

1 Summary

2 The Washington State Department of Transportation (WSDOT) is
3 proposing to develop an area for wetland mitigation as part of the Pontoon
4 Construction Project, a component of the State Route (SR) 520 Bridge
5 Replacement and High-Occupancy Vehicle (HOV) Program. The
6 proposed location is known as the Grass Creek Wetland Mitigation Site
7 (Grass Creek property) and is located in Gray Gables near Hoquiam, in
8 Grays Harbor County, Washington. The Grass Creek property would be
9 modified from its current use to allow natural tidal flow from Grass Creek
10 to enter the property. The site would be modified by mechanically
11 expanding existing natural drainages and removing sections of an earthen
12 berm that bound the property on the east.

13 This document has been prepared as a technical addendum to the Pontoon
14 Construction Project Cultural Resources Discipline Report to assess the
15 effects of the proposed modifications on cultural resources at the Grass
16 Creek property. It also includes an appendix with an ethnographic study
17 prepared by Jay Miller for the Grass Creek area (Appendix C).

18 The area of potential effects (APE) is the geographic area within which a
19 project undertaking might directly or indirectly alter the character or use of
20 historic properties, if any such properties exist (Code of Federal
21 Regulations Title 36, Part 800.16 [36 CFR 800.16]). The APE for the
22 Pontoon Construction Project was defined by WSDOT in consultation
23 with affected tribes and the Washington State Department of Archaeology
24 and Historic Preservation (DAHP) and includes the approximately
25 65 acres that comprise the Grass Creek property currently owned by Mr.
26 David G. Anderson. For this investigation, five drainages and two large
27 sections of an earthen perimeter berm were excavated with shovel probes
28 as part of the archaeological investigations; a historical resources survey
29 was also conducted on this property. The vertical dimension of this
30 investigation was confined to the depth of proposed ground disturbance for
31 the drainage channel improvements, segments of berm removal, and
32 selected plantings.

33 ICF Jones & Stokes excavated 170 archaeological shovel probes along
34 these drainages and berm segments. All were in areas proposed for
35 modification as part of the wetland enhancement at the Grass Creek
36 property. No archaeological sites or significant historic resources were
37 identified at the Grass Creek property.

1 Although a historical drainage and berm were identified on the Grass
2 Creek property, these were determined not National Register of Historic
3 Places (NRHP) eligible; no significant cultural resources were identified at
4 the Grass Creek property. Therefore, a determination of *No Historic*
5 *Properties Affected* is recommended for the Grass Creek property portion
6 of the Pontoon Construction Project APE.

Acknowledgments

Numerous individuals were involved in this project, and all contributed to its completion. The contributions of the authors are notable in this effort, but others supported this project with various research, fieldwork, and writing tasks that this report represents. Foremost are the contributions of Erica Hall, Rori Perkins, and Stacy Schneyder, who helped complete this report. We also recognize the individuals who conducted fieldwork and collected project data: Tait Elder, Pat Elliot, Danny Gilmour, Meredith Mullaley, Kurt Perkins, Andrew Pinger, Pat Reed, and Stephanie Simmons. In addition to conducting excellent fieldwork, each contributed other talents and insights.

We also wish to acknowledge the collegial relationship and helpful information provided by Justine James of the Quinault Indian Nation and the coordination provided by Richard Bellon of the Confederated Tribes of the Chehalis Reservation. Consultation and a site visit by Dr. Richard D. Daugherty and Ruth Kirk were most welcome and also provided a link to the long tradition of local archaeology.

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2 *[Note: All exhibits are compiled at the end of the report after Chapter 10,*
3 *References, and before the appendices.]*

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Abbreviations and Acronyms

2	ACHP	Advisory Council on Historic Preservation
3	AD	Anno Domini
4	APE	Area of Potential Effects
5	CEQ	Council on Environmental Quality
6	CFR	Code of Federal Regulations
7	cm	centimeters
8	DAHP	Department of Archaeology and Historic Preservation
9	Discipline Report	Pontoon Construction Project Cultural Resources Discipline
10		Report
11	EIS	environmental impact statement
12	FHWA	Federal Highway Administration
13	GIS	geographic information system
14	GPS	global positioning system
15	HOV	high-occupancy vehicle
16	NADB	National Archaeological Database
17	NEPA	National Environmental Policy Act
18	NHPA	National Historic Preservation Act
19	NRHP	National Register of Historic Places
20	NRIS	National Register Information System
21	O&WT	Oregon & Washington Territory Railroad
22	RCW	Revised Code of Washington
23	SEPA	State Environmental Policy Act
24	SHPO	State Historic Preservation Officer
25	SR	State Route
26	SSH 9C	Secondary State Highway 9C

1	TCPs	traditional cultural properties
2	USACE	U.S. Army Corps of Engineers
3	USC	United States Code
4	USGS	U.S. Geological Survey
5	WAC	Washington Administrative Code
6	WHR	Washington Heritage Register
7	WISAARD	Washington Information System for Architectural and
8		Archaeological Records Data
9	WSDOT	Washington State Department of Transportation
10	YBP	years before present

1. Introduction

The Washington State Department of Transportation (WSDOT) is proposing to build a casting basin facility in the Grays Harbor area to manufacture large concrete floating bridge pontoons. As described in the Pontoon Construction Project Cultural Resources Discipline Report, these pontoons would be built to replace the floating portion of the Evergreen Point Bridge in the event of a catastrophic failure or to support the planned replacement of the bridge. Since the pontoon construction facility would necessarily remove designated wetlands, a mitigation site was proposed by WSDOT to compensate for the loss of wetlands at the pontoon casting location. The Grass Creek Wetland Mitigation Site (Grass Creek property) would be modified from its current use as a pasture to allow ingress of natural tidal flow from Grass Creek. The property would be modified by mechanically expanding existing natural drainages and removing sections of an earthen berm that bound the property on the east.

This technical addendum to the Pontoon Construction Project Cultural Resources Discipline Report assesses the effects of this wetland mitigation on cultural resources at the Grass Creek property.

Grass Creek Wetland Mitigation Site

The approximately 65-acre Grass Creek property is located on the west bank of Grass Creek in Gray Gables near Hoquiam, Washington (Exhibits 1-1 and 1-2). This generally flat property is currently owned by Mr. David G. Anderson and is zoned as unimproved land. The property is bounded by Grass Creek on the northeast, east, and south, and by State Route (SR) 109 on the west. An earthen berm borders the property at the Grass Creek margin. The Grass Creek property has no standing structures on it except for the earthen berm and several fences that were used to partition pasture areas. Exhibits 1-3 through 1-6 are photos of the property. The property has is largely open grass land, but several large trees are present in the central western portion of the property (near the highway) and a few isolated trees and shrubs are located along the berm at the eastern boundary. A drainage channel has been constructed on the south and west edge (pasture side) of the berm.

WSDOT would purchase all 64.87 acres of this property for the project. The wetland mitigation modifications would be concentrated along five natural drainages at the eastern portion of the property and along two segments of the berm.

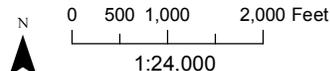


 Area of Potential Effects

Source: USGS (1994) New London, Hoquiam, Westport, and Copalis Crossing Quadrangle Maps. Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for layers is NAVD88.

Exhibit 1-1. USGS Quadrangle Map: Grass Creek Property Area of Potential Effects

Pontoon Construction Project





 Area of Potential Effects

Source: WSDOT (2006) Aerial Photograph.
 Horizontal datum for all layers is State Plane
 Washington South NAD 83; vertical datum for layers
 is NAVD88.

**Exhibit 1-2. Grass Creek Property
 Area of Potential Effects**

Pontoon Construction Project





**Exhibit 1-3. Central and Southern Portion of the
Grass Creek Property, View to the South**

Pontoon Construction Project





**Exhibit 1-4. Southeast Portion of the Grass
Creek Property, View to the Southeast**

Pontoon Construction Project





**Exhibit 1-5. Southern Drainage Area,
View to the East-Southeast**

Pontoon Construction Project





**Exhibit 1-6. Earthen Berm along
Grass Creek: Outer Margin at Low Tide,
View to the East**

Pontoon Construction Project



1 **Project Background**

2 **Personnel**

3 Thomas P. Barrett, Ph.D., is the Principal Investigator for this project. The
4 primary authors of this technical addendum include Thomas Barrett,
5 Christopher Hetzel, J. Tait Elder, and Meredith Mullaley. Appendix A lists
6 the duties and qualifications of project personnel.

7 **Location**

8 The proposed Grass Creek property is located within the northwest quarter
9 of Section 36, Township 18 North, Range 11 West, Willamette Meridian,
10 in Grays Harbor County, Washington, and is identified as Grays Harbor
11 County Assessor parcel number 181136220020 (Exhibit 1-1).

12 The property is located within the shorelines and/or associated wetlands of
13 Grass Creek. Portions of the Grass Creek property within the Ordinary
14 High Water Mark of Grays Harbor are designated as a Shoreline of
15 Statewide Significance under Revised Code of Washington (RCW)
16 90.58.030(2)(e)(i) since they are part of the Grays Harbor Estuary.
17 Furthermore, Grass Creek is located within Planning Area V, Management
18 Unit 10 of the Grays Harbor Estuary Management Plan.

19 **Area of Potential Effects**

20 For archaeological resources, traditional cultural properties (TCPs), and
21 historic resources, an Area of Potential Effects (APE) was established for
22 the entire Pontoon Construction Project (see Cultural Resources Discipline
23 Report), including the acreage being considered for wetland mitigation at
24 the Grass Creek property. The Grass Creek property portion of the project
25 APE consists of vertical and horizontal components. The vertical
26 component for the Grass Creek property includes the maximum proposed
27 below-ground excavation and/or grading for the proposed wetland
28 mitigation. The horizontal component for the Grass Creek property
29 includes the entire 65-acre parcel.

30 To develop the APE for the Pontoon Construction Project, WSDOT
31 consulted with the Washington State Department of Archaeology and
32 Historic Preservation (DAHP) and affected tribes (see Cultural Resources
33 Discipline Report, Project Background section of Chapter 1). In January
34 2010, WSDOT formally requested concurrence on revisions to the APE to
35 add the Grass Creek property to the Pontoon Construction Project APE,
36 and DAHP concurred with the revised APE on January 26, 2010.

37 Appendix B includes all WSDOT correspondence related to the Grass
38 Creek property.

1 **Regulatory Context**

2 Federal, state, and local regulations recognize the public’s interest in
3 cultural resources and the public benefit of preserving them. These laws
4 and regulations require analysts to consider how a project might affect
5 cultural resources and take steps to avoid or reduce potential damage to
6 them. A cultural resource can be considered as any property valued (be it
7 monetary, aesthetic, religious, or other value) by a group of people.
8 Valued properties can be historical in character or date to the prehistoric
9 past—the time prior to written records.

10 The Pontoon Construction Project involves federal funding and permits;
11 therefore, this project is required to satisfy requirements established under
12 National Environmental Policy Act (NEPA) (United States Code Title 42,
13 Chapters 4321 through 4347 [42 USC 4321-4347]) and Section 106 of the
14 National Historic Preservation Act of 1966 (NHPA), as amended (16 USC
15 470 et seq.). The NHPA is the primary mandate governing projects under
16 federal jurisdiction that might affect cultural resources. The purpose of this
17 technical addendum is to identify and evaluate cultural resources in the
18 Grass Creek portion of the project APE to fulfill the requirements of
19 NEPA and Section 106 of the NHPA and to assess the potential effects of
20 the wetland mitigation project on cultural resources.

21 **Federal Regulations**

22 **National Environmental Policy Act**

23 NEPA requires that all major actions sponsored, funded, permitted, or
24 approved by federal agencies (generally referred to as federal
25 undertakings) undergo planning to ensure that environmental
26 considerations, such as impacts on historical, cultural, and archaeological
27 resources, are given due weight in decision-making. The federal
28 implementing regulations for NEPA are in the Code of Federal
29 Regulations, Title 40 Part 1500 through 1508 (40 CFR 1500-1508;
30 Council on Environmental Quality [CEQ]), and for Federal Highway
31 Administration (FHWA) actions, 23 CFR 771. The CEQ regulations
32 include sections on urban quality, historic and cultural resources, and the
33 design of the built environment [Sec. 1502.16(g)].

34 **National Historic Preservation Act Section 106**

35 Section 106 of the NHPA requires federal agencies to consider the effects
36 of actions they fund or approve on any district, site, building, structure, or
37 object that is listed in or eligible for listing in the National Register of
38 Historic Places (NRHP), defined as “historic properties.” The regulations

1 implementing Section 106 are codified at 36 CFR 800. The Section 106
2 review process involves four steps:

- 3 1. Initiate the Section 106 process by establishing the undertaking,
4 developing a plan for public involvement, and identifying other
5 consulting parties.
- 6 2. Identify historic properties within an APE, and evaluate their eligibility
7 for inclusion in the NRHP.
- 8 3. Assess adverse effects by applying the criteria for adverse effect to
9 historic properties.
- 10 4. Resolve adverse effects by consulting with the State Historic
11 Preservation Officer (SHPO) and other consulting agencies, including
12 the Advisory Council on Historic Preservation (ACHP), if necessary,
13 to develop an agreement that addresses the treatment of historic
14 properties.

15 To determine whether an undertaking could affect historic properties,
16 cultural resources (including archaeological, historic, and ethnographic
17 properties) must be inventoried and evaluated for listing in the NRHP.

18 **State Regulations—State Environmental Policy** 19 **Act**

20 Washington’s State Environmental Policy Act (SEPA) requires that all
21 major actions sponsored, funded, permitted, or approved by state and/or
22 local agencies be planned so that environmental considerations—such as
23 impacts on historic and cultural resources—are considered when state
24 agency-enabled projects affect properties of historical, archaeological,
25 scientific, or cultural importance (Washington Administrative Code Title
26 197, Chapter 11, Section 960 [WAC 197-11-960]); these regulations
27 closely resemble NEPA. Similar to NEPA, SEPA considers cultural
28 resources to be properties listed in or eligible for the Washington Heritage
29 Register (WHR), which is the state equivalent of the NRHP and sets forth
30 similar criteria for evaluating cultural resources. The WHR, which is
31 administered by the DAHP, identifies and records significant historic and
32 prehistoric resources at the state level. Any NRHP-eligible property is
33 automatically eligible for the WHR.

2. Cultural Setting

The Grass Creek property is located on the Grays Harbor estuary in Grays Harbor County within the Chehalis River basin. The property is undeveloped land near where Grass Creek enters Grays Harbor. This location is about 2 miles (3.2 kilometers) southeast of where Chenois Creek flows into Grays Harbor, and approximately 7 miles (11.3 kilometers) northwest of Hoquiam.

For details on the regional prehistoric research, Grays Harbor research, and oral history studies in the general vicinity of the Grass Creek property, refer to Chapter 2 of the Pontoon Construction Project Cultural Resources Discipline Report (Discipline Report). In the sections below, only research particular to the Grass Creek property are presented.

Prehistoric Archaeological Resource Potential

[REDACTED]

[REDACTED]

[REDACTED]

5 **Depositional Context Considerations**

6 The potential presence of ancient sites depends on the survival of the
7 landforms on which any such sites were located. Depending on location,
8 estuarine settings can be dynamic due to hydrologic cycles of scour and
9 deposition. Changing sea levels, coseismic subsidence, tsunamis, storms,
10 and tidal currents can significantly affect topographic features, including
11 any cultural deposits; these events can erode the landform altogether.
12 Additional impacts might result from dredging, boat traffic, diking, and
13 foreshore development.

[REDACTED]

[REDACTED]

[REDACTED]

37 **Summary**

38 The prehistoric archaeological context for the Grass Creek property shares
39 a relationship with the larger Pacific Northwest coast; specifically, two

1 main types of sites are anticipated: village shell middens and/or fish trap
2 features. Either for cultural or environmental reasons, sites of these types
3 in the region do not appear to have a time depth greater than roughly 1,000
4 to 1,500 years before present (YBP). In some cases, erosion (or
5 subsidence) has occurred and sites from this or earlier periods might have
6 been scoured (or deeply buried), resulting in an underrepresentation in our
7 survey sample. On the other hand, this limited settlement pattern might
8 reflect a cultural change. In either case, archaeological investigations
9 conducted at the Grass Creek property would contribute information to
10 assist in answering these and other regional questions.

11 **History**

12 Please refer to Chapter 2 of the Discipline Report for details on the Euro-
13 American exploration, settlement, logging industry, laborers,
14 transportation, and physical development of the Grays Harbor region and
15 the climate, geology, flora, and fauna of the Grass Creek property.

16 **Settlement and Development**

17 According to early records, what we now call “Grass Creek” was
18 previously known as “Typso Creek.” This name was in use as early as
19 1858 and is referenced in the field notes of A.C. Smith, deputy surveyor
20 with the U.S. General Land Office (GLO), who led the crew that first
21 surveyed the area in 1858 (GLO 1858). Typso Creek is also referenced in
22 a June 30, 1861, report by Charles F. Winsor, Special Indian Agent of the
23 Washington Territory (U.S. Commission of Indian Affairs 1861), and an
24 1889 chart showing the fisheries in Grays Harbor and the Chehalis River
25 (U.S. Commission of Fish and Fisheries 1889). The origin and meaning of
26 the word “Typso” is unknown, but presumably relates to the name given to
27 the waterway by local inhabitants at the time. The name Typso Creek
28 appears to have fallen out of common usage sometime in the late
29 nineteenth century.

30 Prior to the arrival of Euro-American settlers, the Grass Creek area was
31 inhabited by numerous indigenous peoples. As described in Jay Miller’s
32 ethnographic study (see Appendix C), much is known about the Native
33 Americans who have long lived in the Grays Harbor region and along the
34 coast north of the harbor mouth. Miller noted several references to
35 occupation sites in the vicinity of Grass Creek, possibly at the creek mouth
36 or along its lower reaches. This occupation was also indicated by the 1861
37 report of Special Indian Agent of the Washington Territory, Charles
38 Winsor (U.S. Commission of Indian Affairs 1861). [REDACTED]

1 The James homestead presumably occupied an area east of Point New,
2 south of Grass Creek, and above the Brackenridge Bluff. James
3 constructed a log house, followed by a split cedar home, and started an
4 orchard of apple shoots grafted onto wild crabapple trees native to the
5 area. The family is said to have frequently travelled between the
6 homesteads in Mound Prairie and Grays Harbor, and the youngest son
7 Johnny James was later one of the first homesteaders of what eventually
8 became the city of Hoquiam. According to Van Syckle, by 1942 the
9 orchard and James Rock were the only remaining evidence of the James
10 homestead in the Grass Creek property (Van Syckle and Welsh 1942).

11 Jack Campbell, brother of Archibald Campbell who settled on what is now
12 Fry Creek between Aberdeen and Hoquiam, is the only other individual
13 known to have been an early homesteader in the vicinity of Grass Creek.
14 By 1900, however, nearly all of the land along Grass Creek was platted or
15 subdivided and owned by a variety of individuals or companies, although
16 no improvements are apparent at this time.

17 **Land Ownership**

18 Influenced by the establishment of the Northern Pacific Railroad line from
19 Hoquiam across Grass Creek to Pacific Shores between 1898 and 1905,
20 the ownership of land around Grass Creek would have been attractive to
21 those involved in Grays Harbor's thriving timber industry or seeking
22 speculative real estate opportunities.

23 The Grass Creek property likely appealed to anyone seeking a large open
24 area for grazing livestock. As early as 1858, A.C. Smith recorded the
25 absence of trees on the site as he sought to establish survey markers (GLO
26 1858). Large, open acreage, uncluttered by stumps, was a known
27 commodity in Grays Harbor proclaimed by boosters and sought by those
28 raising livestock, particularly among the region's dairy farmers (Fultz
29 1929).

30 The earliest Grays Harbor County tax records for the Grass Creek property
31 record the owner of the land as N.E. Holman. Holman owned five lots in
32 the vicinity of Grass Creek, including Lots 1 and 4, consisting of
33 approximately 93 acres, from 1908 to 1911. The land had a combined
34 value of between \$485 and \$605. The property was not cultivated and no
35 improvements were recorded. A side note in the tax records states that the
36 lots were previously "school land," but this is unconfirmed. The railroad
37 right-of-way was located adjacent to the site, and appears to be the only
38 established overland access at the time. The right-of-way for the first
39 county road was not recorded until the 1930s.

1 Fred E. Pape acquired Holman’s land between 1910 and 1912, including
2 Lots 1 and 4. The tax records indicate Pape had over 1,515 acres of land
3 under cultivation at that time, but no cultivation on the Grass Creek
4 property. Lots 1 and 4 were assessed with a combined value of \$1,345, and
5 the entire property was recorded as unimproved.

6 Ownership of Lots 1 and 4 passed from Fred E. Pape to Henry E. Pape,
7 who is believed to have been a relative, in 1918. The latter retained
8 ownership of the parcels through the 1940s. The land remained
9 unimproved until 1926, with the assessed value dropping from an initial
10 high of \$1,090 in 1918 to a low of \$930 in 1925. Lot 1 was valued as
11 unimproved timber land in these years, but that is the only apparent
12 difference from earlier valuations. Suddenly in 1926, however, the tax
13 records note improvements to nearly 60 acres of Lots 1 and 4 for use as
14 livestock pasture land and to 4 acres for cultivation. These improvements,
15 which are believed to include the drainage channel and earthen berm that
16 still exist on the property, resulted in a combined assessed value of \$1,800
17 from 1926 to 1929.

18 No tax information was recorded for the Grass Creek property between
19 1930 and 1937, presumably due to the Great Depression. The amount of
20 improved acreage remained the same during this time, but it was no longer
21 noted with a pastured or cultivated use. This absence of information
22 suggests that either such practices no longer occurred on the property or
23 they simply went unrecorded by tax officials.

24 In 1938, the tax records note the construction of a building on Lot 4,
25 recorded as building report number 2417. State Secondary Route 9c,
26 which is now SR 109, was constructed and first opened in 1938. The
27 further development of the Grass Creek area was likely influenced by the
28 improved access to the area provided by this highway and the county road
29 established before it.

30 Unfortunately, all county building permits for this area from the historic
31 period of interest were destroyed by fire. However, the recorded
32 construction is believed to be the complex of structures first visible in a
33 1942 aerial photograph of the property, produced by the U.S. Army Corps
34 of Engineers (USACE), in the far southwest corner of Lot 4 (USACE
35 Army Map Service 1942, 1944, 1950). The complex, which consisted of at
36 least two sizable buildings, a pier, and several outbuildings, was situated
37 on the creek immediately adjacent to the original highway bridge. Several
38 other similar building complexes were present further west on the creek,
39 on both the north and south shores. The exact function of these building

1 complexes is unknown, but they presumably were related to fishing and
2 oyster harvesting, similar to that of buildings along the creek today.

3 John Andrews acquired ownership of Lots 1 and 4 in the 1950s, along with
4 all of the land extending west to the ocean, consisting of Lots 1 and 2 of
5 Section 35. Andrews and his wife Alice retained ownership of the land
6 into the 1960s (Metsker 1952, 1962).

7 **Drainage Channel and Berm**

8 The only improvements that still exist on the Grass Creek property are the
9 drainage channel and the earthen berm, constructed in 1926, that bounds
10 the property along the creek on the south, east, and north. Available
11 evidence suggests the channel was excavated to provide drainage for the
12 Grass Creek property to make it suitable for use as pasture land. Poorly
13 drained pasture land is known to contribute to hoof disease and the
14 inadequate growth of grasses, and therefore is a necessary component of
15 caring for livestock. The practice of excavating a drainage channel around
16 the circumference of a parcel is a common method of improving pasture
17 land, especially in low-lying wetlands, that can be observed in other
18 agricultural districts in the Pacific Northwest and nationwide (Dahl and
19 Allord 1997).

20 At the Grass Creek property, the excavation of the drainage channel
21 resulted in the construction of the large berm that encircles much of the
22 property. Water outlets appear to have been established in two locations,
23 although only one remains. The one existing water outlet penetrates the
24 earthen berm at a point along the northeastern boundary of Lot 1. Still
25 functional, it consists of a square wood-frame water sluice that extends
26 through the earthen berm and outfalls to a short channel leading into the
27 creek. Water drains through the sluice out of the acreage encompassed by
28 the berm.

29 The sluice was constructed using dimensional lumber and bolts, and is in
30 disrepair. Just northeast of the sluice outlet, on the outer margin of the
31 berm, there is a concentration of vertically placed wood stakes and
32 dimensional lumber. The purpose of this concentration is not known, but it
33 could have served to redirect the creek flow to prevent blockage of the
34 sluice outlet. Two other alignments of vertically-placed rounded wood
35 stakes were identified within the drainage channel located inside the berm,
36 along the central-eastern portion of the property. These features may have
37 functioned to block the flow of debris through the drainage channel'.
38 However, their exact purpose is unknown.

1 A second outlet to the drainage channel is believed to have existed at the
2 southern boundary of the parcel, where there is now a breach in the berm.
3 The shadow of an apparent outlet channel is visible in the 1950 USACE
4 aerial photograph of the area (USACE Army Map Service 1950).

5 **Northern Pacific Railroad**

6 In 1898, the Northern Pacific Railroad line was extended to Hoquiam.
7 Known as the Grays Harbor Line and Ocosta Branch of the Tacoma
8 Division, construction of the line continued through Hoquiam toward the
9 Pacific Ocean. In 1905, the line terminated at Moclips, a small beach
10 resort on the Pacific coast (Davison 2005). The route of this line, the
11 remnants of which still exist, generally paralleled what is now the path of
12 State Route 109 (Metsker 1935; USACE Army Map Service 1942).

13 Three miles (4.8 kilometers) west of Hoquiam, the Northern Pacific
14 Railroad line stopped at a station in Grays Harbor City (Mile Marker 76).
15 Established in 1889, Grays Harbor City was a speculative development
16 fueled by the anticipated construction of the first railroad line into Grays
17 Harbor, extending from Centralia, Washington, as an outlet for the
18 Centralia coal mines. The line was to be constructed by the Oregon &
19 Washington Territory Railroad (O&WT), led by George Washington Hunt
20 of Walla Walla, Washington. The O&WT was partially backed by the
21 Northern Pacific Railroad, which was attempting to gain a foothold in the
22 region. Speculators quickly sold newly platted lots in Grays Harbor City, a
23 trestle was erected over the mud flats into the harbor, and the population of
24 Hoquiam increased nearly overnight. Plans and financing for the railroad
25 failed to materialize, however; the O&WT fell into receivership and
26 further development of the town faltered (Davison 2005; Curtiss 2006).

27 The Northern Pacific Railroad line continued west from Grays Harbor City
28 to Point New before it turned north toward Grass Creek. After crossing
29 over Grass Creek on a bridge that was placed west of the existing highway
30 bridge, the railroad continued north through the community of Gray
31 Gables (Mile Marker 76) and passed over the Chenois River. The line
32 turned north at what is now Powell Road, subsequently stopped in the
33 communities of Chenois Creek (Mile Marker 82), Burrows, Tulips,
34 Wilderness, Charman Spur, Copalis (Copalis Crossing), and others, before
35 terminating in Moclips (Curtiss 2006).

36 The extent of the railroad line from Hoquiam to Aloha was abandoned in
37 1982 (Curtiss 2006). The tracks were removed in 1985.

1 **State Route 109**

2 What is now SR 109 was originally established as a county road in the
3 1920s, and may have existed earlier as a local farm road. A 1929 booster
4 publication describes the highway as a paved hard surface for 4 miles (6.4
5 kilometers) west of Hoquiam. Beyond that it existed as a graveled
6 highway all the way to the Queets and Clearwater Rivers (Fultz 1929).

7 The highway was improved and became Secondary State Highway 9C
8 (SSH 9C) in 1937. It followed a slightly different route through the area
9 north of Grass Creek until 1947, when the existing route from Hoquiam to
10 the Quinault Indian Reservation was established. The highway ran from
11 Primary State Highway 9/US 101 in Hoquiam west to Ocean City and
12 north to the southern border of the Quinault Indian Reservation north of
13 Moclips. In 1964, SSH 9C was renumbered to State Route 109 (Bozanich
14 1999a, 1999b).

15 At Grass Creek, the original SSH 9C Highway Bridge was located west of
16 the existing bridge. The original bridge was abandoned when SSH 9C was
17 re-routed at Grass Creek in the mid 1950s. The highway segment adjacent
18 to the Grass Creek property was straightened and the existing highway
19 bridge constructed. This change caused the highway to cut through the
20 southwestern portion of the Grass Creek property. The remnants of the old
21 highway alignment pass in front of the existing building housing Lytle
22 Seafoods Oyster Shack, on the west side of SR 109, forming a portion of
23 the establishment's existing parking area. Remnants of the former highway
24 bridge are visible as sections of timber trestle that extend south from the
25 Oyster Shack parking area.

3. Methods

This chapter describes the research and field methods used to identify and evaluate cultural resources at the Grass Creek property.

Research Methods

Numerous repositories were queried for information on the history of the Grass Creek property, and individuals with specific knowledge of the area were contacted to develop a property-specific context. Comparative research was also conducted on previous archaeological studies within or near the Grass Creek property portion of the project APE, as well as on similar properties located in other parts of the state or region.

Literature Review

ICF Jones & Stokes conducted general and property-specific archival research to document the history of the Grass Creek property. Materials examined included the previous studies, as well as primary and secondary resources including maps and photographs. Research was conducted at the following locations:

- Grays Harbor County Tax Assessor's Office
- Washington DAHP Library
- Special Collections Division University of Washington Libraries
- Washington State Archives
- The WAGenWeb Project (<http://wagenweb.org/>)
- ICF Jones & Stokes cultural resources library

Additionally, ICF Jones & Stokes field personnel spoke with Justine James of the Quinault Indian Nation during the course of this investigation. Through these conversations we were able to acquire additional information retained by tribal elders and knowledgeable local individuals (J. James, personal communication).

Field Methods

Archaeological investigations were conducted February 4 through 12, 2010, and consisted of systematic shovel probe excavation throughout the proposed wetland mitigation area (five drainages and two berm segments). A historic resources survey was conducted on February 10, 2010.

1 **Archaeological Investigations**

2 **Field Survey and Shovel Probes**

3 ICF Jones & Stokes archaeologists conducted a cultural resources survey
4 of areas of potential ground disturbance within the Grass Creek portion of
5 the project APE using standard DAHP-accepted methods appropriate for
6 identifying and recording archaeological sites. The field survey included a
7 pedestrian reconnaissance across the Grass Creek property and shovel-
8 probe excavations to identify buried cultural materials and historic
9 features.

10 Shovel probes were excavated at 10- to 30-meter (32.8- to 98.4-foot)
11 intervals along the margins of the five drainages proposed for
12 modifications within the Grass Creek property, at 30-meter intervals along
13 the outer margin of the berm segments proposed for removal, and in other
14 areas of the property selected based on the judgment of the archaeologists.
15 The specific intervals were employed based on field conditions and in
16 consultation with WSDOT cultural resource specialists. Shovel probes
17 typically consisted of an excavation roughly the shape of a truncated cone,
18 45 to 50 centimeters in diameter at the surface and 40 to 45 centimeters
19 (15.7 to 17.7 inches) at the base. Shovel probes were excavated
20 stratigraphically to a depth of 100 centimeters (39.3 inches) below the
21 surface, unless dense sediments or obstructions (large cobbles, buried
22 stumps) prevented excavation to this depth. All shovel probes were
23 excavated by hand and sediments screened through 6-millimeter
24 (0.25-inch) mesh hardware cloth.

25 Once the excavation of each shovel probe was complete, the contents of
26 the shovel probe were recorded (e.g., sediment, cultural materials, and
27 other observations), the location was mapped using a Trimble GeoXM
28 global positioning system (GPS) unit, and the probe photographed. Upon
29 completion of shovel probe recording, the shovel probe was immediately
30 backfilled, and the sod cap was replaced.

31 Pedestrian reconnaissance was also conducted by field crews in between
32 shovel probe excavations, and by the principal investigator and crew chief
33 throughout the duration of the project. Potential features observed during
34 the pedestrian survey were photographed and described, and their
35 locations were recorded using a Trimble GeoXM GPS.

36 **Geotechnical Monitoring**

37 Subsequent to the archaeological investigations of the proposed areas of
38 ground disturbance within the Grass Creek property, seven geotechnical
39 monitoring wells were excavated. An archaeologist observed these well
40 installations and recorded information on the sediments exposed during

1 drilling. While the underlying purpose of this effort was to install a series
2 of water monitoring wells, the WSDOT drilling crew also took the
3 opportunity to collect sediment samples along the entire length of the well
4 hole for subsequent analysis.

5 All monitoring wells were excavated to a depth of 10 feet (3 meters), with
6 the exception of well 4, which was excavated to 9.5 feet (2.9 meters). At
7 all well locations that could be reached by a track-mounted drill (wells 2,
8 3, 4 5, 6, and 7), a continuous sample of sediment was collected in five
9 segments, using a 2-foot-long (.6 meter), 1.5-inch-internal-diameter (3.8
10 centimeters) soil probe. Upon the completion of 4 feet (1.2 meters) of
11 sampling, or two sample segments, a 4-inch (10.2-centimeter)-diameter
12 rotating auger was used to expand the existing soil probe hole to the depth
13 that the soil probe had already reached. At each well location, this pattern
14 of sediment sampling, followed by augering, occurred three times per well
15 location, once every 4 feet (1.2 meters) for the first 8 feet (2.4 meters), and
16 again for the last 2 feet (.6 meters), for a total depth of 10 feet (3 meters).

17 Well 1 could not be reached by a track-mounted drill and was therefore
18 hand-excavated using an auger. An auger bucket of excavated sediments
19 was collected at 2-foot (.6-meter) intervals. The rest of the sediment was
20 spread out on the surface around the well hole.

21 Once a monitoring well was excavated, a 1-inch (2.5-centimeter)-diameter
22 polyvinyl chloride pipe was placed in the hole and sand was poured
23 around it up to just below ground surface. A 4-inch (10.2-centimeter)-
24 diameter aluminum case was placed around the monitoring well at the
25 surface and cemented at the base.

26 All sediments from each sediment probe, and the collected materials from
27 the hand-excavated auger hole, were investigated for archaeological
28 materials, described for their sedimentary and geomorphological content,
29 and photographed by the archaeological monitor. In addition, samples
30 (sediments and organics) were taken if materials were deemed to be of
31 potential research interest.

32 **Historic Resources Survey**

33 The historic resources survey involved examining and photographing all
34 buildings and structures within the project APE determined to be 45 years
35 of age or older. Only one structure is known to exist in the Grass Creek
36 portion of the APE—a drainage system primarily consisting of a drainage
37 channel and earthen berm. ICF Jones & Stokes' senior architectural
38 historian, Christopher Hetzel, M.A., surveyed and evaluated the structure
39 to determine its eligibility for NRHP listing.

1 A historic resources field survey of the Grass Creek portion of the project
2 APE was conducted on February 10, 2010. The drainage system structure
3 was identified and information collected about its physical characteristics.
4 The data collected included photographs of the structure, the type and
5 materials of significant features, the existence of alterations, and overall
6 physical integrity.

7 The structure was evaluated to determine its eligibility for listing in the
8 NRHP and recorded in the Washington State Historic Property Inventory
9 Form Database, per DAHP and WSDOT reporting standards. A printed
10 record form for the structure is provided in Appendix D of this report. The
11 completed form and a disk containing the dataset exported from the
12 inventory form database will be transmitted to WSDOT.

1 4. Literature Review

2 Records and Archival Research

3 ICF Jones & Stokes conducted record and archive searches for the Grass
4 Creek property to determine if previously recorded archaeological,
5 ethnographic, or historical resources existed in or near the property and to
6 establish a context for assessing the significance of any resources that
7 might be found. National, state, and local inventories of archaeological
8 and historical resources were examined in order to identify significant
9 local historic events and personages, development patterns, data regarding
10 prehistoric populations, ethnography, historic buildings and structures, and
11 the environmental history of the Grass Creek property area.

12 ICF Jones & Stokes' archaeologist, J. Tait Elder, M.A., conducted record
13 searches at DAHP in Olympia, Washington, in January 2010 for the Grass
14 Creek property. The following inventories and sources were consulted:

- 15 • DAHP Archaeological Site and Survey electronic geographic
16 information system (GIS) database
- 17 • The NRHP
- 18 • National Register Information System (NRIS)
- 19 • Washington Information System for Architectural and Archaeological
20 Records Data (WISAARD)

21 Following DAHP standards, all previously recorded archaeological and
22 historic sites and surveys located within 1 mile (1.6 kilometers) of the
23 Grass Creek property were sought using DAHP's GIS database as well as
24 consulting the U.S. Geological Survey (USGS) quadrangles on file.
25 Relevant site and previous investigation report information was
26 photocopied and is currently on file at the Seattle office of ICF Jones &
27 Stokes.

28 Literature Review Results

29 No cultural resources surveys have been conducted and no archaeological
30 sites have been recorded within 1 mile (1.6 kilometers) of the Grass Creek
31 property.



EXHIBIT 4-1
Previously Recorded Archaeological Sites and Historic Resources within 3 Miles of the Grass Creek Property

Site/ NADB No.	Author and Date	Name and/or Title	Site Form Description	NRHP Evaluation
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

NADB National Archaeological Database
NRHP National Register of Historic Places

5. Results

This chapter presents the results of the archaeological investigations and historic resources survey conducted within the Grass Creek property.

Archaeological Investigations

Between February 4 and 12, 2010, Dr. Thomas Barrett, Kurt Perkins, J. Tait Elder, Danny Gilmour, Meredith Mullaley, Stephanie Simmons, Patrick Reed, Patrick Elliot, and Andrew Pinger of ICF Jones & Stokes conducted archaeological investigations of the proposed areas of potential ground disturbance at the Grass Creek property. The investigation included a pedestrian survey and 170 shovel probes. Shovel probes were placed in proposed areas of potential ground disturbance, while the pedestrian survey occurred throughout the Grass Creek property.

Pedestrian Survey

During the pedestrian survey, much of the surface of the Grass Creek property was obscured by vegetation. The vegetation consisted of sedges and grasses, with occasional western hemlock (*Tsuga heterophylla*), stands of Pacific crabapple (*Malus fusca*), sword fern (*Polystichum munitum*), and Oregon grape (*Mahonia aquifolium*) located around the eastern and southern margins of the property. A series of historic features were identified during the pedestrian survey (Exhibit 5-1).

A large earthen berm and an associated drainage channel along the inner margin were identified along the northern, eastern, and southern margins of the Grass Creek property. It was assumed that this berm was the result of the deposition of spoils associated with the excavation of the drainage channel, as the sediment matrix was found to be identical to that observed in the surrounding shovel probes. It is likely that this perimeter drainage channel was used to link all of the natural drainages within the property for the purpose of creating and maintaining pasture land for livestock.

Along the northeastern portion of the property, a square wooden water sluice was identified, through which water drains into and out of the area encompassed by the berm (Exhibits 5-2 and 5-3). The feature was constructed using dimensional lumber and bolts (Exhibit 5-4), and is in disrepair. Just northeast of the outlet on the outer margin of the berm, a concentration of wood stakes and dimensional lumber was identified (Exhibit 5-5). The purpose of this concentration could not be determined. Closer inspection of the cut wall along the outer margin of the berm near



- Brick feature
- + Wood flume
- Ditch
- x—x—x Fence
- Berm
- Area of Potential Effects



Source: WSDOT (2006) Aerial Photograph.
 Horizontal datum for all layers is State Plane
 Washington South NAD 83; vertical datum for layers
 is NAVD88.

Exhibit 5-1. Berm and Ditch Location

Pontoon Construction Project





Exhibit 5-2. View of Sluice at Northwest Outer Margin of Berm, View to the Northwest

Pontoon Construction Project



**Washington State
Department of Transportation**



**Exhibit 5-3. View of Sluce Located within
Berm Margin, View to the East**

Pontoon Construction Project



**Washington State
Department of Transportation**



Exhibit 5-4. Close-Up of Sluice Box Design
Pontoon Construction Project





**Exhibit 5-5. Close-up of Posts
and Cut Wood along Outer Bank of
Berm, View to the North-Northwest**

Pontoon Construction Project



**Washington State
Department of Transportation**

1 the water outlet revealed at least one buried surface, indicated by a black
2 layer of silt underlying mounded berm deposits (Exhibit 5-6).

3 Two alignments of milled lumber stakes were identified within the
4 drainage channel located inside the berm, along the central-eastern portion
5 of the Grass Creek property (Exhibit 5-7 and 5-8).

6 Throughout the property, linear fencepost alignments were identified (see
7 Exhibit 5-1). Many of the post alignments had barbed wire strung between
8 them, but gaps in the wire were present in each alignment.

9 In the southern portion of the property, inside the earthen berm and within
10 the drainage channel, was a concentration of approximately 20 common
11 bricks (Exhibits 5-9 and 5-10). Further survey and limited excavation of
12 this area revealed that these bricks were eroding out of the berm feature.
13 Although some of these bricks appeared to be laid flat, no mortar or other
14 architectural materials were identified in association with this context.
15 Further probing revealed that while some bricks were still contained
16 within the berm, these were grouped in a haphazard fashion, suggesting
17 that they represented a dumping event rather than the remains of an intact
18 feature.

19 While the identification of these bricks was at first suggestive of some
20 former structure, their lack of integrity or associated artifacts, combined
21 with the absence of any recorded structures observed on historical aerial
22 photographs of this area, would remove the likelihood of them being
23 associated with any historical features on the Grass Creek property. No
24 other cultural artifacts or features were found in association with this
25 material.

26 **Subsurface Investigations**

27 A total of 170 shovel probes was excavated in the Grass Creek property
28 (Exhibit 5-11). No intact cultural materials or archaeological features were
29 identified during the course of the shovel probe survey

[REDACTED]

38 The most common sediment profile observed in shovel probes within the
39 area contained by the berm consisted of a shallow layer of brown silt,

40



**Exhibit 5-6. View of Buried Surface
Observed in Cut Wall along Outer Margin of
Berm, View to the West-Northwest**

Pontoon Construction Project





**Exhibit 5-7. Vertical Stake Alignment
in Stream along Inner Margin of Berm,
View to the South**

Pontoon Construction Project





**Exhibit 5-8. Vertical Stake Alignment in Stream
along Inner Margin of Berm, View to the North**
Pontoon Construction Project





**Exhibit 5-9. Overview of Brick Concentration
Located along Southern Berm Channel
Wall, View to the Southwest**

Pontoon Construction Project

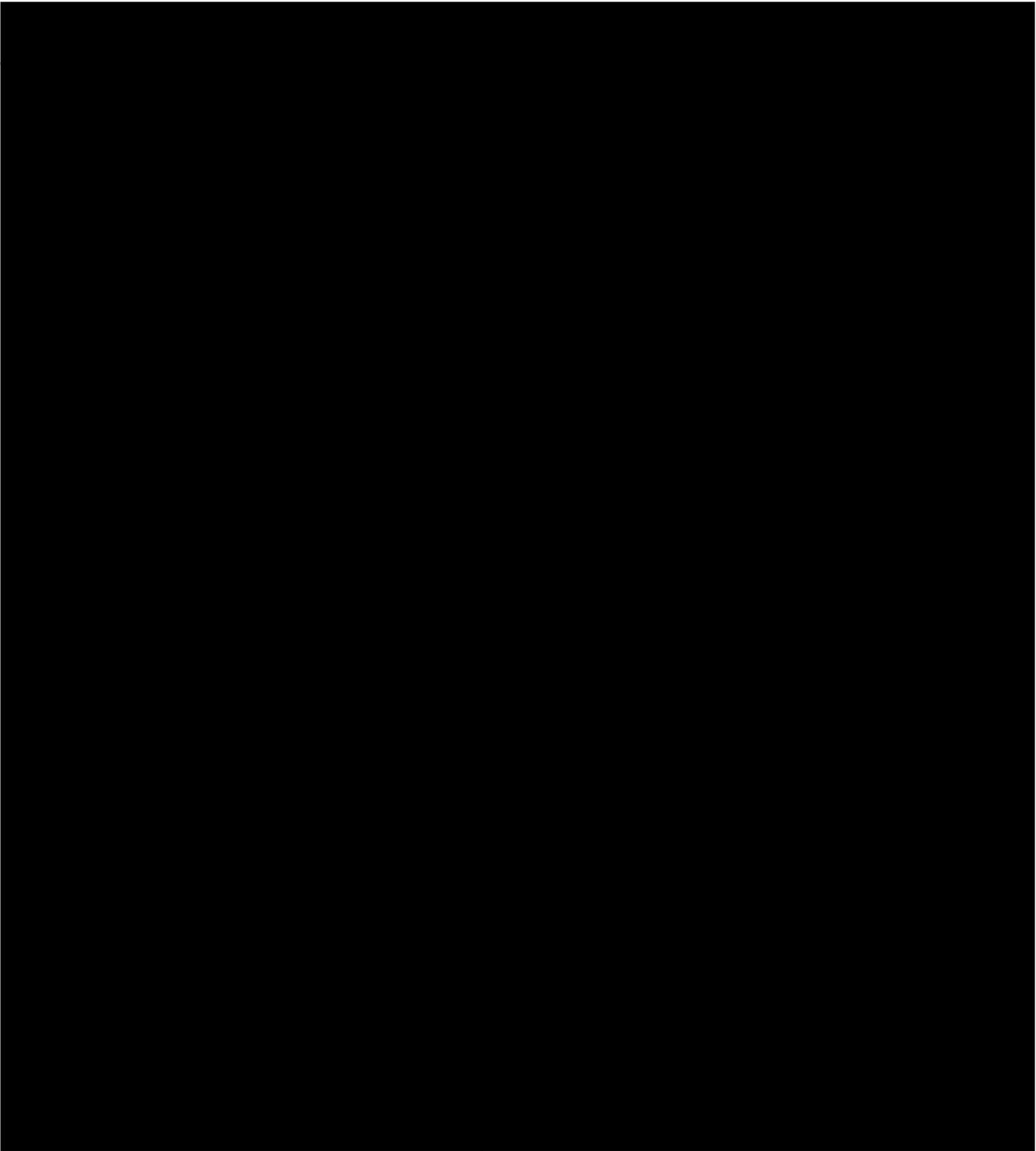




**Exhibit 5-10. Close-Up of Brick
Concentration Located in Cut Wall**

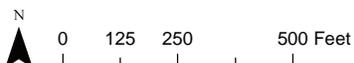
Pontoon Construction Project





Shovel Probe

- ◆ Positive
- Negative
- ▭ Area of Potential Effects



Source: WSDOT (2006) Aerial Photograph.
Horizontal datum for all layers is State Plane
Washington South NAD 83; vertical datum for layers
is NAVD88.

**Exhibit 5-11. Shovel Probe
Locations**

Pontoon Construction Project



1 grading to mottled brown clayey silt, grading into mottled grey silty clay
2 with iron oxide mottles. This profile strongly suggests a low-energy
3 alluvial deposition context with surface soil development affected by a
4 changing water table elevation. In some shovel probes, sediments further
5 graded into dark bluish grey silty clay, suggesting permanent inundation
6 (e.g., hydric soils). Between 60 centimeters (23.6 inches) and 90
7 centimeters (35.4 inches) below surface, a thin black band of organic silt
8 was encountered in many shovel probes (Exhibit 5-12). This band of silt
9 was interpreted to be a buried surface. Since the surface was very thin,
10 lacked accumulated organic matter normally associated with “O” and “A”
11 horizons in forest and high marsh environments, and lacked roots, it is
12 likely that this band of organic sediment represented a stable low marsh or
13 mudflat surface.

14 In the southern portion of the Grass Creek property and around the outer
15 margin of the berm, sediment profiles consisted of a thin layer of mixed
16 brown and grey silt to silty clay, which quickly graded into dark bluish
17 grey to black silt (Exhibit 5-13). No further stratigraphic differences were
18 observed once these sediments were encountered.

19 While excavating shovel probes within the central and southern areas
20 contained by the berm, the water table was often encountered just below
21 the surface (Exhibit 5-14). However, in the northernmost sections of the
22 property, the water table was rarely encountered regardless of the tides.

23 Full descriptions of the shovel probe excavation profiles can be found in
24 Appendix E.

25 **Geotechnical Monitoring**

26 Following the shovel probe survey of the Grass Creek property, an
27 archaeological monitor observed and recorded the sediments exposed
28 during the excavation of seven geotechnical well locations between March
29 22 and 24, 2010 (Exhibit 5-15).

30 No archaeological materials were encountered during the excavation of
31 monitoring wells. Throughout the Grass Creek property, sediments
32 uniformly consisted of massive silts and clayey silts, with rare instances of
33 fine laminae and traces of fine sand. Sediments were alluvial in origin, and
34 graded from a brown to greyish brown “A” horizon at the surface, to a
35 partially inundated mottled grey or greyish brown “B” horizon, followed
36 by grey to dark grey sterile silt. At depth, all well locations exhibited dark
37 bluish grey or dark greenish grey silt, suggesting permanently inundated
38 hydric sediments.

39



Exhibit 5-12. View of Buried Surface Identified in Shovel Probe #101 in Northern Portion of the Grass Creek Property

Pontoon Construction Project





**Exhibit 5-13. Overview of Shovel
Probe #125 on Southern Outer Margin
of Berm, with Dark Hydric Sediments**

Pontoon Construction Project





**Exhibit 5-14. Overview of Shovel Probe
Inundated with Water**

Pontoon Construction Project



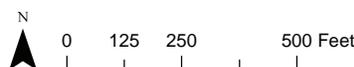


-  Groundwater monitoring well
-  Area of Potential Effects

Source: WSDOT (2006) Aerial Photograph.
 Horizontal datum for all layers is State Plane
 Washington South NAD 83; vertical datum for layers
 is NAVD88.

Exhibit 5-15. Grass Creek Groundwater Well Layout

Pontoon Construction Project



1 Analysis of sediments from all well locations revealed multiple buried
2 surfaces, indicated by a band of black, organic-rich silt (see Exhibits 5-6
3 and 5-12), with sharp contacts at the upper and lower interfaces. The
4 archaeologist postulated that these buried surfaces are related to periodic
5 coseismic subsidence events that occur along the Washington and Oregon
6 coast. In order to cross-verify this hypothesis, as well as add to the
7 regional coastal subsidence record, organic sediment samples were
8 collected from each buried surface found within well 7 for possible
9 analysis. In total, four surfaces were identified, at 3 feet (.91 meters), 5.5
10 feet (1.7 meters), 7.5 (2.3 meters), and 10 feet (3 meters) below surface,
11 and a sample was collected from each surface for possible radiocarbon
12 dating. All other well locations had at least two buried surfaces, located at
13 the same approximate depths listed above.

14 **Historic Resources Survey**

15 The reconnaissance-level historic resources survey of the Grass Creek
16 property identified one resource, consisting of a drainage system formed
17 by the existing drainage channel and earthen berm. Based on Grays Harbor
18 County Tax Assessor data, the existing drainage channel and berm were
19 constructed in 1926. A DAHP historic property inventory report was
20 completed and is included in Appendix D. No other historic resources
21 were identified in the Grass Creek portion of the project APE.

22 **Results of Work Conducted by Others**

23 An ethnographic study of the area surrounding the Grass Creek property
24 was conducted by Dr. Jay Miller for WSDOT. The full report is presented
25 in the Appendix C of this document.

6. Analysis

This chapter presents an analysis of the results presented in Chapter 5, specific to the stratigraphy identified in the archaeological probes and the geotechnical monitoring at the Grass Creek property.

Environmental Analysis

Archaeological and geotechnical excavations at the Grass Creek property indicate the presence of deep deposits of low-energy alluvium across the property. Geotechnical excavations revealed four previous periods of surface stability, indicated by black organic-rich sediments, to a depth of 10 feet (3 meters) below the modern surface (10 feet was the maximum depth of excavation). The absence of roots and an “O” horizon indicate that these surfaces were not forest floors or high marshes, but rather low marshes or mudflats. These periods of surface stability are abruptly interrupted by periods of sedimentation, which occurs at a rate that prevents the colonization of plants. Given the abrupt contact between the organic rich sediment, and the overlying alluvium, it is likely that the periodic sedimentation events are a result of coseismic subsidence, a process that would cause an abrupt drop in surface elevation relative to sea level. Since the Grass Creek property is just above sea level, the newly inundated surface would be subjected to almost constant sedimentation until the combined forces of inter-seismic strain and sedimentation raised the ground surface above sea level. However, the common indicator of coseismic subsidence and a resulting tsunami—a band of coarse sediment with sharp contacts on either interface—was not identified above any of the buried surfaces.

Radiocarbon analysis of these organic sediment samples could potentially determine whether the buried surfaces are a result of coseismic subsidence or simply the result of channel migration and erosion further upstream; however, such analyses are beyond the scope of this project. In addition, micromorphological analysis could be used to reveal laminations of coarser sediment or erosional contacts that may be imperceptible to visual inspection.

Over the last 100 years, anthropogenic land alteration has occurred at the site, and the natural tidal action of Grass Creek was abated by the construction of the earthen berm, which ameliorated the natural flooding of the property. A breach in this berm in 2006 has since allowed some natural flooding to re-occur on the site. Nevertheless, the sedimentary

1 evidence from all excavations on the Grass Creek property indicates that a
2 low-energy, tidally influenced alluvial environment has existed at this
3 location for centuries.

4 **Survey and Shovel Probe Analysis**

5 In keeping with the environmental analysis described above, all excavated
6 shovel probes supported the evidence for a low-energy alluvial
7 environment on the Grass Creek property. As this environment was not
8 conducive to settlement or continuous human occupation, it was perhaps
9 not surprising that no pre-contact archaeological artifacts or features were
10 identified at the Grass Creek property [REDACTED]

[REDACTED]

7. NRHP Eligibility Assessment

The NRHP recognizes properties that are significant at the national, state, and local levels. According to the NRHP, the quality of *significance* in American history, architecture, archaeology, engineering, and culture exists in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association; that meet one or more of the four criteria listed below; and that retain physical integrity. In addition, unless a property possesses exceptional significance, it must also have attained an age of at least 50 years old to be considered eligible for NRHP listing. A building or site can be considered for inclusion in the NRHP if it meets at least one of the following four criteria:

- A. The property is associated with events that have made a significant contribution to the broad patterns of our history.
- B. The property is associated with the lives of persons significant in our past.
- C. The property embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components might lack individual distinction.
- D. The property has yielded, or might be likely to yield, information important in prehistory or history.

The NRHP specifies seven additional criteria—Considerations A through G—that provide special requirements for determining the eligibility of special property types. Ordinarily, the following are not considered eligible for the NRHP, unless they satisfy certain conditions:

- A. Properties owned by religious institutions or used for religious purposes
- B. Structures that have been moved from their original locations
- C. Birthplaces or graves of historical figures
- D. Cemeteries
- E. Reconstructed historic buildings

1 F. Properties primarily commemorative in nature

2 G. Properties that have achieved significance within the past 50 years

3 Historic districts must meet the same criteria as individually eligible
4 properties. Historic districts are defined as those areas that contain a
5 significant concentration, linkage, or continuity of sites, buildings,
6 structures, or objects that form a unified entity, historically or
7 aesthetically, by plan or physical development. The interrelationships of
8 the resources that contribute to a historic district form the basis of a
9 district's historical significance.

10 For both individually eligible properties and historic districts, evaluating
11 the integrity according to the NRHP is grounded in an understanding of a
12 property's or district's physical features and how these features relate to its
13 historical significance. By retaining key, character-defining features, the
14 significance of a resource is conveyed. The NRHP recognizes seven
15 aspects or qualities that, in various combinations, define the integrity of a
16 property. Integrity refers to a property's ability to convey its significance.
17 In other words, a historic property must have enough intact physical
18 characteristics or features to communicate its significance under one or
19 more of the four NRHP criteria. NRHP guidelines recognize seven
20 aspects, or qualities, that define integrity. The Secretary of the Interior
21 defines these aspects as follows:

- 22 • Location: Involves the site location where the resource was originally
23 constructed
- 24 • Design: the form, plan, and style of a property
- 25 • Setting: the physical surroundings of a property
- 26 • Materials: the physical components used in the property's construction
- 27 • Workmanship: the evidence of the craftsmanship or ability of a culture
- 28 • Feeling: the property's ability to express a sense of time
- 29 • Association: the "direct link" evident between the property and an
30 important event or person

31 Historic-era properties might be found eligible for the NRHP under any of
32 the four criteria listed previously (A through D), but pre-contact
33 archaeological sites are usually evaluated solely in terms of Criterion D.
34 To provide an analytical framework in which a property's significance can
35 be evaluated for information value, a context—a broad pattern of historical
36 development—must be developed that includes topical research questions

1 and addresses issues regarding the site’s integrity and the potential of
2 subsurface deposits to exist. A site eligible under Criterion D must have
3 the potential to yield the following:

4 *Important information about some aspect of prehistory or*
5 *history, including events, processes, institutions, design,*
6 *construction, settlement, migration, ideals, beliefs,*
7 *lifeways, and other facets of the development or*
8 *maintenance of cultural systems... Any consideration of a*
9 *property’s eligibility under Criterion D must address (1)*
10 *whether the property has information to contribute to our*
11 *understanding of history or prehistory and (2) whether*
12 *that information is important. (National Park Service*
13 *1982:28)*

14 Archaeological sites with assemblages that include numerous tools,
15 features, ground stone, and living structures are most likely to address
16 numerous research issues, but other attributes of a site might also be
17 considered. All sites have been affected by post-use processes, the severity
18 of which is often greatest on the oldest sites. However, if the site retains
19 enough integrity that its relative age and some indication of the kinds of
20 activities that occurred at the site can be ascertained, then the site is
21 generally considered to have adequate integrity to be evaluated further in
22 terms of the kinds of data it can provide that would be useful in addressing
23 one or more relevant research questions.

24 **Archaeological Resources Evaluations**

25 No archaeological resources were identified at the Grass Creek property.

26 **Historic Resources Evaluations**

27 The historic resources survey of the Grass Creek property identified one
28 resource in the project APE. The existing drainage channel and earthen
29 berm is the only improvement that still exists on the Grass Creek property.
30 Constructed in 1926, the channel and berm parallel each other, bounding
31 the property along the creek on the south, east, and north. Available
32 evidence suggests the channel was excavated to provide drainage for the
33 Grass Creek property to make it suitable for use as pasture land. Because
34 of their earthen construction, the drainage channel and berm have eroded
35 and the southern portion of the berm has been breached. Otherwise, the
36 feature contains relatively good integrity and continues to function as a
37 basic drainage system for the Grass Creek property.

1 The drainage channel and earthen berm are not considered eligible for
2 listing in the NRHP. The reconnaissance-level survey revealed no
3 evidence to suggest that the structures are eligible under NRHP Criteria A
4 or B. The property is not known to be associated with events that have
5 made a significant contribution to the broad patterns of history, nor with
6 the lives of persons significant in our past. None of the recorded property
7 owners were found to figure prominently in local or state history and the
8 property is not recognized as innovative or important in agricultural
9 history. Under NRHP Criterion C, the structure exhibits a simple design of
10 earthen construction. It is a structure with features that are common to
11 agricultural practices in the Pacific Northwest, and many examples of this
12 type of structure exist in the region. The structure does not appear to
13 embody characteristics or a method of construction that would warrant
14 special recognition. Furthermore, there is no evidence to suggest that it is
15 associated with a significant designer, engineer, or craftsman. The
16 structure is not considered to have the data potential to reveal important
17 information about its construction, agricultural practices, or the history of
18 the area. Therefore, it is not considered significant pursuant to Criterion D.

1 8. Effects Analysis

2 Under Section 106 of the NHPA, an adverse effect is found when an
3 undertaking alters, directly or indirectly, any characteristic of a historic
4 property (architectural, historical, or archaeological) that qualifies the
5 property for inclusion in the NRHP. All qualifying characteristics of a
6 historic property are considered, including those that might have been
7 identified subsequent to the original evaluation of the property's eligibility
8 for listing in the NRHP. Adverse effects might include reasonably
9 foreseeable effects caused by the undertaking that could occur later in
10 time, be farther removed in distance, or be cumulative.

11 Archaeology

12 Archaeological investigations identified no archaeological resources
13 within the Grass Creek property; therefore, there will be no direct, indirect,
14 or cumulative effects on historical or prehistoric archaeological resources
15 at Grass Creek. We recommend a finding of *No Historic Properties*
16 *Affected*.

17 Historic Resources

18 No NRHP-eligible historic resources were identified by the historic
19 resources survey of the Grass Creek property. Therefore, no direct,
20 indirect, or cumulative effects would be expected to result from the
21 implementation of the wetland mitigation project. We recommend a
22 finding of *No Historic Properties Affected*.

9. Conclusions and Recommendations

The cultural resource investigations completed for this technical addendum identified no historic properties in the Grass Creek portion of the APE for the Pontoon Construction Project.

Archaeological Resources

ICF Jones & Stokes excavated 170 archaeological shovel probes in the proposed Grass Creek wetland mitigation site. No archaeological sites were identified in the Grass Creek property.

Historic Resources

No NRHP-eligible historic resources were identified by the historic resources survey of the Grass Creek property. Therefore, no direct, indirect, or cumulative effects on historic resources would be expected to result from the development of the Grass Creek property as a wetland mitigation site.

10. References

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1 APPENDIX A

2 **Duties and Qualifications of Project**
3 **Personnel**

Name	Title	Qualifications	Responsibilities
Michelle Dewey	Section 106 Lead/Task Order Manager	MS	Section 106 coordination, project oversight, document review
Yonnel Gardes	Project Manager	MS	Project oversight, document review
Chris Hetzel	Cultural Resources Task lead/Principal Investigator	MA	Section 106 coordination, project oversight, document review, architectural historian
Erica Hall	Project Coordinator	BA	Safety Coordinator, graphics organization
Thomas Barrett	Principal Investigator	PhD	Fieldwork, fieldwork direction, report writing, prehistoric archaeology
Tait Elder	Co-Field Director	MA	Fieldwork, workplan, report writing, artifact analysis, archival research
Kurt Perkins	Co-Field Director	MA in progress	Fieldwork, fieldwork direction, report writing, lab supervisor, artifact analysis, archival research
Danny Gilmour	Crew Chief	MA in progress	Fieldwork, lab work
Patrick Reed	Crew Chief	BA	Fieldwork, data entry
Patrick Elliot	Crew	BA	Fieldwork
Meris Mullaley	Crew	MA in progress	Fieldwork, report writing, lab supervision, lab work, archival research
Stephanie Simmons	Lab Technician	MA in progress	Lab work
Andrew Pinger	Crew	BA	Fieldwork
Rori Perkins	Project Coordinator/GIS Specialist	BS	Project oversight, report writing, graphics

1 APPENDIX B

2 **Section 106-Related Correspondence**
3 **for Grass Creek Property**

ESO Mega Projects
401 Second Avenue S., Suite 300
Seattle, WA 98104
www.wsdot.wa.gov

January 19, 2010

Dr. Allyson Brooks
Washington State Historic Preservation Officer
Department of Archaeology and Historic Preservation
PO Box 48343
Olympia, WA 98504-8343

**Re: SR 520 Pontoon Construction Project
Log # 122107-37-FHWA
Grays Harbor and Pierce County, Washington**

Area of Potential Effects Revision – Concurrence Request

Dear Dr. Brooks:

Per provisions of 36CFR800.4(a)(1), the Washington State Department of Transportation, on behalf of the Federal Highway Administration (FHWA), is continuing Section 106 consultation on the SR 520 Pontoon Construction Project in Grays Harbor, Washington. With this letter and attached maps we are requesting concurrence with an Area of Potential Effects (APE) revision, one that expands the APE to include the newly identified wetland mitigation site on Grass Creek, just south of Gray Gables township along State Route 109 in Gray's Harbor County (see attached figure, Grass Creek APE). Previously we sent descriptions and maps of the APE that included: the two alternative pontoon construction sites in Aberdeen and Hoquiam, Grays Harbor County; a construction facility at the Port of Tacoma, Pierce County (Concrete Technology Corporation or CTC) that might be used to build pontoons for this project; and the preferred location of pontoon moorage in Grays Harbor. You provided concurrence with these portions of the project APE, mostly recently in October, 2009.

The Grass Creek site is approximately 65 acres and is located at the first major bend in the creek, on the east side of SR 109. Presently wetland development plans call for removing two sections of an existing dike that parallel the right bank of Grass Creek, opening the mouths of three former channels on the floodplain that have become filled with sediments as a consequence of dike construction, creation of mudflat at the mouth of a fourth channel, and some planting of native vegetation (see attached figure, Grass Creek – Conceptual Restoration Plan). Planned ground disturbance is relatively minor.

The APE is defined as the surface within tax-parcel boundary and the substrate to a depth of approximately 1 meter (3.3 feet), the maximum depth of planned ground disturbance and excavations (see attached figure, Conceptual Restoration Plan).

We are planning to conduct a surface pedestrian survey, record the dike and any other surface resource, and explore for subsurface archaeological resources by excavating shovel probes behind the dike segments to be removed, in the tideflat creation area, and along both banks of the channels where mouths will be re-opened. We also intend to examine substrate exposed in shovel probes for the presence of buried surfaces created by coseismic subsidence in the uppermost 1 meter (3.3 feet). We will inform your transportation archaeologists well in advance of performing the fieldwork, which is tentatively planned for early February.

Please notify us of your concurrence with the revised APE at your earliest convenience.

If you have any questions, please feel free to contact me, a WSDOT ESO Mega Projects Cultural Resources Specialist, at 206-464-1236 or juellk@wsdot.wa.gov.

Sincerely,



Kenneth E. Juell

Enclosures (2)

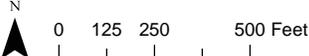
Cc: Randy Everett, FHWA
Allison Hanson, WSDOT
Rob Berman, WSDOT
Margaret Kucharski, WSDOT
Scott Williams, WSDOT Cultural Resources Program
Connie Walker Gray, WSDOT

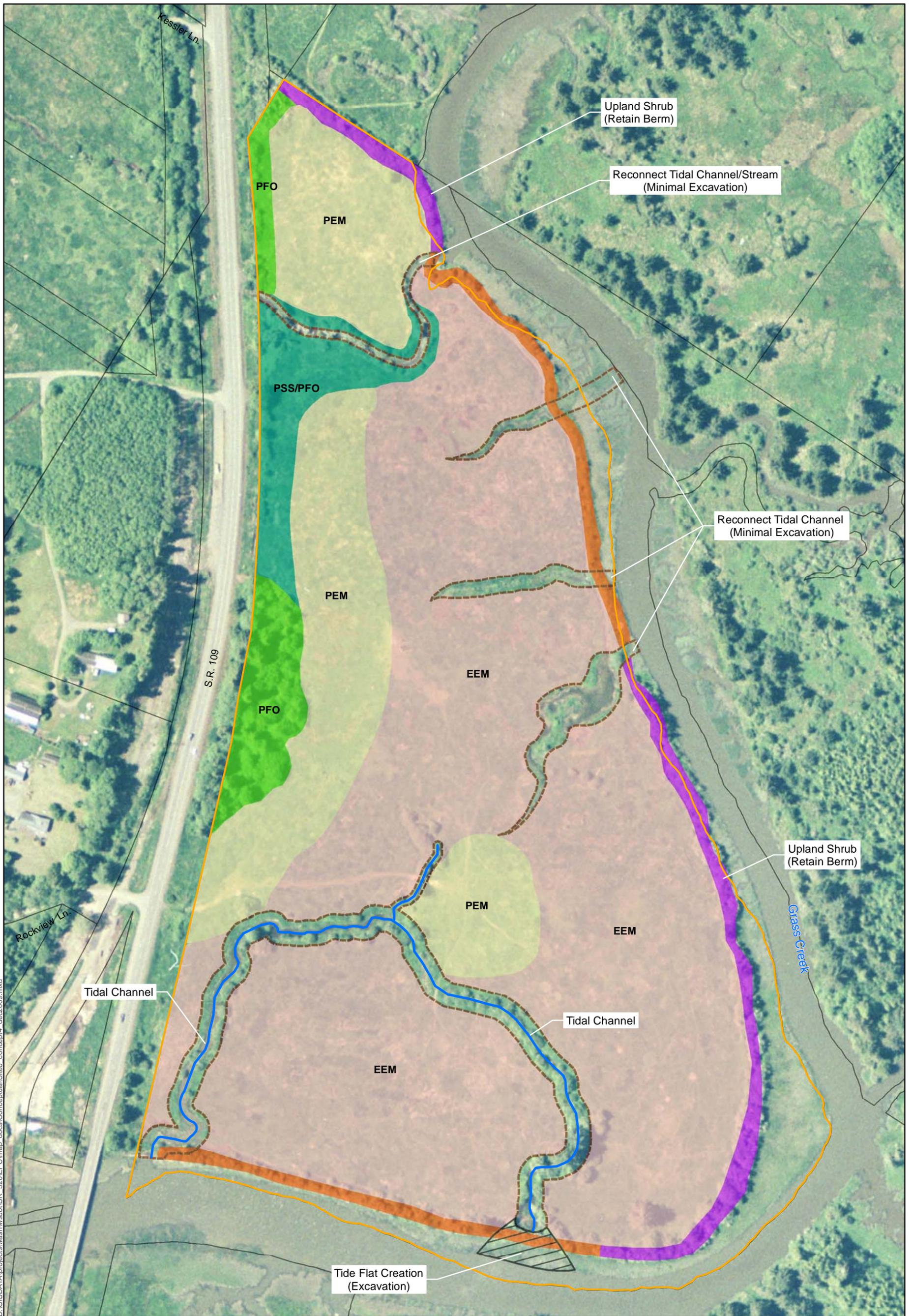


 Area of Potential Effects

**Area of Potential Effects for the
Grass Creek Potential Mitigation
Site**

Pontoon Construction Project



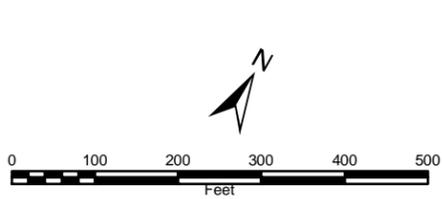


D:\GISDATA\projects\wash\sr520\epc\map_docs\ConceptualSite\concept14_dec2009.mxd

- Notes**
1. Inside berm perimeter channel will be filled.
 2. LWD materials will be installed within tidal channels to increase habitat quality.

Grass Creek - Conceptual Restoration Plan

DRAFT



Legend

- | | |
|--|---|
| Berm Removal | Upland Shrub |
| Estuarine Emergent Habitat (EEM) | Tidal Channel |
| Palustrine Emergent Habitat (PEM) | Tide Flat |
| Palustrine Forested Habitat (PFO) | Candidate Site |
| Palustrine Scrub-shrub/Forested Habitat (PSS/PFO) | Parcel |



**Washington State
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Paula J. Hammond, P.E.
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TTY: 1-800-833-6388
www.wsdot.wa.gov

LTR - 962

January 21, 2010

The Honorable David Burnett
The Confederated Tribes of the Chehalis Reservation
PO Box 536
Oakville, WA 98568

Re: SR 520 Pontoon Construction Project
Section 106 Update to Area of Potential Effects (APE)

Dear Chairperson Burnett:

Per provisions of 36CFR800, the Washington State Department of Transportation (WSDOT), on behalf of the Federal Highway Administration (FHWA), is continuing Section 106 consultation on the SR 520 Pontoon Construction Project in Grays Harbor, Washington.

The purpose of this submittal is to provide your office with an update to the Area of Potential Effects (APE). The APE has been expanded because WSDOT has identified a preferred wetland mitigation site for project impacts, known as the Grass Creek site, and has updated the APE to include this proposed site. The site is approximately 65 acres and is located along State Route 109 in Gray's Harbor County. We are planning to conduct subsurface investigations at this site to determine if archaeological resources are present. We will follow up with your cultural resources staff about the proposed timing of this work, and would very much appreciate visit(s) by Richard Bellon, Dr. Richard Daugherty, and Ruth Kirk during the field work, at their convenience. We are grateful for their time and knowledge of the area.

WSDOT is continuing to evaluate the use of two potential alternative sites in Grays Harbor County for development of a pontoon construction facility, and may also use an existing facility at Concrete Technology Corporation (CTC) in Tacoma for pontoon construction. The APE associated with those facilities remains unchanged.

Enclosed please find an additional map, which was reviewed and approved by WSDOT Cultural Resources Specialists Ken Juell and Connie Walker Gray, to accompany the APE package in your files.

The Tribe's response to this letter, commenting on our APE update, will be appreciated greatly, and we ask respectfully to receive comments from your environmental staff by February 14th.

If you have any questions, please feel free to contact Margaret Kucharski, WSDOT Environmental Lead, at 206-770-3540 or kucharm@wsdot.wa.gov, or Ken Juell at 206-464-1236 or juellk@wsdot.wa.gov.

Sincerely,

A handwritten signature in blue ink that reads "Julie Meredith". The signature is written in a cursive style with a large, prominent "J" and "M".

Julie Meredith, P.E.
Program Director
SR 520 Bridge Replacement and HOV Program

Enclosure

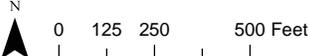
CC: Richard Bellon, Chehalis, w/enclosure
Dr. Richard Daugherty/Ruth Kirk, Chehalis, w/enclosure
Jack Kennedy, Corps, w/enclosure
Diane Lake, Corps, w/enclosure
Randy Everett, FHWA w/o enclosure
Margaret Kucharski, WSDOT, w/o enclosure
Phillip Narte, WSDOT, w/o enclosure
Ken Juell, WSDOT, w/o enclosure
Matthew Sterner, DAHP, w/o enclosure



 Area of Potential Effects

**Area of Potential Effects for the
Grass Creek Potential Mitigation
Site**

Pontoon Construction Project





**Washington State
Department of Transportation**
Paula J. Hammond, P.E.
Secretary of Transportation

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600 Stewart Street, Suite 520
Seattle, WA 98101-1209

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www.wsdot.wa.gov

LTR - 957

January 21, 2010

The Honorable Walter Ward
Hoh Indian Tribe
PO Box 2196
2464 Lower Hoh Rd.
Forks, WA 98331

Re: SR 520 Pontoon Construction Project
Section 106 Update to Area of Potential Effects (APE)

Dear Chairperson Ward:

Per provisions of 36CFR800, the Washington State Department of Transportation (WSDOT), on behalf of the Federal Highway Administration (FHWA), is continuing Section 106 consultation on the SR 520 Pontoon Construction Project in Grays Harbor, Washington.

The purpose of this submittal is to provide your office with an update to the Area of Potential Effects (APE). The APE has been expanded because WSDOT has identified a preferred wetland mitigation site for project impacts, known as the Grass Creek site, and has updated the APE to include this proposed site. The site is approximately 65 acres and is located along State Route 109 in Gray's Harbor County. We are planning to conduct subsurface investigations at this site to determine if archaeological resources are present. We will follow up with your cultural resources staff about the proposed timing of this work, and invite your staff to participate in field work visits, at their convenience.

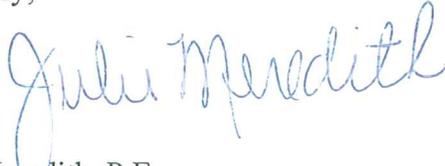
WSDOT is continuing to evaluate the use of two potential alternative sites in Grays Harbor County for development of a pontoon construction facility, and may also use an existing facility at Concrete Technology Corporation (CTC) in Tacoma for pontoon construction. The APE associated with those facilities remains unchanged.

Enclosed please find an additional map, which was reviewed and approved by WSDOT Cultural Resources Specialists Ken Juell and Connie Walker Gray, to accompany the APE package in your files.

The Tribe's response to this letter, commenting on our APE update, will be appreciated greatly, and we ask respectfully to receive comments from your environmental staff by February 14th.

If you have any questions, please feel free to contact Margaret Kucharski, WSDOT Environmental Lead, at 206-770-3540 or kucharm@wsdot.wa.gov, or Ken Juell at 206-464-1236 or juellk@wsdot.wa.gov.

Sincerely,

A handwritten signature in blue ink that reads "Julie Meredith". The signature is written in a cursive, flowing style.

Julie Meredith, P.E.
Program Director
SR 520 Bridge Replacement and HOV Program

Enclosure

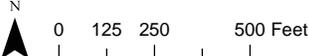
CC: Alexis Barry, Hoh Indian Nation, w/enclosure
Mary Leitka, Hoh Indian Nation, w/enclosure
Jack Kennedy, Corps, w/enclosure
Diane Lake, Corps, w/enclosure
Randy Everett, FHWA w/o enclosure
Margaret Kucharski, WSDOT, w/o enclosure
Phillip Narte, WSDOT, w/o enclosure
Ken Juell, WSDOT, w/o enclosure
Matthew Sterner, DAHP, w/o enclosure



 Area of Potential Effects

**Area of Potential Effects for the
Grass Creek Potential Mitigation
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Pontoon Construction Project





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LTR - 958

January 21, 2010

The Honorable Herman Dillon, Sr.
Puyallup Tribe
3009 Portland Ave
Tacoma, WA 98404

Re: SR 520 Pontoon Construction Project
Section 106 Update to Area of Potential Effects (APE)

Dear Chairperson Dillon:

Per provisions of 36CFR800, the Washington State Department of Transportation (WSDOT), on behalf of the Federal Highway Administration (FHWA), is continuing Section 106 consultation on the SR 520 Pontoon Construction Project in Grays Harbor, Washington.

The purpose of this submittal is to provide your office with an update to the Area of Potential Effects (APE). The APE has been expanded because WSDOT has identified a preferred wetland mitigation site for project impacts, known as the Grass Creek site, and has updated the APE to include this proposed site. The site is approximately 65 acres and is located along State Route 109 in Gray's Harbor County. We are planning to conduct subsurface investigations at this site to determine if archaeological resources are present.

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Sincerely,



Julie Meredith, P.E.
Program Director
SR 520 Bridge Replacement and HOV Program

Enclosure

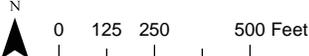
CC: Brandon Reynon, Puyallup Tribe, w/enclosure
Bill Sullivan, Puyallup Tribe, w/enclosure
Jack Kennedy, Corps, w/enclosure
Diane Lake, Corps, w/enclosure
Randy Everett, FHWA w/o enclosure
Margaret Kucharski, WSDOT, w/o enclosure
Phillip Narte, WSDOT, w/o enclosure
Ken Juell, WSDOT, w/o enclosure
Matthew Sterner, DAHP, w/o enclosure



 Area of Potential Effects

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Grass Creek Potential Mitigation
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**Washington State
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www.wsdot.wa.gov
LTR - 961

January 21, 2010

The Honorable Fawn Sharp
President
Quinault Indian Nation
PO Box 189
Taholah, WA 98587

Re: SR 520 Pontoon Construction Project
Section 106 Update to Area of Potential Effects (APE)

Dear President Sharp:

Per provisions of 36CFR800, the Washington State Department of Transportation (WSDOT), on behalf of the Federal Highway Administration (FHWA), is continuing Section 106 consultation on the SR 520 Pontoon Construction Project in Grays Harbor, Washington.

The purpose of this submittal is to provide your office with an update to the Area of Potential Effects (APE). The APE has been expanded because WSDOT has identified a preferred wetland mitigation site for project impacts, known as the Grass Creek site, and has updated the APE to include this proposed site. The site is approximately 65 acres and is located along State Route 109 in Gray's Harbor County. We are planning to conduct subsurface investigations at this site to determine if archaeological resources are present. We will follow up with your cultural resources staff about the proposed timing of this work, and would very much appreciate visit(s) by Justine James during the field work, at his convenience. We are grateful for his time and his knowledge of the area.

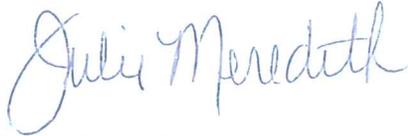
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Sincerely,



Julie Meredith, P.E.
Program Director
SR 520 Bridge Replacement and HOV Program

Enclosure

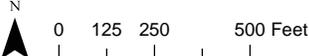
CC: David Bingaman, Quinault Indian Nation, w/enclosure
Justine James, Quinault Indian Nation, w/enclosure
Leilani Chubby, Quinault Indian Nation, w/enclosure
Jack Kennedy, Corps, w/enclosure
Diane Lake, Corps, w/enclosure
Randy Everett, FHWA w/o enclosure
Margaret Kucharski, WSDOT, w/o enclosure
Phillip Narte, WSDOT, w/o enclosure
Ken Juell, WSDOT, w/o enclosure
Matthew Sterner, DAHP, w/o enclosure



 Area of Potential Effects

**Area of Potential Effects for the
Grass Creek Potential Mitigation
Site**

Pontoon Construction Project





**Washington State
Department of Transportation**
Paula J. Hammond, P.E.
Secretary of Transportation

Urban Corridors
SR 520 Project
600 Stewart Street, Suite 520
Seattle, WA 98101-1209

206-770-3500
Fax 206-770-3569
TTY: 1-800-833-6388
www.wsdot.wa.gov

LTR - 959

January 21, 2010

The Honorable Charlene Nelson
Shoalwater Bay Tribe
PO Box 130
Tokeland, WA 98590

Re: SR 520 Pontoon Construction Project
Section 106 Update to Area of Potential Effects (APE)

Dear Chairperson Nelson:

Per provisions of 36CFR800, the Washington State Department of Transportation (WSDOT), on behalf of the Federal Highway Administration (FHWA), is continuing Section 106 consultation on the SR 520 Pontoon Construction Project in Grays Harbor, Washington.

The purpose of this submittal is to provide your office with an update to the Area of Potential Effects (APE). The APE has been expanded because WSDOT has identified a preferred wetland mitigation site for project impacts, known as the Grass Creek site, and has updated the APE to include this proposed site. The site is approximately 65 acres and is located along State Route 109 in Gray's Harbor County. We are planning to conduct subsurface investigations at this site to determine if archaeological resources are present. We will follow up with your cultural resources staff about the proposed timing of this work, and invite your staff to participate in field work visits, at their convenience.

WSDOT is continuing to evaluate the use of two potential alternative sites in Grays Harbor County for development of a pontoon construction facility, and may also use an existing facility at Concrete Technology Corporation (CTC) in Tacoma for pontoon construction. The APE associated with those facilities remains unchanged.

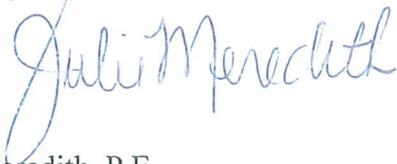
Enclosed please find an additional map, which was reviewed and approved by WSDOT Cultural Resources Specialists Ken Juell and Connie Walker Gray, to accompany the APE package in your files.

The Tribe's response to this letter, commenting on our APE update, will be appreciated greatly, and we ask respectfully to receive comments from your environmental staff by February 14th.

SR 520 Pontoon Construction Project
January 21, 2010
Page 2 of 2

If you have any questions, please feel free to contact Margaret Kucharski, WSDOT Environmental Lead, at 206-770-3540 or kucharm@wsdot.wa.gov, or Ken Juell at 206-464-1236 or juellk@wsdot.wa.gov.

Sincerely,



Julie Meredith, P.E.
Program Director
SR 520 Bridge Replacement and HOV Program

Enclosure

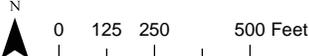
CC: Earl Davis, Shoalwater Tribe, w/enclosure
Jack Kennedy, Corps, w/enclosure
Diane Lake, Corps, w/enclosure
Randy Everett, FHWA w/o enclosure
Margaret Kucharski, WSDOT, w/o enclosure
Phillip Narte, WSDOT, w/o enclosure
Ken Juell, WSDOT, w/o enclosure
Matthew Sterner, DAHP, w/o enclosure



 Area of Potential Effects

**Area of Potential Effects for the
Grass Creek Potential Mitigation
Site**

Pontoon Construction Project





**Washington State
Department of Transportation**
Paula J. Hammond, P.E.
Secretary of Transportation

Urban Corridors
SR 520 Project
600 Stewart Street, Suite 520
Seattle, WA 98101-1209

206-770-3500
Fax 206-770-3569
TTY: 1-800-833-6388
www.wsdot.wa.gov

LTR - 960

January 21, 2010

The Honorable Charles Miller
Skokomish Tribe
North 80 Tribal Center Road
Skokomish, WA 98584

Re: SR 520 Pontoon Construction Project
Section 106 Update to Area of Potential Effects (APE)

Dear Chairperson Miller:

Per provisions of 36CFR800, the Washington State Department of Transportation (WSDOT), on behalf of the Federal Highway Administration (FHWA), is continuing Section 106 consultation on the SR 520 Pontoon Construction Project in Grays Harbor, Washington.

The purpose of this submittal is to provide your office with an update to the Area of Potential Effects (APE). The APE has been expanded because WSDOT has identified a preferred wetland mitigation site for project impacts, known as the Grass Creek site, and has updated the APE to include this proposed site. The site is approximately 65 acres and is located along State Route 109 in Gray's Harbor County. We are planning to conduct subsurface investigations at this site to determine if archaeological resources are present. We will follow up with your cultural resources staff about the proposed timing of this work, and invite your staff to participate in field work visits, at their convenience.

WSDOT is continuing to evaluate the use of two potential alternative sites in Grays Harbor County for development of a pontoon construction facility, and may also use an existing facility at Concrete Technology Corporation (CTC) in Tacoma for pontoon construction. The APE associated with those facilities remains unchanged.

Enclosed please find an additional map, which was reviewed and approved by WSDOT Cultural Resources Specialists Ken Juell and Connie Walker Gray, to accompany the APE package in your files.

The Tribe's response to this letter, commenting on our APE update, will be appreciated greatly, and we ask respectfully to receive comments from your environmental staff by February 14th.

If you have any questions, please feel free to contact Margaret Kucharski, WSDOT Environmental Lead, at 206-770-3540 or kucharm@wsdot.wa.gov, or Ken Juell at 206-464-1236 or juellk@wsdot.wa.gov.

Sincerely,

A handwritten signature in blue ink that reads "Julie Meredith". The signature is written in a cursive style with a large initial 'J'.

Julie Meredith, P.E.
Program Director
SR 520 Bridge Replacement and HOV Program

Enclosure

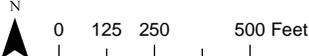
CC: Kris Miller, Skokomish Tribe, w/enclosure
Jack Kennedy, Corps, w/enclosure
Diane Lake, Corps, w/enclosure
Randy Everett, FHWA w/o enclosure
Margaret Kucharski, WSDOT, w/o enclosure
Phillip Narte, WSDOT, w/o enclosure
Ken Juell, WSDOT, w/o enclosure
Matthew Sterner, DAHP, w/o enclosure



 Area of Potential Effects

**Area of Potential Effects for the
Grass Creek Potential Mitigation
Site**

Pontoon Construction Project





STATE OF WASHINGTON

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501
Mailing address: PO Box 48343 • Olympia, Washington 98504-8343
(360) 586-3065 • Fax Number (360) 586-3067 • Website: www.dahp.wa.gov

January 26, 2010

Mr. Ken Juell
WSDOT ESO Mega Projects
401 Second Ave. South, Suite 300
Seattle, Washington 98104-3850

In future correspondence please refer to:
Log: 122107-37-FHWA
Property: SR 520, Pontoon Construction Project
Re: Archaeology - APE Concur

Dear Mr. Juell:

We have reviewed the materials forwarded to our office for the SR 520, Pontoon Construction project. Thank you for your description of the revised area of potential effect (APE) for the Grass Creek wetland mitigation site. We concur with the definition of the revised APE. We look forward to the results of your cultural resources survey efforts, your consultation with the concerned tribes, and receiving the survey report. 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) 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. Please also note that effective Nov. 2, 2009, DAHP requires that all cultural resource reports be submitted in PDF format on a labeled CD along with an unbound paper copy. 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,

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



1 APPENDIX C

2 **Ethnographic Study for the Grass**
3 **Creek Property**

REDACTED

1 APPENDIX D

2 **Historic Property Inventory Form**

**Historic Property
Inventory Report for**

at On State Route 109 in the Vicinity of Gray Gables, WA 98550

LOCATION SECTION

Field Site No.: GrassCreek

OAHP No.:

Historic Name:

Common Name: Drainage Channel and Earthen Berm

Property Address: On State Route 109 in the Vicinity of Gray Gables, WA 98550

Comments:

County Township/Range/EW Section 1/4 Sec 1/4 1/4 Sec Quadrangle
Grays Harbor T18R11W 36 NW COPALIS CROSSING

Coordinate Reference
 Zone: 10 Spatial Type: Point Acquisition Code: Other
 Sequence: 1 Easting: 423881.63 Northing: 5206211.89
 Sequence: 2 Easting: 424060.93 Northing: 5206264.64
 Sequence: 3 Easting: 424237.23 Northing: 5206343.92
 Sequence: 4 Easting: 424219.4 Northing: 5206493.17
 Sequence: 5 Easting: 424067.7 Northing: 5206640.61
 Sequence: 6 Easting: 423917.13 Northing: 5206749.78
 Sequence: 7 Easting: 423796.35 Northing: 5206860.42
 Sequence: 8 Easting: 423701.75 Northing: 5206885.81
 Sequence: 9 Easting: 423635.24 Northing: 5206930.21
 Sequence: 10 Easting: 423537.25 Northing: 5206936.49

Tax No./Parcel No.
181136220020

Plat/Block/Lot
LOTS 1 & 4 LY E OF RR R/W LS HWY

Supplemental Map(s)

Acreage
64.87

**Historic Property
Inventory Report for**

at On State Route 109 in the Vicinity of Gray Gables, WA 98550

IDENTIFICATION SECTION

Survey Name: Addendum-SR520 Pontoon Construction Project

Field Recorder: Hetzel, Christopher

Date Recorded: 3/31/2010

Owner's Name:
Anderson, David G.

Owner Address:
13817 SE 142nd Street

City/State/Zip:
Renton, WA 98059

Classification: Structure

Resource Status
Survey/Inventory

Comments
Not Eligible

Within a District? No

Contributing?

National Register Nomination:

Local District:

National Register District/Thematic Nomination Name:



View of Drainage Ditch (Center) and Earthen Berm (Left), taken 2/7/2010
Looking South

Photography Neg. No (Roll No./Frame No.): GrassCrk001.jpg

Comments:

DESCRIPTION SECTION

Historic Use: Agriculture/Subsistence - Agricultural Field

Current Use: Agriculture/Subsistence - Agricultural Field

Plan: Other

No. of Stories:

Structural System: Other

Changes to plan:

Changes to interior:

Style

Form/Type

Changes to original cladding:

Changes to other: Moderate

Agricultural

Changes to windows:

Other (specify): Erosion and breach

Cladding

Foundation

Roof Material

Roof Type

NARRATIVE SECTION

Date Of Construction: 1926

Study Unit

Other

Architect:

Architecture/Landscape Architecture

Builder:

Agriculture

Engineer:

Property appears to meet criteria for the National Register of Historic Places: No

Property is located in a potential historic district (National and/or local): No

Property potentially contributes to a historic district (National and/or local):

**Statement of
Significance**

The existing drainage system, consisting of a drainage channel and earthen berm, on Grays County Tax Assessor's Parcel Number 181136220020 was evaluated at a reconnaissance level in a cultural resources survey completed at the proposed Grass Creek Wetlands Mitigation site for the SR520 Pontoon Construction Project in the vicinity of Gray Gables, Grays Harbor County, Washington. The wetlands mitigation is to take place across two parcels that are located within a low-lying curve of Grass Creek, just before it terminates at the Pacific Ocean. These parcels are legally defined as Lot 1 (on the north) and Lot 4 (on the south) of Section 36 in Township 18 Range 11 West. Together they form the county parcel.

This Grass Creek site was first surveyed in 1858 by A. C. Smith, deputy surveyor with the U. S. General Land Office, who recorded the creek's name as "Typso Creek" and noted an absence of trees on the site as he sought to establish survey markers (GLO 1858). The earliest Grays Harbor County tax records for the property record the owner of the land as N. E. Holman. Holman owned five lots in the vicinity of Grass Creek, including Lots 1 and 4, consisting of approximately 93 acres, from 1908 to 1911. The land had a combined value of between \$485 and \$605. The property was not cultivated and no improvements were recorded. A side note in the tax records states that the lots were previously "school land," but this is unconfirmed. The railroad right of way was located adjacent to the site, and appears to have been the only established overland access at the time. The right of way for the first county road was not legally recorded until the 1930s.

Fred E. Pape acquired Holman's land between 1910 and 1912, including Lots 1 and 4. The tax records indicate Pape had over 1,515 acres of land under cultivation at that time, but no cultivation on the property. Lots 1 and 4 were assessed with a combined value of \$1,345, and the entire property was recorded as unimproved. Ownership of Lots 1 and 4 passed from Fred E. Pape to Henry E. Pape, who is believed to have been a relative, in 1918. The latter retained ownership of the parcels through the 1940s. The land remained unimproved until 1926, with the assessed value dropping from an initial high of \$1,090 in 1918 to a low of \$930 in 1925. Lot 1 was valued as unimproved timber land in these years, but that is the only apparent difference from earlier valuations. Suddenly in 1926, however, the tax records note improvements to nearly 60 acres of Lots 1 and 4 for use as livestock pasture land and four cultivated acres. These improvements, which are believed to include the drainage channel and earthen berm that still exist on the property, resulted in a combined assessed value of \$1,800 from 1926 to 1929.

No tax information was recorded for the property between 1930 and 1937, presumably due to the Great Depression. The amount of improved acreage remained the same during this time, but it was no longer noted with a pastured or cultivated use. This absence of information suggests that such practices no longer occurred on the property, or simply went unrecorded by tax officials. John Andrews acquired ownership of Lots 1 and 4 in the 1950s, along with all of the land extending west to the ocean, consisting of Lots 1 and 2 of Section 35. Andrews and his wife Alice retained ownership of the land through the 1960s (Metsker 1952, 1964).

The only improvements that still exists on the property are the drainage channel and earthen berm, constructed in 1926, that bounds the property along the creek on the south, east, and north. Available evidence suggests the channel was excavated to provide drainage for the Grass Creek site to make it suitable for use as pasture land. Poorly drained pasture land is known to contribute to hoof disease and the inadequate growth of grasses, and therefore is a necessary component of caring for livestock. The practice of excavating a drainage channel around the circumference of a parcel is a common method of improving pasture land, especially in low lying wetlands, that can be observed in other agricultural districts in the Pacific Northwest and nationwide (Dahl and Allord 1997).

At the Grass Creek site, the excavation of the drainage channel resulted in the construction of the large berm that encircles much of the property. Water outlets appear to have been established in two locations, although only one remains extant. The one existing water outlet punctuates the earthen berm at a point along the northeastern boundary of Lot 1. Still functional, it consists of a square wood frame water sluice that extends through the earthen berm and outfalls to a short channel leading into the creek. Water drains through the sluice out of the acreage encompassed by the berm.

The sluice was constructed using dimensional lumber and bolts, and is in disrepair. Just northeast of the sluice outlet, on the outer margin of the berm, there is a concentration of vertically placed stakes and dimensional lumber. The purpose of this concentration is not known, but it could have served to redirect the creek water flow to prevent blockage of the sluice outlet. Two other alignments of vertically-placed rounded stakes were identified within the drainage channel located inside the berm, along the central-eastern portion of the property. These features may have functioned to block the flow of debris through the drainage channel. However, their exact purpose is unknown.

A second outlet to the drainage channel is believed to have existed at the southern boundary of the parcel, where there is now a breach in the berm. The shadow of an apparent outlet channel is visible in the 1950 USACE aerial photograph of the area (USACE 1950).

The drainage channel and earthen berm have been evaluated according to the eligibility criteria for listing in the National Register of Historic Places (NRHP). The reconnaissance-

**Historic Property
Inventory Report for**

at On State Route 109 in the Vicinity of Gray Gables, WA 98550

level survey revealed no evidence to suggest that the structures are eligible under NRHP Criteria A or B. The structures are not known to be associated with events that have made a significant contribution to the broad patterns of history, nor with the lives of persons significant in our past. None of the recorded property owners were found to figure prominently in local or state history. Under NRHP Criterion C, the structures exhibits a simple design and do not appear to embody characteristics or a method of construction that would warrant special recognition. Furthermore, there is no evidence to suggest that it is associated with a significant designer, engineer, or craftsman. The structures are not considered to be, or have been, the principal source of information. Therefore, they are not considered significant, pursuant to Criterion D.

Based on our review, the property has fair integrity and does not appear eligible for listing in the National Register of Historic Places individually or as a contributor to a potential historic district.

**Description of
Physical
Appearance**

The property contains a drainage system consisting of an excavated drainage channel and an earthen berm. The structures, constructed in 1926, extend in parallel forming the south, east, and north boundaries of the property along the west bank of Grass Creek, which stands immediately adjacent. Available evidence suggests that excavation of the drainage channel resulted in the construction of the berm, as the excavated spoils were placed on the creek-side of the drainage channel. The channel is unlined and measures approximately 10 to 20 feet wide and several feet deep. Various portions of the channel have eroded, resulting in changes to its width and depth. The channel, however, retains integrity as one single water course for its entire length. The earthen berm stands 5 to 10 feet high with a width of approximately 15 to 20 feet. It, too, has eroded, but likewise extends uninterrupted for its entire length, except for a location along the property's southern boundary, where a portion of the berm was recently breached.

As part of the original drainage system, water outlets appear to have been established in two locations along the channel and berm, although only one remains extant. The one existing water outlet punctuates the earthen berm at a point along the property's northeastern boundary. Still functional, it consists of a square wood frame water sluice that extends through the earthen berm and outfalls to a short channel leading into the creek. Water drains through the sluice out of the acreage encompassed by the berm. The sluice was constructed using dimensional lumber and bolts, and is in disrepair.

Just northeast of the sluice outlet, on the outer margin of the berm, there is a concentration of vertically placed stakes and dimensional lumber. The purpose of this concentration is not known, but it could have served to redirect the creek water flow to prevent blockage of the sluice outlet. Two other alignments of vertically-placed rounded stakes were identified within the drainage channel located inside the berm, along the central-eastern portion of the property. These features may have functioned to block the flow of debris through the drainage channel. However, their exact purpose is unknown. A second outlet to the drainage channel is believed to have existed at the southern boundary of the parcel, where the berm is now breached. The shadow of an apparent outlet channel is visible in the 1950 USACE aerial photograph of the area.

**Major
Bibliographic
References**

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Additional Photos for:

at On State Route 109 in the Vicinity of Gray Gables, WA 98550



View of Drainage Ditch and Earthen Berm, Looking East **taken** 2/7/2010

Photography Neg. No (Roll No./Frame No.): GrassCrk002.jpg

Comments:



View of Drainage Ditch and Earthen Berm, Looking Southeast **taken** 2/7/2010

Photography Neg. No (Roll No./Frame No.): GrassCrk003.jpg

Comments:



View of Drainage Ditch and Earthen Berm, Looking South **taken** 2/7/2010

Photography Neg. No (Roll No./Frame No.): GrassCrk004.jpg

Comments:



View of Earthen Berm and Grass Creek, Looking East **taken** 2/7/2010

Photography Neg. No (Roll No./Frame No.): GrassCrk005.jpg

Comments:

Additional Photos for:

at



View of [Drainage Outlet \(Water Sluice\), Looking West](#) **taken** [2/7/2010](#)

Photography Neg. No (Roll No./Frame No.): [GrassCrk006.jpg](#)

Comments:



View of [Drainage Outlet \(Water Sluice\), Looking West](#) **taken** [2/7/2010](#)

Photography Neg. No (Roll No./Frame No.): [GrassCrk007.jpg](#)

Comments:



View of [Vertical Stakes at Water Outlet](#) **taken** [2/7/2010](#)

Photography Neg. No (Roll No./Frame No.): [GrassCrk008.jpg](#)

Comments:



View of [Drainage Outlet \(Water Sluice\), Looking North](#) **taken** [2/7/2010](#)

Photography Neg. No (Roll No./Frame No.): [GrassCrk009.jpg](#)

Comments:

Additional Photos for:

at



View of Drainage Outlet (Water Sluice) inside Berm, Looking **taken** 2/7/2010

Photography Neg. No (Roll No./Frame No.): GrassCrk010.jpg

Comments:



View of Vertical Stakes at Drainage Channel **taken** 2/7/2010

Photography Neg. No (Roll No./Frame No.): GrassCrk011.jpg

Comments:



View of Grass Creek Site Map, Showing Channel and Berm **taken** 2/7/2010

Photography Neg. No (Roll No./Frame No.): GrassCrk012.jpg

Comments:

View of **taken**

Photography Neg. No (Roll No./Frame No.):

Comments:

1 APPENDIX E

2 **Shovel Probe Excavation Profiles**

General Stratigraphic Designations

- Strat 1** Brown silt, grading to clayey silt, massive, few small rootlets, smooth contact, moderate compaction, overbank alluvium
- Strat 2** Brown clayey silt, grading to mottled brown silty clay, increasing organic content (bark frags, blackened organics), dense compaction, blocky, very low energy alluvium
- Strat 3** Mottled grey silty clay with orange mottles, many small rootlets, semi-permanent water table, very low energy alluvium, blocky, dense compaction
- Strat 4** Dark bluish grey to black silty clay to clay, sporadic organics, massive, rootlets common, mudflat deposits
- Strat 5** Very dark greyish brown to black peat, dense compaction with yellowish brown concretions
- Strat 6** Bluish black clay, little organics, with small black mottles, few larger reddish orange clasts

Probe #	Width	Depth	Soil Description
			Missing 148-151 (not excavated)
1	45	90	0-45 cm: Strat 2 45-90 cm: Strat 3
2	50	96	0-26 cm: Strat 2, loose brown silty clay, massive, rootlets throughout 26-96 cm: Strat 3, greyish brown, blocky, red mottling, rootlets
3	40	90	0-30cm: Strat 2 30-75 cm: Stat 3 75-90 cm: Strat 4
4	45	100	0-49 cm: Strat 2 49-75 cm: Strat 3 75-100 cm: Strat 4
5	50	85	0-30 cm: Strat 2, loose brown silty clay, massive, rootlets throughout 30-85 cm: Strat 3, greyish brown, blocky, red mottling, rootlets
6	40	94	0-25 cm: Strat 2 25-90 cm: Strat 3, grey silt with reddish brown mottles 90-94 cm: Very dark grey interbedded decaying organics (not strat 4)
7	45	100	0-53 cm: Strat 1 53-100 cm: Strat 2, greyish brown with reddish brown mottles
8	50	100	0-24 cm: Strat 2, brown silty clay, massive, rootlets 24-100 cm: Strat 3, greyish brown, blocky, red mottling, rootlets

9	40	94	0-30 cm: Strat 2, gradual contact 30-92 cm: Strat 3 92-94 cm: Strat 4, thin light yellow silt interbedding around root
10	45	100	0-35 cm: Strat 2 35-100 cm: Strat 3
11	50	100	0-27 cm: Strat 2, brown silty clay, massive, rootlets 27-79 cm: Strat 3, greyish brown blocky, red mottling, rootlets 79-84 cm: Massive black to dark grey silt, rootlets 84-100 cm: Strat 3
12	45	100	0-28 cm: Strat 2 28-78 cm: Strat 3 78-100 cm: Strat 4, bluish grey
13	45	97	0-25 cm: Strat 2 25-75 cm: Strat 3, tan/yellow interbedded silt lines in both strats, seems to follow roots 75-97 cm: Strat 4
14	45	100	0-22 cm: Very dark greyish brown silt with abundant organics, "O" under old Sitka Spruce 22-58 cm: Strat 1 58-100 cm: Strat 2
15	50	100	0-25 cm: Strat 2, brown silty clay, massive, rootlets 25-100 cm: Strat 3, greyish brown, blocky, red mottling, rootlets
16	40	91	0-13 cm: Strat 2, gradual contact 13-85 cm: Strat 3, dark grey transition for 10 cm before black silt 85-91 cm: Strat 4
17	45	100	0-22 cm: Strat 2 22-82 cm: Strat 3 82-100 cm: Strat 4
18	40	95	0-8 cm: Strat 2 8-18 cm: Very dark grey silt band, no gravels, differs from strat 2 only by color 18-90 cm: Strat 3 90-95 cm: Strat 4
19	46	100	0-32 cm: Reddish brown silt, many small rootlets, minreal formation in hydric soils, graded interface. 32-100 cm: Strat 3
20	50	100	0-40 cm: Strat 2 40-100 cm: Strat 3

21	40	93	0-37 cm: Strat 2 37-93 cm: Strat 3, iron oxide clasts around rootlets
22	46	56	0-46 cm: Strat 2 46-56 cm: Strat 3
23	45	97	0-70 cm: Strat 1, increasing clay and gradual mottling transition 70-97 cm: Strat 3, small blocky peds
24	45	100	0-43 cm: Strat 1 43-100 cm: Strat 2
25	44	93	0-93 cm: Strat 2, began to change into grey with red mottling (strat 3) at 93 cm)
26	45	96	0-75 cm: Strat 1, increased clay mottling with depth, gradual contact 75-96 cm: Strat 3, many brown silt mottles with some iron oxide staining, small blocky peds
27	47	96	0-70 cm: Strat 1 with blocky peds, no gravels and many fine to coarse roots 70-87 cm: Strat 2 with grey mottles, more clay, less silt, no gravels, and many fine roots 87-96 cm: Black mottling, anerobic peaty materials, Strat 3, small blocky peds, no gravels, few fine roots
28	35	94	0-42 cm: Strat 1 42-70 cm: Strat 3 70-94 cm: Black organic stained strat 4
29	43	94	0-58 cm: Strat 1 58-81 cm: Strat 3, moderate mottling, dense compaction, abrupt contact, rootlets 91-94 cm: Strat 4, low organic content, rootlets, black
30	42	92	0-28 cm: Strat 1 with large roots, gradual transition 28-57 cm: Strat 3, increased bog iron content with depth, highest concentration at 57 cm, gradual contact 57-92 cm: Mixture of strat 3 and 4, dense compaction
31	41	93	0-35 cm: Strat 2 35-93 cm: Strat 3, iron oxide root casts, mottling
32	45	100	0-10 cm: Strat 2 10-85 cm: Strat 3 85-100 cm: Strat 5

33	50	100	0-35 cm: Strat 1 35-50 cm: Strat 2 50-92 cm: Strat 3 92-100 cm: Strat 5
34	48	100	0-30 cm: Strat 1 30-60 cm: Strat 2 60-88 cm: Strat 3 88-100 cm: Strat 5
35	45	100	0-48 cm: Strat 1 48-90 cm: Strat 3 90-100 cm: Strat 5
36	48	100	0-43 cm: Strat 1, graded contact 43-92 cm: Strat 3, graded contact 92-100 cm: Strat 5
37	45	95	0-25 cm: Strat 2 25-75 cm: Strat 3 75-95 cm: Strat 3, with a layer of dark peat at 75-80 cm. Peat mottled with strat 3 at end of unit.
38	40	91	0-4 cm: Strat 2 4-91 cm: Strat 3, interbedded in strat 3 were two 2-4 cm thick areas of reddish brown silt.
39	40	90	0-5 cm: Strat 2 5-65 cm: Strat 3 65-90 cm: Very dark bluish grey silt with many rootlets (and brown mottles around roots), some bluish black mottles in lower 10 cm, dense compaction
40	46	97	0-15 cm: Strat 2, gradual contact 15-45 cm: Strat 2 and 3, combination, with some grey, gradual transition 45-84 cm: Strat 6, gley, dry and clayey 84-97 cm: Strat 6, grey, clayey silt with finer sand particles and small organics throughout
41	45	100	0-37 cm: Strat 2, mottled brown clayey silt, gradual contact 37-81 cm: Strat 3, at 60 cm, increased iron oxide, strong mottles around rootlets, gradual contact 81-100 cm: Bluish grey clay, little organics with small black mottles, few large reddish orange clasts
42	40	93	0-67 cm: Strat 3, many roots, reddish brown mottling in upper 30 cm 67-81 cm: Strat 5, many roots, some rotten bark, clear lower boundary, mottled with strat 3 81-93 cm: Strat 3, darker grey than upper strat 3, but fewer mottles

43	40	91	<p>0-4 cm: Strat 2 4-77 cm: Strat 3, a few large roots 77-91 cm: Strat 5, thick, very fibrous fine roots and small chunks of wood. Strat was mottled with dark grey silt in lower 5 cm.</p>
44	47	97	<p>0-19 cm: Strat 1, gradual contact 19-22 cm: Stat 2-3 gradual transition into grey with high amount of mottles, and some organics 32-84 cm: Strat 3, Grey with high amount of mottling and some organics, pinecones 84-97 cm: Gradial transition into dark stained organic materials, increasing with depth, wood and bark.</p>
45	50	95	<p>0-23 cm: Strat 2, some medium roots, gradual lower contact 23-88 cm: Strat 3, lower 15 cm had more reddish brown mottles than normal 88-95 cm: Strat 5, thick organic fibers, a few 1-5 cm fragments of rotten wood</p>
46	40	96	<p>0-40 cm: Strat 1, gradual contact 40-85 cm: Strat 3, highly mottled, some organics with depth, , abrupt contact 85-88 cm: Strat 5, highly organic 88-96 cm: Dark stained intermixed with mottled grey strat 3</p>
47	44	100	<p>0-43 cm: Strat 2, very little mottling, concentrated root cap, gradual contact 43-70 cm: Strat 3, gradual contact with mottling 70-89 cm: Strat 4, bluish grey with brown mottles very dense clayey silt 89-100 cm: Peat, high organic content with wood chunks</p>
48	45	90	<p>0-20 cm: Strat 2, super concentrated root cap, abrupt contact 20-47 cm: Strat 3, every little mottling, 2 large roots, bark coming out of wall. 47-85 cm: Strat 3, with mottling 85-90 cm: Peat/glay with bark chunks, gradual contact</p>
49	40	98	<p>0-7 cm: Strat 2 7-45 cm: Strat 3, clear lower boundary 45-98 cm: Strat 3, same as previous, but with tan mottles sporadically, black mottles in lower 10 cm.</p>
50	40	98	<p>0-20 cm: Strat 2, many roots 20-98 cm: A dark bluish grey clayey silt, sporadic organics, massive, rootlets, common, no gravels (strat 4)</p>

51	35	94	0-26 cm: Super concentrated root cap in strat 2, abrupt contact 26-94 cm: Strat 6, soft bluish grey, high organic content 0-13 cm: Strat 1 with high organic content, many fine roots
52	42	96	13-21 cm: No description 21-28 cm: Strat 3, little mottling, gradual contact 28-96 cm: Strat 4, bluish grey, very dense, no mottling
53	40	92	0-4 cm: Strat 2 4-92 cm: Strat 3, more mottled in top 30 cm, mottled with dark bluish black in lower 10 cm
54	45	94	0-3 cm: Strat 2, high root content, surface grasses 3-7 cm: Black organic layer, many fine roots 7-94 cm: Strat 3, some areas with less mottling, some layers with reddish and peat mottling
55	50	100	0-8 cm: Black peat 8-100 Strat 3, varying between few mottles to many mottles with much peat
56	45	100	0-8 cm: Reddish peat 8-100 cm: Strat 3, varying between few mottles to many mottles with much peat
57	45	100	0-10 cm: Reddish peat with many medium roots 10-100 cm: Strat 3, varying between few mottles to many mottles with much peat
58	43	78	0-78 cm: Strat 3, varying between few mottles to many mottles with much peat
59	50	100	0-12 cm: Mottled reddish brown silty clay with many small rootlets 12-100 cm Strat 3 with bands of highly organic peat
60	45	100	0-100 cm: Strat 3 with bands of highly organic peat
61	50	100	0-100 cm: Strat 3 with bands of highly organic peat
62	43	100	0-12 cm: Strat 2 12-100 cm: Strat 3 with inclusions of peat between 75-90 cm, light mottling
63	50	100	0-88 cm: Strat 3, very light mottling 88-100 cm: Strat 5
64	45	100	0-50 cm: Strat 3, light mottling 50-100 cm: Strat 3, increasing mottles, larger and stronger

65	51	100	0-28 cm: Strat 2, light mottling 28-90 cm: Strat 3, strong mottles 90-100 cm: Strat 5
66	45	100	0-22 cm: strat 2, light mottles 22-85 cm: Strat 3, strong mottles 85-100 cm: Strat 5
67	45	100	0-42 cm: Mixed and redeposited strat 3, disturbed 42-44 cm: Buried surface 44-100 cm: Strat 1
68	48	100	0-25 cm: Mixed Strat 2, disturbed 25-60 cm: Strat 2 60-100 cm: Strat 3
69	45	100	0-32 cm: Strat 2 32-88 cm: Strat 3 88-100 cm: Black silty clay
70	45	100	Excavated, but records lost
71	50	100	0-45 cm: Strat 2 45-100 cm: Strat 3 with many strong mottles
72	45	100	0-31 cm: Strat 2 31-80 cm: Strat 3 80-100 cm: Black silty clay
73	48	100	0-58 cm: Strat 3 58-100 cm: Black silty clay
74	45	100	0-62 cm: Strat 3, few strong mottles 62-100 cm: Black silty clay with interbeds of reddish brown silt
75	47	100	0-100 cm: Strat 3 with fewer strong mottles
76	50	95	0-95 cm: Strat 3, stronger mottles with depth
77	47	100	0-8 cm: Strat 2, many strong mottles 8-88 cm: Strat 3, many small mottles 88-100 cm: Black silty clay
78	45	92	0-30 cm: Strat 3 30-92 cm: Strat 3 with strong reddish brown mottles
79	50	91	0-8 cm: Strat 2 8-75 cm: Strat 3 75-91 cm: Strat 6, gradating black to mottled with strat 3 after 87 cm
80	50	92	0-2 cm: Strat 2 2-80 cm: Strat 3, 2-30 cm highly mottled (Reddish brown) 80-90 cm: Strat 4, very fine roots 90-92 cm: Mottling of strat 5 and strat 3

81	45	95	0-3 cm: Strat 2 3-73 cm: Strat 3, clear lower transition 73-85 cm: Strat 5, rootlets, clear lower contact 85-93 cm: Strat 3, inclusions/mottling with a darker grey silt and a few black stains
82	40	92	0-3 cm: Strat 2, sod, organics 3-92 cm: Strat 3, mottling decreases with depth
83	45	92	0-11 cm: Strat 2 11-71 cm: Strat 3 71-92 cm: Strat 5, rootlets and decaying organics in lower 5-10 cm, grading into a dark grey.
84	48	100	0-31 cm: Strat 3 31-100 cm: Strat 3 with strong reddish brown mottles
85	50	100	0-81 cm: Strat 3, light mottles 81-100 cm: Interbeds of strat 3 and black silt
86	45	100	0-22 cm: Strat 2 22-90 cm: Strat 3, sharp contact 90-100 cm: Black silty clay
87	50	97	0-25 cm: Strat 1 25-55 cm: Strat 2 55-90 cm: Strat 4 90-100 cm: Strat 5
88	50	101	0-30 cm: Strat 1, small bits of charcoal 30-50 cm: Strat 2 50-85 cm: Strat 3 85-90 cm: Peat, strat 5 90-100 cm: Strat 4
89	45	100	0-53 cm: Strat 2 53-98 cm: Strat 3 98-100 cm: Black organic silt to silty clay, seen in cut wall profile, dense compaction
90	45	97	0-21 cm: Strat 2 21-62 cm: Strat 3 62-83 cm: Black clayey silt with roots, gradual transition 83-97 cm: Strat 3, more yellowish brown mottles
91	50	100	0-19 cm: Strat 2 19-62 cm: Strat 3, transition to strat 4 has fewer reddish mottles 62-100 cm: Clear upper boundary
92	45	95	0-17 cm: Strat 2, very dense compaction 17-73 cm: Strat 3, very dense compaction 73-95 cm: Strat 4, very dense compaction

93	50	110	0-33 cm: Strat 2 33-83 cm: Strat 3, bog iron concentration at 56 cm, yellow concretions and rootlets at 70 cm, abrupt transition 83-110 cm: Black, grading to dark grey, silty clay, highly rooted, dense compaction
94	55	108	0-22 cm: Strat 2 22-81 cm: Strat 3 81-108 cm: Black, grading to dark grey, silty clay, highly rooted
95	45	100	0-13 cm: Strat 1 13-50 cm: Strat 2 50-75 cm: Strat 3 75-100 cm: Black silty clay
96	45	100	0-18 cm: Strat 2 18-90 cm: Strat 3, sharp contact 90-100 cm: Black silty clay
97	45	100	0-85 cm: Strat 3, sharp contact 85-100 cm: Black silty clay
98	45	100	0-15 cm: Strat 2 15-95 cm: Strat 3, sharp contact 95-98 cm: Black silty clay, graded contact 98-100 cm: Strat 3, strong mottles
99	45	100	0-22 cm: Strat 2 22-90 cm: Strat 3, sharp contact 90-100 cm: Black silty clay
100	45	100	0-38 cm: Strat 2, clear contact 38-98 cm: Strat 3, sharp contact 98-100 cm: Black silty clay
101	48	100	0-11 cm: Strat 1 11-48 cm: Strat 2 48-73 cm: Strat 3, sharp contact, becoming sandier with depth 73-78 cm: Black silty to silty clay with small rootlets, sharp contact 78-83 cm: Grey fine sandy silt with few small mottles, dense compaction 83-89 cm: Black silt to silty clay with few small roots, sharp contact 89-100 cm: Grey fine sandy silt with few small mottles, dense compaction
102	45	100	0-15 cm: Strat 1 15-45 cm: Strat 2 45-85 cm: Strat 3 85-100 cm: Black silt to silty clay with few small roots
103	45	100	0-28 cm: Strat 2 28-100 cm: Strat 3

104	48	100	0-20 cm: Strat 4, abrupt contact 20-40 cm: Strat 4, grey to light grey 40-100 cm: Strat 4, grading from dark to very dark grey
105	45	100	0-67 cm: Strat 3 67-100 cm: Strat 4, dark grey grading to black
106	47	100	0-46 cm: Strat 3 46-100 cm: Strat 4, dark
107	50	102	0-54 cm: Strat 3 54-102 cm: Strat 4, dark grey type 0-31 cm: Strat 7
108	45	100	31-100 cm: Strat 4, bluish grey clay to silty clay, reed plant portions at surface contact, mudflat 0-42 cm: Mixed and mottled strat 2 and strat 3, disturbed
109	45	100	42-100 cm: Strat 4 with abundant reed grass fragments 0-26 cm: Strat 2
110	45	100	26-100 cm: Stat 3, mostly grey with some reddish brown mottles. Very high organic content (roots and reeds)
111	46	99	0-29 cm: Strat 3, abrupt contact 29-99 cm: Strat 4
112	45	100	0-18 cm: Strat 2 with some grey mottling 18-100 cm: Strat 4, dark bluish grey with many organics
113	43	100	0-30 cm: Strat 3, abrupt wavy contact 30-100 cm: Strat 4, amount of organics varied throughout
114	50	100	0-37 cm: Strat 2, some grey mottles 37-100 cm: Strat 4, dark bluish grey
115	45	100	0-35 cm: Mixed and mottled strat 2 and strat 3, disturbed 35-100 cm: Strat 4 with abundant reed grass fragments
116	45	100	0-14 cm: Strat 2 14-100 cm: Strat 4, dark bluish grey throughout, high organic content
117	40	100	0-33 cm: Mixed and mottled strat 2 and strat 3, disturbed 33-100 cm: Strat 4 with abundant reed grass fragments
118	50	100	0-54 cm: Strat 3, gradual contact 54-83 cm: Strat 4, very few organics, dark grey, water leaching, abrupt contact 83-100 cm: Strat 4, very dark grey to balck, few to no organics

119	45	100	0-24 cm: Mixed and mottled strat 2 and strat 3, disturbed 24-100 cm: Strat 4 with abundant reed grass fragments
120	45	100	0-24 cm: Strat 7 with many roots 24-100 cm: Strat 4 with many small grass fragments
121	40	97	0-30 cm: Strat 2, gradual contact 30-74 cm: Strat 3, decreasing rootlets 74-85 cm; Strat 5, dense organics, twig fragments 85-97 cm: Strat 4, dark grey to bluish grey clayey silt, moderate compaction
122	41	100	0-55 cm: Strat 2 55-95 cm: Strat 3, increase in strength of mottles 95-100 cm: Strat 4
123	45	98	0-11 cm: Strat 2, mostly in sod-cap 11-90 cm: Strat 3, mottled with reddish brown in upper portion, at approximately 80 cm, began to mottle with underlying strat 4, gradually increasing 90-98 cm: Strat 4, no organics
124	47	104	0-44 cm: Strat 2, gradual contact 44-98 cm: Strat 3, many rootlets, moderate mottling, gradual transition 98-104 cm: Strat 4, many rootlets
125	Unlisted	100	0-15 cm: Strat 3, abrupt contact 15-51 cm: Strat 4, black to dark grey clayey silt with organics, dense compaction, hydric, some silical particles, mudflat, abrupt contact 51-100 cm: Strat 4, dark bluish grey silty clay, lack organic staining
126	43	100	0-35 cm: Strat 2, gradual contact 35-100 cm: Strat 3, high organic content, increasing with depth
127	40	100	0-13 cm: Strat 2 13-83 cm: Strat 3 83-100 cm: Strat 6, a few organics present
128	45	100	0-6 cm: Strat 2, grading into strat 3 6-100 cm: Strat 3
129	50	100	0-100 cm: Strat 4, dark bluish grey, many roots and organics, very strong sulphur smell, some black inclusions throughout.
130	45	96	0-66 cm: Strat 3, highly mottled grey to brown 66-74 cm: Strat 4, few organics, dark grey to black moderate to loose compaction 74-96 cm: Strat 3, dark grey with few mottles

131	45	100	0-8 cm: Strat 4, many roots and rhizomes 8-100 cm: Strat 4
132	49	85	0-45 cm: Strongly mottled strat 3 with many roots 45-85 cm: Black silty clay
133	45	10	0-10 Brown clayey silt with high concentration of rounded gravels
134	46	98	0-63 cm: Strat 1, very gradual transition 63-94 cm: Strat 3, little to no rootlets, abrupt transition 94-98 cm: Black clayey silt, compacted, little to no organics
135	45	100	0-15 cm: Strat 1 15-55 cm: Strat 2 55-82 cm: Strat 3 82-100 cm: Black organic silt to silty clay, dense compaction
136	50	100	0-28 cm: Strat 1, loose brown, abundant rootlets in first 10 cm 28-85 cm: Strat 3, grey with mottling 85-100 cm: Black, organic rich, silty sand
137	43	100	0-42 cm: Strat 1, gradual lower contact 42-69 cm: Strat 3, very mottled 69-86 cm: Very black silt to clay with some organics 86-100 cm: Strat 3, grey mottling
138	45	100	0-22 cm: Strat 1 22-62 cm: Strat 2 62-85 cm: Strat 3 85-90 cm: Black organic silt to silty clay, dense compaction 90-100 cm: Strat 3
139	45	100	0-32 cm: Strat 2, with organics, loose brown sediments, abrupt contact 32-69 cm: Strat 3, increase in mottling with depth, abundant rootlets, gradual contact 69-100 cm: Black organic rich silty sand
140	47	102	0-55 cm: Strat 1, gradual contact 55-77 cm: Strat 3, abrupt contact 77-92 cm: Black clayey silt, little organics, moderate compaction, abrupt contact 92-102 cm: Strat 3, highly mottled, iron oxide staining

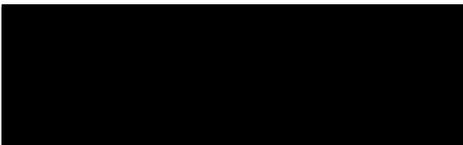
141	50	100	0-17 cm: Strat 1, loos with organics 17-67 cm: Strat 3 67-75 cm: Blakc organic rich silty sand 75-100 cm: Strat 3
142	45	100	0-50 cm: Strat 1 50-79 cm: Strat 3, abrupt lower contact 79-100 cm: lack clayey silt, moderate compaction
143	55	96	0-32 cm: Strat 1, gradual contact 32-76 cm: Strat 3, abrupt contact 76-86 cm: Black organic rich silty sand 86-96 cm: Strat 3 with bands of organic rich silty sand
144	50	99	0-50 cm: Strat 1, gradual contact 50-64 cm: Strat 3, abrupt contact 64-80 cm: Black silty clay grading to dark grey, slightly mottled, slight sheen, rootlets, gradual contact 80-99 cm: Strat 3, highly mottled, iron oxide staining
145	50	100	0-35 cm: Strat 2 35-57 cm: Strat 3 75-79 cm: Black organic rich silty sand 79-86 cm: Strat 3 86-89 cm: Black organic rich silty sand 89-96 cm: Strat 3 96-100 cm: Strat 3 with strong orange mottling and bright orange inclusions consistent with soil leaching/iron oxidiation
146	45	110	0-34 cm: Strat 2 34-95 cm: Strat 3 95-100 cm: Black organic silt to silty clay, dense compaction 100-110 cm: strat 3
147	50	90	0-30 cm: Strat 2 30-85 cm: Strat 3, slight silica content 85-90 cm: Black, grading to dark grey, silty clay, highly rooted
152	60	116	0-30 cm: Strat 1, many roots at surface 30-68 cm: Strat 3 68-75 cm: Blck silty clay with roots, blocky structure 75-116 cm: Strat 3
153	50	97	0-26 cm: Strat 3, graded with some brown mottling 26-97 cm: Strat 3, gradual with varying degrees of mottling, few pockets of organic black materials, very hydric.
154	49	97	0-20 cm: Strat 2, gradual to diffuse 20-97 cm: stat 3, gradual to diffuse

155	47	99	0-7 cm: Very dark brown organic rich sod layer (darker than strat 2, but similar context) 7-99 cm: Strat 3, mottled with brighter orange brown between 7 and 25 cm
156	43	98	0-24 cm: Strat 2, gradual contact, many roots 24-98 cm: Strat 3, gradual contact with pockets of peaty material at around 90 cm
157	40	100	0-6 cm: Strat 2 (Sod cap) 6-75 cm: Strat 3, reddish brown mottles decrease with depth, clear lower boundary 75-100 cm: Strat 4, mottled with inclusion of Strat 3
158	45	100	0-4 cm: Strat 2 4-29 cm: Strat 3, gradual contact 29-78 cm: Strat 4, many roots in upper 30 cm of strat, small amount of grey mottles 78-100 cm: Same as strat 4, but dark bluish grey in color
159	45	98	0-7 cm: Strat 2 7-79 cm: Strat 3, fewer reddish brown mottles after 50 cm 79-98 cm: Strat 4, a few rootlets throughout
160	45	105	0-19 cm: Strat 2 19-48 cm: Strat 4, black, high organic content-not decomposed 48-60 cm: Strat 5, mixed with strat 4 60-105 cm: Strat 4, dark bluish grey
161	45	100	0-100 cm: Strat 4, large quantity of organics, decreasing at bottom
162	44	100	0-9 cm: Strat 4, many roots and rhizomes 9-100 cm: Strat 4, dark bluish grey silty clay to clay, moderate compaction
163	45	100	0-28 cm: Strat 7 28-100 cm: Strat 4, bluish grey clay to silty clay with inclusions of fine sandy silt, reed plant portions at surface interface, intact, mudflat
164	45	99	0-50 cm: Strat 3, thin organic rich black layer at 10 cm, abrupt contact 50-99 cm: Strat 4
165	45	100	0-32 cm: Mixed and mottled strat 2 and strat 3, disturbed 32-100 Strat 4 with abundant reed and grass fragments
166	45	100	0-26 cm: Strat 2 26-27 cm: Black silt/peat layer visible in sidewall, not when screening 27-100 Strat 3, mostly grey, some reddish brown mottles. Very high organic content (roots and dried reeds)

167	45	100	0-22 cm: Mixed and mottled strat 2 and strat 3, disturbed 22-100 cm: Strat 4 with abundant reed grass fragments throughout, smells like rotten eggs
168	45	63	0-20 cm: Mixed and mottled strat 2 and strat 3, disturbed 20-63 cm: Strat 4 with abundant reed grass fragments
169	45	99	0-22 cm: Strat 3, abrupt wavy contact 22-99 cm: Strat 4, moist
170	50	98	0-36 cm: Strat 3, abundant organics (rootlets), abrupt contact 36-98 cm: Strat 4, grey darkening with depth
171	45	100	0-15 cm: Strat 2 15-95 cm: Strat 3 95-100 cm: Black silty clay,
172	47	100	0-75 cm: Strat 3 75-100 cm: Black silty clay
173	45	100	0-85 cm: Strat 3 85-100 cm: Black silty clay
174	45	100	0-85 cm: Strat 3 85-100 cm: Black silty clay

Comments	Artifacts
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Water table at 8 cm	No
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Water table at 48 cm	No
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Water table at 30 cm	No
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Water table at 29 cm	No
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Water table at 30 cm	No
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Water table at 55 cm	No
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Water table at 25 cm	No
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More roots in strat 2



Probe next to stand
of trees

Water table at 50 cm No

Water table at 51 cm No

Water table at 60 cm No

Water table at 19
cm. No

Water table at 78 cm No

Water table at 20 cm No

Water table at 35
cm No

Water table at 55 cm No

Water table at 30
cmbs No

Water table at 20 cm No

Water table at 50 cm No

Water table at 25 cm No

Terminated early,
rising water table to 6 cm below surface No

Water table at 70 cm No

Water table at 70 cm No

Water table at 50 cm.

Small amount of charcoal at around 64 cm No

Water table at 50 cm No

Water table at 66 cm No

No

No

Water table at 28 cm. Near trees. No

No

Water table at 5 cm No

Water table at 30 cm No

Water table at 62 cm No

Water table at 50 cm No

Water table at 40 cm No

Water table at 60 cm No

No

Unsure if mudflat or
alluvium No

No

No

Water table at 70 cm No

Water table at 26 cm No

No

Water stabilized at
73 cm

No

No

No

Terminal depth at 90
cm, dense No
compaction

Water table began at
65 cm, but lowered No
to 85 cm

Water table at 60 cm No

Pockets of black,
peaty materials No

Water table at 30 cm No

Water table at 35 cm No

Water table at 70 cm No

Water table at 20 cm No

Water table at 10 cm No

Water table at 55 cm No

Water table at 63
cm.
Terminal depth at 78 No
cm, hit large cedar
branch

Water table at 20 cm No

Water table at 50 cm No

Water table at 45 cm No

Water table at 72 cm No

water table at 60 cm No

Water table at 45 cm No

Water table at 55 cm No

Water table at 42 cm No

Water table at 92 cm No

Water table at 60 cm No

Water table at 55 cm No

No

Water table at 60 cm No

Water table at 42 cm No

Water table at 50 cm No

No

Water table at 25 cm No

Water table at 15 cm No

Water table at 10 cm No

Water table at 15 cm No

Water table at 25 cm No

Water table at 70 cm No

Water table at 85 cm No

Water table at 60 cm No

Water table at 65 cm No

Water table at 31 cm No

Water table at 30 cm No

Water table at 35 cm No

Water table at 30 cm No

No

No

Water at 55 cm No

Water at 65 cm No

Water table at 69 cm No

Water table at 15 cm No

Water table at 20 cm No

Water table at 90 cm No

No

Water table at 85 cm No

No

No

Water table at 25 cm No

Strange sharp
contact at base of
SPs, organic layer to
sterile sand, Likely
stable surface at one
point. No

Water table at 60 cm No

Water table at 65 cm No

Organics, sporadic wood/bark inclusions No throughout

Water table at 74 cm No, modern shotgun shell casing at 16 cm

Concrete rubble, metal fragment, gravels Yes

Saturated, no standing water No

Water table at 82 cm. No

No

No

Medium bark/wood fragments No

No

No



No

No

No

No

No

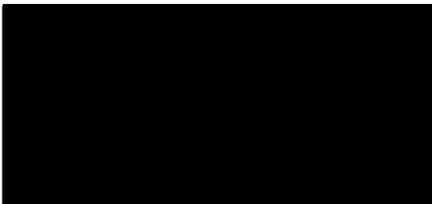
No

Water table at 80 cm No

No

Water table at 80 cm No

Red plastic shotgun
shell casing at 30 cm Yes



Water table at 100
cm No

Water table at 97 cm No

Water table at 100
cm No

Water table at base
of shovel probe No

Saturated with depth
, no standing water No

Wet, but not inundated No

Water table at 85 cm. Sloppy and infilling. No

Terminated, identified as part of berm, cannot dig in berm No



No

Water table at 61 cm No

Water table at 90 cm No

No

Water table at 97 cm No

No

Water table at 94 cm No

Many large roots, no water No

Water table at 96 cm. No
Soil leaching at base of ST.

Water table at 90 cm No

No

Used post-hole digger between 100 and 110 cm No

Water table at 32 cm No

Water at 15 cm No

No

No

Water table at 92 cm No

Many rootlets throughout No

No



Water table at 90 cm No

No

Very saturated, no standing water No

Wet, but not inundated No

No

No

No

No

No

Terminal depth at 63
cm, large log at base No
of shovel probe

No

No

Water table at 75 cm No

Water table at 32 cm No

Water table at 47 cm No

Water table at 30 cm No