of the site sloped from north to south. Surface visibility was poor with asphalt, gravel, grass, and compacted imported and local fill. There was some exposure in disturbed areas within grassy areas. Local land modifications were visible with some surfaces made higher than others some areas obviously shaped. Three probes were augured to over 3 meters below the surface, with native sand encountered in two of these in Areas A and B. Other probes found compact fill and gravelly sands. For shovel probe details, see Appendix A. A summary of investigation in each work area follows.

Area A (Alternate location for Secondary Clarifier #3):

Area A is located in the southeastern-most area east of the proposed Aeration Basin #3 (Figure 9). The area is flat with sparse grass and wood chips on top of sand and gravel. An east-west sewer runs along the south end, and a north-south electrical runs along the west margin, with a gravel road to the north and east. This area lies above wooded area to south and is about 3 feet higher in elevation than Area C, the southern-most work area. SP-1 reached through about 75 cm of fill into native sand and silty sand over 3 meters below the surface (Figure 10). SP-2 stopped on gravels at about 75 cmbs (Figure 11). Several fill episodes are apparent in Area A, with a combination of import and local fill that is very compact. Mr. Vendetti informed the crew that an apartment building was formerly in this area. Push pile of dirt and wood debris were noted at the southeast end of Area A.

Area B (Equipment Storage Building):

Area B is a rectangular area with a gravel road to the east and an empty grass lot where a house has been removed since the most current air photo was taken (Figure 12). The ground is disturbed where the house stood, with hummocky areas of sand and weeds. One rose bush remains in the northeast corner of Area B. A wooden fence separates Area B on the east from an existing house. SP-3 encountered fill (Figure 13). SP-4 encountered sand that was compact on top but digging was easier all the way down to depths over 3 meters. No utilities were visible but there are power lines and a waterline, oriented east-west outside Area B to the north.

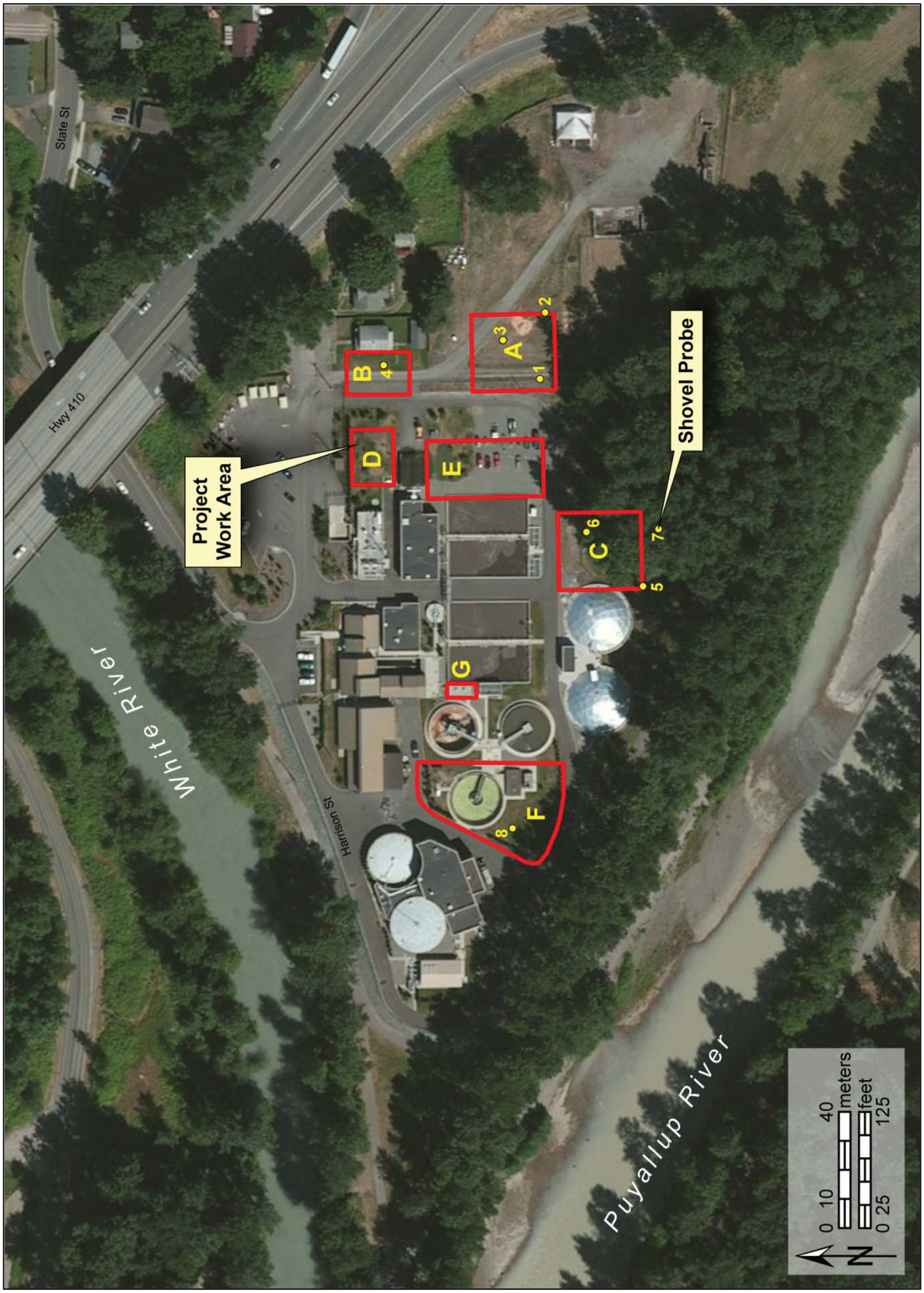

Figure 8. Current conditions showing shovel probe locations.

Figure 9. Overview of Area A and Shovel Probe 3, view north.

Figure 10. Shovel Probe 1 (0-~120 cmbs) in Area A.

Figure 11. Shovel Probe 2 stopped at 75 cmbs on gravels.

Figure 12. Overview of Area B, looking south.

Figure 13. Shovel Probe 3 (0-342 cmbs) showing fill in Area B.

Area C: (Secondary Clarifier #3)

Area C is adjacent to the east of the Secondary Clarifier #2 and is the preferred location for Secondary Clarifier #3 (Figure 14). The western portion is cleared with grass, new tree plantings and sand exposed on the surface. The eastern portion is a hardwood forest with a very hummocky surface that appeared to have been pushed around into piles on the edges. A chain link fence is along the north, separating the area from Areas E and A. To the south is a paved trail and a riparian corridor. The forest understory consists of blackberry, Oregon grape, tall grasses, wetland plants, and weeds. This area is disturbed, with the surface north of SP-6 cut down about a foot. The natural topography slopes down to south. Push piles of wood and debris were noted in the forest. SP-5 encountered compact fill and no opportunity to auger. SP-7 was excavated in the woods where surface was about 2 feet lower than that at SP-5 and SP-6, stopped on cobbles at about 39 cmbs.

Area D: Solids Storage Building

The area is a landscaped hill between 63rd Street E and the developed WWTP (Figure 15). The mound of dirt appears to have been shaped by a machine and has new, manicured grass and three small trees, with four small conifers bordering the east edge. A power line is north-south across the eastern half of the area. The facility biofilters are located in between Area D and E to the south. The natural topography on the north side of 63rd Street E is several feet lower than the mounded area. As the area appears to be fill, no probes were placed in Area D.

Figure 14. Overview of Area C and SP-5, view south-southwest.

Figure 15. Overview of Area D, looking west.

Area E: Aeration Basin #3

Area E is mostly a gravel parking lot that Mr. Vendetti said has been "exposed" (Figure 16). North of the gravel is a flat grassy area with four young apple trees and three small young conifers, an electrical transformer, and a light post. This area, like Area F, was considered low potential due to the level of prior disturbance. A shovel scrape verified that compacted sand and gravel fill in the area.

Area F: (Several proposed Alternative B improvements):

Area F is landscaped with grass and sprinklers (Figure 17). SP-8 verified that this area is comprised of fill. The surface of natural topography slopes from north to south, with terrain outside the WWTP noticeably lower.

Area G: Primary Sludge Pump Building

Area G is the smallest work area in the middle of the developed WWTP (Figure 18). Mr. Vendetti said it had been dug out before. There are concrete buildings to north and south of Area B and WWTP aeration ponds to the east and a primary clarifier to the west, with concrete walkways to the west and cobbles (fill) in between. Since the area was built up and visibly made on fill, there was deemed to be no potential for encountering archaeological materials and no probes were placed in Area G.

Figure 16. Overview of Area E, looking south.

Figure 17. Overview of Area F and SP-8, view west.

Figure 18. Overview of area G, looking east.

CONCLUSIONS AND RECOMMENDATIONS

Subsurface testing shows that the WWTP is highly disturbed from construction of the wastewater treatment systems during different periods. Fill was found in all areas, though shovel probes could not always penetrate due to compact gravelly and cobbly sediments. Depth of fill is probably variable; native surfaces were encountered in two subsurface tests at 75 cmbs.

It is possible that in spite of disturbance, some native surfaces are intact beneath fill and could be encountered during excavation. In Areas A (Alternate location for Secondary Clarifier #3) and C (proposed location for Secondary Clarifier #3) where there is less disturbance and excavation for placement of clarification tanks will be deep, it is possible that construction will encounter intact native surfaces that have the potential to contain cultural materials.

SWCA recommends monitoring by a qualified archaeologist during excavation in Area A and Area C where excavation will reach native sediments. Monitoring should be carried out under a Monitoring and Discovery Plan that provides guidance on procedures to be followed in the event cultural resources are uncovered. It is always possible that cultural resources could be found within other portions of the project during construction, and the Monitoring and Discovery Plan should include provisions for inadvertent discovery during unmonitored construction as well. If geotechnical investigations are carried out prior to construction, archaeological monitoring of these borings might help to characterize subsurface deposits and limit the need for onsite monitoring during construction.

REFERENCES

Ames, Kenneth M. and Herbert D. G. Maschner

1999 *Peoples of the Northwest Coast: Their Archaeology and Prehistory*. Thames and Hudson, London.

Avey, Mike and Crista Starwich

1985 *Pierce County Cultural Resource Survey: Archaeology- Phase I.* Fort Steilacoom Community College.

Barnosky, Cathy W.

1984 Late Pleistocene and Early Holocene Environmental History of Southwestern Washington State, U.S.A. *Canadian Journal of Earth Science* 21:619-629.WA-CL.

Blukis Onat, Astrida R., Morgenstein, Maury E., LeTourneau, Philippe D., Stone, Robert P., Kosta, Jerre, Johnson, Paula

2000 *Archaeological Investigations at stuwe'yuq - Site 45KI464, Tolt River, King County, Washington*. BOAS, Seattle, WA.

Butler, B. Robert

1961 The Old Cordilleran Culture in the Pacific Northwest. Occasional Papers of the Idaho State College Museum, No. 5, Pocatello, ID.

Carlson, R. L.

1990 History of Research in Archaeology. In *Northwest Coast,* Handbook of North American Indians, Vol. 7, Wayne Suttles (ed.), Smithsonian Institution, Washington, D.C.

Champman, Judith S., David V. Ellis, Eric E. Forgeng, David T. Francis, Timothy J. Hills, and Julia J. Wilt

1996 Cultural Resources Inventory of the Proposed Worldcom Fiber Optic Cable Project, Portland Oregon to Seattle, Washington. Prepared for G E Raleigh and Associates, Beaverton, Oregon and WorldCom Network Services. Inc., Tulsa. Oklahoma. Archaeological Investigations Northwest. Inc.

Chatters, James and Gretchen Kaehler

2012 Washington State Archaeological Site Inventory Form, 45PI1276. On file, Department of Archaeology and Historic Preservation, Olympia, Washington

City of Sumner

2010 *City of Sumner Comprehensive Plan Update and Amendments Draft Environmental Impact Statement*. August 2010. Sumner, WA.

City of Sumner/Ryan House Museum

n.d. A Self-Guided Tour through the Historical Landmarks of Sumner Washington. Online document accessed July 31, 2013: http://www.ci.sumner.wa.us/Documents/sumnerwalkingtour.pdf

Daffodil Valley Times and the City of Sumner

n.d History of the South Puget Sound (Including Bonney Lake, Edgewood, Fife, Milton, Orting, Puyallup, Sumner, Tacoma): A-Z History of Sumner, Washington . Online resource accessed July 30, 2013: http://www.daffodilvalleytimes.com/history/index.html

Demuth, Kimberly
2005 *Letter Report: Cultural Resources in the SR 167 Valley Freeway Corridor*. Prepared for Perteet Engineering. ENTRIX, Inc., Seattle, Washington.

Department of Archaeology and Historic Preservation
2013a Cemetery Detail Report, 45PI891, Sumner Cemetery. On file, Department of Archaeology and Historic Preservation, Olympia, Washington.

2013b Cemetery Detail Report, 45PI971, Powers Woodlawn Mausoleum and Columbarium. On file, Department of Archaeology and Historic Preservation, Olympia, Washington.

Dethier, D. P., Fred Pessl, Jr., R. F. Keuler, M. A. Balzarini and D. R. Pevear
1995 Late Wisconsin Glaciomarine Deposition and Isostatic Rebound, Northern Puget Lowland, Washington. *Geological Society of America Bulletin* 107:1288-1303.

Dragovich, Joe D., Patrick T. Pringle and Timothy J. Walsh
1994 Extent and Geometry of the Mid-Holocene Osceola Mudflow in the Puget Lowland - Implications for Holocene Sedimentation and Paleogeography. *Washington Geology* 22:3-26.

Fladmark, Knut R
1982 An Introduction to the Prehistory of British Columbia. Canadian Journal of Archaeology No. 6.

Franklin, Jerry F. and C.T. Dyrness
1988 *Natural Vegetation of Oregon and Washington.* Oregon State University Press.

Gibbs, G., W. F. Tolmie, and G. Mengarini
1877 *Tribes of Western Washington and Northwestern Oregon*. Seattle, Washington, Shorey.

Gill, Matthew and Margaret Berger
2007 *Cultural Resources Survey for the Shaw Road Extension Project. Pierce County, Washington*. Prepared for Parametrix, Inc., Puyallup, Washington. Cultural Resource Consultants, Inc., Bainbridge Island, Washington.

Gray & Osborne, Inc., February
2000 *City of Sumner Final Comprehensive Facility Plan Amendment No. 1*. Prepared for the City of Sumner. Gray and Osborne, Inc., Seattle, Washington.

Gustafson , Carl E. And Clare Manis
1984 *The Manis Mastodon Site: An Adventure in Prehistory*. Manis Enterprises, Sequim, Washington.

Happy, Rita, Florence K. Lentz
1981 National Register of Historic Places Inventory-Nomination Form, 45PI175, Ryan House. On file, Department of Archaeology and Historic Preservation, Olympia, Washington.

Hartmann, Glenn
2010 *Letter Report: Cultural Resources Assessment for the White River Trail (Confluence to Bridge St) Project, Sumner, Pierce County, WA*. Prepared for City of Sumner. Cultural Resource Consultants, Inc., Bainbridge Island, Washington.

Kennedy Jenks
1999 *City of Sumner Final Comprehensive Facility Plan*. Prepared for the City of Sumner. Kennedy Jenks, Seattle, Washington.

Kerwin, John
1999 *Salmon Habitat Limiting Factors for the Puyallup Basin, Water Resource Inventory Area 10.* Washington Conservation Commission. Olympia, Washington

Kidd, Robert Stuart
1964 A Synthesis of Western Washington Prehistory from the Perspective of Three Occupation Sites, (San Juan and Snohomish Counties.) Masters Thesis, University of Washington, Seattle, WA.

Kiers, Roger
2010 *Cultural Resources Survey, SR 512, SR 410 and SR 167, Portland Ave. to King County Line, Flow Map Improvements, Pierce County, Washington*. Washington State Department of Transportation, Cultural Resources Program.

Kirk, Ruth and Richard Daugherty 1978
1978 *Exploring Washington Archaeology*. University of Washington Press, Seattle.

Kopperl, Robert E., Christian J. Miss, and Charles M. Hodges
2010 *Results of Testing at the Bear Creek Site, 45-KI-839, Redmond, King County, Washington.* Prepared for the City of Redmond and David Evans and Associates, Inc. Northwest Archaeological Associates, Inc.

Lane, Barbara
1973 Anthropological Report on the Identity, Treaty Status, and Fisheries of the Puyallup Tribe of Indians. Unpublished report in author's possession; copy of manuscript is also housed in SWCA Seattle office library.

Martin, Paul S.
1973 The Discovery of America. *Science* 179:969-974.

Matson, R. G. and G. Coupland
1995 *The Prehistory of the Northwest Coast*. San Diego, California, Academic Press.

Mattson, John Lyle
1971 A Contribution to Skagit Prehistory. Master’s thesis, Department of Anthropology, Washington State University, Pullman, WA..

Meltzer, David J. and Robert C. Dunnell
1987 Fluted Points from the Pacific Northwest. *Current Research in the Pleistocene* 4:64- 67.

National Resources Conservation Service [NRCS]
2013 Web Soil Survey, National Cooperative Soil Survey. Soil Map – Pierce County, Washington (Sumner WWT).

Office of United States Surveyor General
1864 General Land Office Plat for Township 20 North, Range 4 East, Willamette Meridian. Olympia, Washington.

1865 General Land Office Plat for Township 20 North, Range 4 East, Willamette Meridian. Olympia, Washington.

Pierce County Office of Community Development
1983 *Pierce County Cultural Resource Inventory, Volume VII: Central Planning Area: Puyallup Valley*. Pierce County Office of Community Development.

Porter, S. C. and T. W. Swanson
1998 Radiocarbon Age Constraints on Rates of Advance and Retreat of the Puget Lobe of the Cordilleran Ice Sheet During the Last Glaciation. *Quaternary Research* 50:205-213.

Puyallup NE
1931 White River orthophotos - 1931, Puget Sound River History Project, Department of Earth & Space Sciences, University of Washington.

Puyallup NE
1940. Duwamish, Puyallup, White, Black, Green, and Carbon Rivers orthophotos - 1940, Puget Sound River History Project, Department of Earth & Space Sciences, University of Washington.

Reese, Gary Fuller
1974 *Historic roads and Trails of Pierce County*. Tacoma Public Library.

Ruby, Robert H., and John A. Brown
1992 *A Guide to the Indian Tribes of the Pacific Northwest.* Revised Edition. University of Oklahoma Press, Norman and London

Ryan, Amy M. and the Sumner Historical Society
1988 *The Sumner Story: Sumner Washington 1853-1900*. Heritage Quest Press, Orting, WA.

Shong, Michael
2003 *Heritage Resources Investigations for the City of Puyallup Riverfront Trail Project-Phase 2 (SR 512 to East Main) Pierce County, Washington*. Prepared for Perteet Engineering, Lakewood, Washington. Northwest Archaeological Associates, Inc., Seattle, Washington.

Smith, M. W.
1940 *The Puyallup-Nisqually*. New York, Columbia University Press.

Thorson, Robert M.
1989 Glacio-Isostatic Response of the Puget Sound Area, Washington. *Geological Society of America Bulletin* 101: 1163-1174.

Tsukada, M.
1982 Pseudotsuga menziesii (MIRB) Fanco: Its Pollen Dispersal and Late Quaternary History in the Pacific Northwest. *Japanese Journal of Ecology* 32: 159-187.

Waterman, T.T.
[1920] 2001 *Puget Sound Geography*.[edited with additional material from Vi Hilbert, Jay Miller, and Zalmai Zahir].Lushootseed Press, Zahir Consulting Services, Federal Way, Washington.

Waters, Michael R., Thomas W. Stafford, Jr., H. Gregory McDonald, Carl Gustafson, Morten Rasmussen, Enrico Cappellini, Jesper V. Olsen, Samian Szklarczyk, Lars Juhl Jensen, M. Thomas P. Gilbert, and Eske Willerslev
2011 Pre-Clovis Mastodon Hunting 13,800 Years Ago at the Manis Site, Washington. *Science* 21 October 2011.

Wessen, Gary and M. Leland Stilson
1987 *Resource Protection Planning Process, Southern Puget Sound Study Unit.* Prepared for the Washington State Department of Community Development. Office of Archaeology & Historic Preservation, Olympia, Washington.

Whitlock, Cathy
1992 Vegetational and Climatic History of the Pacific Northwest during the Last 20,000 Years: Implications for Understanding Present-day Biodiversity. *Northwest Environmental Journal* 8 (1):5-28.

Zulauf, Allen S., Miles L. Raver, Alfonso DeBose, and Jonathan F. Edwards
1979 *Soil Survey of Pierce County, Washington Area*. Soil Conservation Service United States Department of Agriculture, Soil Conservation Service, in cooperation with the Washington Agricultural Experiment Station.

Zehfuss, P.H., B. F. Atwater, J. W. Vallance, H. Brenniman and T. A. Brown
2003 Holocene lahars and their by-products along the historical path of the White River between Mount Rainier and Seattle. In Swanson, T.W. (Ed.) *Western Cordillera and adjacent areas: Geological Society of America Field Guide* 4: 209-223. Boulder, Colorado.

APPENDIX A: SHOVEL PROBE TABLE

Table A-1. Shovel Probe Data

SP NO.	UTM (Zone 10, NAD83) NORTHING	EASTING	STRATIGRAPHIC DESCRIPTION (CENTIMETERS BELOW SURFACE)	INTERPRETATION	CULTURAL MATERIAL
Area A					
1	5227568	556568	0-29: Gray gravelly sand; many small to large angular and subangular and subround pebbles and cobbles; common fine roots in upper 18 cm; compact; clear, wavy lower boundary.	Fill	0-10: 2 plastic fragments; 1 brown bottle glass fragment
			29-52: Brownish gray gravelly sand; many small to large angular and subround pebbles and cobbles; compact. Older fill, possibly local.		
			52-62: Brownish gray gravelly sand; small to large angular and subround pebbles and cobbles; 5 cm diameter root; compact; clear, smooth boundary.		
			62-114: Brownish gray silty fine sand; gradual, smooth boundary. Began augering at 102 cm.		
			114-226: Grayish yellowish brown fine sandy silt; iron oxide mottles; very few charcoal flecks; oxidation increases with depth; gradual, smooth boundary.		
			226-345: Grayish brown slightly silty fine sand. Probe terminated at 345 cm due to no recovery because of 3-5 cm round and subround gravels.		
2	5227566	556591	0-21: Light yellowish grayish brown gravelly fine sand; very many small-large and subangular pebbles; common, small-medium, subrounded and round cobbles; combination of imported and local fill – recent; compact; abrupt, wavy lower boundary.	Fill	10-20: 5 chunks slag 10-30: 1, 24 cm long chunk of concrete 20-40: 1 chuck slag; 1 brown bottle glass fragment; 2 chunks dried out branch wood
			21-44: Grayish, yellowish brown silty, gravelly, fine to coarse sand; very many, small-large, angular, subangular, round, and subround pebbles and cobbles; compact; abrupt, wavy lower boundary.	Fill	35-55: 1 red plastic fragment; 1 chunk slag; 1 clear glass fragment.
			44- 75: Bluish gray gravelly, fine to medium sand; many small to large round, subround and subangular pebbles; common, large, subround cobbles. At 55 cmbs: large 20 x 20 cm cobble could not be pry up; began augering in other half of probe. Probe terminated at 75 cmbs due to no recovery in auger due to gravels.	Fill	47: metal nail coming out of east sidewall
Area B					
3	5227580	556582	0-14: Gray gravelly sand; many small to large angular, subangular, subrounded pebbles; common fine roots; compact; abrupt, wavy lower boundary.	Fill	
			14-21: Brownish gray fine silty sand; iron oxide streaking; compact; abrupt, wavy lower boundary.	Fill	
			21-46: Grayish brown, fine silty sand; many small to large angular, subangular and subround pebbles and cobbles; compact; abrupt, wavy lower boundary.	Fill	1 plastic fragment
			46-60: Bluish gray fine silty sand; many small to large angular and subangular pebbles and cobbles; burned wood (3-9 cm); abrupt, wavy lower boundary.	Fill	Aluminum foil fragments, burned wood (sawn no milled), electrical tape, plastic fragments, burned painted gypsum board
			60-73: Brownish gray silty fine sand; clear wavy lower boundary.		
			73-154: Grayish brown slightly silty fine sand; boundary obscured by auger. Probe terminated at 154 cmbs due to no recovery due to 1-6 cm gravels, round and subround pebbles.		

Table A-1. Shovel Probe Data

SP NO.	UTM (Zone 10, NAD83) NORTHING	EASTING	STRATIGRAPHIC DESCRIPTION (CENTIMETERS BELOW SURFACE)	INTERPRETATION	CULTURAL MATERIAL
4	5227621	556573	0-22: Brownish gray fine sand; compact; clear, smooth lower boundary.	Fill	0-10: 1 piece plastic; 1 clear glass fragment
			22-95: Grayish brown fine sand; gradual, smooth lower boundary.		
			95-115: Brownish gray “salt and pepper” fine sand; clear, smooth lower boundary. Began augering at 100 cmbs.		
			115-128: Brown fine sandy silt with charcoal and organics; clear, smooth lower boundary.		
			128-176: Grayish brown, slightly silty, fine sand with charcoal and organics; lower boundary obscured in auger hole.		
			176-233: Grayish brown fine sand.		
			233-250: Grayish brown fine sandy silt; orange oxidation mottles at 248 cmbs.		
			250-343: Grayish brown fine sandy silt; oxidation mottles, organics – few fine twigs. Probe terminated at 342 cmbs due to maximum depth of ager extension.		
Area C					
5	5227532	556497	0-8: Gray silty fine sand with common rootlets; abrupt, wavy lower boundary.		
			8-24: Gray silty fine sand; common iron oxide mottles and streaking; abrupt, wavy lower boundary.		
			24-49: Bluish gray silty fine sand; common subangular, subround, and round small to large pebbles and cobbles (up to 13x17cm); upper 10 cm compacted: common iron oxide mottles. Probe terminated due to large cobbles and compaction.		
6	5227552	556516	0-42: Light grayish brown cobbly, very fine sand; few common roots; many small to large subround cobbles; common small to large subround pebbles; clear, smooth lower boundary. Disturbed.		5-25: 1 piece cloth; 1 piece PVC, 1 plastic fragment 25-45: 1 clear plastic fragment 34: electrical wire in NE wall 40-60: 1 piece (6 cm long) milled wood
			42-63: Light brown, gravelly fine sand; common many small to large subround pebbles; few common subround cobbles. Probe terminated at 63 cmbs due to impenetrable cobbles.		
7	5227527	556517	0-39: Light grayish brown slightly silty, gravelly fine sand; common to many organics; common small to large subround pebbles; few common small to large subround cobbles. Probe terminated at 39 cmbs due to impenetrable cobble.		
Area F					
8	5227577	556414	0-9: Brownish fine sandy silt; common rootlets; clear, smooth lower boundary.	Fill	
			9-23: Brown silty fine sand; common small to large subround, and round small to large pebbles and cobbles; compact; abrupt, wavy lower boundary.	Fill	Glass fragments, red tile (flower pot or tile fragment)

Table A-1. Shovel Probe Data

SP NO.	UTM (Zone 10, NAD83) NORTHING	EASTING	STRATIGRAPHIC DESCRIPTION (CENTIMETERS BELOW SURFACE)	INTERPRETATION	CULTURAL MATERIAL
			23-76: Bluish gray fine silty sand; small to large subangular, subround, and round pebbles and cobbles; compact. Probe terminated due to cobbles and compaction.		