Sumner Station Access Improvements Project

Cultural Resources Technical Report

Submitted to:
Sound Transit

Seattle, Washington
March 2016

Historical
Research
Associates, Inc.

This report was prepared by HRA Principal Investigators Carl Williams, MS, and Chrisanne Beckner, MS, who meet the Secretary of the Interior's professional qualification standards for architectural history, and Carol Schultze, PhD, RPA, Jenny Dellert, MS, Lynn Compas, MA, RPA, and Alex Stevenson, MS, who meet the Secretary of the Interior's professional qualification standards for archaeology. This report is intended for the exclusive use of the Client and its representatives. It contains professional conclusions and recommendations concerning the potential for project-related impacts to archaeological resources based on the results of HRA's investigation. It should not be considered to constitute project clearance with regard to the treatment of cultural resources or permission to proceed with the project described in lieu of review by the appropriate reviewing or permitting agency. This report should be submitted to the appropriate state and local review agencies for their comments prior to the commencement of the project.

Executive Summary

The Central Puget Sound Regional Transit Authority (Sound Transit) is proposing to improve access to the Sumner Station for pedestrians, bicyclists, and drivers. Approximately 1,000 people ride a Sounder train or ST Express bus from the Sumner Station every day. Over 40 percent of Sounder riders drive and park at the Sumner Station or use nearby on-street parking. Another 25 percent use local bus services to access the Sumner Station. The remaining Sounder riders (35 percent) access Sumner Station via kiss-and-ride services or non-motorized modes of transportation. Many of these riders find it difficult to access the station because parking is full by the second morning train before 6 am. Traffic congestion already creates delays at intersections around the station, similarly affecting both drivers and buses.

Sound Transit is expanding its South Line Sounder rail service, which is planned to include three new round trip trains by 2017 for a total of 13 daily round trips. Sound Transit is also forecasting ridership to increase to 1,500 riders in Sumner by 2035. Additional parking capacity and congestion management will be required to meet this growing ridership demand. Similarly, additional bicycle and pedestrian amenities will improve non-motorized access to the station.

On August 28, 2014, the Sound Transit Board identified the existing Sumner Station parking lot as a preferred location for improvements. These improvements include maintaining the majority of existing parking spaces at the transit center surface lot and building a garage at the station. The proposed project includes a five-level, 623-space parking garage. On completion of the project, the number of parking spaces would be 857, including the existing parking spaces that remain at the station. The project also would include intersection improvements, bicycle storage, curb ramps, street lighting, and an optional pedestrian bridge.

This Project is supported by Federal Transportation Administration (FTA) funds and, as such, is defined as a federal undertaking requiring compliance with Section 106 of the National Historic Preservation Act (as amended). In support of the project, Sound Transit tasked Historical Research Associates, Inc. (HRA), with conducting a cultural resources inventory and evaluation of historic-era buildings, structures, and objects (BSO) located within the Area of Potential Effects (APE) for the Project.

There is a high probability for identifying archaeological resources within the APE. Since the area is paved, an archaeological inventory was not possible at this time. In lieu of an inventory HRA observed sediments from geotechnical boring samples that are indicative of a relatively low-energy depositional environment; thereby, increasing the probability for intact archaeological materials. The

structural foundation design for the Sumner Station is currently not known but may include ground disturbing excavation as deep as 15 feet below surface and pilings or geopiers as deep as 80 feet below surface to support this facility. As a result, HRA recommends the following:

- An Archaeological Resource Monitoring and Inadvertent Discovery Plan (ARMTP) would be developed for the construction phase of the project.
- The protocols and level of monitoring established by the ARMTP would be informed as the foundation for the project design is developed. Monitoring protocols would include a range of on-site monitoring from daily monitoring, spot checks on a regular basis, to on-call. The level of monitoring would be recommended by the Project Archaeologist and reflect the probability for discovering archaeological materials during the construction.

HRA also conducted a reconnaissance-level cultural resources inventory and evaluation of historic-era resources within one tax parcel of the proposed garage and pedestrian overpasses. HRA identified 13 BSOs within the APE that were constructed during the historic era and had not yet been evaluated by State Historic Preservation Office (SHPO) at the Washington Department of Archaeology and Historic Preservation (DAHP) for eligibility to the National Register of Historic Places (NRHP). As part of the study, HRA completed historic property inventory forms (HPIs) for each resource in the Washington Information System for Architectural and Archaeological Records Data (WISAARD), as per DAHP guidelines.

FTA has determined in consultation with SHPO that no historic resources within the APE are eligible for listing in the National Register of Historic Places (NRHP) or the Washington Heritage Register (WHR). Regarding the Burlington Northern Railroad, FTA determined, in consultation with SHPO, that the rail resources within the APE are considered non-contributing elements to a larger, possible NRHP-eligible resource (Sterner 2015 [Appendix A]).

Given that there are no cultural resources eligible for the NRHP within the APE, the consultant recommends that there are "no historic properties affected" from the Project.

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List of Acronyms

AIRFA	American Indian Religious Freedom Act
APE	Area of Potential Effects
ARMPT	Archaeological Monitoring and Treatment Plan
BNSF	Burlington Northern Santa Fe
B.P.	before present
DAHP	Department of Archaeology and Historic Preservation
EO	Executive Order
FMR	fire-modified rock
FTA	Federal Transportation Authority
GLO	General Land Office
HPI	Historic Property Inventory Form
HRA	Historical Research Associates, Inc.
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
RCW	Revised Code of Washington
SHPO	State Historic Preservation Officer
SRHP	Sumner Register of Historic Places
TCP	Traditional Cultural Property
USSG	U.S. Surveyor General
WHR	Washington Heritage Register
WISAARD	Washington Information System for Architectural and Archaeological Records Database

1. Introduction and Project Description

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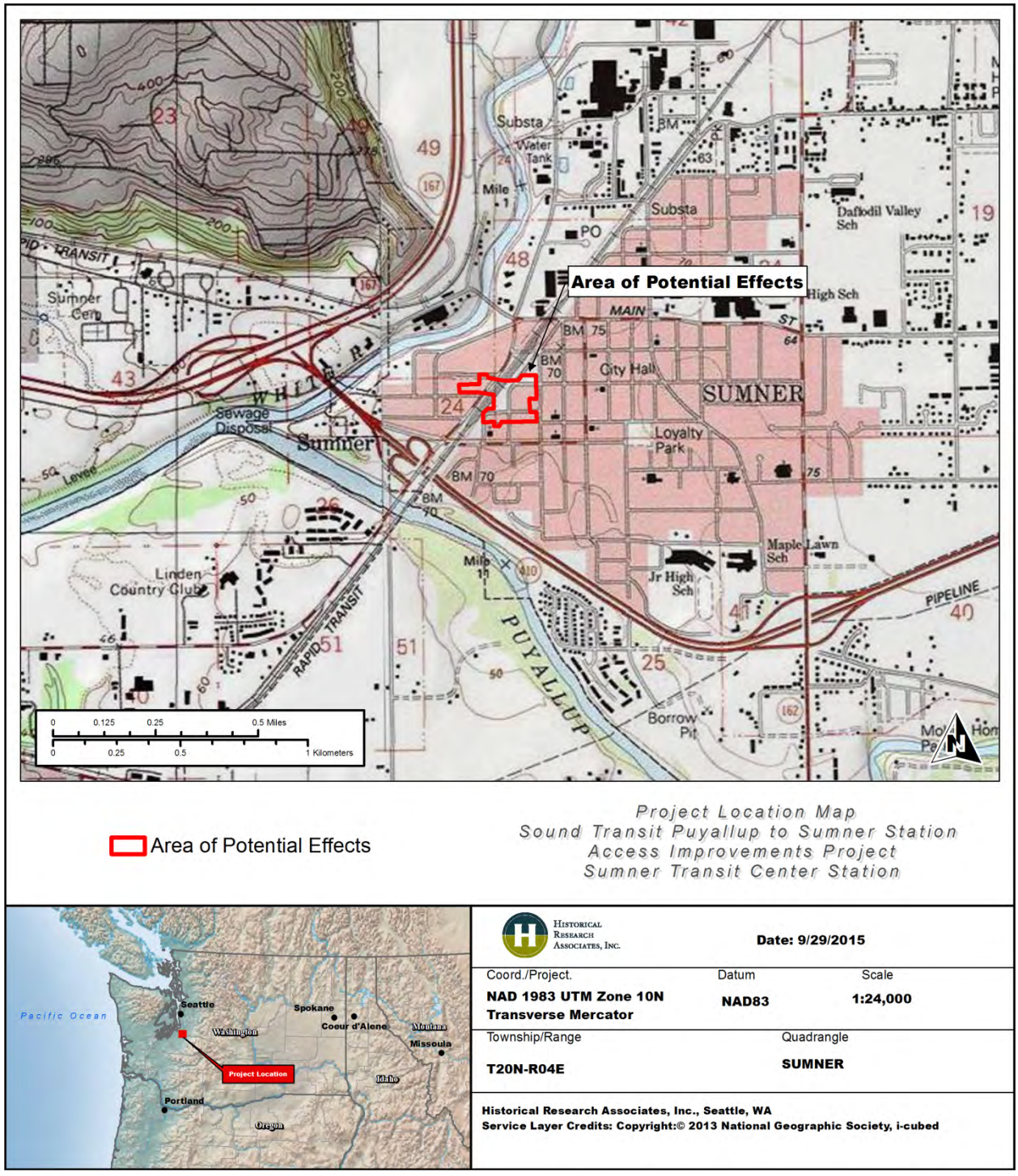

Figure 1-1. Project location and APE Map.

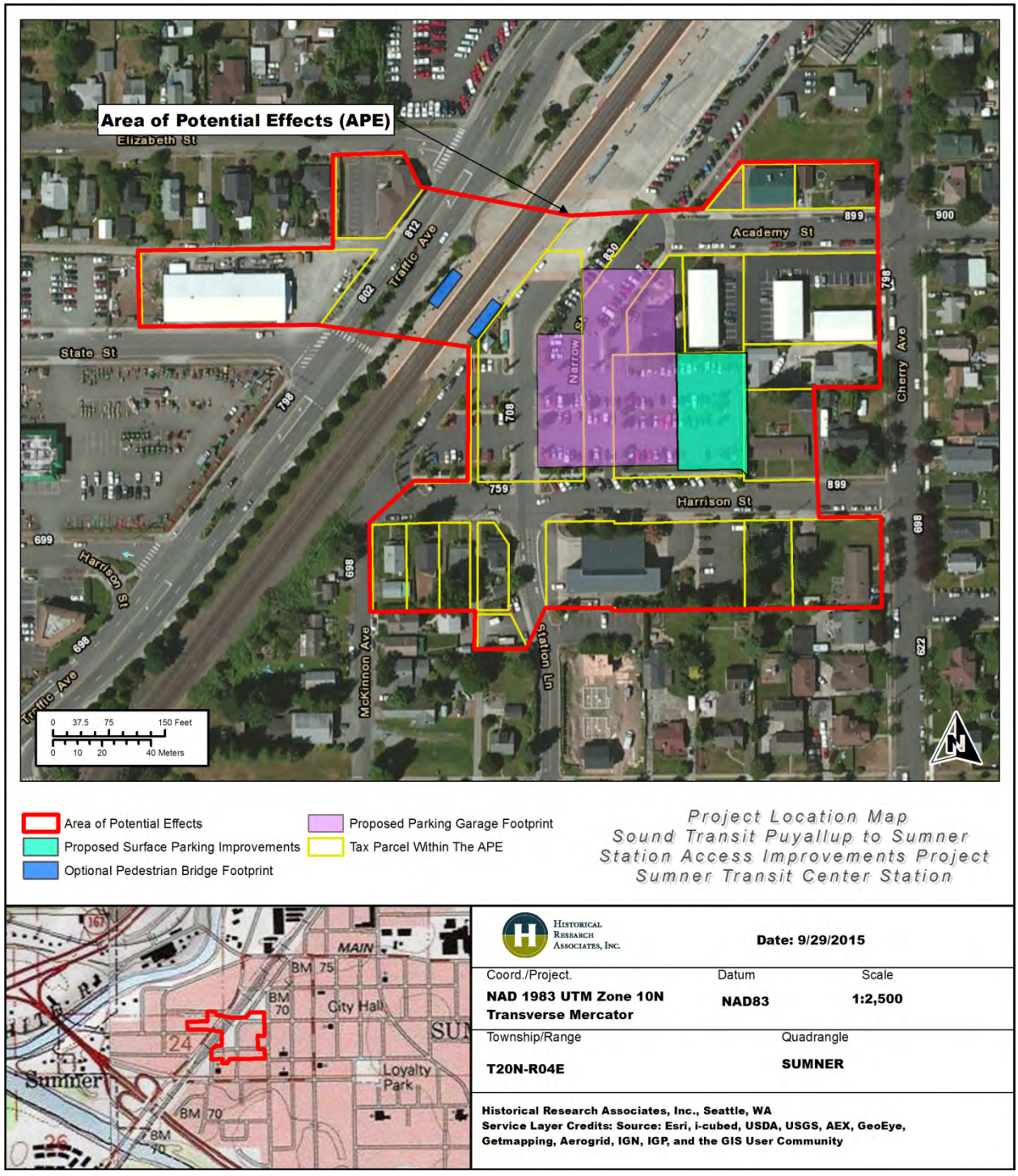

Figure 1-2. Area of Potential Effects (APE).

1.1 Purpose of Technical Report

The purpose of this report is to document the cultural resource studies that have taken place for the project thus far. This document reports the results of background research, probability for archaeological resources, recommendations for archaeological monitoring and continuous coring, and the evaluation of architectural resources located within the APE for the project.

1.2 Regulatory Context

This Project includes funding from the FTA and as such, is defined as a federal undertaking subject to compliance with the National Historic Preservation Act (NHPA) of 1966, as amended and implementing regulations under 36 CFR 800 (Section 106). NHPA states that any federal or federally assisted project or any project requiring federal licensing or permitting must consider the project's effects on historic properties listed in, or eligible for listing in, the NRHP. FTA is the lead agency for Section 106 implementation, and DAHP is a consulting party.

NHPA provides for consultation with American Indian groups when the proposed Project might affect cultural or traditional places or resources that have value to an Indian tribal group derived from the role the property plays in the community's historically rooted beliefs, customs, and practices (NHPA Section 101). In addition, the American Indian Religious Freedom Act (AIRFA) of 1978 and Executive Order (EO) 130007 that protects Indian Sacred Sites must be considered when investigating archaeological sites and traditional cultural properties (TCPs).

NHPA encourages coordination with the environmental review process required by other statutes, including the National Environmental Policy Act (NEPA) and Section 4(f) of the United States (U.S.) Department of Transportation Act of 1966. Section 4(f) mandates that the Federal Highway Administration and other Department of Transportation agencies cannot approve the use of land from significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historic sites unless there is no feasible and prudent alternative to the use of the land, and the action includes all possible planning to minimize the harm to the property resulting from use.

Cultural resources are also considered under NEPA, and NHPA encourages maximum coordination with NEPA. NEPA establishes national policies and goals for the protection of the environment, including cultural resources. One of the mandates of NEPA is to "preserve important historic, cultural, and natural aspects of our national heritage" (Section 101 [42 USC § 4331]).

The Project is also subject to laws of the State of Washington, including the Revised Code of Washington (RCW), particularly RCW 27.44 regarding Indian Graves and Records, and RCW 68.60 regarding Abandoned Historic Cemeteries and Historic Graves. The Project is not subject to review

under the City of Sumner's Historic Preservation Code (Ord. 2275 § 2 (part), 2008), as the ordinance only applies to historic resources listed on the Sumner Historic Register (SHR).

1.3 Area of Potential Effects

The APE is defined as the area in which a federal undertaking may affect NRHP-listed or -eligible properties and takes into account both direct effects, such as demolition of the property, and indirect effects, such as visual changes affecting the character and setting of the property.

The proposed garage will be located on Station Lane between Harrison and Academy Streets in the City of Sumner, Township 20 North, Range 4 East, Sections 24 and 25, of the Willamette Meridian. Pursuant to 36 CFR 800, FTA has determined in consultation with DAHP that the APE extends one parcel beyond the Project footprint or area of ground disturbance. To the north, the APE is bound by residences north of Academy Street, parking, and two commercial buildings. An existing parking lot and McKinnon Avenue make up the western boundary. The southern boundary is flanked by residences, a parking lot, an alleyway, and a fence line. Cherry Avenue and an apartment building are located along the eastern edge (see Figures 1-1 and 1-2). DAHP concurred with the proposed APE by letter on May 4, 2015 (DAHP to FTA, May 4, 2015).

2. Consultation

2.1 State Historic Preservation Officer and Other Consulting Parties

In accordance with 36 CFR 800, FTA is the lead federal agency who determines whether a resource is eligible to the NRHP and WHR, in consultation with the State Historic Preservation Officer (SHPO). Other consulting parties include the City of Puyallup and the Tribes. All correspondence is located in Appendix A.

2.2 Tribes

As required by 36 CFR 800, FTA sought government-to-government consultation with potentially affected Native American Tribes, and initially provided Project information and followed up by telephone. Consultation with the Tribes has identified no information regarding TCPs that the Project would affect.

The tribes consulted with include the Puyallup Tribe, Nisqually Tribe, Muckleshoot Indian Tribe, and Confederated Tribes and Bands of the Yakima Nation. FTA will continue to consult with tribal governments throughout the duration of the Project in accordance with Section 106.

3. Archival Research

3.1 Methods and Materials Reviewed

HRA project archaeologist Jenny Dellert, MA, consulted DAHP's WISAARD database for cultural resource reports, previously recorded archaeological sites, and/or historic properties listed in or eligible for listing in the NRHP or WHR within ¼ mile (mi) of the proposed locations. Research archaeologist Carol Schultze, PhD, reviewed historic-era General Land Office (GLO) plats and maps. HRA's architectural historian Chrisanne Beckner, MS, also searched the Pierce County Assessor's records to determine the number and age of structures located on the tax parcel(s) proposed for the Project and those immediately adjacent. Both Dellert and Beckner accessed WISAARD to locate any historic property inventory forms (HPIs) already created for the same parcels. HRA's architectural historian Carl Williams, MS, reviewed the Pierce County Register of Historic Places and the SHR for locally significant properties. Unless noted in the following sections, the reader can assume that results of the research conducted in a particular document or record were negative.

3.2 Results

3.2.1 Previous Cultural Resource Studies

There has been one cultural resource study within 0.25 mi of the Sumner Station APE. This was for the White River Trail project that included the construction of a new trail down the north side of West Main Street (Hartmann 2010). No cultural resources were identified during the corridor study.

3.2.2 Previously Recorded Cultural Resources

No previously recorded archaeological sites or isolates were identified within 0.25 mi of the Sumner Station APE. The nearest archaeological site is to the APE is Site 45PI1276, the Bray Site (Gustafson 2012), which is a precontact camp on a bluff overlooking the Puyallup River. It is located approximately 2 mi north of the Sumner Station APE. This site was a dense concentration of lithic artifacts, fire modified rock (FMR), and organic midden, with numerous possible earth ovens. Projectile point types suggest an Olcott occupation (Chatters and Fairbanks 2013).

3.2.3 Cemeteries

No previously recorded cemeteries were identified within 0.25 mi of the Sumner Station APE. The nearest cemetery is the Sumner Cemetery, located approximately 1 mi to the west of the Sumner Station. It is the original pioneer cemetery for the town of Sumner, with burials as early as 1850 (DAHP 1982).

3.2.4 Historic Maps

HRA reviewed historic-era maps and plats depicting the development of Sumner through time. The United States Surveyor General (USSG) GLO plat from 1864 depicts roads that lead to the modern town of Sumner, which was not platted at the time the map was produced. The area along the Puyallup River is platted, but no ownership patents are noted. An unnamed road transects the project footprint, including the northern portion of the proposed parking garage, the day care center, and the northern portion of the proposed surface parking improvement area (USSG 1864).

The 1865 GLO plat indicates that the land surrounding the APE has been platted and some claims have been made. The APE is located within a 160.1 acre parcel owned by William Kinkard. No buildings, structures, or other uses of the property are depicted. The roadway noted on the 1864 GLO is also not depicted (USSG 1865).

The first maps indicating development within the APE are the Sanborn Fire Insurance Maps (Sanborn map). Development within areas where ground disturbance will occur during construction and demolition of the day care center is first depicted on the 1908 Sanborn—an out building and the Burlington Northern Santa Fe (BNSF) railroad grade are present (Sanborn 1908).

By 1919, the Sanborn depicts a building designated as Autos, and Narrow Street has been platted. The railroad grade is also, of course, still present (Sanborn 1919). The APE remains the same on the 1927 Sanborn, with the exception of the subdivision of what was previously one parcel into five parcels (Sanborn 1927).

Between 1927 and 1944, the APE becomes more developed by commercial buildings. The Auto building is still present, along with two out buildings. The property subdivided on the 1927 Sanborn is no longer subdivided and is owned by the Puget Sound (next word not legible) and Exchange. The rail alignment is also depicted (Sanborn 1944).

3.2.5 Historically Significant Properties

One known historic property is located within 0.25 mi of the Sumner Station. The Ryan House, a historic residence built between 1875 and 1885 that has been converted into a public library, was listed in the WHR and NRHP in 1975 (DAHP 2014).

Portions of the BNSF rail line that runs through the APE are also part of a larger BNSF rail corridor that runs north and south through the state of Washington. Although no portions of the railroad within 0.25 miles of the APE have been found eligible, DAHP has determined that other sections of the line, including sections in or within the vicinity of Cheney, Conway, Arlington, Oroville, Woodinville, Camas, and Prindle are eligible for listing in the NRHP (DAHP 2015).

3.2.6 DAHP Predictive Model

The DAHP predictive model for archaeological sites is based on statewide information, using large-scale factors. Information on geology, soils, site types, landforms, and from GLO maps was used to establish or predict probabilities for archaeological resources throughout the state. The DAHP model uses five categories of prediction: Low Risk, Moderately Low Risk, Moderate Risk, High Risk, and Very High Risk. The model indicated that the Sumner Station APE is in a High to Very High Risk location for the discovery of cultural resources (Appendix B).

4. Environmental Context

Human land-use patterns would have been affected over time by environmental factors such as topography, climate, geology, fauna, and flora. The following sections provide a summary of the environmental and cultural background for the project vicinity. They present resources that could have been available during prehistoric and ethnographic times to groups traveling through, residing in, or using the project vicinity.

4.1 Topography and Geology

The Project is situated within the Puget Trough physiographic province, which extends south from the Canadian border to the confluence of the Willamette River and the Columbia River and is bounded on the east by the Cascade Range and on the west by the Olympic Mountains (Franklin and Dyrness 1973; Troost and Stein 1995). A gently rolling terrain with elevations within 525 feet above mean sea level characterizes the Puget Trough.

Several episodes of ice sheet advances and retreats occurred during the Late Pleistocene, with the Vashon Stade of the Fraser Glaciation being the latest. The Cordilleran Ice Sheet covered Puget Sound approximately 14,000 years ago, carving and scouring the topography during advances and retreats. Glacial outwash materials consisting of porous gravels and sands, and hard till with pockets of silt and clay were deposited as the ice retreated (Booth et al. 2004; Franklin and Dyrness 1973). Floodwaters from the melting ice also influenced the landscape. The glacial activity caused large depressions in the topography of Puget Sound, which later formed bays, inlets, and fjords as the ice melted and sea levels rose (McKee 1972).

More specifically, the APE is located near the confluence of the Puyallup and White Rivers in the Tacoma watershed. Within this river basin, between approximately 1,300 and 1,800 feet of unconsolidated sediment overlies bedrock, including glacial and post-glacial sediments (Jones 1996). Infilling occurred within the Puyallup River basin throughout much of the early and middle Holocene, a process that was controlled by relative sea level within Puget Sound. Sea level in Puget Sound did not stabilize to near modern levels until approximately 6000 years before present (B.P.) (Clague et al. 1982; Mosher and Hewitt 2004).

Throughout the Holocene, the river has transported and deposited sediment from the Cascade Mountain Range, including lahar deposits from Mount Rainier, near present-day Tacoma (Borden and Troost 2001). Around 5,700 years ago, a catastrophic lahar, the Osceola Mudflow, buried more than 125 square mi of the Puget Lowland in rock debris, glacial ice, and clay-rich sediment (Crandell

1971; Crandell and Waldron 1956; Dragovich et al. 1994; Vallance and Scott 1997). The mudflow originated as a massive, deep-seated avalanche that swept down the north face of Mount Rainier and flowed into the nearby drainages, including the Puyallup River basin. Mid- to Late Holocene deposits overlaying the Osceola Mudflow have been measured up to 280 feet thick near Fife (Dragovich et al. 1994). In many places, modern fill overlays this recent alluvium.

Landforms adjacent to river systems have the potential to contain deeply buried archaeological sites, because they are generally very active zones of deposition. Archaeological sites in these areas may also be encountered at or near the surface.

4.2 Climate and Vegetation

Following glacial retreat and the uplifting of landforms around Puget Sound and the Cascades, the newly exposed glacial sediments were likely barren of vegetation. Rapidly, between approximately 13,000 and 12,000 years ago, a much cooler and drier climate fostered and supported an ecosystem characterized by lodgepole pine (*Pinus contorta*), sedges (*Cyperaceae* sp.), sage (*Artemisia*), and a variety of grasses and herbs. After 12,000 years ago, the climate warmed while continuing to dry, and Douglas fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), and red alder (*Alnus rubra*) joined the developing parkland forest. During this time, terrestrial mega-fauna, black-tailed deer (*Odocoileus hemionus*), and elk (or wapati, *Cervus elephus*) would have browsed on grasses, shrubs, and herbs in the newly emerging forest parkland. This warm, dry period lasted from approximately 12,000 to 7,000 years ago, with relatively high summer temperatures and more frequent summer droughts than in modern times (Barnosky et al. 1987; Brubaker 1991; Whitlock 1992).

By around 6,000 years ago, the climate of the region had cooled and moistened to levels comparable to today's maritime regime, producing the current western hemlock vegetation zone. Floodplain Forest communities dominated the landscape. Red alder and Oregon ash (*Fraxinus latifolia*) growth prevailed along the major floodplains (Collins and Sheikh 2005:52–69). Western redcedar (*Thuja plicata*) and Douglas fir grew in abundance throughout the bottomlands. The main understory plants in wetland or riverine environments included horsetail (*Equisetum* sp.), salmonberry (*Rubus spectabilis*), bull rushes (*Scirpus* sp.), salal (*Gaultheria shallon*), and rose (*Rosa* sp.). Camas (*Camassia quamash*), wapato (*Sagittaria lancifolia*), and a variety of edible berries were available along the Puyallup and White Rivers prior to Euroamerican colonization in the late 1800s (Franklin and Dyrness 1973; Suttles and Lane 1990:489).

4.3 Fauna

Larger terrestrial mammals roaming the vicinity of the testing location would have included elk, deer, black bear (*Ursus americanus*), coyote (*Canis latrans*), and mountain lion (cougar, *Felis concolor*).

Smaller mammals would have included snowshoe hare (*Lepus americanus*), red fox (*Vulpes vulpes*), and weasel (*Mustela frenata*) (Kruckeberg 1991; Larrison 1967). Lacustrine and riverine faunal resources included beaver (*Castor canadensis*), otter (*Lutra candensis*), and muskrat (*Ondatra zibethica*). Freshwater fish, such as trout, whitefish, and eels, were netted or fished. Important aquatic mammals included the harbor seal (*Phoca vitulina*), river otter (*Lutra* sp.), and as many as twenty species of waterfowl (Suttles and Lane 1990).

Most importantly for the local human populations, salmon and steelhead species (*Oncorhynchus* sp.) seasonally migrated up the Puyallup River (Kruckeberg 1991; Larrison 1967; Suttles and Lane 1990; Williams et al. 1975). Also, Chinook (*O. tsawytscha*), coho (*O. kisutch*), pink (O. *gorbuscha*), and chum (*O. keta*) salmon utilize the Puyallup and Stuck River watershed (Williams et al. 1975:103).

5. Cultural Context

5.1 Prehistoric Background

The landscape of the Pacific Northwest may have been available for human occupation after the retreat of the continental glaciers, approximately 15,000 B.C. (Dixon 2013). Radiocarbon and DNA analysis from the Manis Mastodon Site (45CA218), located on the Olympic Peninsula in northwestern Washington, dates pre-Clovis occupation to 13,800 years ago (Waters et al. 2011:351). This is one of the oldest archaeological sites in North America. Recent excavations at the Bear Creek site in eastern Seattle have confirmed that there was a late Pleistocene human occupation there, dating to before 13,000 B.P. (Kopperl et al. 2010).

Ames and Maschner's cultural chronology indicates changes are based on technological advances and the increase in sedentism (1999:57–112). An archaic assemblage, locally known as Olcott, appears during the early Holocene, circa 8000 to 5000 BP. These sites are generally located upland settings on glacial till or inland foothill valleys where settlement was possible as climate and landforms stabilized (Blukis Onat et al. 2000; Chatters et al. 2011). As the climate and sea-level reached near-modern conditions in the mid-Holocene, prehistoric people appear to have intensified the use of coastal resources. Sites cluster along the shorelines and often include extensive midden deposits of shellfish, fish, birds, and a range of game animals (Ames and Maschner 1999; Larson and Lewarch 1995).

Use of a variety of microenvironments in different locations throughout the year encouraged the development of the seasonal round for fishing, hunting, and gathering plants and other materials. Ames and Maschner (1999:25) suggest this is indicative of a complex hunter-gather economy, a transitional time from the foraging economy to a collector economy with decreasing residential mobility. Over time, changes in settlement patterns included the use of semi-subterranean pithouses in semi-permanent and permanent village sites, indicating an increase in sedentism (Nelson 1990:483). Overall demographic increase and resource intensification gave rise to additional innovations in technology, sedentism, extra-local contacts, and social stratification (Ames and Maschner 1999:87). These dynamics accelerated throughout the Late Prehistoric and the Ethnographic Periods.

5.2 Ethnographic Background

The APE for the Sumner Station is within the aboriginal territory of the Puyallup and Muckleshoot Tribes. These modern group names incorporate a number of previously independent smaller groups who were consolidated during the reservations period (Lane 1975; Smith 1940). The Puyallup and Muckleshoot peoples had close ties with their neighbors, including the Nisqually, Steilacoom, and Duwamish. These groups share a Southern Coast Salish cultural tradition (Carpenter 1986; Haeberlin and Gunther 1930; Lane 1972a, 1972b, 1973, 1975; Smith 1940). They pursued a seasonal round that incorporated diverse ecological resource niches in marine, riverine, and terrestrial environments (Haeberlin and Gunther 1930). Salmon and shellfish were a dietary staple (Thrush 2007:237–238). Semipermanent and permanent winter villages were located along water courses, many near key fishing locations. Dwellings in the villages consisted of cedar plank longhouses designed to hold multiple families (Haeberlin and Gunther 1930). Seasonal camps were utilized during the spring, summer, and fall to obtain specialized resources in a variety of locations, such as berry gathering and hunting at inland locations. Waterfowl and other birds contributed to the diversity of the diet and were especially hunted during spring and fall migrations (Thrush 2007:237).

Early twentieth-century ethnographer Thomas Talbot Waterman recorded Native American place-names in the vicinity of Sumner (Hilbert et al. 2001). The locations Waterman recorded are frequently tied to watercourses or resources available at the site or nearby.

Three named locations are in the vicinity of the Sumner Station APE. Waterman lists a village on the Stuck River just north of the present town of Sumner, called *Qwe'qwestob* or *g"ig"istalb,* translated as "sandy place" (Hilbert et al 2001:257). Near the Sumner Station APE is listed *StExo'-tsid*, meaning the "mouth of the Stuck," for the confluence of the White (Stuck) and Puyallup Rivers. The name of the river, *StEx,* means "plowed through" and refers to a myth of the Puyallup people (Hilbert et al 2001:257). Also listed to the north of the Sumner Station APE along the north side of the river is *Tcaba'bid*, meaning "dig," in reference to a depression on the top of a plateau across from the town of Sumner. Waterman mentions pits dug at this location to catch deer (Hilbert et al 2001:257).

5.3 Historic Context

5.3.1 Sumner Context

Hudson's Bay Company trappers hunted and explored the Sumner region in the early 1800s. William F. Tolmie is the first recorded Euroamerican to enter the region, when he arrived from Fort Nisqually to care for some injured trappers in 1833. The Donation Land Act of 1850 spurred others to claim homesteads in the region by 1852. The Medicine Creek Treaty of 1854 led to friction

between Native American and Euroamerican groups, which erupted during the Indian Wars of 1855–1856. Settlers retreated to Fort Steilacoom and did not return until 1859 (Chesley 2008).

Sumner was first settled in 1853 as an agricultural community producing hops, flowers, berries, and vegetables. It was platted as a town in 1883 as a stop along the Northern Pacific rail line. George Ryan, who had built much of the downtown, was elected as the first mayor of the town of approximately 500 people. The town was originally named Stuck Junction and then, for a time, was known as Franklin (after a town in New York State). However, by 1891, there were so many towns named Franklin that the U.S. Postal Department requested the name be changed. A lottery of potential names led to the selection of Sumner, after abolitionist senator Charles Sumner of Massachusetts (Connor 2014).

Whitworth College was founded in 1890 at the corner of Academy and Cherry, southeast of the Sumner Station APE, after holding classes in the local Presbyterian Church as early as 1884. The college would move to Tacoma, seeking to attract a larger student population, in 1899, and then Spokane, in 1914 (Arksey 2007). Throughout this era, the Sumner Station APE was covered with agricultural fields, including hops (Sanborn 1892, 1899).

Sumner remained largely agricultural and sparsely populated into the middle of the twentieth century. In 1957, the Puget Sound Bulb Exchange built a new warehouse with office space for both the bulb exchange and the Rhubarb Growers Association in the Sumner Station APE (*Tacoma News Tribune* 1957). The local economy continues to be centered on agriculture; however, the town has now grown to more than 10,000 people (Connor 2014).

In 1990, Washington's High Capacity Transportation Act authorized King, Pierce, and Snohomish Counties to establish a high-capacity transit system. The three-county Joint Regional Policy Committee, a precursor to the Regional Transit Authority (RTA), began meeting in 1992 and put forward a tri-county plan for light rail, commuter trains, and regional bus service that voters adopted in 1996. RTA changed its name Sound Transit in August 1997. Sounder commuter trains began carrying passengers between Seattle and Tacoma with service along BNSF rails in Sumner in 2000 (Hamilton 2006).

5.3.2 Northern Pacific Railroad Context

In the early nineteenth century, on the heels of the Lewis and Clark expedition, entrepreneurs and other advocates anxious to claim the western territory and its abundant raw resources advocated for a transcontinental railroad. In 1853, Congress appropriated $150,000 and sent multiple survey teams to examine four possible routes to the Pacific Ocean. Isaac Stevens, who was heading west to serve as Washington's first territorial governor, performed a portion of the survey on his way. Stevens' team traveled from Minnesota to Olympia, exploring various options for what was known as the

northern route. Although they proved a northern route through the Cascade Mountains was possible, Stevens and his men found the terrain to be mountainous, snowy, and treacherous. Events, including the California Gold rush, convinced the Union Pacific Railroad to construct the first transcontinental line along a southern route that reached the Pacific Ocean by way of California (Armbruster 1999:3–16; Lewis 1912:187).

Washington's territorial leaders, including A. A. Denny and Governor Stevens, helped keep alive the dream of a northern route. In 1864, President Abraham Lincoln signed the act that created the Northern Pacific Railroad Company (NPRR) (Northern Pacific Railroad Company 1865). The new railroad received the nation's largest land grant ever given to a railroad, 470 million acres spanning the western half of the United States, with Lake Superior as the eastern terminus and Puget Sound as the western terminus (Lewis 1912:187; Schwantes 1996:173). The railroad was initially designed to cross over the Cascade Mountains, as Stevens recommended. However, the city of Portland, located along the Columbia River to the south, was booming, and the NPRR feared competitors would build rail lines to the region first. The company's leaders amended their charter and changed the plan to instead construct a line along the Columbia River to Portland and then head north to Puget Sound. This line became known as the Pacific Division of NPRR's transcontinental line. The Cascade line through the mountains, relegated to branch status, would have to wait (Lewty 1987:2–5).

NPRR's boosters were surprised to find that neither option inspired enough investors to fund construction. In 1870, as the project stalled, Congress granted the young railway company permission to sell bonds to help raise capital. With the help of the venerable financial firm Jay Cooke and Company, which was charged with managing the railway's finances, bonds were sold and the monies raised to enable construction to begin at Thompson Junction, west of Duluth, Minnesota. That same year, construction began on the western end at Kalama, Washington. New track headed north on the Columbia River toward Puget Sound (BNSF 2015:31; Lewis 1912:189).

In 1872, the NPRR decided to locate its western terminus at Tacoma, leaving the growing city of Seattle off the mainline, a move that baffled Seattle residents and led to long-standing animosity between the Seattle press and the NPRR. A small settlement withith numerous acres of undeveloped shoreline, Tacoma undoubtedly appealed to NPRR's larger development plans. Historians of the era argued that the city of Tacoma was "purely the creation of the railroad" and that its "advance to the position of an important town" only dated from 1872, "when it received a great stimulus from the certainty that it had only a year to wait for the connection of the Northern Pacific track in Montana, which would unite the Sound with the Atlantic Coast by unbroken rail connection" (Smalley 1883:375). Construction continued north of Kalama toward Tacoma throughout 1873, but NPRR's funds were running short. It was not the only railroad struggling. In early September, the New York Warehouse & Securities Company, which financed other railroads, declared itself insolvent, followed

soon after by Kenyon Cox & Company, which financed Canada Southern Railway. On September 18, 1873, Jay Cooke & Company also shut its doors. The Pacific Division line was still 12 miles from Tacoma (Lewty 1987:12). Work came to a virtual halt until Captain J. C. Ainsworth financed the completion of the line with his own resources. The first train from Kalama to what was then known as New Tacoma arrived on December 16, 1873 (Robertson 1995:236).

Both the east and the west sections of the transcontinental line lay nearly dormant until the late 1870s (Renz 1973:31). In 1877, under the presidency of Charles B. Wright, the NPRR employed Chinese and European laborers to build a short, 26-mile branch line from Tacoma through Puyallup and southeast to what is now known as Wilkeson. There, trains could collect coal mined from the foothills of Mount Rainier. According to historian Louis T. Renz, "coal wharves and storage sheds were ready at Tacoma, and the Kalama shops built 100 four wheel coal cars. This branch plus the wharves and mine development cost $600,000 and of this $300,000 was from earnings and the rest from temporary loans" (Renz 1973:31). NPRR investors bought up the coal mines, and coal was soon moving to Commencement Bay by rail (Hogerhuis 2015).

Vitally important in the late nineteenth century, coal fueled the region's growing network of railroads, which were the most efficient option for connecting markets coast to coast. Seattle residents were so angry over the loss of the NPRR and so anxious to connect to coal mines in Renton that city residents built their own line. In 1877, the Seattle & Walla Walla Railway, a locally constructed rail line, began hauling coal from Renton to Seattle's Elliott Bay. By 1878, Seattle had extended the line to new coal mines in Newcastle (Kirk 2003:281; Williams 2013). The Seattle & Walla Walla provided coal to Seattle, and in turn, the coal mines provided profit for the railroad. According to author Ruth Kirk, by the 1880s, "the towns of Newcastle and Coal Creek comprised the second largest community in King County. As the county's earliest sizable industry, Newcastle coal mining caused Seattle to grow from a small village in the 1860s to a major port city in the 1880s" (Kirk 2003:347). Although the line was a financial success, Seattle's citizens were not able to advance the Seattle and Walla Walla any farther south (Williams 2013).

In the late 1870s, the NPRR was attempting to complete its transcontinental line along the Columbia River to Portland. In 1879, the NPRR negotiated with noted railroad financier and one-time newspaper reporter Henry Villard to use the Oregon Railway & Navigation Company's tracks between Wallula, Washington, and Portland, Oregon. That year, under NPRR's new president Frederick Billings, construction along the transcontinental line began anew. By 1881, tracks from Minnesota had reached the eastern edge of the Montana Territory (BNSF 2015).

Although the NPRR line terminated in Tacoma, roughly 30 miles south of Seattle, and Seattle was growing rapidly, the NPRR did not immediately build a link between the two cities. This left the door open to other investors interested in Seattle, its port, and its nearby natural resources. Villard formed the Oregon Improvement Company to purchase the Seattle & Walla Walla rail line, expand

it, and manage associated transportation assets including steamers, docks, and wharves. Villard also promised to build Seattle a link to the NPRR near Wilkeson and thereby use the transcontinental route to connect Seattle with the nation. In 1880, the *Seattle Daily Intelligencer* confirmed as much, stating that it was "reliably informed" that Villard himself would put 50,000 to 60,000 dollars toward construction of the Cascade route through the Cascade mountains. According to the *Intelligencer*, "everything points to the conclusion that the road will be built across the mountains next summer" (*Seattle Daily Intelligencer* 1880). In 1881, Villard took his plan further, convincing investors to add to a pool of money even though they had no idea what the investment was for. In what became known as the "blind pool," the popular financier was able to collect the funds needed to buy a controlling interest in the NPRR without alerting competitors. Villard then became president of the NPRR and formed a new holding company, the Oregon & Transcontinental Company, to manage shared interests in both the NPRR and the Oregon Railway & Navigation. The new company would also raise the funds needed to finance construction of both companies' railroads (Villard 1904:297).

To form the needed link between Seattle and the NPRR, Villard first identified a connection point on the existing NPRR line to Wilkeson. He chose Meeker, just east of Puyallup, and then requested bids for construction of a line north to Stuck Junction, roughly 6 mi away. In 1882, Joseph F. Nounan Company of San Francisco and J. R. Myers of Portland received the contract. Using 250 Chinese laborers and 50 Euroamerican laborers, the partners made slow progress north of Meeker, halting construction when nearby rivers overflowed their banks (Armbruster 1998; *Seattle Daily Post-Intelligencer* 1882). By the end of 1882, the NPRR had completed the line from Meeker to Stuck Junction, terminating north of Sumner near Auburn (Lewis 1912:191). At the same time, the Oregon & Transcontinental Company constructed a new line from Seattle south to Stuck Junction (Smalley 1883:430). Named the Puget Sound Shore Line, this new line became the link between Seattle and the NPRR (Renz 1973:49). However, as the two lines prepared to finalize the connection in 1883, Villard's vast network of companies, which were overextended and low on funds, crashed. Villard stepped down from the NPRR and retreated in nervous exhaustion. First, the Seattle press quoted critics who characterized Villard as defiant, careless, and coldhearted, a great, wealthy lover of money who would remain a millionaire. Then they grew sympathetic, casting Villard as a pauper, a poor and sick victim of his own enthusiasms, who gave his all for the success of the NPRR and lost everything (*Seattle Daily Post-Intelligencer* 1883, 1884a). In the wake of Villard's retreat, the new president of the NPRR, Robert Harris, announced that he would complete the line through the Cascades and would also complete the Puget Sound Shore Line (Armbruster 1998).

Fourteen hundred Chinese laborers completed the last few miles of track between Tacoma and Seattle. However, Harris was busy trying to finance the Cascade branch of the transcontinental line and untangle Villard's financial records. The line between Tacoma and Seattle, finally complete, sat idle (Armbruster 1999:85). The line became known in the media as the "orphan road" as neither the NPRR nor any other company claimed responsibility for it or worked to furnish it with regularly

scheduled service (Lewis 1912:191). It was not until June 1884 that the first train along the orphan road arrived in Seattle, carrying a small number of NPRR men. They stayed in Seattle a short while before taking a steamer back to Tacoma, as the railroad into town included no side track, had no way for the train to turn around, and the tracks had not yet been extended to the bay (Armbruster 1999:91). By July, irregular service between Seattle and Tacoma had begun (Armbruster 1999:92). The train operated briefly under difficult conditions, running to Seattle and then backing up to return to Tacoma. By August 1884, a brief statement from NPRR management called a stop to even minimal service (*Seattle Daily Post-Intelligencer* 1884).

In June 1885, articles in the *Seattle Daily Post-Intelligencer* suggested that once again, railroad men were traveling to Seattle on behalf of the orphan road, "the only piece of property in King County assessed to 'unknown owner'" (*Seattle Daily Post-Intelligencer* 1885). By July 5, 1885, the orphan road was back in business. The road was suddenly opened to traffic and daily trains began to depart Tacoma for Seattle in the middle of the night and then back up along the track to Tacoma the following afternoon. In fall 1885, the orphan road was reinspected, a turntable was installed at the northern end, ballast was added, and on October 26, the orphan road was yet again back in business, running two trains a day between Tacoma and Seattle, although times remained inconvenient (Armbruster 1999:103) (Figure 5-1).

While the orphan road was still improving, the NPRR focused on completing the Cascade route through Stampede Pass. In 1887, the NPRR completed a switchback above an incomplete tunnel in order to allow the first train to come through the Cascades to Tacoma in July (Lewis 1912:191). Trains clearing the pass ran west through Buckley, Orting, and then north through Puyallup and into Tacoma, using a portion of the early coal road from Tacoma to Wilkeson. The Puget Sound was finally linked, via the northern route, to the east (Armbruster 1999:108, 117) (Figure 5-2).

Railway World, an industry journal, claimed that this event was so important to citizens of eastern and western Washington Territory, "on account of its practical removal of a barrier which has heretofore prevented free intercourse between the inhabitants of opposite sides of the Cascade mountains," that they were planning a reunion at the tunnel (*Railway World* 1887) The *Railroad Gazette* celebrated the completion by running details provided by Northern Pacific vice president Thomas F. Oakes: "On July 1, 1887, we began operating the switchback over the Cascade Mountains, which has a grade of 297 ft. per mile. The distance is 3.7 miles from foot of grade on east side to summit, and 3.5 miles from foot of grade at west side to summit" (*Railroad Gazette* 1888). The *Gazette* went on to document just how treacherous train travel could be at this time. In 1888 alone, Northern Pacific trains were partially derailed numerous times, either after running over cattle, running into other trains, breaking wheels, or hitting landslides (*Railroad Gazette* 1888).

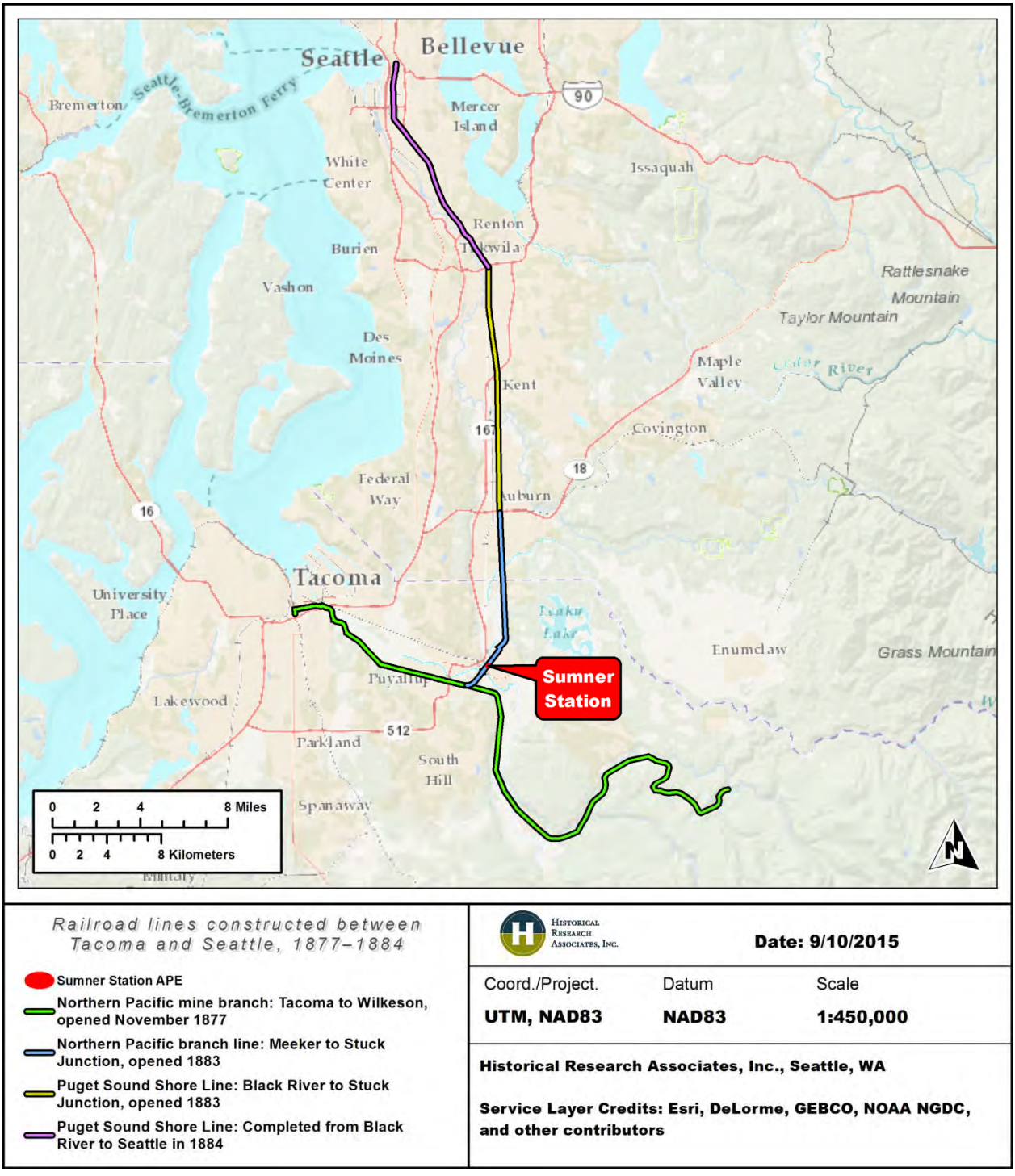

Figure 5-1. Railroads lines constructed between Tacoma and Seattle, 1877–1884.

Figure 5-2. Men posing on Northern Pacific Railway tracks, Stampede Pass, ca. 1887. Photo courtesy of University of Washington Digital Collections.

By the late 1880s, the NPRR was producing route maps that celebrated the cities along its transcontinental route, bolstering its decision to terminate at Tacoma by praising the city's deep water port and noting that Commencement Bay had developed "a larger shipping business than any other port in the Pacific Northwest." By that time, its ships carried wheat to Europe, coal to San Francisco, and lumber to California, South America, China, Australia, and New Zealand (Northern Pacific Railway Company n.d.). The NPRR went on to claim that the Tacoma was the grandest hotel in the Pacific Northwest, and that the city was fully equipped with waterworks, gas and electric lights, cable and motor street railroads, and two colleges, one for men and one for women (Northern Pacific Railway Company n.d.).

Relations between the NPRR and Seattle improved after the city suffered a tremendous fire in June 1889. The southern half of downtown, along with rail resources like the depot, wharves, and docks,

was destroyed. Tacoma and the NPRR responded by sending rail cars full of volunteers and supplies, including, eventually, brick and Wilkeson sandstone (Armbruster 1999:110). Soon after the fire, in November 1889, Washington joined other western states along the NPRR route in claiming statehood. Washington was officially a part of the union. In 1890, the NPRR purchased the Puget Sound Shore Line outright and the new line from Puyallup to Seattle was then operated by the Northern Pacific & Puget Sound Shore Railroad Company (Robertson 1995:235).

Progress continued throughout the early 1890s. However, in 1893, the national economy slid back into economic collapse, and the NPRR and other railroads went bankrupt. In 1896, the NPRR was sold to the Northern Pacific Railway Company (NPRW). Partially bolstered by the Klondike Gold Rush, Seattle and the Puget Sound region emerged from the depression stronger and cities including Seattle and Tacoma continued to prosper while new railroad routes proliferated throughout Washington (Armbruster 1999:138).

In 1898, the *Seattle Daily Intelligencer* detailed the spider web of main routes and branch lines that crisscrossed Washington:

> An advantage with Washington possesses over any other Pacific state is that it is traversed from east to west by two competing transcontinental railroads, the Northern Pacific and Great Northern, while the Canadian Pacific comes in from the north, both to Seattle and Spokane. . . . The Northern Pacific, in addition to its main line, has the Spokane and Palouse branch from Spokane to Genesee and Farmington, the Grays Harbor branch from Olympia along both shores of Grays harbor, the Willapa harbor branch from Centralia to South Bend, the Puget Sound Shore Line from Meeker Junction to Seattle, the Central Washington branch from Cheney to Coulee through the Big Bend country, the Spokane and Seattle from Spokane to Davenport, the Seattle and International from Seattle to Sumas, the Snoqualmie, the Hunt system of 111 miles in Walla Walla country, its total mileage in the state being 1,355. [*Seattle Daily Intelligencer* 1898]

By 1899, Sumner's train depot was located on the west side of the NPRW line; however by 1919, the depot had been moved east of the rail line to its present location (Sanborn 1899, 1919). The historic depot is no longer extant, nor are any of the switch lines or spurs lines that connected the NPRW with flanking warehouses and canneries.

In 1901, the NPRW partnered with Great Northern Railway Company to purchase the majority of remaining stock in the Chicago, Burlington, & Quincy Railroad. The two companies partnered again in 1905 to construct the Spokane, Portland, & Seattle Railway. In 1970, the relationship was finalized when the NPRW merged with Great Northern and others and became part of Burlington Northern Inc. (BNSF 2015:34). As noted above, the Sounder commuter trains began carrying passengers between Seattle and Tacoma along the BNSF rails in Sumner in 2000 (Hamilton 2006). New depots and other associated resources along the line date from this period.

6. Expectations for Prehistoric, Ethnographic Period and Historic-Era Archaeological Resources

Based on the background review and archival research documented in Sections 3 through 5, HRA developed probabilities for prehistoric, ethnographic, and historic Native American, and historic Euroamerican, archaeological resources. The Project is located near the Puyallup and White/Stuck Rivers and locations of ethnographic places and other landmarks indicate long-term settlement at the confluence of these two rivers. This is a prime location for human settlement, as it affords access to travel routes and an abundance of marine and riverine resources. Use of the region for travel and/or settlement during the prehistoric and ethnographic periods is likely. Therefore, in previously undisturbed areas below the ground surface, there is a high potential for prehistoric, ethnographic, and historic Native American cultural resources. Prehistoric and ethnographic period resources could include lithic, bone, and shell artifacts, as well as the food and technological materials from plants and animals. Evidence for fishing is also expected.

The Sumner Station Project is located in the oldest portion of Sumner. The potential for encountering historic-era sites and artifacts is very high. This area has a long history of settlement by Euroamerican which began in the 1890s for agricultural, residential, and commercial purposes. The proximity to the World War II period Camp Harmony also increases the likelihood that important cultural material may be present. Historic-era resources may include, but are not limited to, artifacts and features associated with these uses, such as glass bottles, vessels, or fragments; ceramic dishware or vessels; metal fragments, cans, or machinery parts; concrete; brick; and milled wood. Given the high probability of identifying archaeological resources within the APE we recommend that an Archaeological Monitoring and Treatment Plan (ARMTP) be developed for the project.

7. Geotechnical Bore Sampling and Analysis

7.1 Geotechnical Bore Sample Methods

HRA archaeologists reviewed geotechnical bore logs provided by HWA Geosciences (HWA) (Appendix C) and examined sediment samples taken by HWA during geotechnical boring. Samples were reviewed over a period of two days and included both split spoon samples and sediment extruded from Shelby tubes which were taken using mud rotatory drilling. Sediment samples were taken at approximately 2.5 foot intervals up to 25 feet below surface, and at 5 foot intervals below this. The samples were bagged in the field by HWA, and HRA reviewed these bagged samples in HWA's laboratory. Structure and orientation of sample (up and down) were therefore not retained.

HRA archaeologists examined all samples from between 5 and 130 feet below surface (or to the depth of the bore, whichever was shallower). All examined samples—with the exception of those interpreted as Osceola mudflow deposits—were deposited on a paper towel outside of the sample bag and broken apart to view the structure of the sediment. Osceola mudflow deposits were examined in the sample bag visually and manually to ensure that no larger artifacts were present. In bores extending below 130 feet below surface, HRA examined selected samples at deeper depths when the bore log description suggested the presence of a partly exposed or stable surface (e.g., peat deposits).

HRA compared the sediment characteristics (i.e., consistency and notable inclusions) against that noted by HWA in the bore logs, photographed the sample, and examined the sample for the presence of cultural materials or sediments that might be indicative of a stable surface suitable for habitation. HRA archaeologists made notes on sediments where information pertinent to archaeological recommendations was not noted by HWA staff.

7.2 Geotechnical Bore Sample Analysis Results

A total of six bore hole (BH) samples (BH-1, -2, -3, -4, -5, and -6) were reviewed for Sumner Station (Figure 7-1). The following is a general description of observed sediments and geologic interpretation made by HWA Geosciences staff and HRA archaeologists. A basic discussion of the archaeological potential for each sediment type is also included because this information is used to generate recommendations.

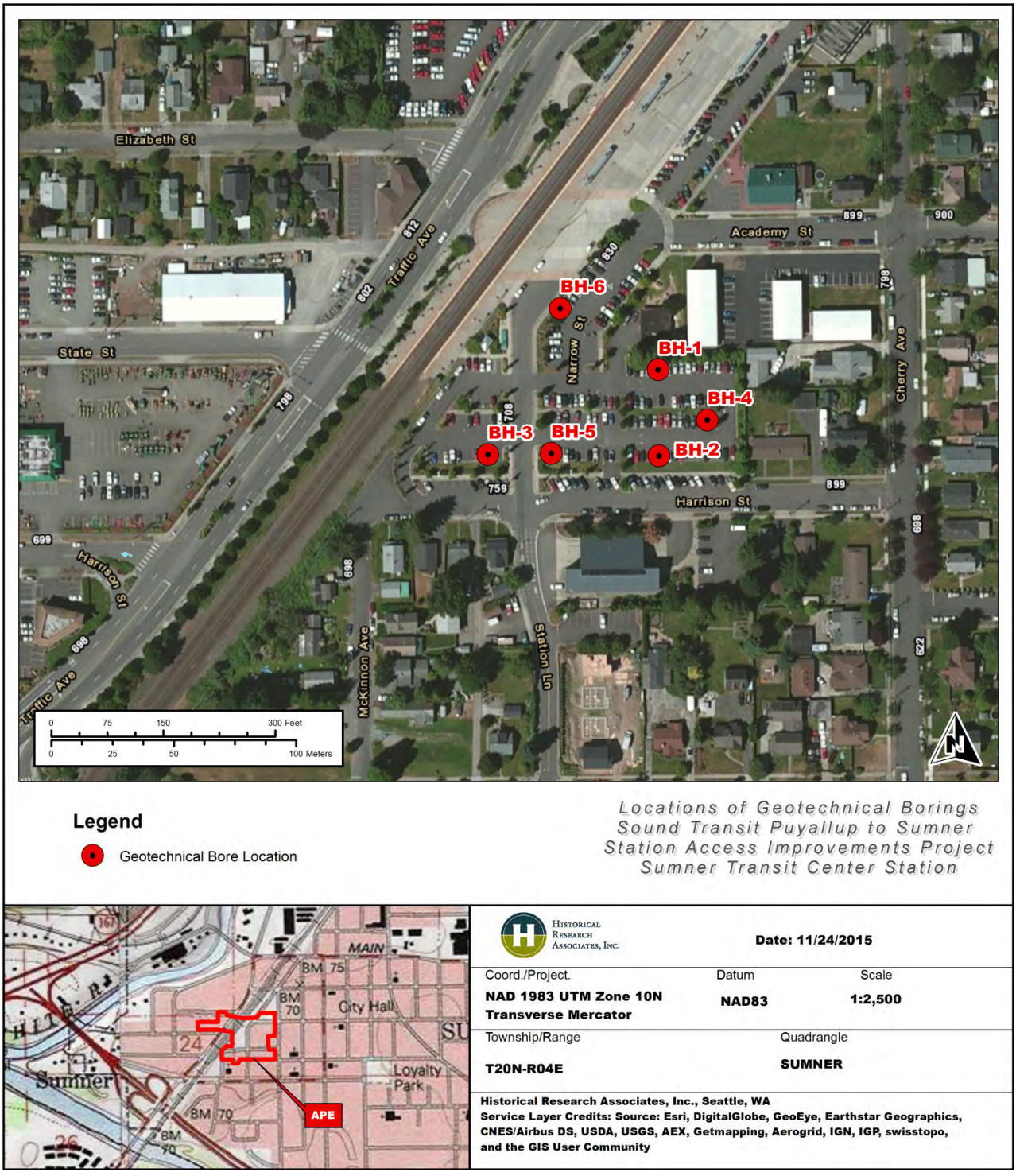

Figure 7-1. Locations of geotechnical boreholes within the Sumner Station APE.

Four distinct deposits were noted in the bores drilled at the Sumner Station location (Table 7-1). Fill measuring 4 to 6 feet in thickness was noted in bores BH-1, -2, -3,and -6; no fill was noted in BH-4 or BH-5. Fill has little to no potential to contain intact archaeological deposits. In each of the bores, below the fill, fine to coarse sand within varying amounts of gravels was noted and was interpreted as recent alluvium. Recent alluvium was noted to an average depth of approximately 40 feet in Bores BH-1 through BH-5, but was only approximately 10 feet thick in BH-6 (Bores BH-3 and -4 were terminated at approximately 30 feet below surface). Organics including chunks of wood were observed in this sediment, but they appeared to be suspended in sediment and were not indicative of a stable surface that was subaerially exposed for an extended period of time. Alluvium indicative of a lower energy depositional environment, like much of that observed at these depths, has a moderate to high potential to contain intact archaeological deposits. No soil development was noted in the samples. The recent alluvium was underlain by grey silt and sand containing subrounded unsorted gravels. These were interpreted as Osceola Mudflow sediments, which were deposited in the area about 5700 B.P. (Crandell 1971). Osceola sediments have no potential to contain intact archaeological deposits. This layer at Sumner Station ranged from approximately 40 feet thick in BH-2 to only 15 feet thick in BH-6. It overlaid sediment interpreted as older alluvium. The older alluvium generally consisted of silt with occasional bedding and suspended organics. It formed the deepest depositional package at Sumner Station. Again, alluvium indicative of a low energy depositional environment has a moderate to high potential to contain intact archaeological deposits. No cultural materials were observed in any samples from the Sumner Station bores.

Table 7-1. Average Depth and Thickness of Sediment within the Sumner APE.

Sediment Type	**Depth**	**Thickness**
Fill	0-5 feet	5 feet
Recent Alluvium	5-35 feet	30 feet
Osceola	35-75 feet	40 feet
Older Alluvium	Below 75 feet	Unknown

8. Historic-era Architectural Resources

8.1 Architectural Inventory Methods

HRA's architectural historian performed site visits on January 20, May 27, and June 11, 2015, and prepared photographs and field notes for all historic-era resources within the APE. HRA identified 13 historic-era resources that needed to be inventoried and evaluated (Figure 8-1), including single-family dwellings, multifamily dwellings, a restaurant, a commercial warehouse, and the BNSF rail line, which runs through the APE. HRA prepared HPIs for all inventoried resources.

8.2 Architectural Inventory Results

The following table provides detailed information for each resource along with FTA's eligibility determinations (Table 8-1).

8.3 Register Criteria

8.3.1 National Register of Historic Places

The criteria for listing a resource in the NRHP require that, in addition to a resource generally being over 50 years of age and possessing integrity, it must meet at least one of the following criteria, outlined in 36 CFR 60.4 (NPS 2002):

A. Property is associated with events that have made a significant contribution to the broad patterns of our history; or

B. Property is associated with the lives of persons significant in our past; or

C. Property embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction; or

D. Resource has yielded, or is likely to yield, information important in prehistory or history.

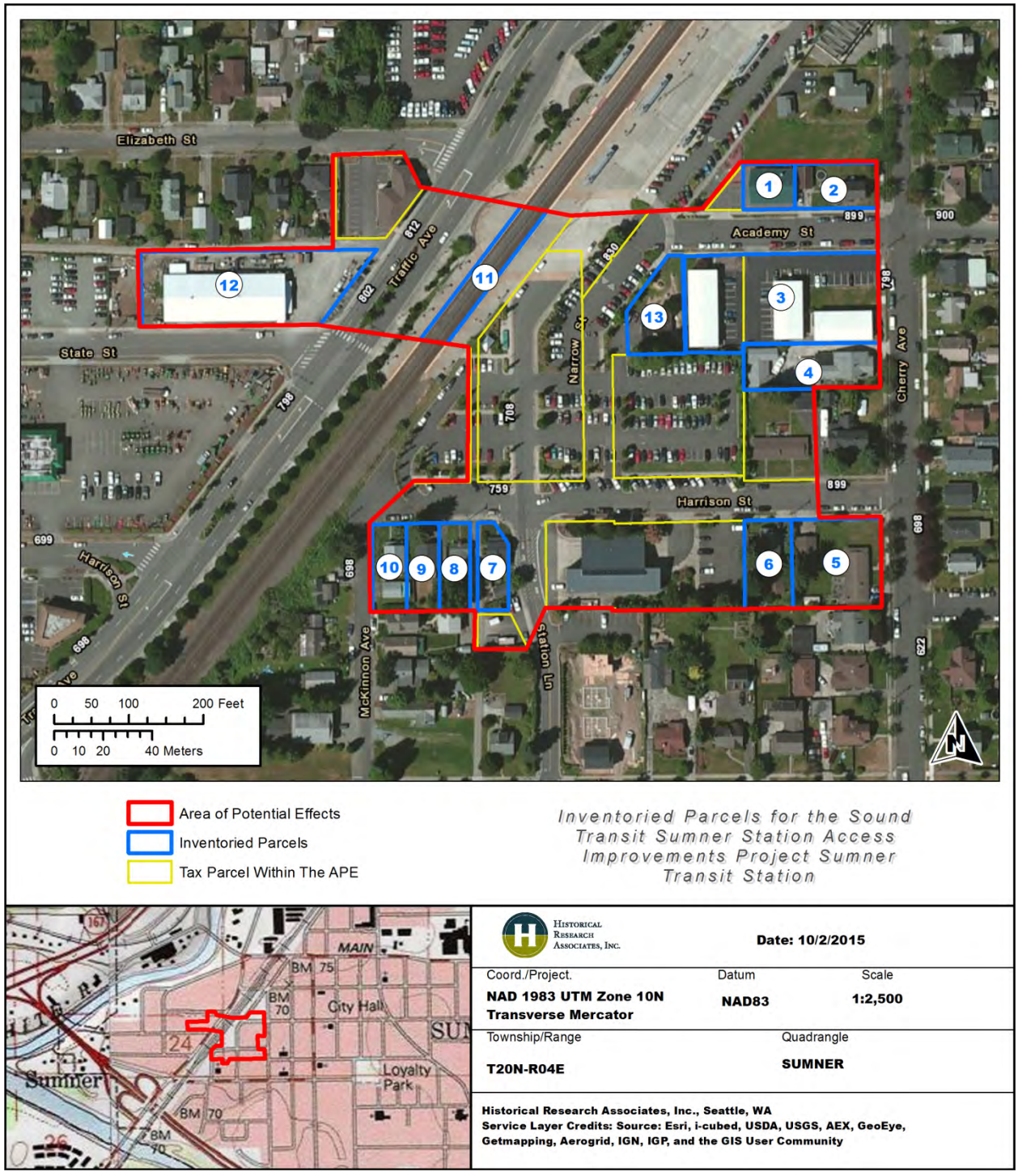

Figure 8-1. Historic-era buildings, structures, and objects within the APE.

Table 8-1. Inventoried Resources within the APE.

	Address	Tax Parcel (s)	Year Built	Current Use	Eligible for NRHP	Eligible for the WA Register
1	813 Academy St	7985100131	1963	Restaurant	No	No
2	802 Cherry Ave	7985100132	1906	Duplex	No	No
3	728 Cherry Ave	7985100242 & 0420243120	1967	Multifamily Apartments	No	No
4	712 Cherry Ave	7985100253	1916	Single Family Residence	No	No
5	624 Cherry Ave	7985100272	1968	Single Family Residence	No	No
6	816 Harrison St	7985100271	1914	Single Family Residence	No	No
7	714 Harrison St	5680000032	1900	Single Family Residence	No	No
8	708 Harrison St	5680000060	1922	Single Family Residence	No	No
9	706 Harrison St	5680000050	1925	Single Family Residence	No	No
10	702 Harrison St	5680000040	1920	Single Family Residence	No	No
11	810 Maple St (Sumner Station & Railroad)	NA	1877/2000	Railroad Track	*	*
12	800 Traffic Ave	4250000120	1939	General Warehouse Storage	No	No
13	725 Narrow St	0420243179	1957	Commercial	No	No

* FTA has determined in consultation with SHPO that the resources of the BNSF railroad within the APE are non-contributing elements to a larger, possible NRHP-eligible resource (Sterner 2015 [Appendix A]).

8.3.2 Integrity

Integrity is related to how a property's physical features are tied to and convey its significance. It is based on "why, where and when a property is important" (NPS 2002). In order to retain integrity, a property must retain most of the seven aspects of integrity, which are as follows:

- Location: the place where the property was constructed or the place where the historic event occurred.
- Design: the combination of elements that create the form, plan, space, structure, and style of a property.
- Setting: the physical environment of a historic property.
- Materials: the physical elements that were combined or deposited during a particular period of time, and in a particular pattern or configuration, to form a historic property.
- Workmanship: the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
- Feeling: a property's expression of the aesthetic or historic sense of a particular period of time.
- Association: the direct link between an important historic event or person and a historic property (NPS 2002).

8.3.3 Washington Heritage Register

To be eligible for listing in the Washington Heritage Register, historic resources must meet the following criteria:

- A building, site, structure or object must be at least 50 years old. If newer, the resource should have documented exceptional significance.
- The resource should have a high to medium level of integrity, i.e. it should retain important character defining features from its historic period of construction.
- The resource should have documented historical significance at the local, state or federal level. The Washington Heritage Register application identifies the following criteria for significance:
    - The property belongs to the early settlement, commercial development, or original native occupation of a community or region.

- The property is directly connected to a movement, organization, institution, religion, or club which served as a focal point for a community or group.
- The property is directly connected to specific activities or events which had a lasting impact on the community or region.
- The property is associated with legends, spiritual or religious practices, or life ways which are uniquely related to a piece of land or to a natural feature.
- The property displays strong patterns of land use or alterations of the environment which occurred during the historic period (cultivation, landscaping, industry, mining, irrigation, recreation).
- The property is directly associated with an individual who made an important contribution to a community or to a group of people.
- The property has strong artistic, architectural or engineering qualities, or displays unusual materials or craftwork belonging to a historic era.
- The property was designed or built by an influential architect, or reflects the work of an important artisan.
- Archaeological investigation of the property has or will increase our understanding of past cultures or life ways (DAHP 2015).

8.4 Architectural Resource Evaluation

HRA inventoried 13 historic-era resources within the APEFTA has determined in consultation with SHPO that no historic-era resources within the APE are eligible for listing in the NRHP or the WHR. A small section of the Burlington Northern Railroad corridor between Tacoma and Seattle is found within the APE. FTA determined, in consultation with SHPO, that the rail sections within the APE are non-contributing elements to a larger, possible NRHP-eligible resource (Sterner 2015 [Appendix A]). The larger corridor along with the smaller BNSF sections within the APE is discussed in more detail below because of its role in Washington State's history, although it is not evaluated for eligibility for the NRHP. Determining the eligibility of the Seattle-to-Tacoma BNSF corridor is beyond the scope of the present undertaking. A conclusion about the corridor's eligibility would require an analysis of the existence and significance of remaining elements throughout the corridor and an assessment of their relationship to one another.

8.4.1 Discussion of BNSF Rail Line

Physical Description: The BNSF rail line, constructed in 1883 by the NPRR, includes two parallel rail tracks running northeast–southwest through Sumner within the APE. It is part of the larger railroad corridor between Seattle and Tacoma. The resource within the APE consists of the rail corridor, the tracks, and associated rail beds. The standard-gauge tracks are separated from one another by a chain-link fence, and consist of gravel rail beds, metal rails, and wood ties. Raised from the level of the tracks are two platforms servicing the east and west sides of the track. Pedestrian access between the two platforms is gained by a track-level crossing that runs parallel to the east–west running Maple Street. Both platforms include multiple covered waiting areas and one covered seating area toward the northern edge of the east side of the tracks. A concrete ramp with metal railings centrally located on each platform provides ADA access to the commuter trains.

Constructed in three segments between 1882 and 1884, the Puget Sound Shore Line, also known as the "orphan road," connected communities, including Sumner, first to the growing cities of Seattle and Tacoma and eventually east to the rest of the country. The orphan road was the subject of controversy and financial trouble and was the central cause of friction between the two burgeoning cities during the late nineteenth century, causing both Tacoma and Seattle to make great strides in their local transportation markets. Locally, the line is associated with the growth of Sumner and the Puyallup Valley, as the agricultural products of the area, such as the region's internationally known hops and bulbs, could be harvested and shipped, to either Tacoma or Seattle and then on to markets worldwide.

Although the Puget Sound is associated with both Henry Villard and Robert Harris, successive NPRR presidents, the line itself is not completely indicative of either figure's lives nor does it mark their crowning achievements. Despite the fact that Villard initiated the financing and construction of the Puget Sound Shore Line, he did not see it to completion, as he stepped down as president of the NPRR in 1884 due to financial troubles. And although the line was completed under Harris, it was not a priority, as the NPRR focused on completing the Cascade route through Stampede Pass. The line would be called the orphan road as neither the NPRR nor any other company claimed responsibility for it or worked to furnish it with regularly scheduled service.

The rail crossing, platforms, and stations are not significant for their architectural qualities. The rail line itself is not significant for its architectural or engineering qualities as it utilizes standard-gauge rail and ties that are ubiquitous along U.S. routes and modern safety features including protection gates and lights. Additionally, no significant engineering or architecturally unique railroad structures, such as a trestle, bridge, or historic depot are located within the APE.

The rail line is of typical construction and is not likely to yield any new information about our history or prehistory.

8.4.1.1 Integrity

The BNSF rail line continues to run through its original rail corridor in Sumner's APE and retains integrity of location. The rail line features standard-gauge tracks supported by gravel ballast along a long, linear corridor and retains integrity of design. The rail line's associated features, including warehouse buildings, canning buildings, houses, and side tracks, have all been removed. Crossing streets and traffic controls have been upgraded, as has the rail line itself, which now includes associated modern safety features. In light of these changes, the line no longer retains integrity of setting. Wood ties, iron rails, and gravel ballast have been repaired or replaced in kind, and the rail line retains integrity of materials and workmanship. The line remains part of a larger Puget Sound rail network that continues to connect Tacoma to Seattle. The current rail line continues to serve its original function, to use the original rail corridor, and to follow its original path through the city, flanked by development that is permanently altered by a diagonal rail corridor passing through an otherwise gridded city. The line, therefore, retains integrity of feeling. As an active rail line, the resource retains a direct link to its historic past and retains integrity of association.

8.4.2 Eligibility of BNSF rail line within the APE

FTA has determined, in consultation with SHPO, that the BNSF rail resources within the APE are non-contributing elements to a larger, possible NRHP-eligible resource (Sterner 2015 [Appendix A]).

8.5 Determination of Effects to Historic Properties during Construction and Operation

There are no historic resources eligible for the NRHP within the APE. Therefore, the consultant recommends that there are "no historic properties affected" during construction and operation of the Project.

9. Summary

9.1 Archaeological Resources

There is a high probability for identifying archaeological resources within the APE. Since the area is paved, an archaeological inventory was not possible at this time. In lieu of an inventory HRA observed sediments from geotechnical boring samples that are indicative of a relatively low-energy depositional environment; thereby, increasing the probability for intact archaeological materials. The structural foundation design for the Sumner Station is currently not known but may include ground disturbing excavation as deep as 15 feet below surface and pilings or geopiers as deep as 80 feet below surface to support this facility. As a result, HRA recommends the following:

- An ARMTP would be developed for the construction phase of the project.
- The protocols and level of monitoring established by the ARMTP would be informed as the foundation for the project design is developed. Monitoring protocols would include a range of on-site monitoring from daily monitoring, spot checks on a regular basis, to on-call. The level of monitoring would be recommended by the Project Archaeologist and reflect the probability for discovering archaeological materials during the construction.

9.2 Historic-Era Architectural Resources

FTA has determined in consultation with SHPO that no historic resources within the APE are eligible for listing in the NRHP or the WHR. FTA determined, in consultation with SHPO that the Burlington Northern Railroad resources within the APE are non-contributing elements to a larger, possible NRHP-eligible resource.

Given that there are no cultural resources eligible for the NRHP within the APE, the consultant recommends that there are "no historic properties affected" from the project.

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Appendix A. Agency Correspondence

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

March 1, 2016

Mr. John Witmer
Federal Transit Administration
915 Second Avenue
Federal Building, Suite 3142
Seattle, WA98174-1002

In future correspondence please refer to:
Project Tracking Code: 050415-46-FTA
Property: Sound Transit, Sumner Sounder Station Access Improvements
Re: No Historic Properties

Dear Mr. Witmer:

Thank you for contacting our office and providing a copy of the cultural resources survey report completed by HRA. We have concurred previously that there are no standing structures within the area of potential effects that are eligible for listing in the National Register of Historic Places (NRHP). However, since there has been only a cursory investigation of subsurface resources to date, we concur with your determination that an archaeological resource monitoring and treatment plan and an inadvertent discovery plan be developed for the project. The Department of Archaeology and Historic Preservation will need to review drafts of these documents prior to implementation. As such, we concur with your finding of no historic properties affected.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

These comments are based on the information available at the time of this review and on the behalf of the State Historic Preservation Officer in conformance with Section 106 of the National Historic Preservation Act and its implementing regulations 36CFR800.

Should additional information become available, our assessment may be revised. In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity must stop, the area secured, and this office and the concerned tribes notified.

Thank you for the opportunity to review and comment. If you have any questions, please contact me.

Sincerely,

Matthew Sterner, M.A.
Transportation Archaeologist
(360) 586-3082
matthew.sterner@dahp.wa.gov

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

December 3, 2015

Mr. John Witmer
Federal Transit Administration
915 Second Avenue
Federal Building, Suite 3142
Seattle, WA 98174-1002

In future correspondence please refer to:
Log: 050415-46-FTA
Property: Sound Transit, Sumner Sounder Station Access Improvements
Re: BNSF Elements Non Contributing

Dear Mr. Witmer:

Thank you for contacting the Washington State Department of Archaeology and Historic Preservation (DAHP). Your correspondence has been reviewed on behalf of the State Historic Preservation Officer under provisions of Section 106 of the National Historic Preservation Act of 1966 (as amended) and 36 CFR Part 800. My response is based upon documentation contained in your communication.

As far as the Burlington Northern Railroad resources that have been identified within the area of potential effect (APE) for the project, DAHP concurs with your determination that these resources should be considered non-contributing elements to a possible, larger National Register of Historic Places (NRHP) eligible resource. As such, we would consider impacts from your project to these resources the same as we would consider impacts to a resource that is considered not eligible for listing in the NRHP.

However, if additional information on the property becomes available, or if any archaeological resources are uncovered during construction, please halt work in the area of discovery and contact the appropriate Native American Tribes and DAHP for further consultation.

Thank you for the opportunity to review and comment. Should you have any questions, please contact me.

Sincerely,

Matthew Sterner, M.A.
Transportation Archaeologist
(360) 586-3082
matthew.sterner@dahp.wa.gov

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

May 4, 2015

Mr. John Witmer
Federal Transit Administration
915 Second Avenue
Federal Building, Suite 3142
Seattle, WA 98174-1002

In future correspondence please refer to:
Log: 050415-46-FTA
Property: Sound Transit, Sumner Sounder Station Access Improvements
Re: Archaeology - APE Concur

Dear Mr. Witmer:

We have reviewed the materials forwarded to our office for the Sumner Sounder Station Access Improvements project. Thank you for your description of the area of potential effect (APE) for the project. I concur with the definition of the APE. I look forward to the results of your cultural resources survey efforts, your consultation with the concerned tribes, and receiving the survey report. I would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4) and the survey report when it is available.

These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer in conformance with Section 106 of the National Historic Preservation Act and its implementing regulations 36CFR800. Should additional information become available, our assessment may be revised.

Please note that DAHP requires that all historic property inventory and archaeological site forms be provided to our office electronically. Also, please note that DAHP requires that all cultural resource reports be submitted in PDF format on a labeled CD or electronically. For further information please go to http://www.dahp.wa.gov/documents/CR_ReportPDF_Requirement.pdf.

Thank you for the opportunity to review and comment. If you have any questions, please feel free to contact me.

Sincerely,

MAY 7 2015 PM 3:50

Matthew Sterner, M.A.
Transportation Archaeologist
(360) 586-3082
matthew.sterner@dahp.wa.gov

JW

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

May 14, 2015

Mr. John Witmer
Federal Transit Administration
915 Second Avenue
Federal Building, Suite 3142
Seattle, WA 98174-1002

In future correspondence please refer to:
Log: 050415-46-FTA
Property: Sound Transit, Sumner Sounder Station Access Improvements
Re: Not Eligible

Dear Mr. Witmer:

Thank you for contacting the Washington State Department of Archaeology and Historic Preservation (DAHP). The historic property inventory form for the property (a child care center) at 725 Narrow Avenue, Puyallup, Washington, has been reviewed on behalf of the State Historic Preservation Officer under provisions of Section 106 of the National Historic Preservation Act of 1966 (as amended) and 36 CFR Part 800. Our review is based upon documentation contained in your communication.

Research indicates that the property is not currently listed in the Washington Heritage Register or National Register of Historic Places. The property is not eligible for listing in the National Register of Historic Places under criterion C. As a result of this finding, further contact with DAHP is not necessary.

Thank you for the opportunity to review and comment. Should you have any questions, please contact me.

Sincerely,

Matthew Sterner, M.A.
Transportation Archaeologist
(360) 586-3082
matthew.sterner@dahp.wa.gov

MAY 18 2015 PM 3:10

Appendix B. DAHP Statewide Predictive Model

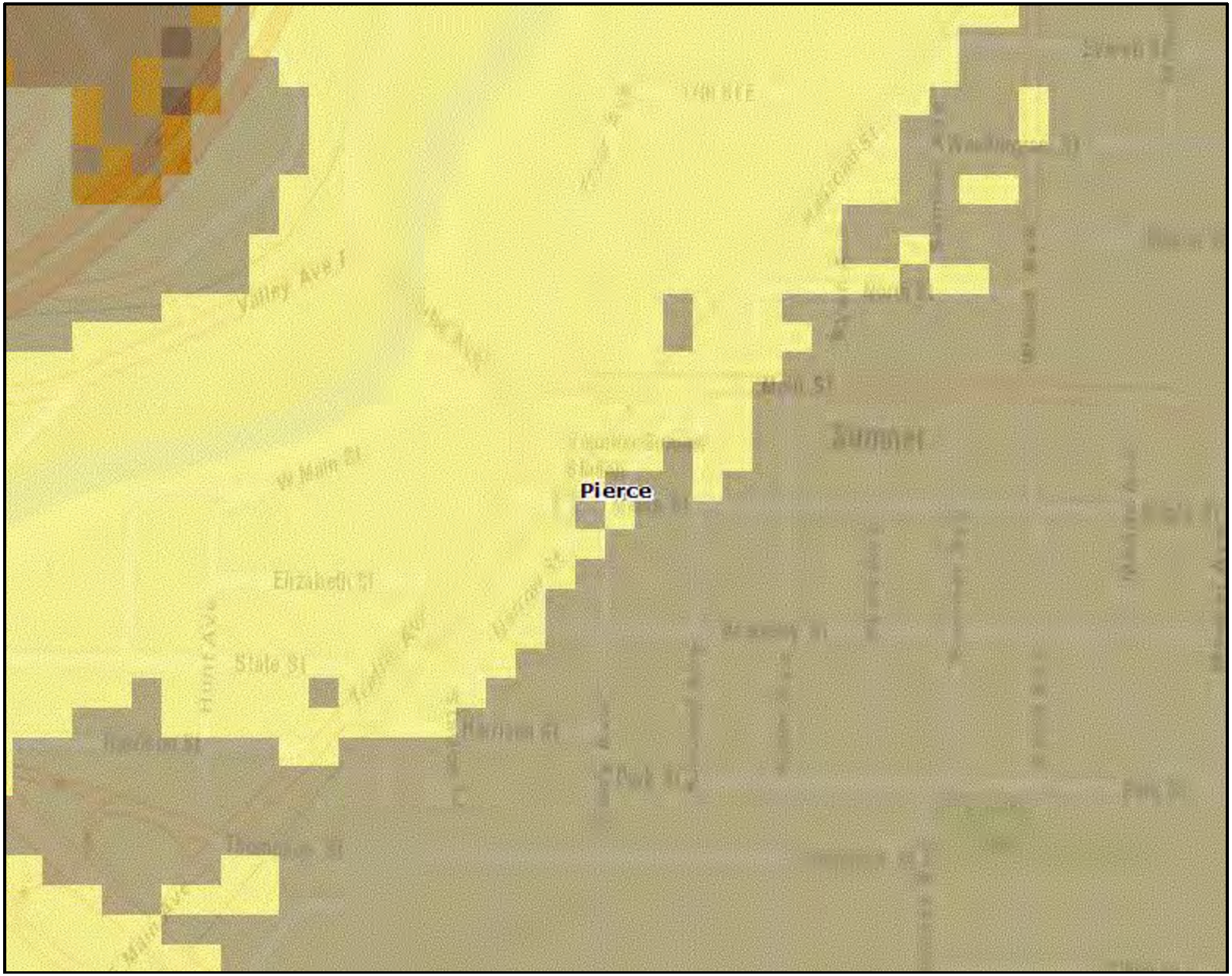
LEGEND

County Boundaries

Environmental Factors with Archaeological Resources Result

- Survey Contingent Upon Project Parameters: Low Risk
- Survey Contingent Upon Project Parameters: Moderately Low Risk
- Survey Recommended: Moderate Risk
- Survey Highly Advised: High Risk
- Survey Highly Advised: Very High Risk

World Street Map



Title: Sumner Station

Description:

254 762 1524 2540
0 508 1016 2032 Feet

NAD83 State Plane Washington South (HARN)

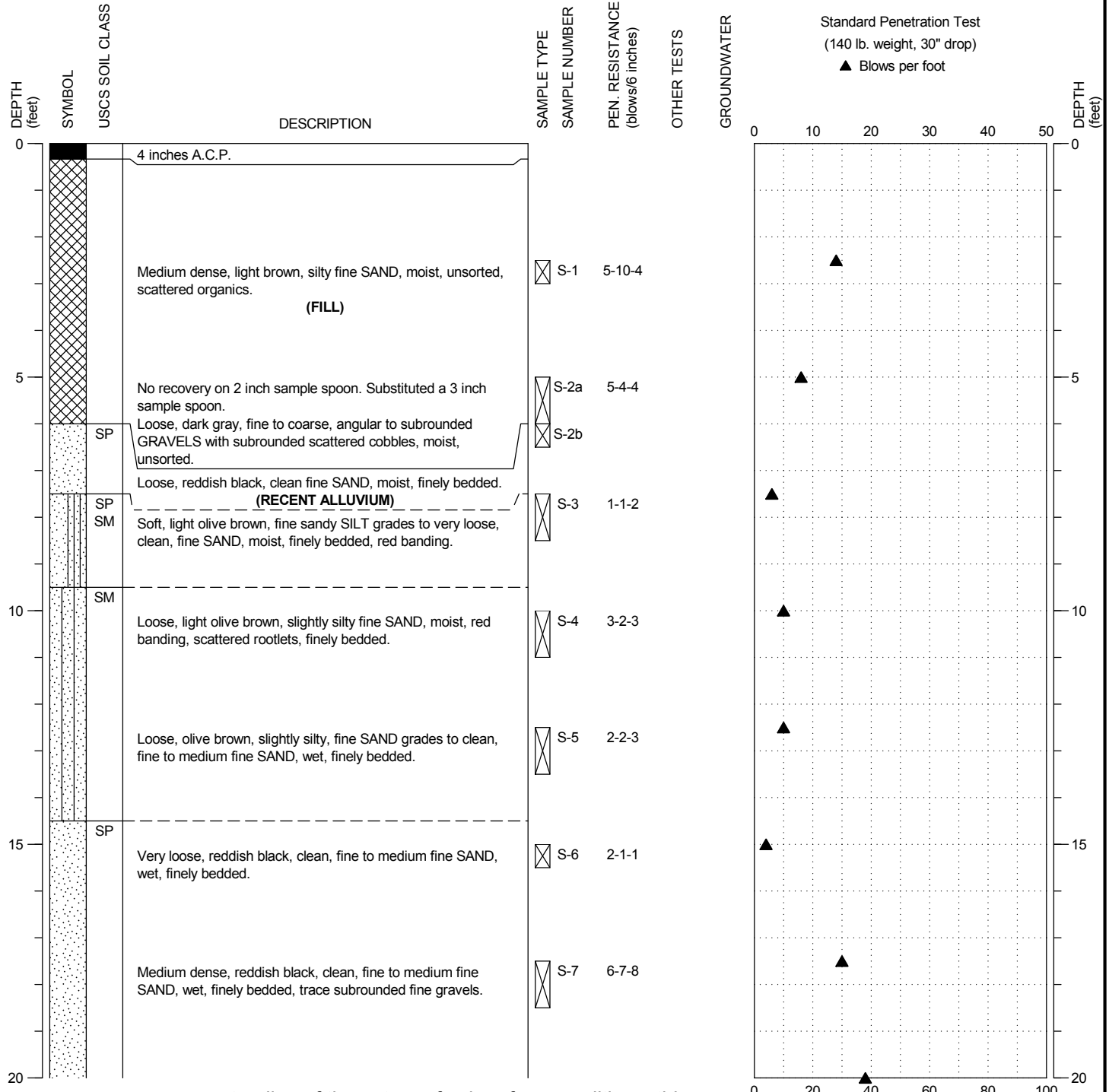
DISCLAIMER: This map is for reference purposes only. All distances and locations are approximate.

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION
Protect the Past, Shape the Future

Appendix C. HWA Geosciences Geotechnical Bore Logs

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/16/2015
DATE COMPLETED: 9/17/2015
LOGGED BY: H. Bray



For a proper understanding of the nature of subsurface conditions, this exploration log should be read in conjunction with the text of the geotechnical report.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

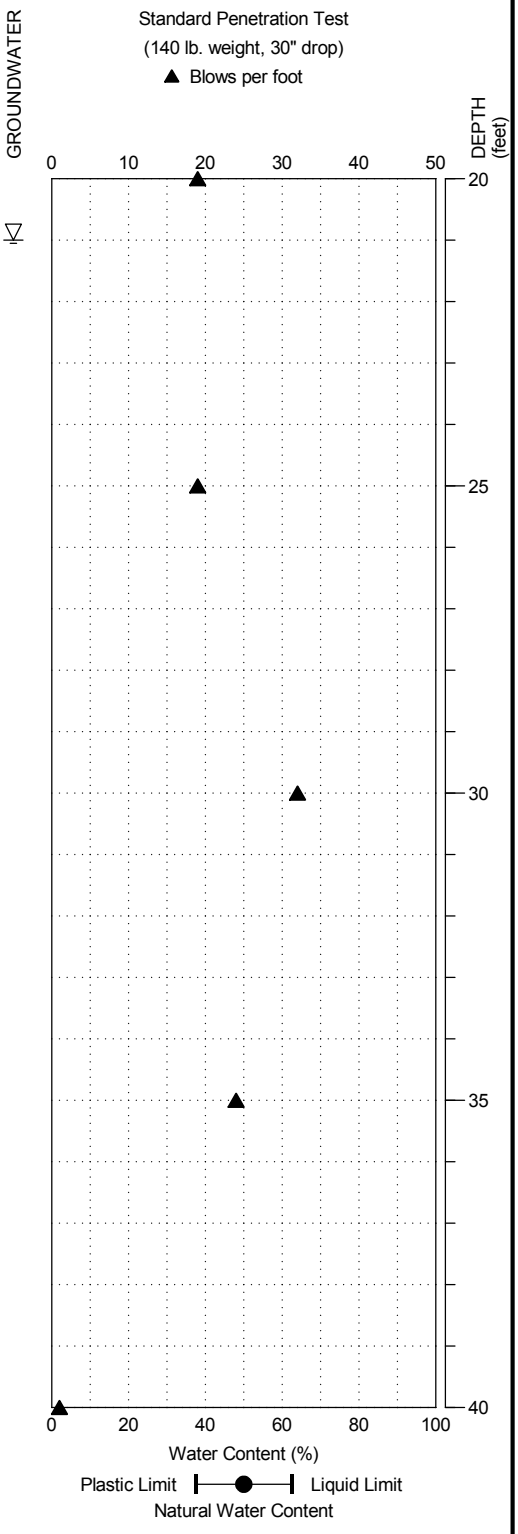
BORING:
BH-07

PROJECT NO.: 2013-075-21 FIGURE: A-8

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/16/2015
DATE COMPLETED: 9/17/2015
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
20			Medium dense, reddish black, clean, fine to coarse SAND with trace subangular fine gravels, becomes more gravelly with depth, wet, finely bedded.		S-8	8-9-10		
		SW						
25			Medium dense, reddish black, clean, fine to coarse SAND with subrounded fine to coarse gravels, wet, unsorted.		S-9	6-8-11		
30			Dense, reddish black, clean, fine to coarse SAND with subrounded to subangular fine to coarse gravels, wet, unsorted.		S-10	18-17-15		
35			Medium dense, reddish black, clean, fine to coarse SAND with subrounded to subangular fine to coarse gravels, wet, unsorted.		S-11	13-10-14		
		SM						
40								



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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

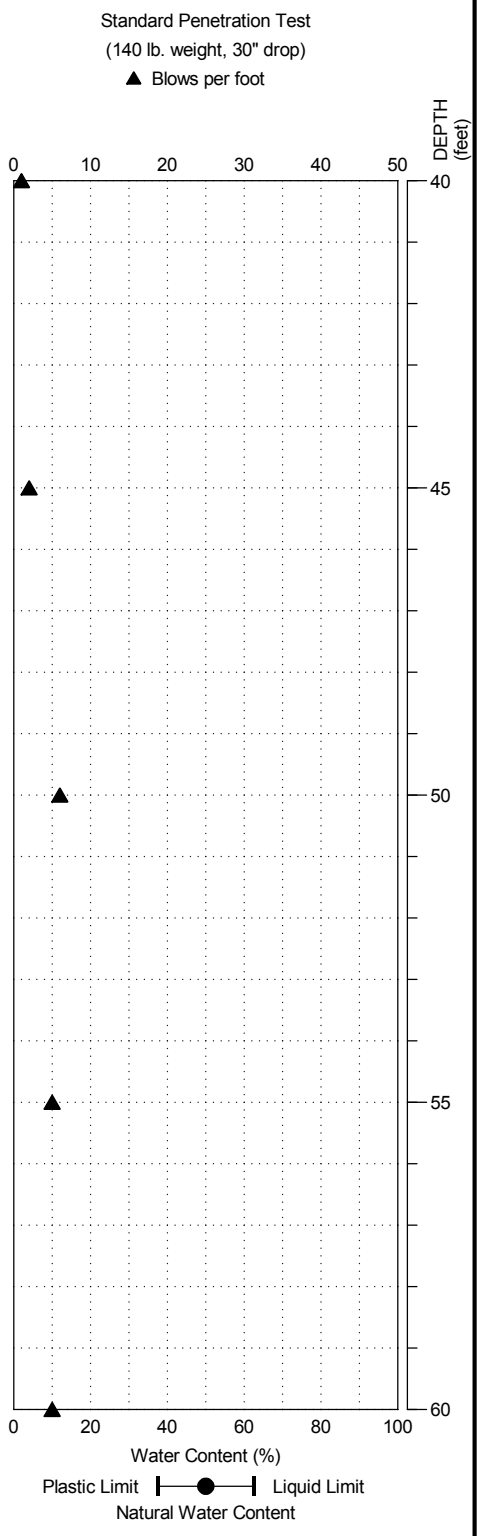
BORING:
BH-07

PROJECT NO.: 2013-075-21 FIGURE: A-8

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/16/2015
DATE COMPLETED: 9/17/2015
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
40			No recovery on 2 inch sample spoon. Substituted a 3 inch sample spoon. Very loose, light olive gray, very silty, fine to coarse SAND with subrounded to subangular, fine to coarse gravels, wet, unsorted, scattered woody debris. **(OSCEOLA MUDFLOW)**		S-12	1-0-1		
45			Very loose, light olive gray, very silty, fine to coarse SAND with subrounded to subangular fine gravels, wet, unsorted, ash tuffs in sample.		S-13	0-1-1		
50			Loose, light olive gray, very silty, fine to coarse SAND with subrounded to subangular fine gravels, wet, unsorted.		S-14	1-2-4		
55			(Same) Scattered woody organics and ash tuffs.		S-15	4-3-2		
60								



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DRILLING COMPANY: Holocene Drilling
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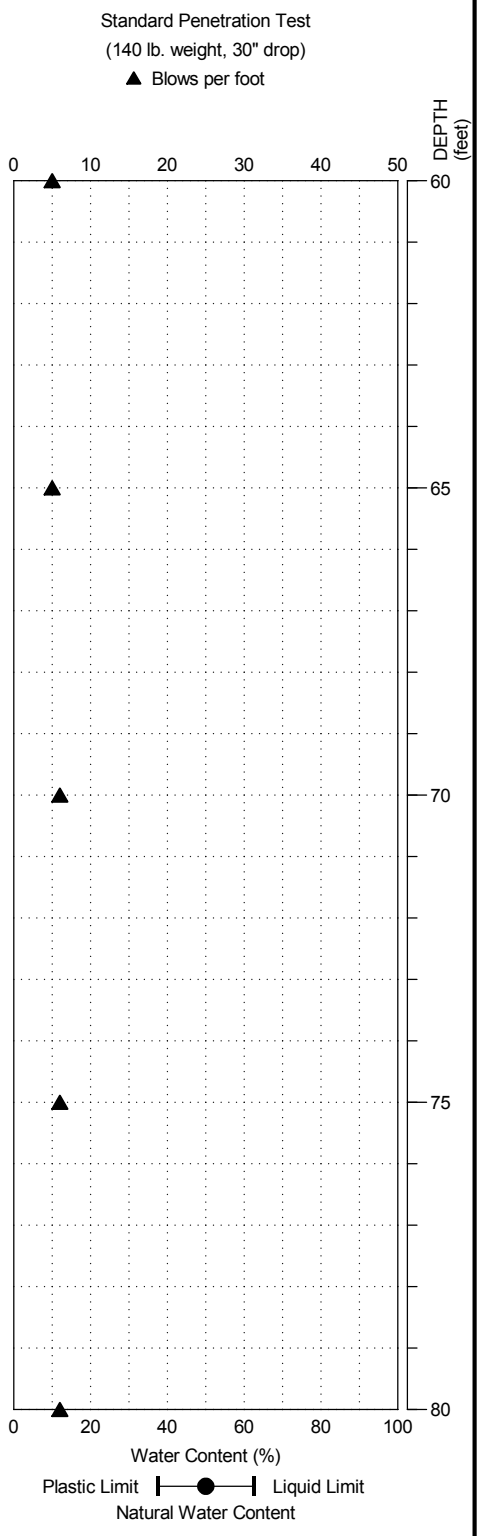
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/16/2015
DATE COMPLETED: 9/17/2015
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
60			(Same)		S-16	2-3-2		
65			Loose, light olive gray, very silty, fine to coarse SAND with subrounded fine gravels, wet, unsorted, ash tuffs in sample.		S-17	3-2-3		
70			Loose, light olive gray, very silty, fine to coarse SAND with subrounded fine gravels, wet, unsorted.		S-18	4-2-4		
75			Loose, light olive gray, very silty, fine to coarse SAND with angular to subangular fine to medium fine gravels, wet, unsorted.		S-19	4-2-4		
80								



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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

BORING:
BH-07

PROJECT NO.: 2013-075-21 FIGURE: A-8

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/16/2015
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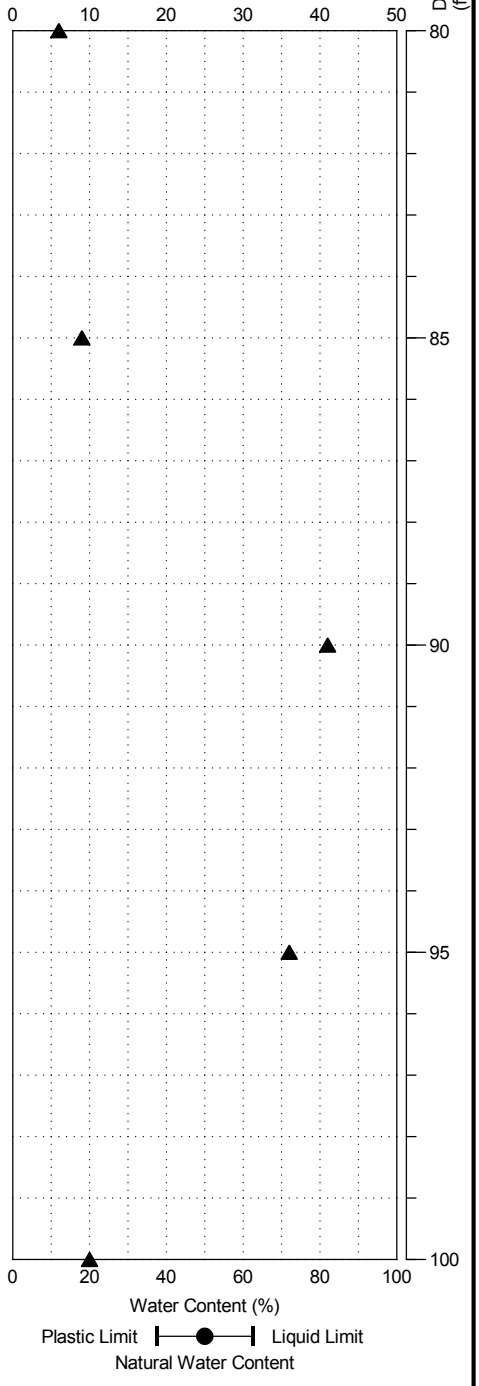
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
80			Loose, light olive gray, very silty, fine to coarse SAND with subrounded to subangular fine gravels, wet, unsorted.		S-20	4-2-4		
85		ML	Stiff, light olive gray, plastic SILT with light brown banding, wet, finely bedded. **(OLDER RECENT ALLUVIUM)**		S-21	4-4-5		
			Light olive gray grades to brown, slightly fine sandy SILT, wet.		S-22			
		SM	Dark olive gray, silty fine SAND, wet.					
90			No recovery on 2 inch sample spoon. Substituted a 3 inch sample spoon. Blow counts overstated due to gravels. Dense, dark olive gray, slightly silty fine SAND with angular to subangular, fine to coarse gravels, wet, light brown banding, finely bedded.		S-23	20-17-24		
95		ML SM	Dense, reddish black, very silty fine SAND with 3 inch lenses of light olive gray, plastic silt, angular to subangular fine gravels, wet, finely bedded.		S-24	28-17-19		
100		ML						

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

BORING:
BH-07

PROJECT NO.: 2013-075-21 FIGURE: A-8

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/16/2015
DATE COMPLETED: 9/17/2015
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
100			Stiff, blue/green SILT with light brown banding, wet, plastic, finely bedded.		S-25	4-5-5		
			Driller notes gravelly drilling at 101.5' bgs, aborted shelby sample.					
		ML SM						
105			Medium dense, light brown grades to reddish black, very silty fine SAND with lenses of silt, wet, finely bedded, scattered woody organics.		S-26	11-4-8		
110			Dense, dark reddish-gray, clean, fine SANDE, wet, finely bedded, scattered woody organics, trace coarse angular gravels, interbedded light olive brown silt lenses.		S-27	16-24-25		
115			Sample lost due to gravels lodged between sampler and ball-bearing catch.		S-28	4-7-10		
		ML						
120								

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot

0 10 20 30 40 50

DEPTH (feet)

0 20 40 60 80 100

Water Content (%)

Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

BORING:
BH-07

PROJECT NO.: 2013-075-21 FIGURE: A-8

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/16/2015
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DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
120			Hard, light olive gray SILT, wet, nonplastic, finely bedded.		S-29a	12-23-26		
		SP	Dense, reddish-black, clean, fine SAND, wet, finely bedded.		S-29b			
			Borehole terminated at 121.5 feet bgs. Abandoned with cement-bentonite grout.					
125								
130								
135								
140								

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot

0 10 20 30 40 50

DEPTH (feet) 120 125 130 135 140

0 20 40 60 80 100

Water Content (%)

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

BORING:
BH-07

PROJECT NO.: 2013-075-21 FIGURE: A-8

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/14/2015
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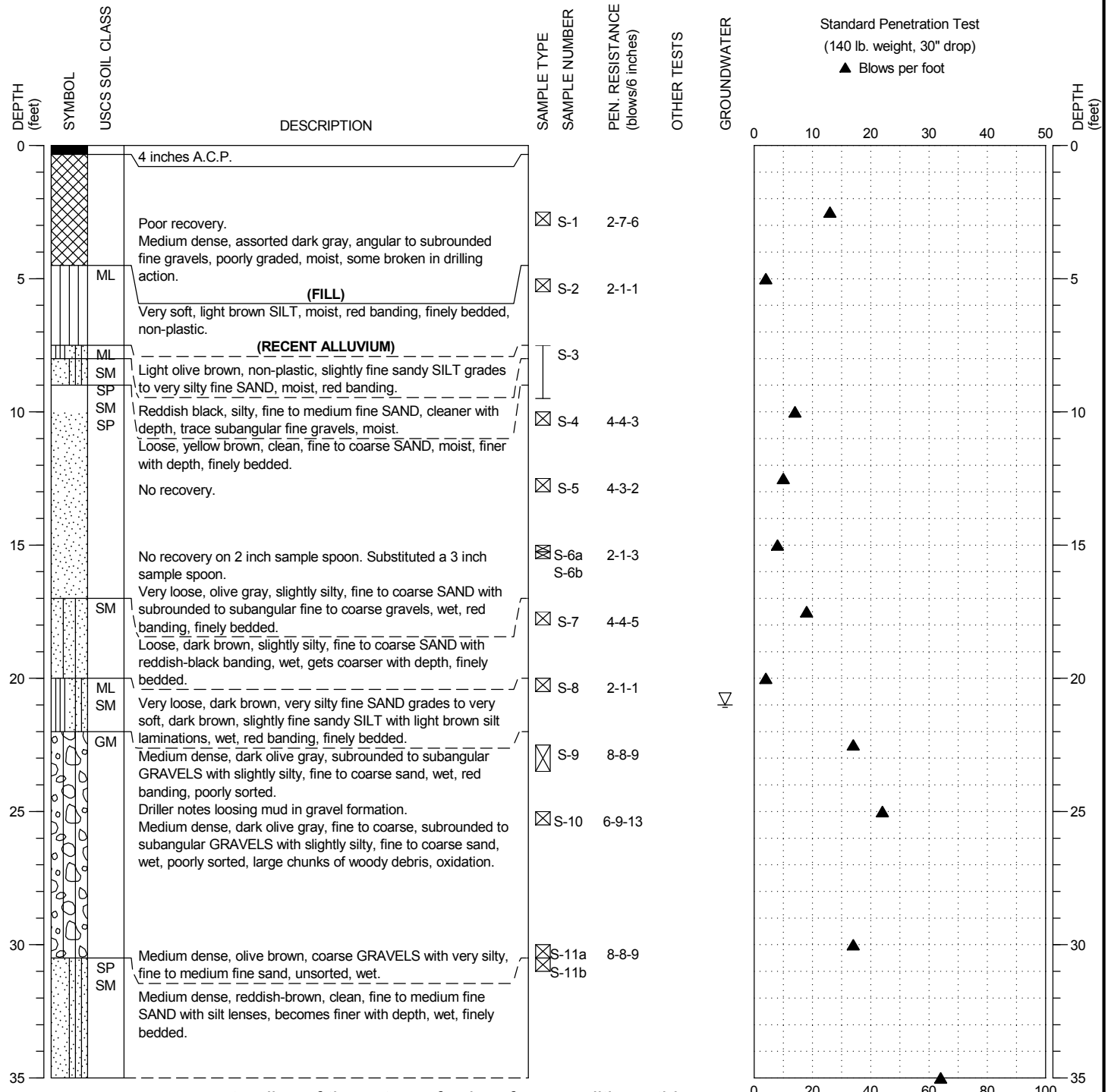

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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

BORING:
BH-08

PROJECT NO.: 2013-075-21 FIGURE: A-9

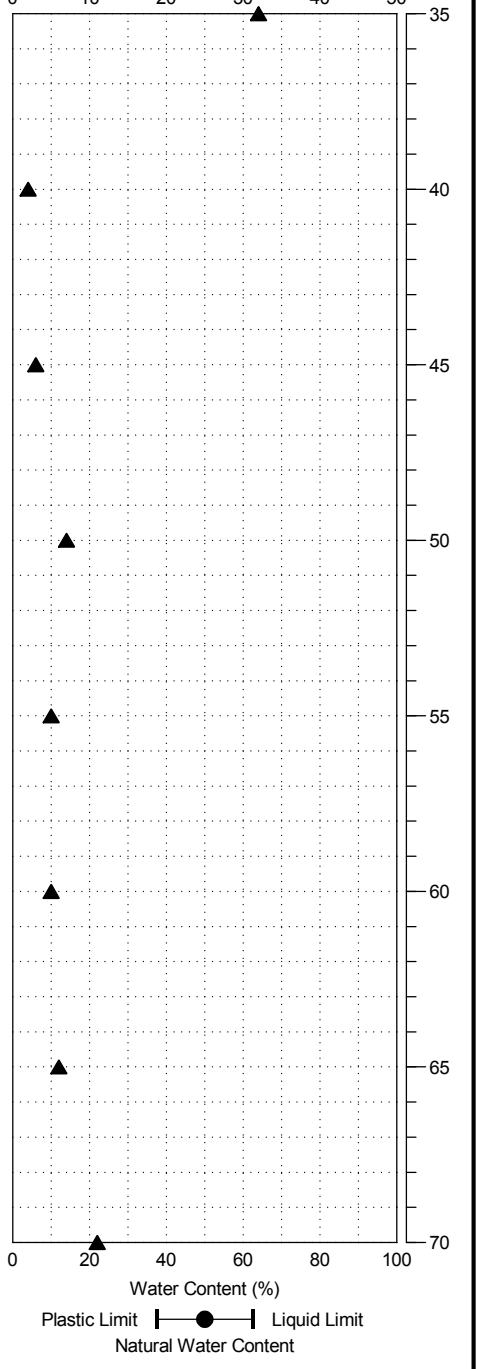
DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/14/2015
DATE COMPLETED: 9/15/2015
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE / SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
35		SP	Dense, reddish-black, clean, fine to medium fine SAND, wet, finely bedded.	S-12a	10-14-18	
		SM	Dense, reddish-black, slightly silty, fine to coarse SAND with abundant fine to coarse, subrounded to subangular gravels, wet, unsorted. **(OSCEOLA MUDFLOW)**	S-12b		
40			No recovery.	S-13	1-1-1	
45			Very loose, light olive gray, very silty, fine to medium fine SAND with rounded fine gravels, wet, unsorted.	S-14	1-1-2	
50			Loose, light olive gray, very silty, fine to coarse SAND with subrounded to subangular fine gravels, wet, unsorted, scattered woody debris. 4 inch ashey layer in middle of sampler.	S-15	2-5-2	
55			Loose, light olive gray, very silty, fine to coarse SAND with subrounded to subangular fine gravels, wet, unsorted, scattered woody debris.	S-16	4-2-3	
60			No recovery.	S-17	2-2-3	
			No recovery on 2 inch sample spoon. Substituted a 3 inch sample spoon. Loose, olive gray, very silty, fine to coarse SAND with subrounded to subangular fine gravels, wet, unsorted, scattered woody debris.	S-18		
65			Loose, light olive gray, very silty, fine to medium fine SAND with subangular fine gravels, wet, unsorted, scattered woody debris and pumice chunks.	S-19	3-2-4	
70						

GROUNDWATER

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

BORING:
BH-08

PROJECT NO.: 2013-075-21 FIGURE: A-9

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/14/2015
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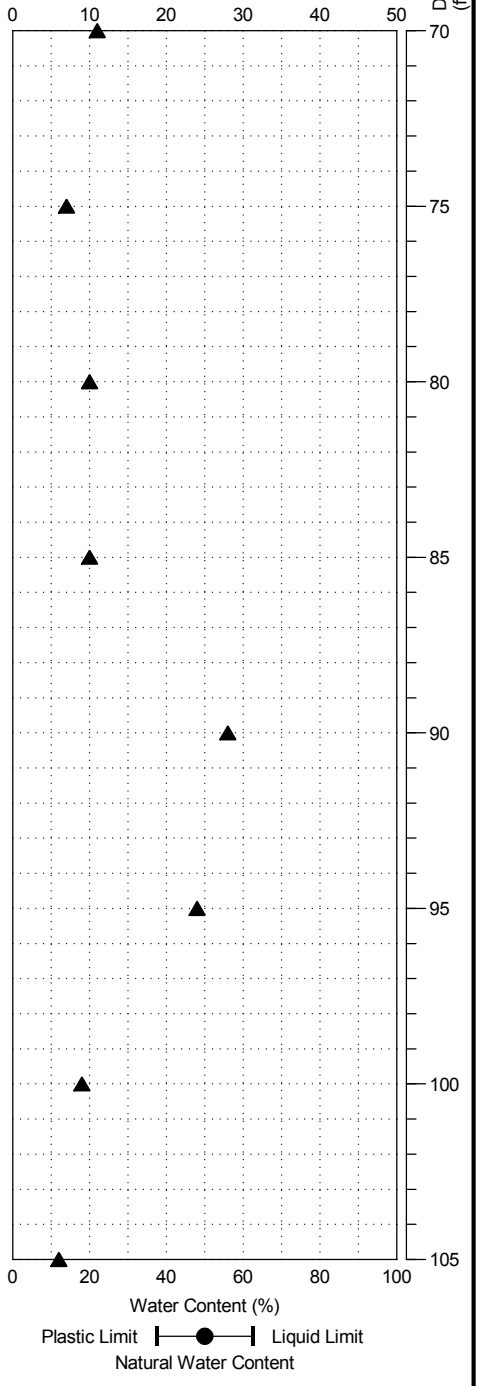
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
70			No recovery.		S-20	4-5-6		
75			Loose, light olive gray, very silty, fine to coarse SAND with subrounded to subangular gravels, wet, unsorted, scattered woody debris, pumice chunks.		S-21	2-3-4		
80			No recovery.		S-22	2-4-6		
			No recovery on 2 inch sample spoon. Substituted a 3 inch sample spoon. Medium dense, light olive gray, very silty, fine to coarse SAND with subrounded to subangular gravels, wet, unsorted.		S-23			
85			Poor recovery. Overstated blow counts due to gravels in sampler. Loose, light olive gray, very silty, fine to coarse SAND with subangular gravels, wet, unsorted.		S-24	1-3-7		
90		SP SM	Medium dense, reddish-black, clean fine SAND grades to slightly silty fine SAND, wet, finely bedded. **(OLDER RECENT ALLUVIUM)**		S-25	10-15-13		
95			Medium dense, light olive gray, slightly silty fine SAND grades to clean fine SAND, wet, finely bedded, scattered organics crossing bedding.		S-26	12-10-14		
		ML						
100			Medium stiff, light yellow brown grades to light olive gray, non-plastic SILT with light yellow brown banding in lower 12 inches, wet, finely bedded, scattered woody organics. Shelby. No recovery due to collapse under dense material.		S-27	3-4-5		
					S-28			
105		SM						

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



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SUMNER, WASHINGTON

BORING:
BH-08

PROJECT NO.: 2013-075-21 FIGURE: A-9

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/14/2015
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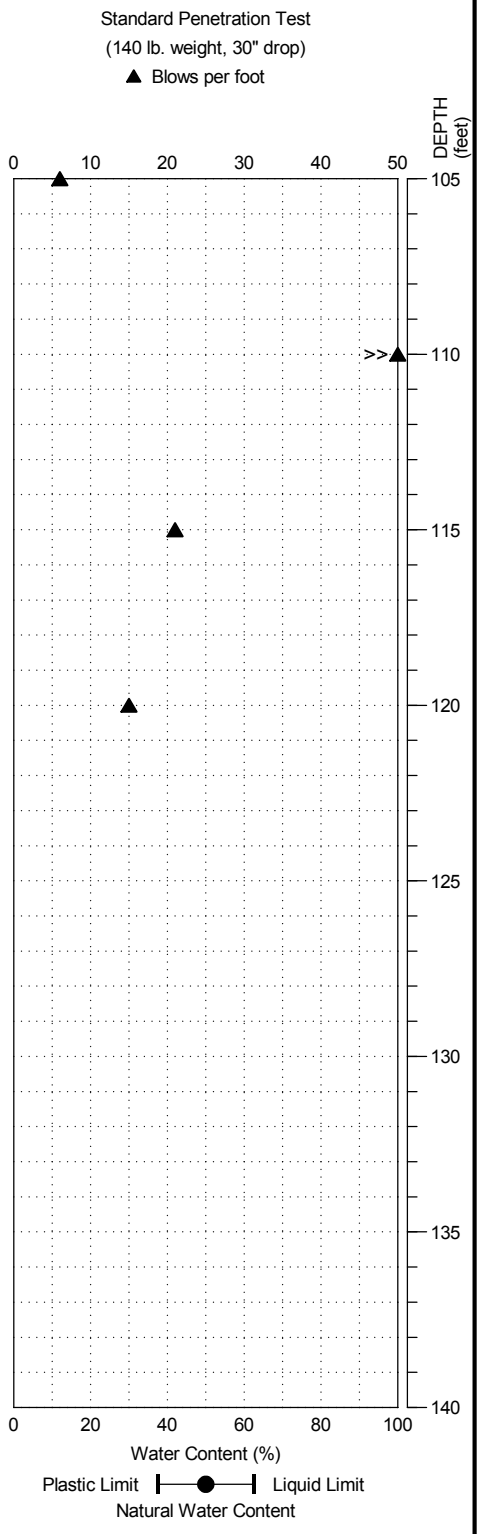
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
105			No recovery.		S-29	9-3-3		
			No recovery on 2 inch sample spoon. Substituted a 3 inch sample spoon.		S-30			
			Loose, reddish-black, slightly silty fine SAND with lenses of olive gray silt, wet, finely bedded, lower 4 inches is partially decaying tree root.					
110		SP	Dense, reddish-black, clean fine SAND, wet, finely bedded.		S-31	19-26-29		
		SM						
115			Medium dense, dark olive brown, silty fine SAND with a 3 inch lense of clean fine sand 6 inches down, wet, finely bedded, scattered woody organics crossing bedding.		S-32	13-9-12		
		SP SM						
120			Medium dense, light olive gray, clean fine SAND grades to very silty fine SAND, wet, scattered woody organics crossing bedding, finely bedded.		S-33	10-8-7		
			Borehole terminated at 121.5 feet bgs. Abandoned with cement-bentonite grout.					
125								
130								
135								
140								



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SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

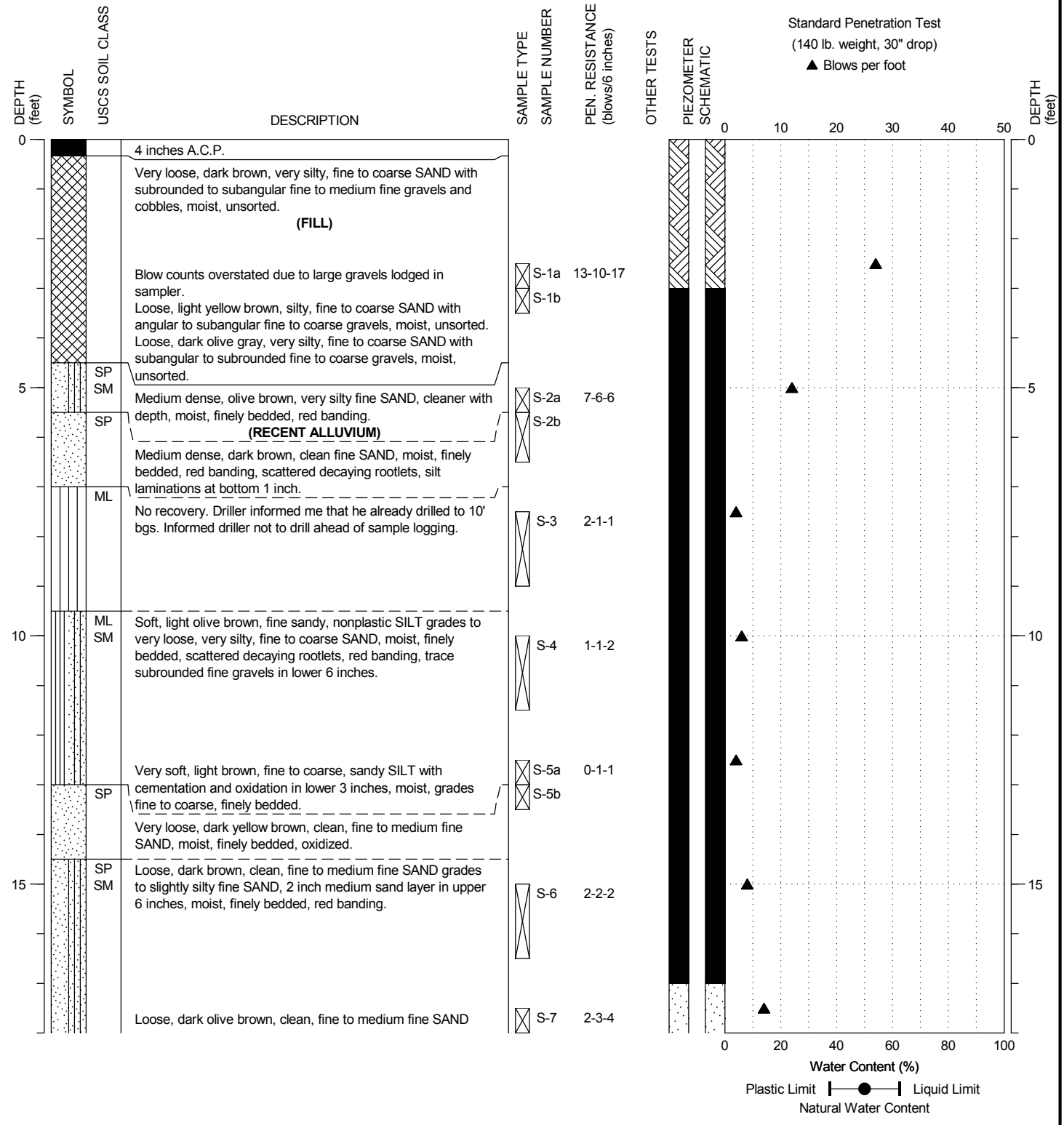
BORING:
BH-08

PROJECT NO.: 2013-075-21 FIGURE: A-9

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Hollow Stem Auger
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
LOCATION: Sumner Transit Station

SURFACE ELEVATION: 41.00 ± feet
CASING ELEVATION ± feet

DATE STARTED: 9/18/2015
DATE COMPLETED: 9/18/2015
LOGGED BY: H. Bray



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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

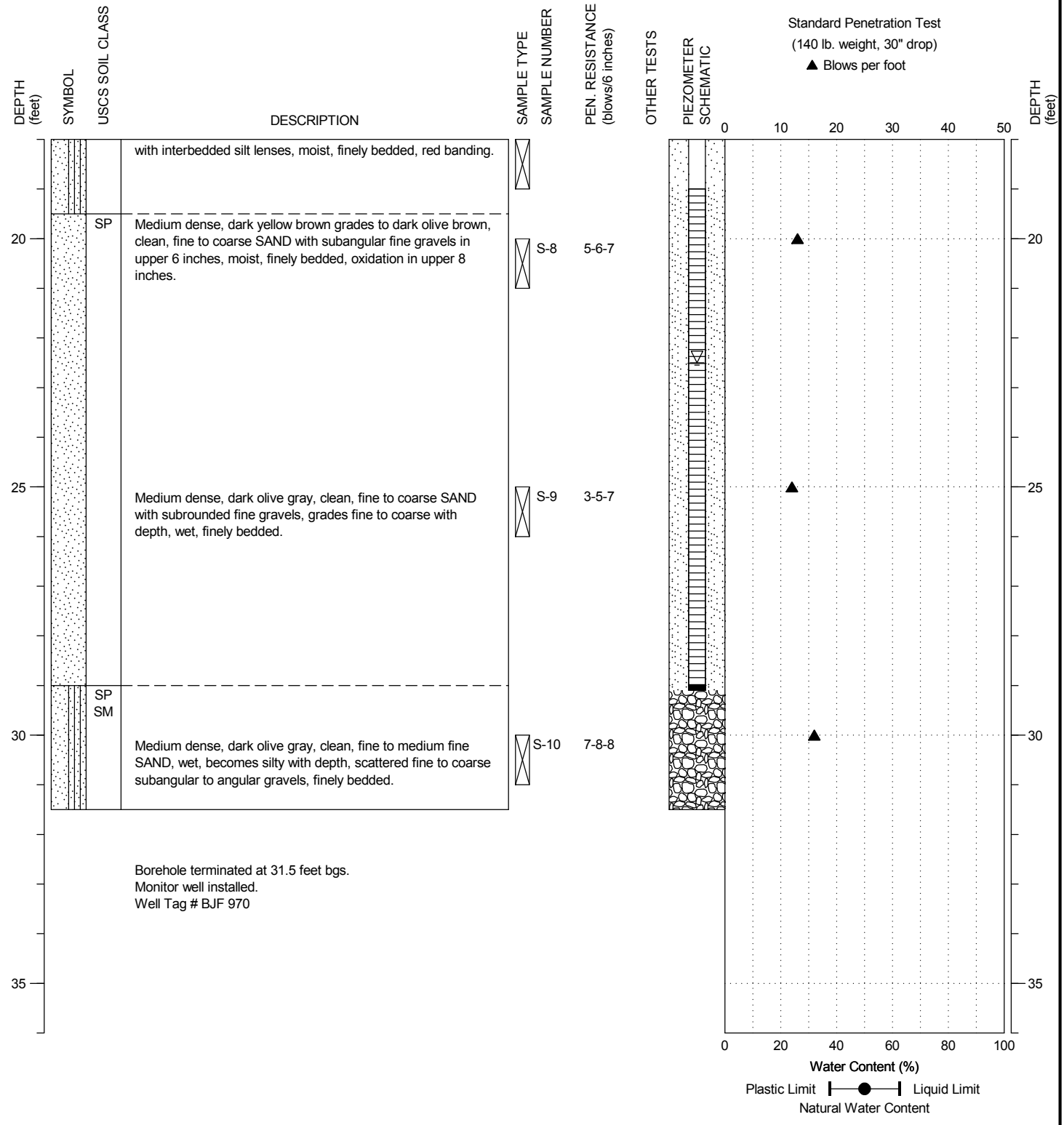
BORING:
BH-09

PROJECT NO.: 2013-075-21 FIGURE: A-10

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Hollow Stem Auger
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
LOCATION: Sumner Transit Station

SURFACE ELEVATION: 41.00 ± feet
CASING ELEVATION ± feet

DATE STARTED: 9/18/2015
DATE COMPLETED: 9/18/2015
LOGGED BY: H. Bray



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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

BORING:
BH-09

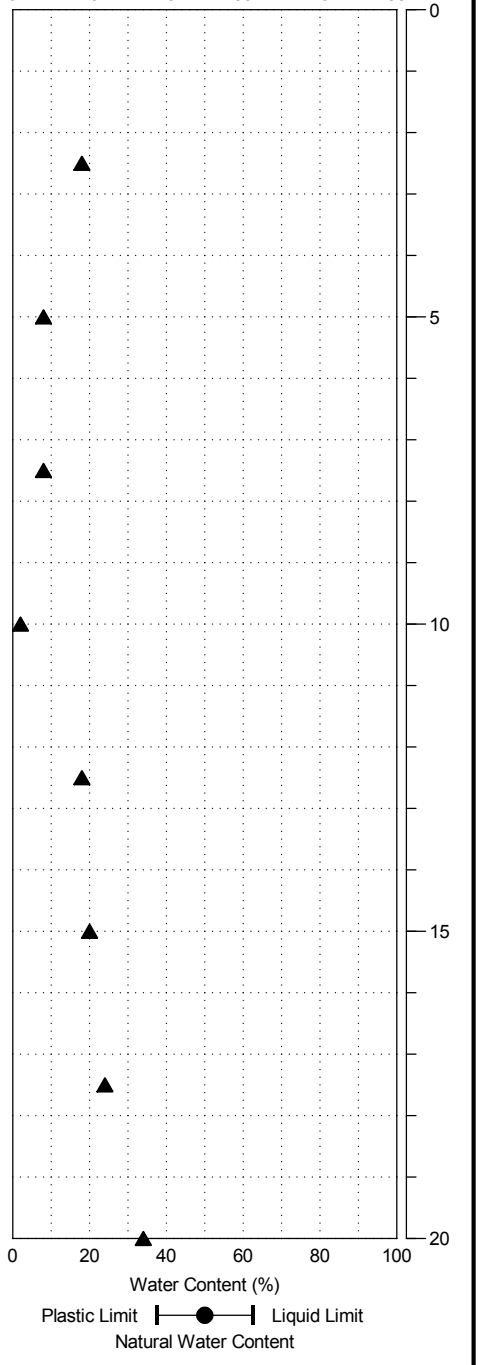
PROJECT NO.: 2013-075-21 FIGURE: A-10

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Hollow Stem Auger
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/18/2015
DATE COMPLETED: 9/18/2015
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0			4 inches A.C.P.					
		SM	Loose, light yellow brown, very silty fine SAND with interbedded silt lenses, moist, red banding, scattered rootlets, finely bedded. **(RECENT ALLUVIUM)**		S-1	3-4-5		
5			Very loose, light yellow brown, silty fine SAND, moist, finely bedded.		S-2	1-2-2		
			Very loose, light yellow brown, slightly silty fine SAND with interbedded layers of clean, fine to medium fine sand, moist, scattered organics, red banding, finely bedded.		S-3	1-2-2		
10		SP SM	Very loose, light yellow brown, clean fine SAND with interbedded layers of slightly silty fine sand, moist, finely bedded, red banding.		S-4	0-0-1		
			Loose, light yellow brown grades to olive gray, slightly silty find SAND grades to fine to coarse, clean SAND, moist, finely bedded, red banding.		S-5	3-4-5		
15			Medium dense, dark olive gray, slightly silty fine SAND grades to clean, fine to coarse SAND, moist, finely bedded, red banding.		S-6	3-4-6		
			Medium dense, dark olive gray, clean, fine to coarse SAND with interbedded very silty fine sand lenses, moist, scattered subrounded fine gravels, finely bedded, red banding.		S-7	4-5-7		
20		SP						

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

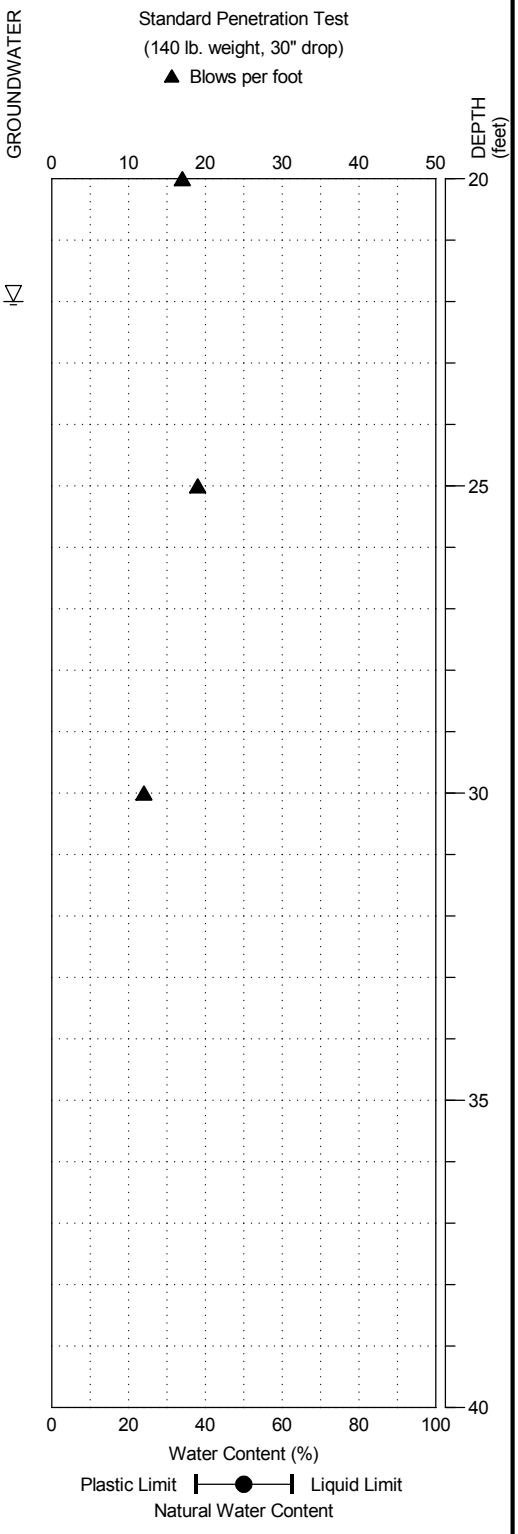
BORING:
BH-10

PROJECT NO.: 2013-075-21 FIGURE: A-11

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Hollow Stem Auger
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 9/18/2015
DATE COMPLETED: 9/18/2015
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
20			Medium dense, dark olive brown, clean, fine to coarse SAND with subangular to subrounded fine gravels, moist, red banding, finely bedded, decomposed organics.		S-8	7-8-9		
25			Medium dense, dark yellow brown grades to dark olive gray, clean, fine to coarse SAND, wet, finely bedded, scattered subrounded to subangular, fine to coarse gravels.		S-9	4-7-12		
30			Medium dense, dark olive gray, clean, fine to coarse SAND with subrounded to subangular, fine to medium fine gravels, grades from fine to coarse, wet, finely bedded, gravelly in lower 6 inches.		S-10	3-5-7		
			Borehole terminated at 31.5 feet bgs. Abandoned with bentonite chips.					
35								
40								



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HWA GEOSCIENCES INC.

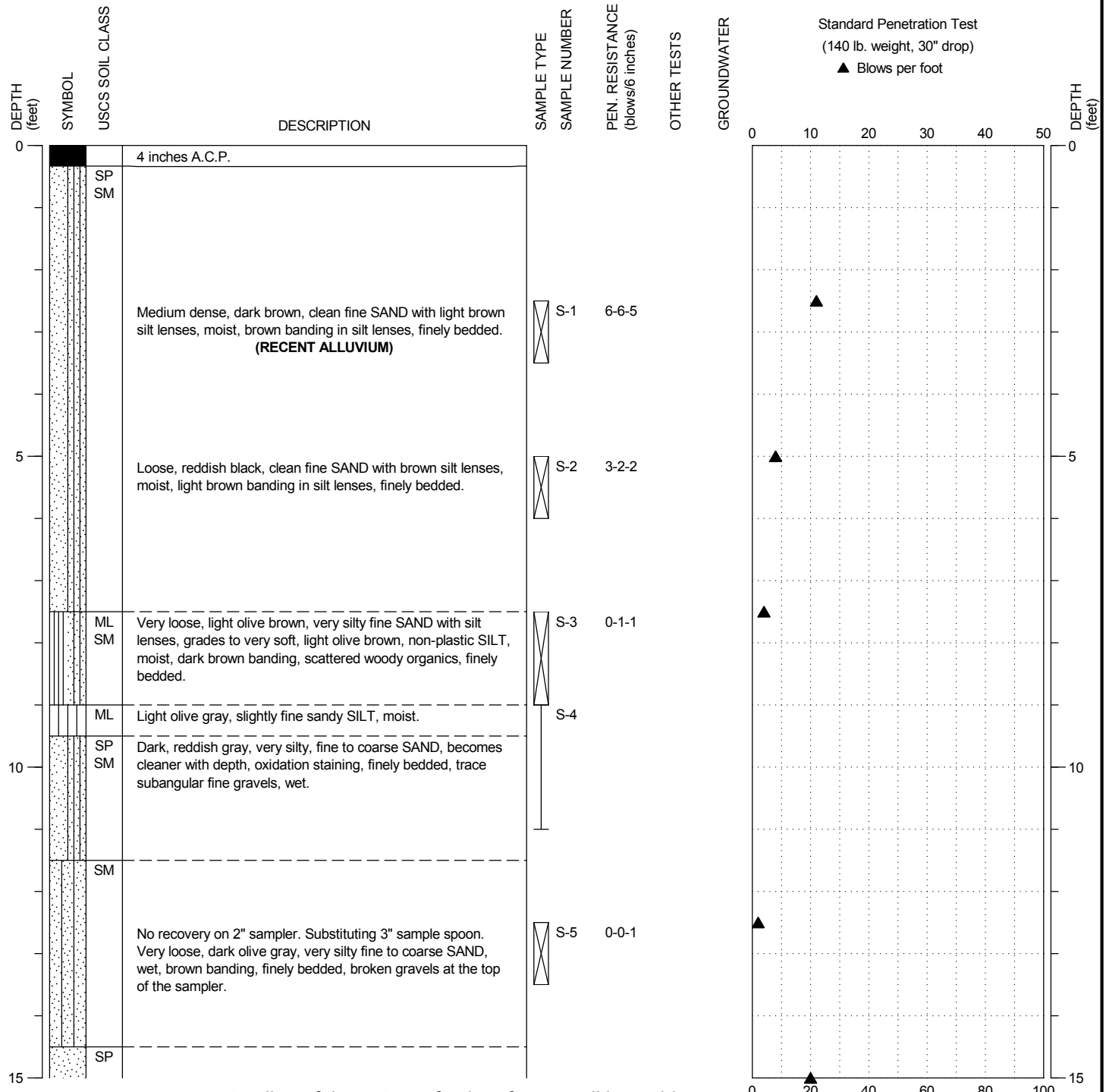
SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

BORING:
BH-10

PROJECT NO.: 2013-075-21 FIGURE: A-11

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 10/5/2015
DATE COMPLETED: 10/6/2015
LOGGED BY: H. Bray



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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

BORING:
BH-11

PROJECT NO.: 2013-075-21 FIGURE: A-12

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 10/5/2015
DATE COMPLETED: 10/6/2015
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
15			No recovery on 2" sampler. Substituting 3" sample spoon. Overstated blow counts due to gravels. Medium dense, subrounded fine gravels grades to dark olive gray, clean, fine to coarse SAND, wet, broken gravels at the top of the sampler.		S-6	6-5-5		
		GP	Driller notes loosing mud in gravel formation.					
		SM	Loose, reddish black, slightly silty fine SAND with laminations of very silty fine SAND, wet, red banding, broken gravels at the top of the sample spoon, finely bedded. Wood chunk in lower 3 inches of sample.		S-7	3-2-3		
			Driller notes that they are drilling through a wood formation. **(WOOD DEBRIS)**					
20		SP	Very loose, reddish black, clean fine SAND, wet, finely bedded, upper 2 inches are tree root. **(RECENT ALLUVIUM)**		S-8	0-1-1		▽
25			Loose, reddish black, clean, fine to coarse SAND, wet, finely bedded, subrounded to subangular fine to coarse gravels, coarse gravel in spoon sample may have overstated the blow counts.		S-9	3-6-11		
30								

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot

0 10 20 30 40 50

DEPTH (feet) 15 20 25 30

0 20 40 60 80 100

Water Content (%)

Plastic Limit ⊢●⊣ Liquid Limit

Natural Water Content

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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

BORING:
BH-11

PROJECT NO.: 2013-075-21 FIGURE: A-12

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 10/5/2015
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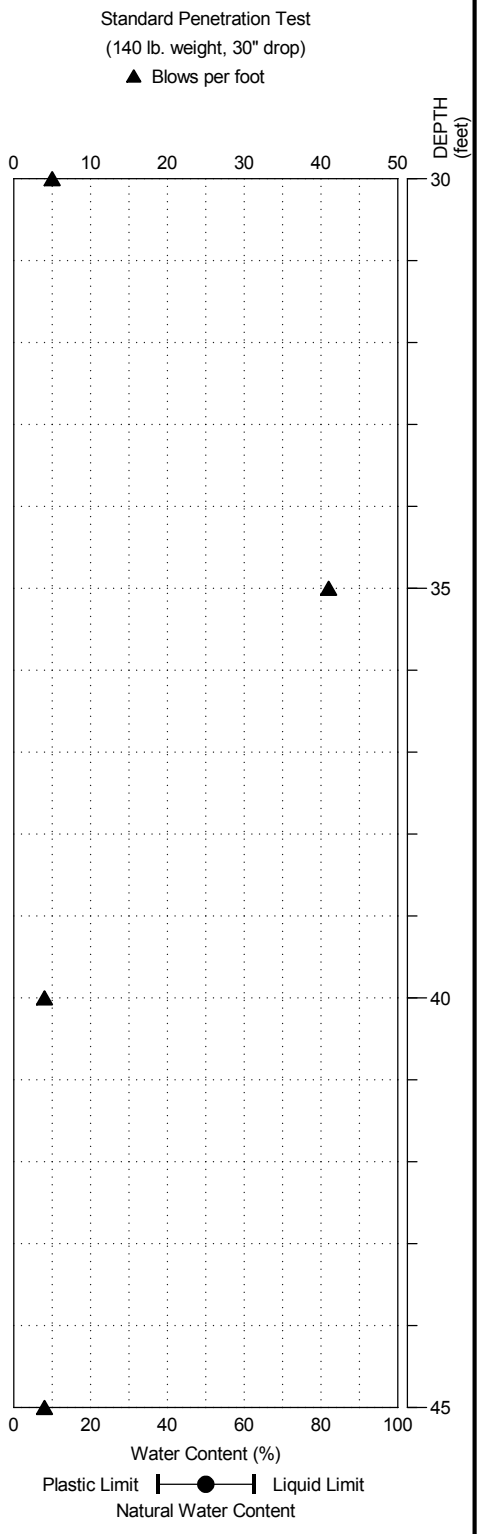
DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
30			Loose, reddish black, clean fine to coarse SAND with a 4 inch wood chunk, wet, finely bedded, scattered subangular coarse gravels.		S-10	7-3-2		
35			Dense, reddish black, clean fine to coarse SAND with subrounded to subangular fine to coarse gravels, wet, finely bedded, broken gravels in the top of the sample spoon.		S-11	19-20-21		
		SM						
40			Loose, light olive gray, very silty, fine to coarse SAND with subrounded fine gravels, wet, unsorted, non-stratified. **(OSCEOLA MUDFLOW)**		S-12	1-2-2		
45								



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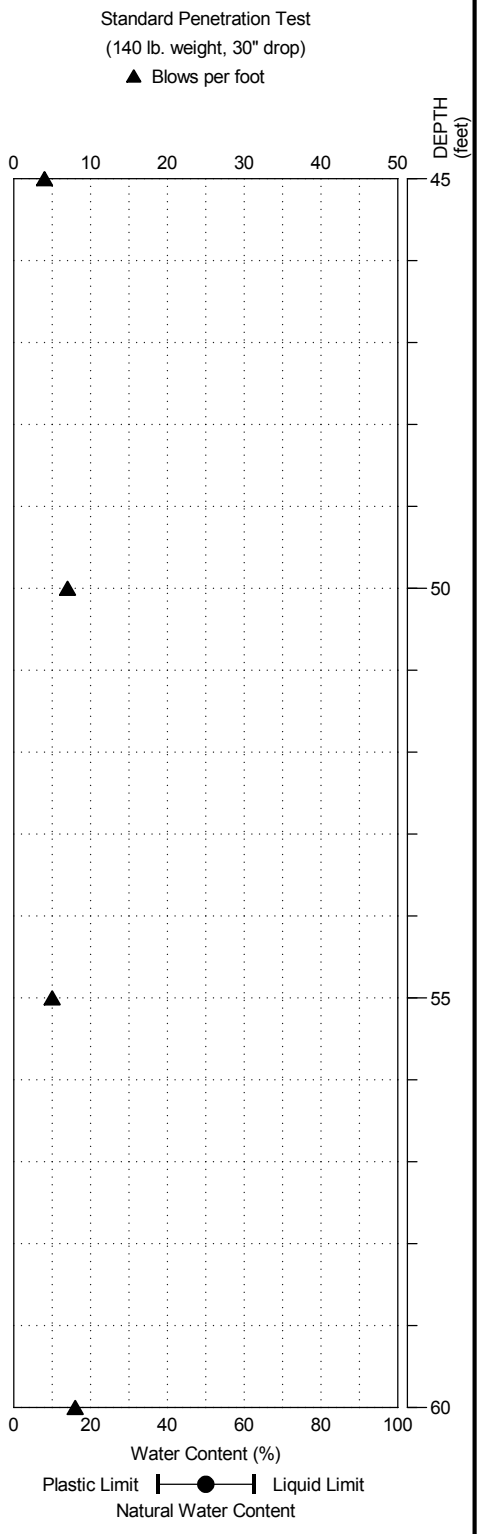
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 10/5/2015
DATE COMPLETED: 10/6/2015
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
45			(Same) Subangular fine gravels.		S-13	2-2-2		
50			(Same) Subangular fine gravels and scattered woody debris.		S-14	2-4-3		
55			(Same) Subrounded coarse gravels and scattered woody debris.		S-15	2-2-3		
60								



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HWA GEOSCIENCES INC.

SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

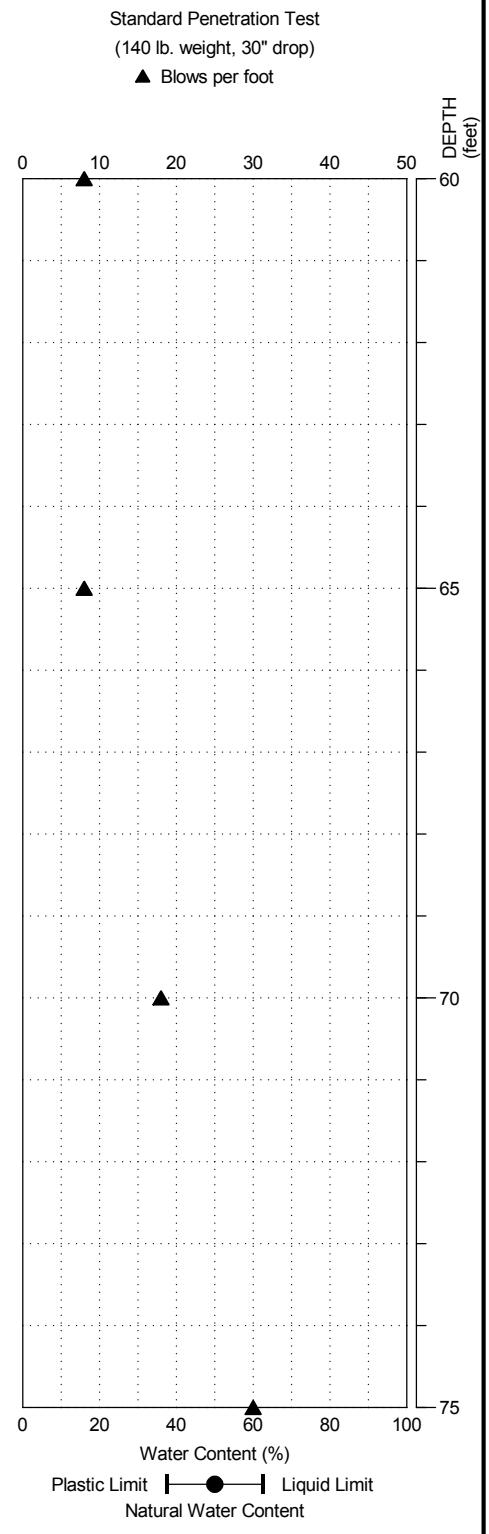
BORING:
BH-11

PROJECT NO.: 2013-075-21 FIGURE: A-12

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 10/5/2015
DATE COMPLETED: 10/6/2015
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
60			(Same) Subrounded coarse gravels and scattered woody debris.		S-16	3-4-4		
65			(Same) Subrounded coarse gravels, scattered woody debris, and ash tuffs.		S-17	2-4-4		
70			(Same) Becomes medium dense, subrounded coarse gravels.		S-18	4-8-10		
75								



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SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
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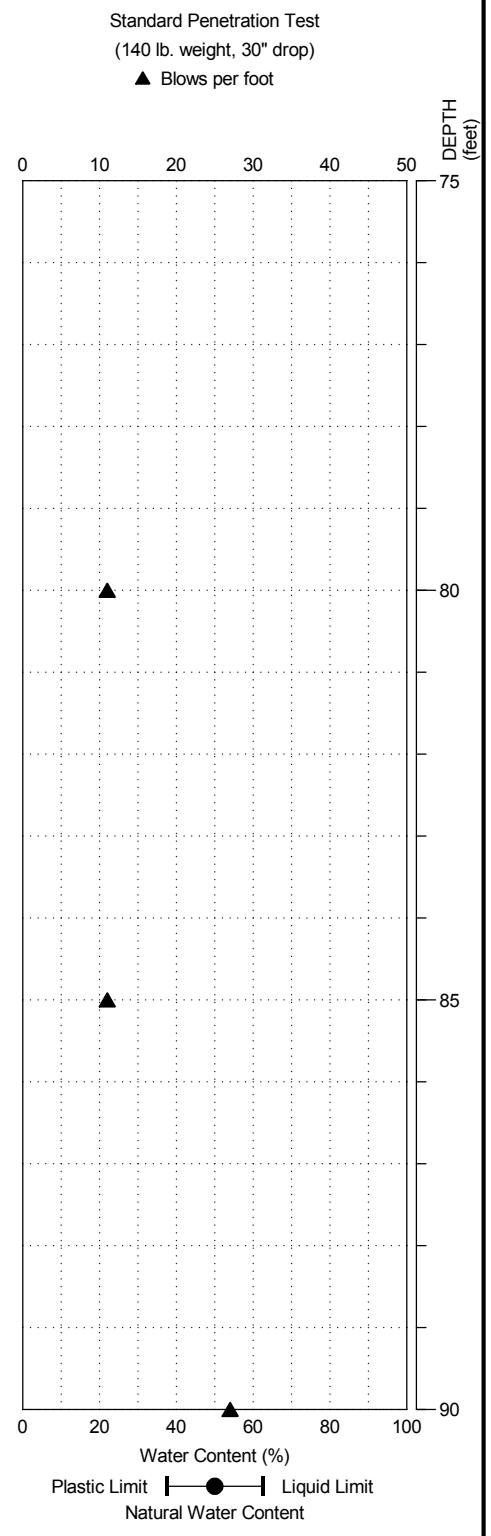
DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE / SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
75			(Same) Subangular fine gravels, scattered woody debris, and ash tuffs.	S-19a	4-5-25		
		ML	Hard, dark olive green to blue, non-plastic SILT, moist, finely bedded. **(OLDER RECENT ALLUVIUM)**	S-19b			
			Driller notes dense drilling at 78 feet bgs.				
		SM					
80			Medium dense, light olive gray, very silty, fine to coarse SAND with subrounded fine to coarse gravels, wet, unsorted, scattered woody debris.	S-20	3-5-6		
		ML					
85			Medium dense, dark olive brown grades to olive green/blue, non-plastic SILT, moist, finely bedded, scattered organics.	S-21a	3-5-6		
		SM	Loose, reddish black, slightly silty fine SAND with silt lenses, wet, finely bedded.	S-21b			
90							



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BORING:
BH-11

PROJECT NO.: 2013-075-21 FIGURE: A-12

DRILLING COMPANY: Holocene Drilling
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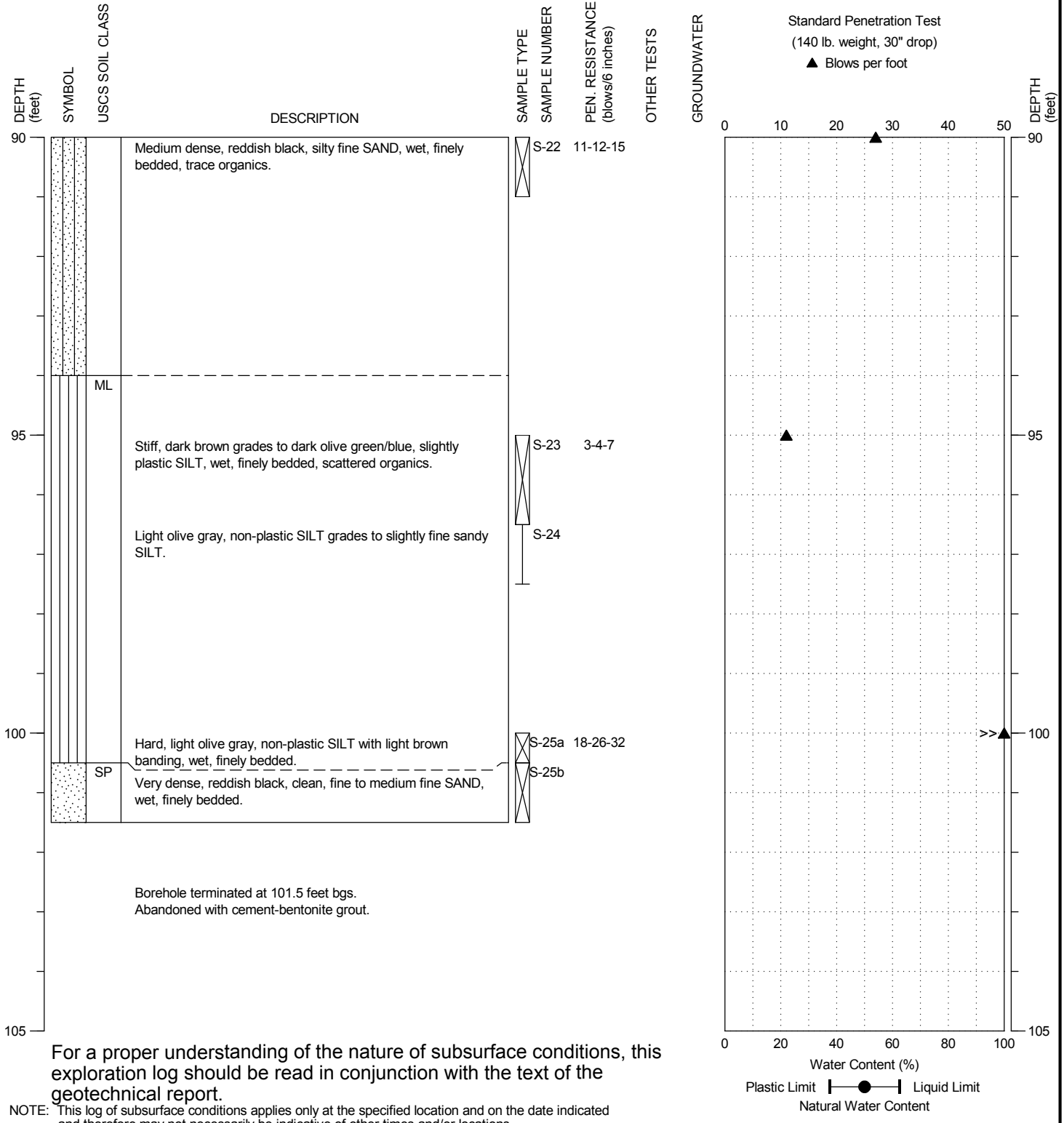

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SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 10/7/2015
DATE COMPLETED: 10/8/2015
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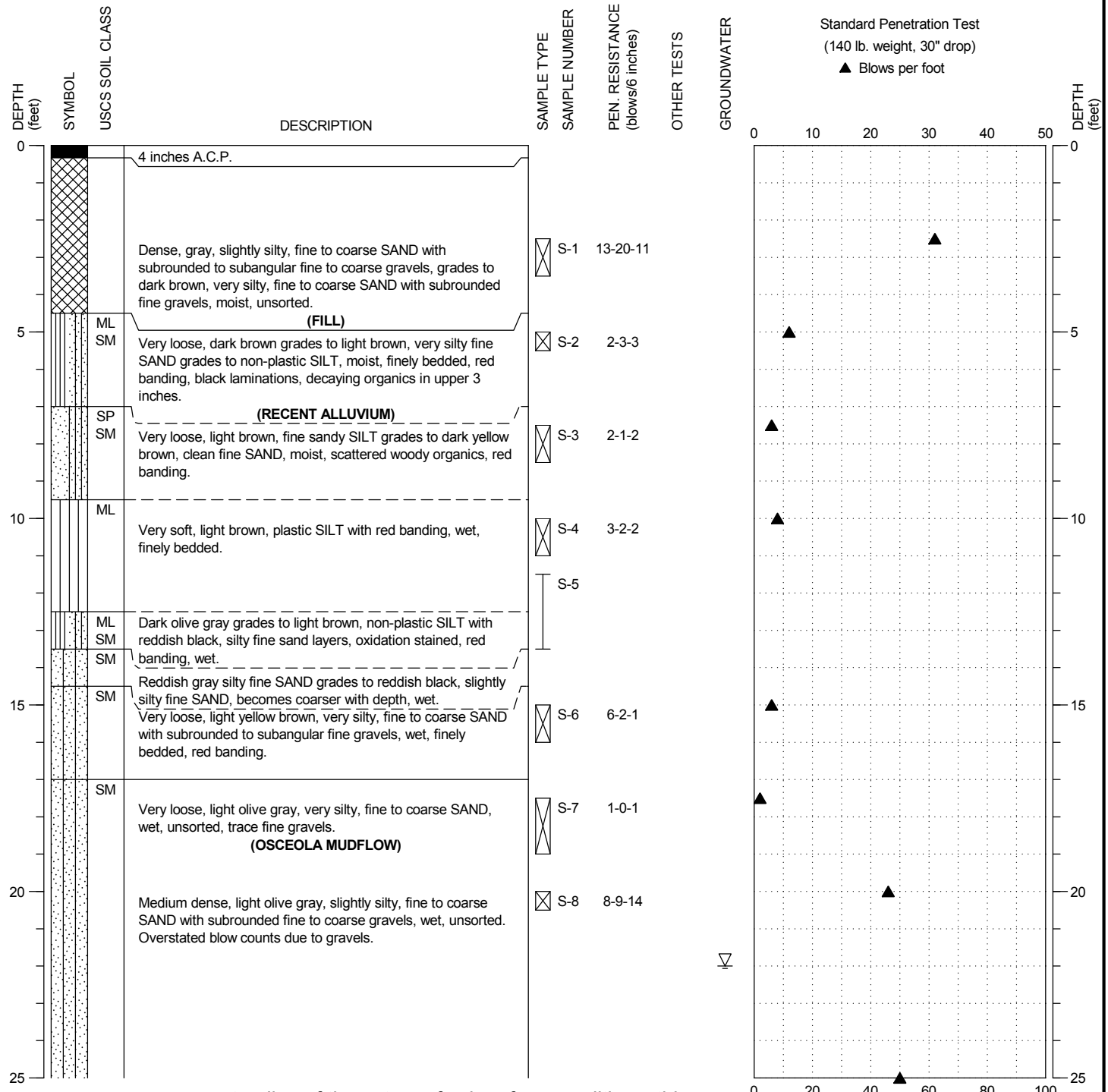

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SUMNER STATION ACCESS IMPROVEMENTS
SUMNER, WASHINGTON

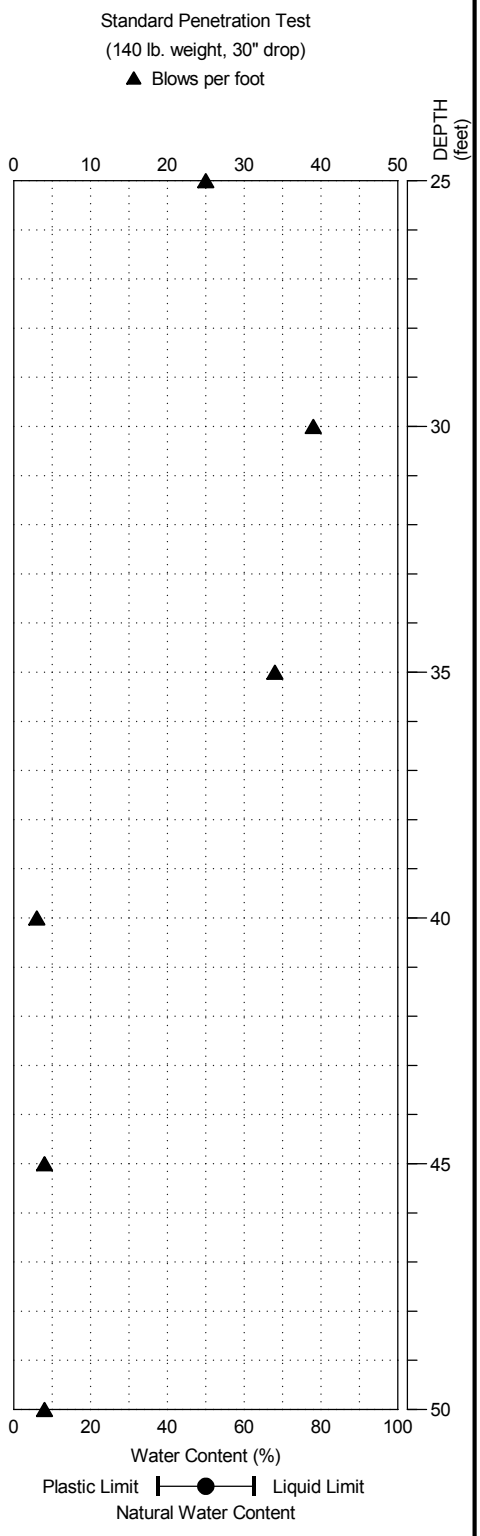
BORING:
BH-12

PROJECT NO.: 2013-075-21 FIGURE: A-13

DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: BK-81 Truck Rig, Mud Rotary w/ 5" tricone bit
SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 10/7/2015
DATE COMPLETED: 10/8/2015
LOGGED BY: H. Bray

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
25			Poor recovery. Medium dense, light olive gray, slightly silty, fine to coarse SAND with subrounded fine to coarse gravels, wet, unsorted. Overstated blow counts due to gravels.	☒	S-9	16-15-10		
30			Dense, dark olive brown grades to reddish black, very silty, fine to coarse SAND with abundant subrounded to subangular fine to coarse gravels, wet, unsorted.	☒	S-10	10-23-16		
35		SW	No recovery on 2 inch sample spoon. Substituted a 3 inch sample spoon. Dense, reddish black, clean fine to coarse SAND with rounded cobbles and subrounded to rounded, fine to coarse GRAVELS, wet, poorly sorted, scattered woody debris. Overstated blow counts due to coarse gravels.	☒	S-11	12-17-17		
40		SM	Very loose, light olive gray, very silty, fine to coarse SAND with subrounded fine gravels, wet, unsorted, non-stratified.	☒	S-12	1-2-1		
45			Poor recovery. (Same)	☒	S-13	2-1-3		
50								



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BORING:
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PROJECT NO.: 2013-075-21 FIGURE: A-13

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SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 10/7/2015
DATE COMPLETED: 10/8/2015
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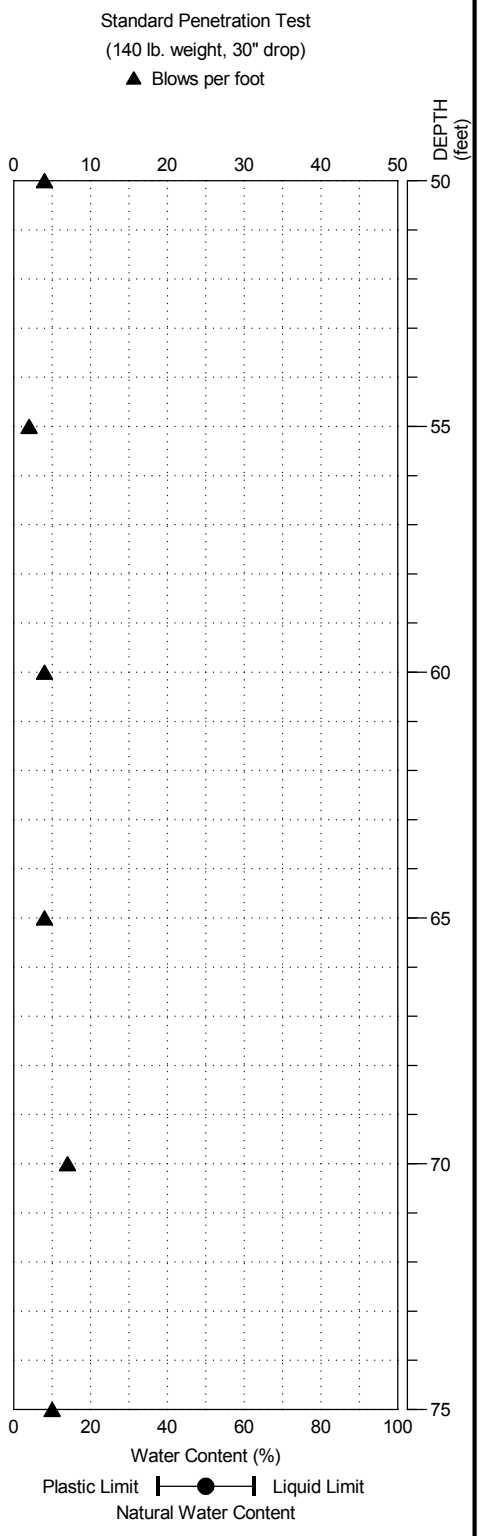
DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
50			Poor recovery. Sampler check-ball lodged open with gravel piece. (Same)	☒	S-14	3-2-2		
55			(Same) Ash tuffs and scattered organics.	☒	S-15	2-1-1		
60			(Same)	☒	S-16	1-1-3		
65			(Same)	☒	S-17	2-2-2		
70			(Same) Becomes loose, ash tuffs and wood debris.	☒	S-18	2-3-4		
75								



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BORING:
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PROJECT NO.: 2013-075-21 FIGURE: A-13

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SAMPLING METHOD: SPT w/ Autohammer; Shelby Tube
SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
DATE STARTED: 10/7/2015
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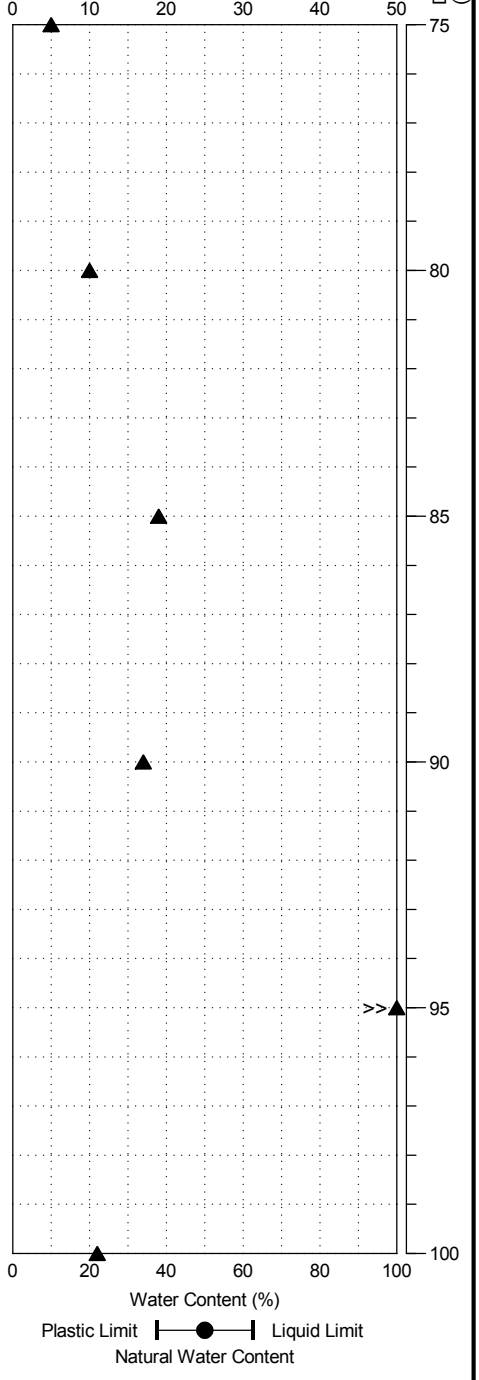
DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
75			(Same) Scattered angular cobbles and wood debris.		S-19	2-2-3		
80			No recovery on 2 inch sample spoon. Substituted a 3 inch sample spoon. (Same) Scattered woody debris.		S-20	5-5-5		
85			(Same) Becomes medium dense.		S-21	7-10-9		
90		ML	Poor recovery. Very stiff, olive green, moderately plastic SILT, wet, finely bedded. **(OLDER RECENT ALLUVIUM)**		S-22	5-6-11		
95		SM	No recovery on 2 inch sample spoon. Substituted a 3 inch sample spoon. Very dense, reddish black, very silty fine SAND with silt laminations, becomes sandy with depth, wet, scattered woody debris, finely bedded, scattered angular fine gravels.		S-23	18-28-32		
		ML	Overstated blow counts due to gravels.					
100								

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



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BORING:
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SURFACE ELEVATION: 41.00 ± feet

LOCATION: Sumner Transit Station
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DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
100			Stiff, light olive gray, plastic SILT, with light brown banding, wet, fine sand laminations, scattered organics.		S-24	4-4-7		
			Borehole terminated at 101.5 feet bgs. Abandoned with bentonite chips.					
105								
110								
115								
120								
125								

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot

0 10 20 30 40 50

DEPTH (feet)

0 20 40 60 80 100

Water Content (%)

Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

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BORING:
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