CULTURAL RESOURCES ASSESSMENT
FOR THE
IRONDALE IRON AND STEEL PLANT (45JE358) HISTORIC DISTRICT (DT128) REMEDIATION AND RESTORATION PROJECT
JEFFERSON COUNTY, WASHINGTON

REDACTED

August 26, 2011

Report Number 21578

NORTHWEST ARCHAEOLOGICAL ASSOCIATES/SWCA.
SEATTLE, WASHINGTON

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Report Prepared for

GeoEngineers
Washington Department of Ecology
&
U.S. Corps of Engineers

By

Jessie Piper

August 26, 2011

Report Number 21578

REDACTED

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CULTURAL RESOURCES REPORT COVER SHEET

Author: Jessie Piper

Title of Report: Cultural Resources Assessment for the Irondale Iron and Steel Plant (45JE358) Historic District (DT128) Remediation and Restoration Project,

Date of Report: August 26, 2011

County(ies): Jefferson

Section: 35 Township: 30N Range: 1 W
Section: 2 Township: 29N Range: 1 W
Quad: Port Townsend South Acres: ~23

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Export Files submitted? ☐ Yes ☒ No

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

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☒ Yes ☐ No

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

DAHP Archaeological Site #:
45JE358
DT128
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ABSTRACT

Jefferson County Public Works plans to develop a county park at the site of the former Irondale Iron and Steel Plant, an historic property, 45JE358, listed on the National Register of Historic Places (NRHP) that operated from 1881 until 1919. The DOE is currently assisting Jefferson County Public Works in cleanup of the site, which contains waste material and debris left from the steel making process. In addition to DOE cleanup efforts, restoration work will be carried out along the shoreline forming the western boundary of the project in order to enhance fish habitat and restore other environmental values. The remediation and restorations efforts must be completed prior to development of the park. Northwest Archaeological Associates, Inc. (NWAA), which previously conducted a conditions assessment of the remnants of the Irondale Iron and Steel Plant facilities, has identified potential adverse effects to components of the historic district from the cleanup action and proposed measures to avoid or mitigate these effects. Due to the depth of fill in the project area, no adverse effects to pre-contact resources are anticipated.

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INTRODUCTION

Jefferson County Public Works plans to develop a county park at the site of the former Irondale Iron and Steel Plant, an historic property, 45JE358, listed on the National Register of Historic Places (NRHP) that operated from 1881 until 1919 (Figures 1 and 2). An incomplete cleanup of the iron and steel plant in 1919 left waste material and debris from the steel making process on site, contaminating localized areas that have been identified by the Washington State Department of Ecology (DOE) through a series investigations (GeoEngineers 2009 a, 2009b, 2011). The objective of the cleanup action is to eliminate, reduce, or otherwise control to the extent feasible and practicable, unacceptable risks to human health and the environment posed by petroleum hydrocarbons and metals in upland soil and marine sediment at the Site in accordance with MTCA (WAC 173-340) and other applicable regulatory requirements (GeoEngineers 2011b).

In addition to DOE cleanup efforts, restoration work will be carried out along the shoreline forming the western boundary of the project in order to enhance fish habitat and restore other environmental values. The remediation and restorations efforts must be completed prior to development of the park. Northwest Archaeological Associates, Inc. (NWAA) previously conducted a conditions assessment of the remnants of the Irondale Iron and Steel Plant facilities to assist the DOE in the permitting process that was required to allow additional contaminant testing (Smith 2011b, c).

Project Location

The Irondale Iron and Steel Plant is located on an 11 acre parcel in Section 35 of Township 30 North, Range 1 West and Section 2 of Township 29 North, Range 1 West, Willamette Meridian, in Southeast Jefferson County within the boundaries of Irondale townsite (Figure 1). The Irondale Iron and Steel Plant, designated archaeological site 45JE358, is the primary component of the Irondale Iron and Steel Plant Historic District (DT128). The historic district was determined eligible for the National Register of Historic Places (NRHP) in 1983 because of its association with the development of the iron and steel production industry on the west coast of North America in the late 1800s and early 1900s (NRHP 2010). It is also listed on the Washington State heritage register and the National Park Service Historic Engineering Record (Britton and Britton 1983).

Regulatory Context

The shoreline portion of the project will be carried out under a U.S. Army Corps of Engineers (ACE) Joint Aquatic Resources Permit (JARPA). Because of the federal permit, the project will be subject to the National Historic Preservation Act (NHPA),1966, as amended. Section 106 of the National Historic Preservation Act (NHPA) requires agencies to identify and assess the effects of federally permitted or approved undertakings on historic resources, archaeological sites, and traditional cultural properties (TCPs), and to consult with others to find acceptable ways to avoid or mitigate adverse effects. The process concludes with issuance of an agreement document that stipulates the agreed upon measures to reach these goals.

For the purposes of this report, terminology associated with Section 106 of the NHPA will be used for consistency, although upland portions of the project will be subject to State rather than Federal legislation and oversight.

Figure 1. General location.

Figure 2. Irondale Iron and Steel Plant Historic District project area.

National Register of Historic Places and Adverse Effects

Eligible properties, like the Irondale Historic District, must possess integrity, defined as the ability to convey its significance. The seven aspects of integrity include location, design, setting, materials, workmanship, feeling, and association (National Park Service, 1991, 1997). Measuring resource integrity requires an understanding the district's "character-defining features," meaning those features that best convey the significant historic property's association with the particular historic theme or event. Identification of character defining features is also central to assessing the affect of a proposed action on a significant historic resource.

The Irondale Historic District is an important concentration of resources united historically and by plan and physical development that is significant because of its association with the early history of West Coast iron and steel production (Stalheim 1983a). In addition, the remnants of the iron and steel production facilities, 45JE358 may provide important information regarding the development and operation during the late 1800s and early 1900s, making the site important for the archaeological data potential that it represents.

PROJECT BACKGROUND

The Irondale Historic District encompasses approximately 13 acres in both upland and coastal settings along Port Townsend Bay that have been shaped by historic industrial processes. The 1856 U.S. Coast Survey map of the coastline south of Chimacum Creek, drawn before industrial development of Irondale began in the 1880s, depicts a narrow beach backed by a steep bluff that was later occupied by the iron and steel plant. North of the plant site, the beach widened and formed a long spit on the south side of the mouth of Chimacum Creek (Figure 3). During the development of the Irondale Iron and Steel Plant in the late 1800s and early 1900s, upland areas were excavated and graded to prepare for construction of the buildings and production equipment, and a portion of the intertidal area was filled with dredge spoils to accommodate expansion of storage and loading facilities along the shoreline. The eastern, shoreward portion of the Irondale Iron and Steel Plant presently lies at an elevation approximately 12 feet above mean sea level (AMSL) and the ground surface in this area is relatively level. The western, inland portion of the project area is marked by a steep bluff that rises to between 70 and 100 feet AMSL. The remains of the Irondale Iron and Steel Plant are situated below the crest of the bluff (Figure 4).

Vashon outwash is exposed along the shoreline south of the project area and glaciolacustrine deposits compose the upland west of a narrow beach (Schasse and Slaughter 2005). The bluffs are dissected by creeks that have incised ravines and now drain into the Puget Sound. During historic development of the beach, the bluffs were cut back and the spoils were used to widen and elongate the beach. Today, the beach is mapped by geologists as artificial fill (Schasse and Slaughter 2005). Geotechnical investigations carried out for the project, along with geoarchaeological investigations at the north end, show that fill varies between 5 and 15 feet thick (Morton et al. 2009; Willis 2005). A small, unnamed creek that once flowed across the beach has been channelized and runs through a culvert. Any alluvial fan associated with the creek is buried by the fill in the central portion of the project area. The original narrow beach in the project area was not part of the tidal flat at the mouth of Chimacum Creek. The tidal marsh formed as a result of deposition from the creek and did not reach the project area.

Historic photographs of the Irondale Iron and Steel Plant show that the property was completely stripped of vegetation while the plant was in operation; grasses and mixed herbs presently

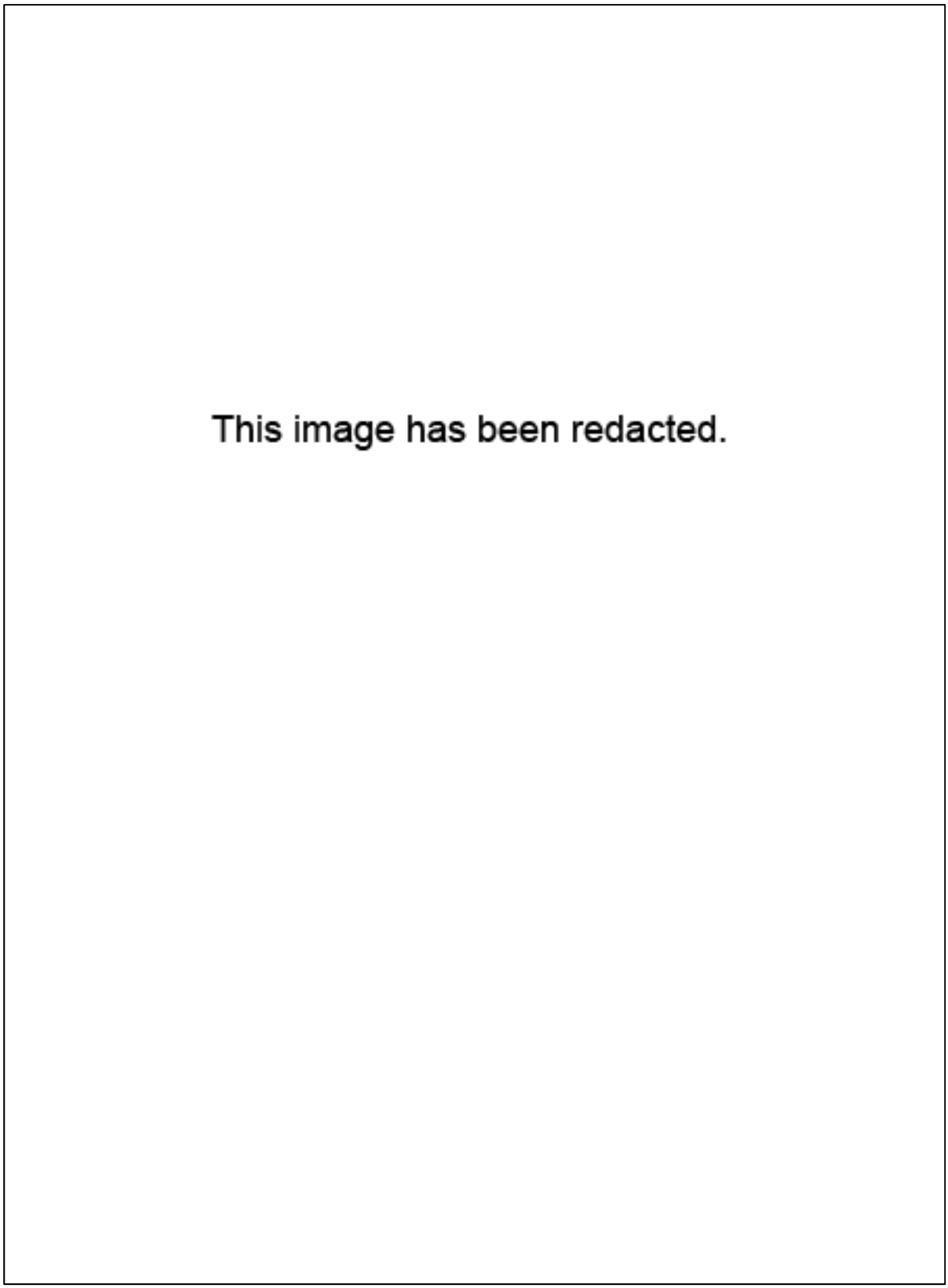

Figure 3. U.S. Coastal Survey map, 1856, showing Irondale project area and village to north.

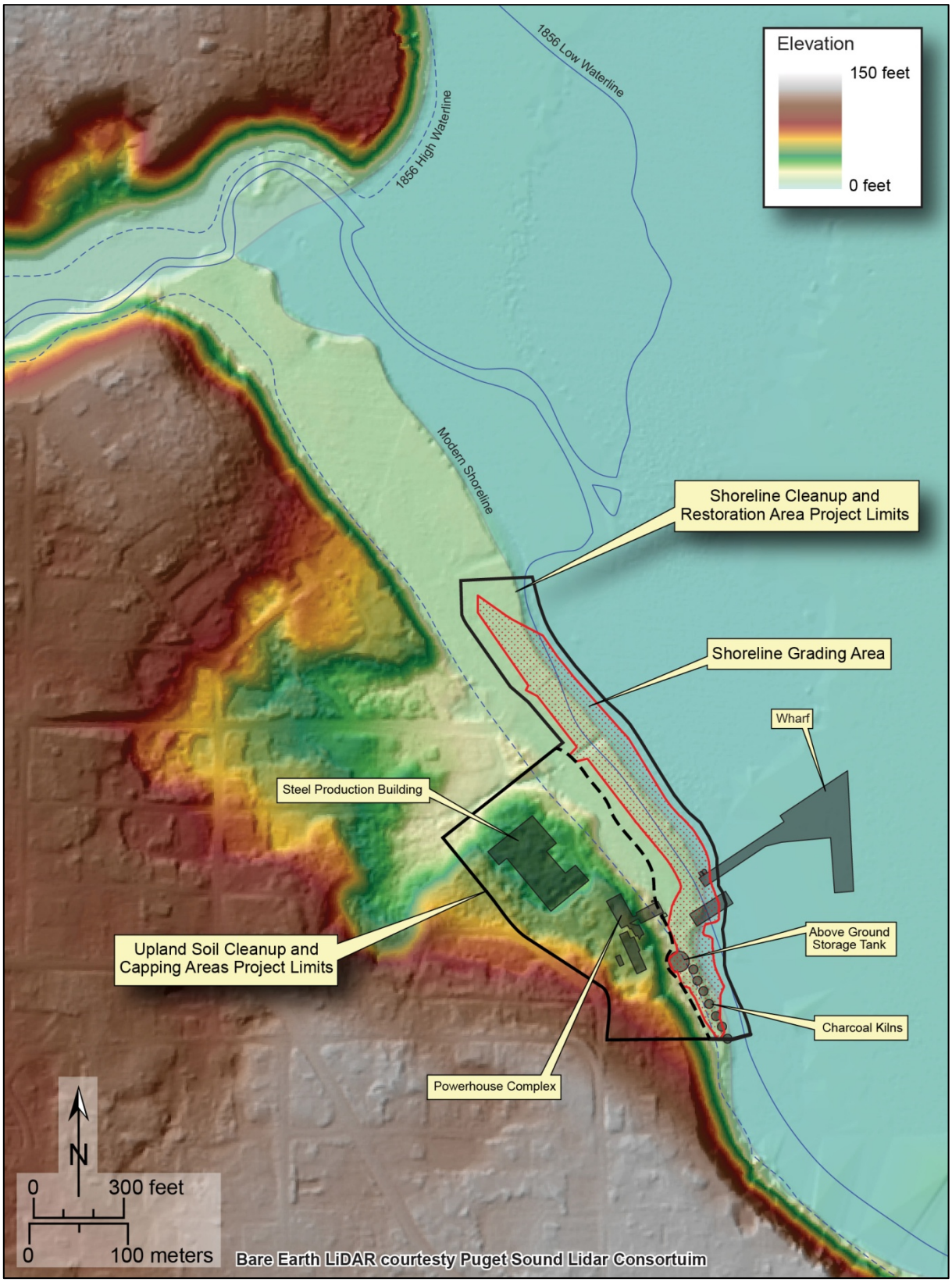

Figure 4. Profile of bluff in project area.

cover the low-lying areas in the eastern portions of the project area and alder, maple and scattered Douglas fir, with a thick understory of shrubs, Himalayan Blackberry vines, and forest duff cover the upland areas.

Native Americans in the Project Vicinity

The project area is located within the Chemakum traditional territory, which extended from the mouth of Hood Canal to Port Discovery Bay (Elmendorf 1990). At contact, the Chemakum were a small group whose language was similar to Quileute, people associated with the Pacific Coast south of Cape Flattery. At the time of contact, these groups were separated by the Makah and the Clallam (Castile 1985; Eels1996), an indication that the Chemakum language may have been more widespread in the past (Elmendorf 1990).

A large village, *Tsets-i-bus* was reported to be a village in the vicinity of [redacted] and a gathering place for area groups. The village, said to be surrounded by a stockade, was variously said to be [redacted] (Castile 1985; Eels 1996; Elmendorf 1990). Remains of a village at [redacted] were associated with Clallam people, including Lahanim, also called Prince of Wales and a son of the great Clallam leader Chetzemoka. A final Clallam potlatch was held at the village in 1891 (Hansen and Stump 1974 cf Willis 2005).

The Chemakum were described as hostile and involved in skirmishes with surrounding groups. Eels and Elmendorf describe a raid on a Chemakum stockade village (Castile 1985; Eels 1996; Elmendorf 1990). Warfare, along with epidemics such as smallpox that decimated the native population, took its toll. In 1877 the group counted 90 people, but by 1887 apparently only 10 remained (Gibbs 1877; Castile 1985).

The 1856 U.S. Coast Survey that mapped the Port Townsend Bay and Hadlock Bay areas, showed a village situated at [redacted]. The map shows a cluster of linear and circular structures seemingly surrounded by a fence-like boundary, possibly a stockade (Figure 3). By 1859, when Swan visited [redacted] area, he saw an active sawmill on the site and gave no account of a village (Swan 1971). Historic photos from the early part of the 20th century show five Native Americans, the Hicks family, later identified as Suquamish, at [redacted] where small houses can be seen in the background (Torka's Studio 1914)

Native people in the Port Townsend Bay area would have followed a seasonal pattern of resource gathering that combined fishing, inland hunting and gathering (Blukis-Onat 1976; Elmendorf 1990). Villages like the one at [redacted] were situated close to fisheries resources which in the Puget Sound region included all five species of salmon, as well trout, halibut, flounder, herring, sturgeon, dogfish, and rockfish available in the surrounding waters (Blukis Onat 1976). Like other Northwest groups, the Chemakum made use of ocean-going canoes to explore the surrounding coastline and bays, engaged in fishing and in gathering littoral resources such as clams, mussels, oysters, scallops, and other shellfish. Black tail deer, black bear, elk, river otter, raccoon, mountain beaver and hare, provided furs, skins, and food. Waterfowl were also important sources of food and down. While the village was the primary occupation site, throughout the food-gathering round, small temporary camps were made in inland areas when berries, nuts, and other useful plants came into season.

When the Chemakum signed the Treaty of Point No Point in 1855 they were assigned to the Skokomish Reservation, however, few of the Chemakum moved to the Skokomish Reservation and by the early twentieth century the Chemakum appear to have been assimilated into the

neighboring Clallam and Twana communities (Elmendorf 1990; Ruby and Brown 1992). The 1856 U.S. Coast Survey map of Port Townsend and Admiralty Inlet shows the location of an Indian Village [redacted]. Ethnographers who conducted interviews with Native peoples around the mouth of Hood Canal and Port Townsend Bay in the late 1800s reported that a single village named C'ic'abus was located [redacted] and that the village was surrounded by a stockade (Elmendorf 1990), however, it is unclear whether this place name described the village at [redacted]. Historic photographs indicate that Native Americans continued to inhabit coastal areas around [redacted] into the early twentieth century.

Historic Development of the Irondale Iron and Steel Plant

Following the discovery of bog iron in the Chimacum Valley in the 1870s, the Puget Sound Iron Company initiated the start of the iron-making industry in the Washington Territory by developing the townsite of Irondale and building blast furnace and associated facilities to process the iron ore (Britton and Britton 1983). The Irondale Iron Plant operated sporadically in the 1880s and was unexpected shut down at the end of 1889. In 1901, the plant was reopened by the Pacific Steel Company, which expanded the production capacity of the original plant and prepared to produce steel. Following the death of the Pacific Steel Company owner, the plant was closed again in 1904. In 1906, the plant was acquired by the owner of a large investment company who set about modernizing the iron production facilities and expanding into steel production. Beginning in 1909, the Steel Production Plant was constructed northwest of the original Powerhouse and Iron Casting facilities. Construction of the Steel Production Building and equipment required extensive excavation to prepare the grade for the poured concrete and masonry foundations that supported the superstructure, furnaces, and rolling mills required to produce the finished steel.

While work proceeded on the steel plant, the Irondale Steel Company hired a dredger to fill upwards of 100 acres of tidelands along the waterfront from the Irondale plant to the mouth of Chimacum Creek to serve as a waterfront storage yard for raw materials and finished products. The Irondale Steel Company was reorganized into the Western Steel Corporation in 1910 and steel production peaked that winter, however, in October 1911 one of the largest holders of Western Steel Corporation debt filed a petition for the involuntary bankruptcy of the corporation and the Irondale Iron and Steel Plant was forced to shut down again. In January 1914, the Irondale Plant was sold to the Pacific Coast Steel Company, which disassembled the steel production equipment and relocated them to its Youngstown Steel Plant in Seattle. The Irondale Iron Plant was reopened briefly at the beginning of World War I to produce pig iron, however, in 1919, when its raw material supplies were exhausted, the Irondale Iron Plant was shut down for the final time, the remaining facilities were demolished, and the associated machinery was sold for scrap.

Previous Investigations

The project is within the boundaries of the Irondale Iron and Steel Plant site (45JE358, the major component of the Irondale Historic District (DT128), which is listed on the National Register of Historic Places (Smith 2011a; Stalheim 1983a), and. The project [redacted] of an ethnohistoric Native American village recorded as 45JE277 at [redacted]

Archaeological testing completed by Willis (2005) for fill removal and restoration of Washington Department of Fish and Wildlife lands between [redacted] identified isolated Native

American artifacts in historic fill and beach sand deposits (Figure 5). The artifacts, now grouped as 45JE285 and 45JE286, were determined to have been deposited by wave action and did not represent activity in an occupation or village site. The artifacts are small, water-worn lithic flakes, one of which was found in levels where bottle glass also appeared. They were found in comingled fill and beach sand and in an underlying layer of beach sands that contained fragments of shell and gravel indicating it may actually be hydraulic dredge fill. Monitoring for completion of the restoration project identified two east-west rows of pilings (45JE289) [redacted]. No additional cultural resources were found during monitoring (Sharley 2006a, b) (Figure 5).

Another identified site, the Irondale Jail (45JE103), a component of the Historic District, is located north of the Iron and Steel Plant and outside of the current project area. It was constructed in 1911 and when recorded in the 1980s, it was found to be in a dilapidated condition (Stalheim 1983b). In 2006 a riprap bulkhead was placed below the slope to provide protection for the site.

In 2010, Northwest Archaeological Associates, Inc. (NWAA) conducted a conditions assessment of the remains of the Irondale Iron and Steel Plant and prepared an archaeological site form for the property (Smith 2011a, 2011b). The site form was updated during archaeological monitoring of contaminant sampling (Smith 2011c). A total of 69 historic archaeological features were recorded during the conditions assessment and NWAA archaeologists relocated nearly all of the features documented in the 1983 (Figure 6). In addition, they also recorded a poured cement slab that once supported the Weighing House, and a series of pilings and milled timbers associated with the wharf, charcoal and coke warehouse, bulkheads and cribbing within the intertidal zone along the waterfront. It is likely that additional structural elements and historic debris associated with the wharf complex, and other components of the working waterfront at Irondale are located in the subtidal zone. Although a combination of natural processes and human activities have affected the physical condition of some portions of the Irondale Iron and Steel plant in the 27 years since these properties were initially documented, these components continue to contribute to the eligibility of the Irondale Historic District.

Iron and Steel Plant Components, Activity Areas and Associated Features

Pedestrian survey of the project area revealed the remains of at least six buildings and 69 associated features involved in the operation of the Irondale Iron and Steel Plant (Figure 6, Table 1). An archaeological site form describing these features was submitted to the DAHP and the site number 45JE358 was assigned to the remnants of the Irondale Iron and Steel Plant (See Appendix B). While four of the features described in 1983 could not be relocated, an additional 17 features that were not identified during the 1983 survey were described in 2010. The following sections describe each of the identified plant components and its associated features.

Stock House, Blast Furnace and Iron Casting House

According to historic photos, the Stock House was along the shoreline at the west end of the wharf and the Blast Furnace and Iron Casting House were built on a terrace midway up the bluff. Iron ore, limestone flux and charcoal or coke were mixed in the Stock House and transported to the Blast Furnace via an elevator and bridge.

The poured concrete foundation of a water tank was located near the southeast corner of the Stock House and a small portion of the masonry foundation that supported one of the hot stoves

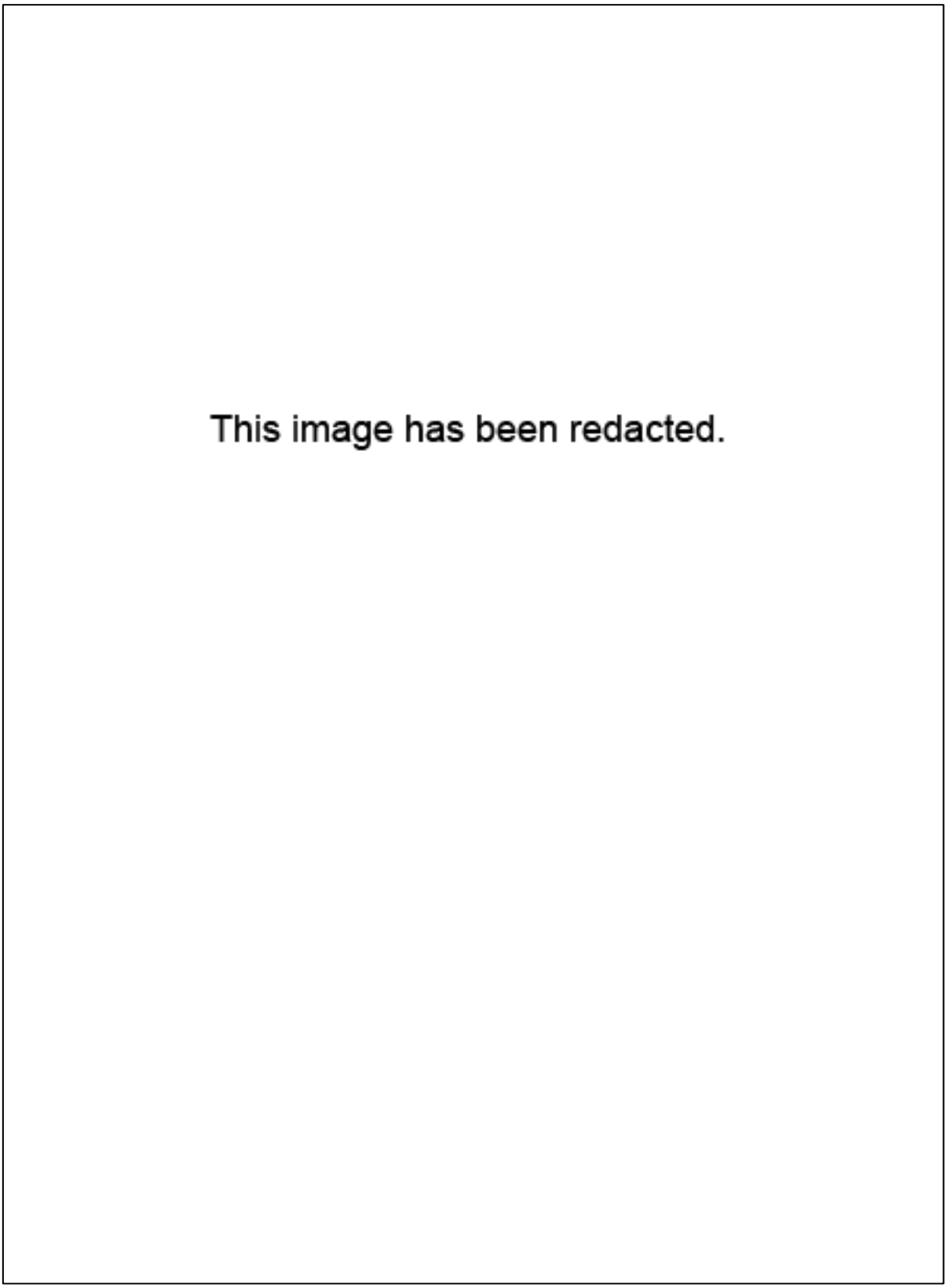

Figure 5. Project area and WDFW project testing area.

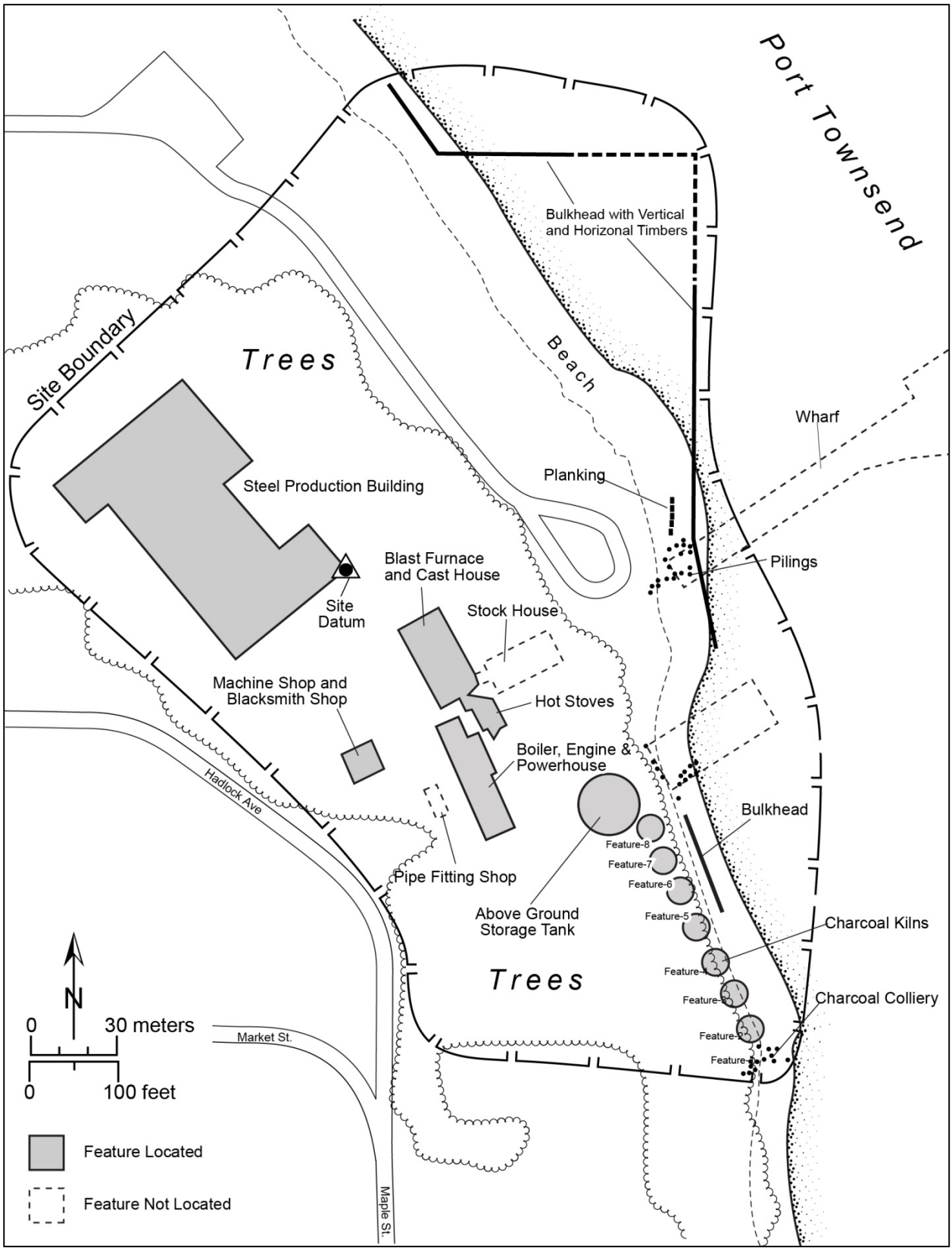

Figure 6. Irondale Iron and Steel Plant Historic District conditions in 2010.

Table 1. Adverse Effects to Irondale Iron and Steel Plant Resources

PLANT COMPONENT	IDENTIFIED /POSSIBLE FEATURES	SURVEYED FEATURES	RECORDED		POTENTIAL EFFECTS
			1983*	2010	
Iron Cast House (1881-1919)	Blast Furnace	Rubble Pile	X	X	Grubbing , capping
	Hot Stoves	Foundation L	X	X	Grubbing, capping
	Building Foundations	-	-	-	?
	Casting Troughs	-	-	-	?
	Cinder Conveyor	-	-	-	?
Engine House (? - 1919)	Machinery Foundations	Blower Engine Foundation A	X	X	Grubbing, capping
		Foundation B	X	X	Grubbing, capping
		Foundation H	X	X	Grubbing, capping
Electric Power House (? - 1919)	Machinery Foundations	Foundation C	X	X	Grubbing, capping
		Foundation D	X	X	Grubbing, capping
		Foundation E	X	X	Grubbing, capping
		Foundation F	X	X	Grubbing, capping
		Foundation G	X	X	Grubbing, capping
Boiler House (? - 1919)	Unknown	Foundation I	X	-	Grubbing, capping
	Unknown	Foundation J	X	-	Grubbing, capping
Unknown Building	Unknown	Foundation K	X	-	?
Machine Shop	Building Foundations	-	-	-	No planned actions in this area
	Machinery Foundations	-	-	-	No planned actions in this area
Blacksmith Shop	Building Foundations	-	-	-	No planned actions in this area
	Forge	-	-	-	No planned actions in this area
Pipe Fitter Shop	Building Foundations	-	-	-	No planned actions in this area
	Machinery Foundations	-	-	-	No planned actions in this area
Steel Production Building (1909-1914)	Charging Aisle	Smokestack Base (3)	X	X	Grubbing, capping
		Regenerator Area Foundations (7)	X	X	Grubbing, capping
(1910-1914)	Open-hearth Furnace Area	Open Hearth Furnace Foundations (11)	X	X	Grubbing, capping
		Ingot Pouring Aisle Foundations	X	X	Grubbing, capping
(1910-1914)	Electric Crane	Base of Crane	X	X	Grubbing, capping
		Continuous Reheat Furnace Foundation	X	X	Grubbing, capping
		Unidentified Foundation #1	X	X	Grubbing, capping
		Lifting Table (2)	X	X	Grubbing, capping
(1910-1914)	22-inch Mill	Corliss Engine Base	X	X	Grubbing, capping
		Mill Pit	X	X	Grubbing, capping
		Flywheel Pit	X	X	Grubbing, capping
		22-inch Mill Foundation	X	X	Grubbing, capping
(1910-1914)	Rolling Mill Complex (Western Portion)	Billet Shears	X	X	Grubbing, capping
		14-inch Rolling Mill	X	X	Grubbing, capping
		Flywheel Pit	X	X	Grubbing, capping
(1910-1914)	Rolling Mill Complex (Eastern Portion)	Conveyor (to Cooling Bed)	X	X	Grubbing, capping
		Cooling Bed	X	X	Grubbing, capping
		Corliss Engine Base	X	X	Grubbing, capping

Table 1. Adverse Effects to Irondale Iron and Steel Plant Resources

PLANT COMPONENT	IDENTIFIED /POSSIBLE FEATURES	SURVEYED FEATURES	RECORDED		POTENTIAL EFFECTS
			1983*	2010	
		9-inch Rolling Mill	X	X	Grubbing, capping
	Northwest Corner of Plant	Unidentified Foundation #2	X	X	Grubbing, capping
		Unidentified Foundation #3	X	X	Grubbing, capping
		Unidentified Foundation #4	X	X	Grubbing, capping
Stock House	Building Foundation	-	-	-	No effect
	Elevator	-	-	-	No effect
	Ore Conveyor	-	-	-	No effect
	Bridge	-	-	-	No effect
	Water Tank	Foundation Wall	X	-	No effect
Above Ground Fuel Tank (1909-1919)	Steel-Lined Concrete Tank Walls	Concrete Tank Walls	X	X	Demolition
Scrap Shears	Foundation	-	-	-	Grading, grubbing, capping
Skull Cracker	Foundation	-	-	-	Grading, grubbing, capping
Working Waterfront	Wharf	Piling Alignments	-	X	Excavation, fill, grading
	Weigh House	Concrete Foundation	-	X	Excavation, fill, grading
Charcoal Production Facilities (1884-1910)	Bulkhead	Wood Pilings and Planking	-	X	Excavation, fill, grading
	Charcoal Colliery (Reportedly 20 Kilns in 2 Lines)	Pilings (Feature 1)	-	X	No action in this area
		Kiln Foundation (Feature 2)	-	X	Partial fill, grading
		Kiln Foundation (Feature 3)	-	X	Partial fill, grading
		Kiln Foundation (Feature 4)	-	X	Partial fill, grading
		Kiln Foundation (Feature 5)	-	X	Partial excavation , fill, grading
		Kiln Foundation (Feature 6)	-	X	Excavation, grading
		Kiln Foundation (Feature 7)	-	X	Excavation, grading
		Kiln Foundation (Feature 8)	-	X	Excavation, grading
	Charcoal/Coke Storage Warehouse	Piling Alignments	-	X	Excavation, slag removal
Tideland Fill 1881- ca. 1918	Slag Disposal Area	Stratified Slag Deposits Welded Slag Deposit	-	X	Excavation, grading, fill
	Bulkhead	Horizontal Logs and Timbers	-	X	Excavation, grading, fill
Tideland Fill (1910)	Sediment Retaining Wall	Wood Pilings and Planking	-	X	Excavation, grading, fill
		Dredge Sediment Deposit	-	X	Excavation, grading, fill
Vessel Remains	-	Vessel Hull Fragment	-	X	Excavation, grading, fill

* HAER (Britton and Britton 1983)

was identified during the 1983 survey. While one of the hot stove foundations was relocated in 2010, no additional features associated with the Blast Furnace, Casting House or Stock House, including the water tank foundation described in 1983, were identified during the 2010 survey.

Bricks, both whole and fragmentary, as well as slag and other historic debris were found around the Blast Furnace, Casting House and Hot Stoves locations. Foundation elements associated with these buildings are present at the Hot Stoves and may be present beneath the rubble and historic debris at the Blast Furnace. In addition, the hillslope west of the Stock House appears to be very unstable and mass wasting of the hillside may have covered portions of the Stock House foundation as well as the adjacent water tank foundation since it was recorded in 1983.

Engine House and Electric Power House

The Engine House and Electric Power House were both in a long open building south of the Blast Furnace and Iron Casting House. Three foundations (Foundations A, B and H) from the Engine House were found at the north end of the building footprint and five concrete foundations (Foundations C-G) were relocated at the site of the Electric Power House at the south end of the building footprint. The most prominent of these features is the Blower Engine base and flywheel pits (Foundation A) in the northwest corner of the structure (JCHS 2005). The Blower Engine base is composed of masonry bricks and the flywheel pits are masonry lined. Four large bolts, each measuring three inches in diameter and at least 8 feet in length are between the two flywheel pits. Two other foundations (Foundation B and H) were also relocated on the west and south sides of the Engine House. The arrangement of foundation features (Foundations C-G) within the Electric Power House footprint closely matches the arrangement of machinery shown in a 1910 photograph of this activity area.

With the exception of the Blower Engine foundation, comparison with the 1983 photographs showed that the physical integrity of all of the features identified within the Engine House and Electric Power House had not changed since they were recorded. When the Blower Engine base and flywheel pits were recorded in 1983, the brick and mortar masonry base of the foundation was crumbling and the bolts that anchored the Blower Engine to the masonry base were all bent to the west, most likely during the removal of the Blower Engine. Damage to brick and mortar lining of the west flywheel pit and a saw cut mark near the center of the southwest bolt observed in 2010 indicate that looters, likely seeking scrap metal from around the site, had unsuccessfully attempted to remove all or a section of the southwest bolt. The surface in the southern half of the Engine House and Electric Power House footprint is covered with a dense layer of invasive English ivy that completely obscures the Electric Power House features.

Boiler House

According to historic photographs, the Boiler House was constructed adjoining the north side of the Engine House and contained a bank of three boilers (JCHS 2005b). A small section of a brick and mortar masonry foundation (Feature I) was recorded in 1983, however, this feature was not relocated during the 2010 field survey.

Pipe Fitter's Shop, Machine Shop, and Blacksmith Shop

Historic photographs of the Iron and Steel Plant show a series of small buildings west of the Power House Complex and Iron Casting House that are described as a Pipe Fitter's Shop, Machine Shop and Blacksmith Shop (Unknown 1910:52). Another building, of unknown function, was north of the Casting House prior to 1910. This building is most clearly visible in a 1909 photograph taken during the construction of the open hearth furnaces in the Steel Production Building. Surface reconnaissance conducted in 1983 and in 2010 failed to identify any traces of these structures.

Onsite Charcoal Production Facilities

The remains of seven of the original twenty charcoal kilns were located along the shoreline during the 2010 survey. These features were not described during the 1983 HAER project. When the charcoal production facilities were completed, the kilns appear to have been built in two rows with an estimated 13 set in the east row, and the remaining kilns placed as space allowed on the west side of the first row. Historic photographs of the charcoal production facilities suggest that wood was transported along a piling-supported walkway that ran between the two rows of kilns and was fed into the kilns via hatches near the top (JCHS 2005c). After

the load was fired, the finished charcoal was removed through doors located at the base. At least one warehouse appears to have been built on piers along the waterfront to store the finished charcoal. When the above ground portions of the charcoal kilns were demolished to increase the size of the waterfront storage yard, it appears that much of the demolition debris was pushed into the intertidal area and at least seven of the kiln foundations were left in place. Mass wasting along the bluff may be obscuring portions of the west line of charcoal kiln foundations.

Above Ground Fuel Storage Tank

The outer, concrete wall of the 6,000 barrel above ground fuel storage tank installed in 1910 is present at the base of the hillslope along the shoreline. This tank was constructed with steel reinforced concrete and was originally lined with steel. A small hole has been punched in the east side of tank near the base of the concrete wall to prevent rainwater from collecting in the tank. Between 1983 and 2010 an 8 foot section of the concrete wall on the northeast side was removed, presumably to allow access. The inside walls of the concrete tank are now covered with graffiti. This tank was constructed in an area that once housed several charcoal kilns and it is possible that the foundations of these or other charcoal production facilities may be present beneath the above ground storage tank.

Steel Production Building

The Steel Production Building was a sprawling complex that extended at least 300 feet (North to South) by almost 190 feet (East to West). This building was divided into at least seven activity areas in which different steps in the steel making process were performed. The Charging Aisle, located on the south end of the structure was where iron, flux and scrap steel were fed into three open hearth furnaces. The molten steel was removed from the furnaces and shaped into ingots along the Ingot Pouring Aisle. The ingots were reheated in a continuous reheat furnace before being run through a 22-inch Rolling Mill. A 14-inch Rolling mill and 9-inch Rolling Mill were subsequently used to further reduce the size of the steel and the finished steel bars were left to cool on three different cooling beds. All of the features identified in the remains of the Steel Production Building during the 1983 HAER project were relocated during the 2010 survey.

Charging Aisle, Open-Hearth Furnace and Ingot Pouring Aisle

The boundaries of the Charging Aisle, Open-hearth Furnace, and Ingot Pouring Aisle areas are defined by a continuous pour concrete retaining wall that also marks the south end of the Steel Production Building, and the masonry foundations along the north side of the Ingot-Pouring Aisle. Although the superstructure of the Open-Hearth Furnace was removed when the building was demolished, the foundations that supported the furnace facilities are mostly still visible. Beginning at the south side of this area, three large smokestack foundations area present along the south side of a tall concrete retaining wall. Each is marked by a round vertical shaft that terminates approximately fifteen feet below top of the foundation in a clean-out hole accessible through the south wall of the Steel Plant Building foundation. A series of thirteen masonry piers supported the Charging Aisle, and sixteen brick and mortar masonry piers supported the weight of three open hearth furnaces. Only seven of the Charging Aisle piers and eleven of the Open Hearth Furnace foundations remain standing and several of these have been tagged with graffiti. Comparison of the 1983 and 2010 overviews reveals little change in the physical integrity of the concrete, and brick and mortar foundations in this section of the plant. While almost half of the Ingot Pouring Aisle foundation walls remain intact, portions of the footings in the east, central and west sections have collapsed.

Rolling Mills, Shears and Cooling Bed

The masonry foundations that define the extent of the 22-inch Rolling Mill and the Billet Shears are largely intact, however the masonry foundations of the Corliss Engine Base were pushed apart by tree roots in the years since they were recorded in 1983. The prominent concrete-lined mill pit, lifting table pits, and flywheel pit remain open and the walls of these features are stable. Similarly, the concrete and masonry features within the 14- and 9-inch rolling mill complex in the northeast corner of the Steel Production Building area are largely unchanged since they were recorded in 1983. The brick and mortar masonry walls along the edges of the Cooling Bed are intact, however, the eastern sections of this structure are heavily overgrown with maple trees and other vegetation.

Waterfront Features

The Irondale Iron and Steel Plant relied on its waterfront location to move raw materials to the plant and to transport finished products to distant markets. When the Irondale Iron Plant was built in 1881, a simple pier supporting a narrow gauge rail was sufficient to provide for plant operations, however, the waterfront was modified as the plant increased it production capacity and expanded into steel production. For example, the addition of onsite charcoal production required additional square footage along the waterfront; the increasing capacity of the blast furnace required larger stockpiles of raw materials and storage areas for finished products; and the larger ocean-going vessels needed to transport raw materials and finished products required appropriate loading and unloading facilities. These needs were met through bulkhead construction, filling of the tidelands and the construction of storage warehouses and a series of piers and wharves.

Tideland Filling Features

A series of three features related to the development of the Irondale Iron and Steel Plant facilities along the shoreline were identified within the intertidal zone during the 2010 survey. None of these features were described in the 1983 HAER report. Historic photographs taken of the Irondale waterfront the late 1800s and early 1900s illustrate different episodes in the development of this portion of the plant, clarify the sequence of tideland filling and the function of the various features associated with these episodes.

Charcoal Production Facilities Bulkhead (1884-1910)

Between 1884 and 1910 a bulkhead composed of vertical piling and stacked horizontal planks and logs extended along the Irondale waterfront from the south end of the charcoal kilns to the north side of the Irondale Iron Plant wharf. A photograph of the southern portion of the Irondale waterfront in 1901 shows that cobble and boulder size ballast rock was used to further armor the seaward side of the bulkhead. Inspection of the intertidal zone east of the charcoal kiln foundations revealed the remnants of an alignment of vertical wood pilings and horizontal and vertical wood planks that marks the eastern extent of the bulkhead built on the seaward side of the charcoal kilns.

Slag Disposal Area

Slag generated by the Irondale blast furnace was gradually used to fill an area south of the wharf. In preparation for filling this area, a stacked log bulkhead was built directly south of the wharf and both granulated and coarse-grained slag material, as well as other production waste was dumped at this location. The slag disposal area and stacked log bulkhead are visible in the bottom left corner of at 1901 photograph of the west end of the wharf. Cross sections of the

uppermost slag deposits exhibit cross-bedding representing discreet episodes of deposition as slag was periodically removed from the blast furnace during its operation. Along the east edge of the granulated slag deposits, NWAA archaeologists mapped horizontal logs and the remains of vertical pilings partially buried in intertidal sediments that are the remains of the log bulkhead that defined the eastern extent of the slag disposal area.

1910 Tideland Fill Area and Associated Features

In March 1910, the Western Steel Corporation proposed to fill a 1300 foot strip of tidelands north of the Irondale wharf and contracted the dredger Tacoma to complete the project. In preparation for the dredging and filling, cribbing built with rows of vertical pilings, milled timber cross members, horizontally stacked timbers, and buried deadman pilings and logs was installed along the east side of the proposed fill area to contain the dredge sediments. (JCHS 2005d, 2005f). During a series of low tides the remnants of between two and five rows of vertical pilings braced with milled timber cross members and backed with horizontally stacked timbers were recorded along an alignment extending over 425 feet (130 meters) north of the remains of the wharf and beyond the northern boundary of the current project area. This feature marks the eastern boundary of the 1910 fill area.

Waterfront Wharves and Warehouses

A single wharf with a short frontage and hopper for loading rail cars was built along the waterfront when the Irondale Iron Plant was built in 1881 (JCHS 2005e). A Weigh House with scales to measure the weight of incoming ore, scrap metal and flux was also situated at the west end of the wharf. During the 1910 expansion of the Irondale waterfront, the wharf was rebuilt and extended to 600 feet with a frontage of 400 feet. Narrow gauge rail lines were extended along the frontage to facilitate the unloading of ocean-going steam ships. After 1910, ore was offloaded from steamships into a series of hoppers set along the face of the wharf and was then measured out into narrow gauge rail cars that hauled the ore to the Stock House. In addition to supporting the plant operations, the Irondale wharf was the landing point for passenger ferries such as the *Chippewa*, and *SS Hyak* (JCHS 2004, 2010). Historic photos show additional narrow piers and covered structures set on pilings over the tidelands perpendicular to the shoreline south of the main wharf. The southernmost structure may have housed the sawmill and log splitting machinery used to prepare wood for the charcoal kilns and the northern structure was a charcoal, and later, coke storage warehouse (Unknown 1910:52). An inclined ramp visible in one of the historic photographs that appears to link the waterfront to the walkways between the row of charcoal kilns may represent a conveyor that was added in 1901 to improve the efficiency of charcoal production. A concrete slab foundation measuring 20 feet long (North/South) by 11 feet wide (East/West) that supported the Weigh House and alignments of pilings that mark the western end of the Irondale wharf were recorded in the intertidal zone north of the slag deposits. Alignments of pilings in the intertidal zone south of the slag deposit appear to mark the location of the charcoal/coke storage warehouse east of the charcoal kilns and later above ground fuel storage tank. Examination of the intertidal zone further south did not reveal evidence of the second covered structure or additional piling supported piers or ramps.

Gridirons

In addition to the waterfront wharves and warehouses, the designers of the Irondale Iron and Steel Plant envisioned two loading/unloading areas for barges along the waterfront and a gridiron for maintaining company owned barges and scows (Unknown 1910:52). The barge loading gridirons were proposed on the north and south sides of the wharf and the maintenance

gridiron was situated along the shoreline south of the Charcoal/Coke Storage Warehouse. A photograph of the Irondale waterfront after the construction of the Steel Production Building in 1910 shows at least one of the gridirons for repairing or unloading barges along the south side of the Irondale wharf (JCHS 2005g), and other gridirons may have been built on either side of the coke storage warehouse visible on the left side of the photograph. It is unclear whether the gridiron along the face of the filled waterfront north of the Irondale wharf was ever constructed. The survey revealed little evidence of these gridirons; horizontal beams exposed near the top of the intertidal zone north of the remains of the bulkhead and south of the slag deposits may represent part of the barge repair grid or foundation cribbing for some associated structures built between the bulkhead and the coke storage warehouse.

Vessel Remains

Examination of an air photo taken in 1976 at low tide revealed parallel alignments of wood timbers immediately south of the slag disposal area. Inspection of this portion of the intertidal zone revealed milled and planed timbers with square iron nails and spikes representing the remains of a small section of a flat bottom barge or scow hull.

Subtidal Historic Features and Debris Scatters

In addition to the features identified in the intertidal zone, divers who have visited subtidal portions of the Irondale waterfront report extensive concentrations of pilings and dispersed artifact scatters over 500 feet east of the current shoreline that are likely associated with the main wharf at the Irondale Iron and Steel Plant. Additional piling alignments and debris scatters may also be found further south offshore from the charcoal production facilities.

PROPOSED ACTIONS

The objective of the cleanup action is to eliminate, reduce, or otherwise control to the extent feasible and practicable, unacceptable risks to human health and the environment posed by petroleum hydrocarbons and metals in upland soil and marine sediment at the Site in accordance with MTCA (WAC 173-340) and other applicable regulatory requirements. Details of the clean up tasks are described in the *Draft Engineering Design Report Irondale Iron and Steel Plant Irondale, Washington for Washington State Department of Ecology* (June 30, 2011) (GeoEngineers 2011b).

The remediation and restoration work will consist of tasks related to four general categories of activities: Mobilization and Site Preparation, Contaminated Soil and Sediment Excavation, Upland Environmental Capping, and Site Restoration.

Mobilization and Site Preparation

Mobilization and site preparation will consist of transporting construction equipment and materials to the site and constructing temporary controls and facilities necessary to begin construction activities. The primary access is at the east terminus of East Moore Street at an existing public access parking lot. Other access may be developed from Hadlock Avenue from the west if required for delivery of materials to the upland capping areas. Where necessary access points will be stabilized using quarry spalls or other suitable materials to minimize sediment tracking. Other related activities include designation of a construction staging area and materials management areas. Site preparation will include clearing and grubbing vegetated/forested areas in preparation for capping, debris removal, and demolition of an existing above ground concrete tank.

Contaminated Soil and Sediment Excavation

Contaminated soil and sediment will be excavated in three general areas of the Site: upland soil above the ordinary high water mark (OHW) south of the 6,000 barrel above ground concrete tank; upland soil north of the concrete tank; and marine sediment below OHW. Overburden soil will be excavated as needed to gain access to underlying contaminated soil. The excavations will be completed in a manner that allows segregation and reuse of clean overburden soil. The preliminary limits of excavation will be determined by the results of field screening. Once the preliminary limits are reached, verification soil samples will be collected for laboratory analysis from the excavation sidewalls and base. Additional excavation and sampling will be performed until complete removal of contamination has been achieved. Once excavation is completed, the area will be backfilled and compacted to create a finished surface.

Upland Environmental Capping

Upland capping will cover the power house complex and former steel production building areas (Figure 7). Vegetation will be cleared from these areas with larger trees allowed to remain in place if determined to be healthy and not impacted by site contaminants. Approximately 6 to 12 inches of sand would be placed on the cleared ground surface as a leveling layer and separated from the 2-foot thick cap by a geotextile fabric. A final 1-foot layer of topsoil would be placed as a planting substrate.

Shoreline Remediation and Restoration

Following completion of remedial excavation of the bank in the southern portion of the project, the shoreline and the adjacent uplands will be re-graded to create a more gradual and consistent intertidal slope and a net increase of beach along the shoreline. Grading will reach a maximum depth of 3-4 feet, with the greatest amount of fill being removed at the current OHW, extending the intertidal zone landward between 20-50 feet. The new OHW area will be surfaced with reclaimed sandy fill from shoreline grading, and then armored with large woody debris to protect the beach and decrease inland erosion. Areas disturbed by remedial excavation, capping, or regrading for shoreline restoration will be planted to restore of improve vegetation and wildlife habitat. Invasive species will be removed from the shoreline and native tree and shrub species will be installed south of the above-ground storage tank location. A small drainage near the northern end of the property will be restored by removing invasive species and planting with native shrub and tree species. Utilities affected by construction, grading, and planting will be restored.

PROJECT EFFECTS

Under the National Historic Preservation Act, the criteria of adverse effect are applied to determine if adverse effects to historic properties are likely to occur. The Criteria of Adverse Effect consist of 1) an adverse effect is found where an undertaking may alter the characteristics of a historic property that qualify it for inclusion on the National Register; or 2) diminish the integrity of the property's location, design, setting, material, workmanship, feeling, or association. An adverse effect can arise from natural forces, poor land management practices, or from visitor impact, looting, or vandalism in areas of public use. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative (36 CFR Sec. 800.5(1)(1).

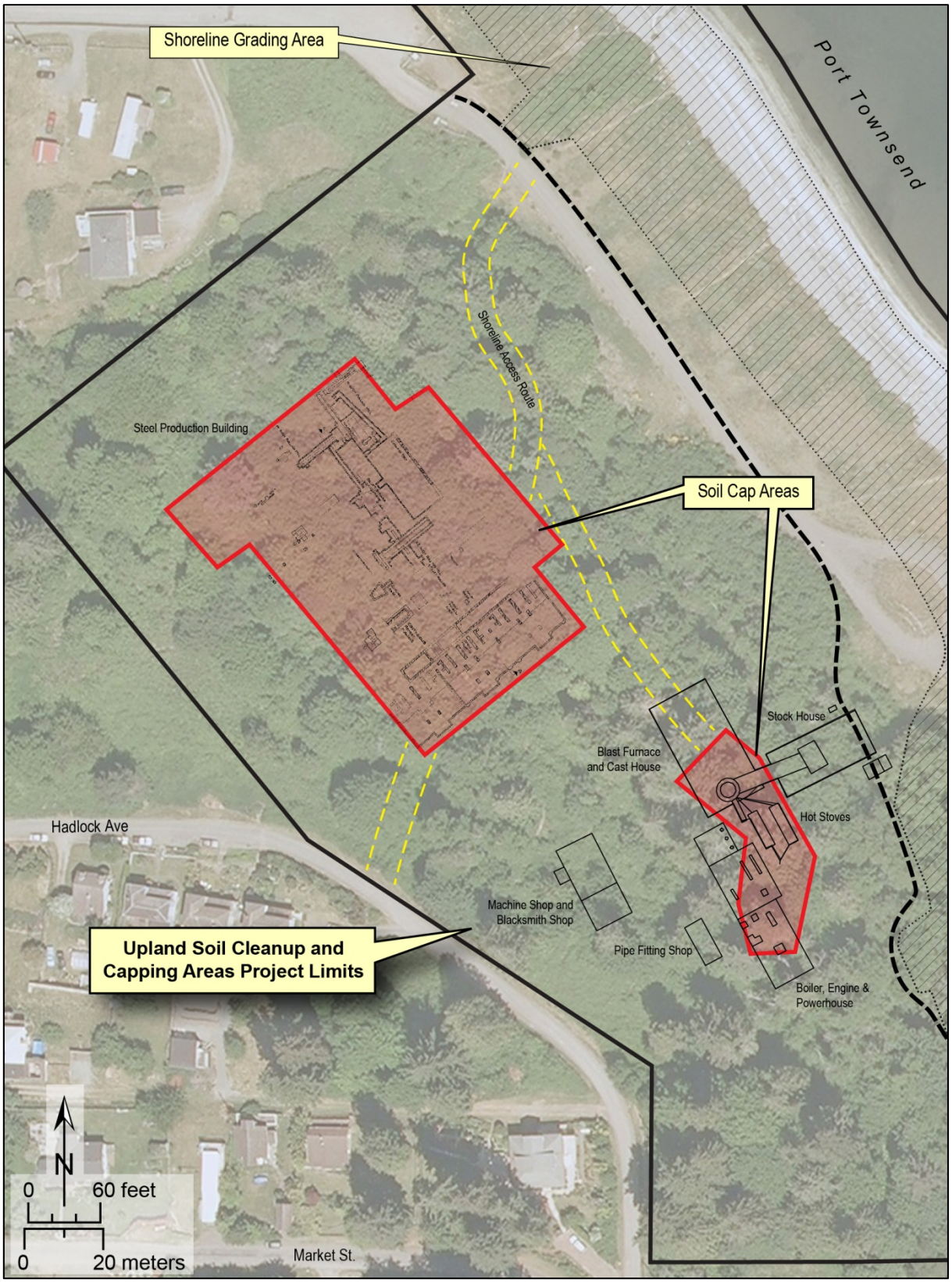

Figure 7. Upland soil cleanup and capping areas.

Ground disturbance related to excavation of contaminated sediments and slag removal, and shoreline grading, would adversely affect the Irondale Historic District (DT 128) and the Irondale Iron and Steel Plant site (45JE358) by removing, damaging, or obscuring features that contribute to National Register eligibility of the historic district. Construction would have positive benefits as well by reducing or ending shoreline erosion and providing an opportunity to identify additional features that are either obscured by vegetation or buried, e.g., the Machine, Blacksmith, and Pipe Fitting shops in the upland, additional kilns south of the above ground tank, or the pads for the Scrap Shears and Skull Cracker in the intertidal zone (Figure 6).

Excavation of slag and contaminated sediments and subsequent restoration would have the greatest potential to adversely affect historic district components. The above ground tank would be removed and excavation of adjacent sediment and slag may damage evidence of additional kilns or encounter evidence of additional activities in contaminated deposits. Remains of the existing kilns in this area, Features 5-8, would be disturbed (Figures 8 and 9).

Backfilling and environmental capping would damage the integrity of the historic district by removing features of the steel production complex and powerhouse building from view, reducing or eliminating the visual identification of their internal structures and spatial relationships. In the shoreline area, placement or excavation of fill would expose or obscure historic features, such as remains of bulwark structures and wharf pilings. Grading to compact the final surface would pose a threat to resources along the slope between the uplands and the intertidal area and along the shoreline potentially intersecting additional elements of known features and possibly damaging undocumented features or artifacts. Grubbing and clearing and preparation of haul routes have the potential to damage the architectural characteristics and materials of the known foundations.

No adverse effects to pre-contact resources are anticipated from the project due to the depth of fill in the shoreline work area and low potential for human occupation throughout the Holocene. The original shoreline in the project area was a narrow strip of beach below a steep bluff, much of which was sub-tidal and the rest intertidal (Figure 4). The narrow beach would not have been a favorable location for human occupation. In general, Puget Sound experienced sea-level rise during the Holocene and inundation was further intensified by tectonic subsidence along fault lines. The project area is less than 1 mile west of the South Whidbey Island Fault Zone and experienced such subsidence (Schasse and Slaughter 2005).

During the early 1900s, fill was placed on the beach below the bluff to extend the shoreline outward to provide additional staging and storage room for iron and steel plant operations. According to historic accounts, a cribbing structure was built along the base of the bluff, and fill was placed along the shoreline all the way to Chimacum Creek (Smith 2011b:22) (Figure 10) resulting in formation of an artificial bench beyond the original tidal zone (Figure 3). This artificial surface extends north into the “fill recruitment bench” on Washington Department of Fish and Wildlife (WDFW) lands, the area of archaeological testing in 2005 prior to beach restoration that has since been completed (Willis 2005) (Figure 5; Figures 11, 12, 13).

Geotechnical testing carried out for the Irondale cleanup project shows that the average depth of the fill in the bench area is seven feet (Morton et al. 2009). Removal of fill by grading will take place north of the sediment remediation and slag removal areas (Figure 2). Shoreline grading will remove some fill material and blend the Irondale beach into the completed WDFW project to join the restoration project areas and even out the shoreline slope. It is not expected to expose native sediments, nor encounter pre-contact cultural deposits.

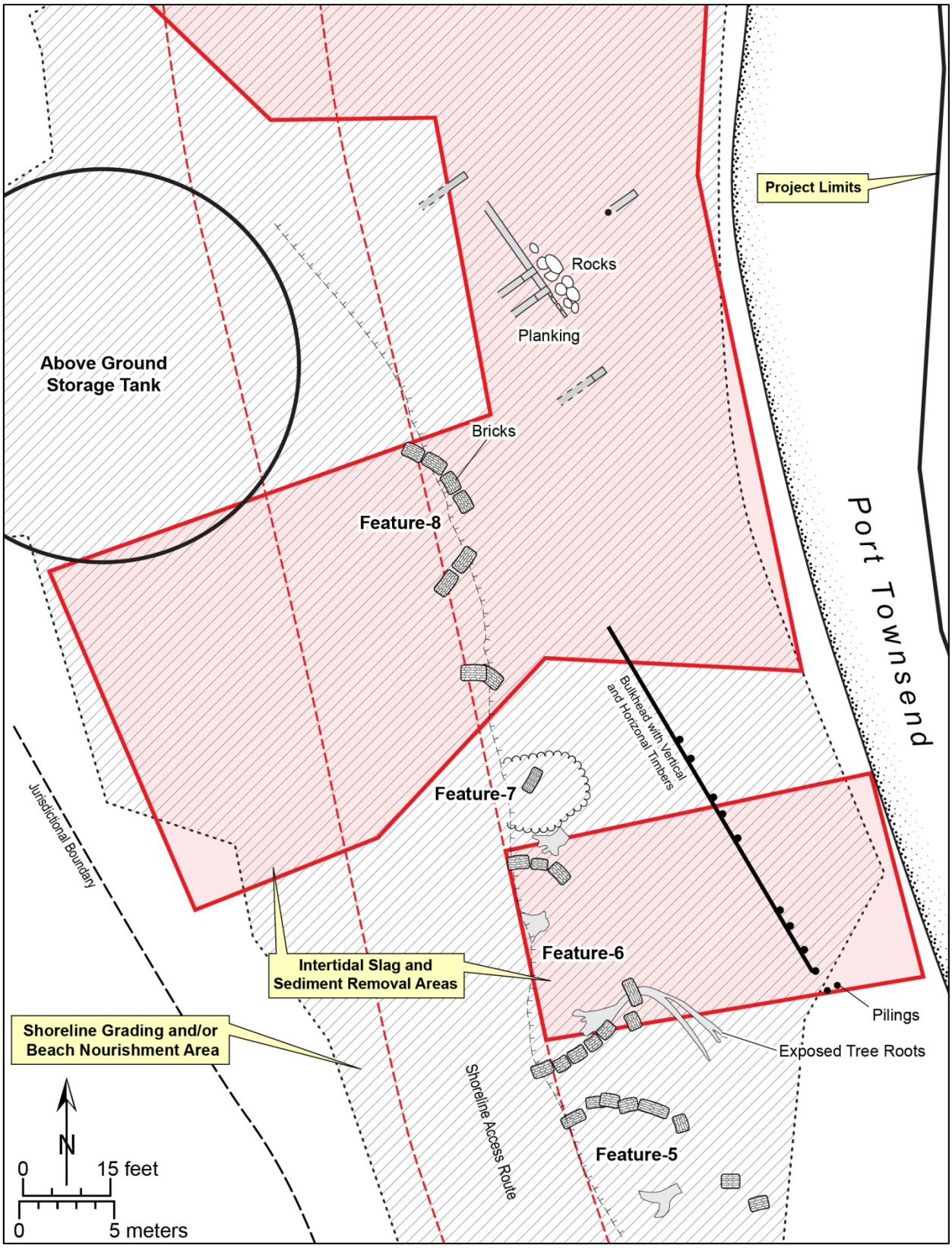

Figure 8. Charcoal kilns in area of contaminated soil and slag removal.

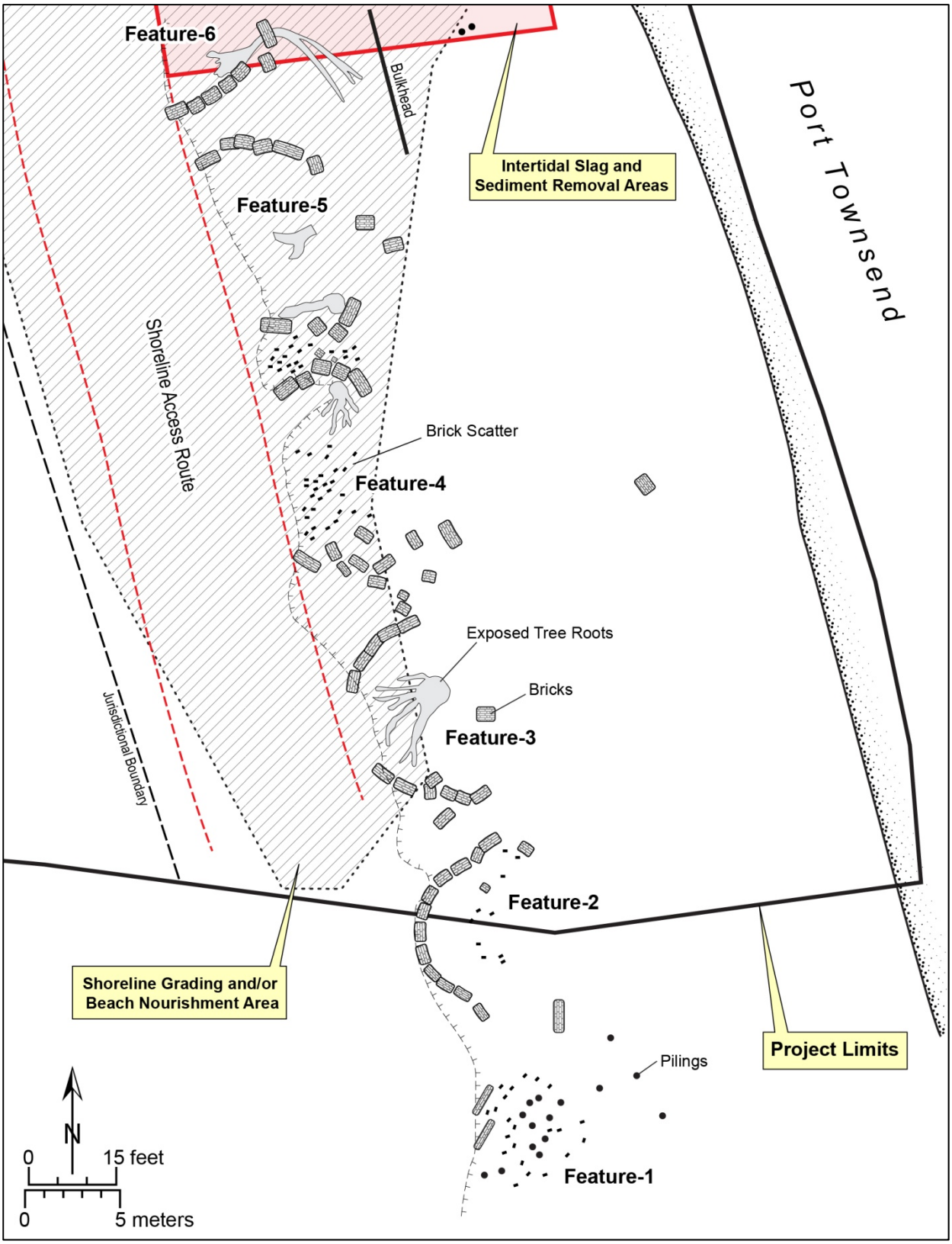

Figure 9. Charcoal kiln in area of contaminated soil and slag removal.

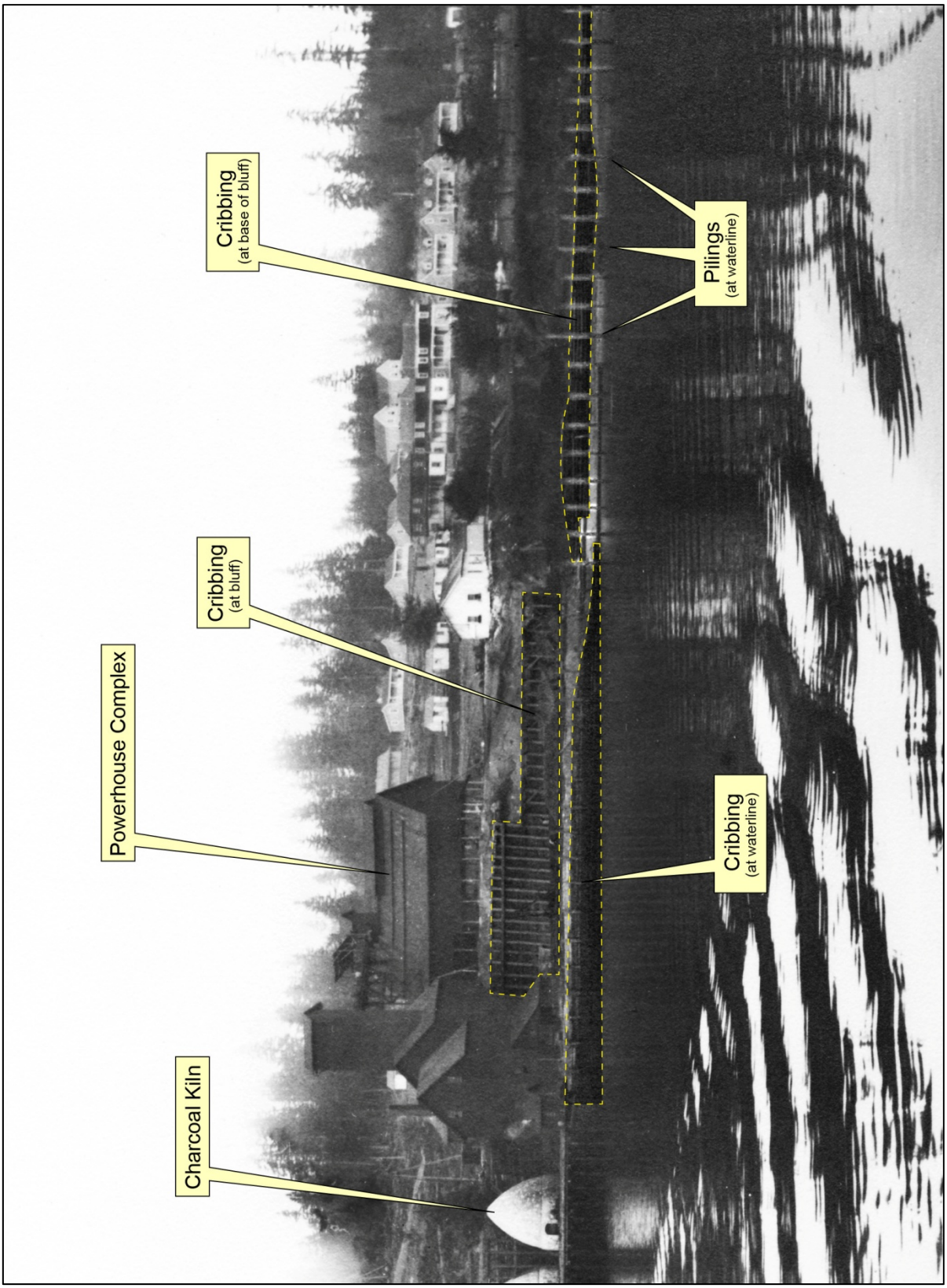

Figure 10. Cribbing under construction during filling process. (A. Curtis 433).

Figure 11. WDFW restoration project north of Irondale, in 2001 before restoration work, and in 2006 after restoration work.

Figure 12. WDFW restoration project north of Irondale, in 2001 before restoration work, and in 2006 after restoration work.

Figure 13. WDFW restoration project north of Irondale, in 2001 before restoration work, and in 2006 after restoration work.

RECOMMENDATIONS

As currently designed, effects from project construction are unavoidable, although some actions can be performed in a way that minimizes them. For others, onsite documentation before and during construction is recommended. And finally a program of mitigation is recommended for those adverse effects that cannot be avoided.

Pre-construction Documentation

Prior to any construction within the shoreline area, NWAA recommends completion of documentation of features identified in 2010. This includes recording the remains of a sunken vessel in the intertidal area as well) total station documentation of the bulkhead, warehouse piers/foundation.

NWAA recommends that prior to any work in the intertidal sediment and slag removal area, archaeologists thoroughly document the remains of charcoal kilns Features 5 through 8 (Figure 8 and 9) in the sediment and slag removal area, and then remove the northern portion of Feature 5 and all of Features 6-8, with the goal of replacing them on the new surface once work is completed.

Monitoring During Construction

To avoid or minimize damage to known or unrecorded features, a qualified archaeologist should monitor vegetation grubbing; excavation of contaminated soil and sediment and removal of slag deposits; removal of the above-ground concrete storage tank; and infilling and capping to minimize adverse impacts to project features. The archaeologist should also monitor grading that will be used to form the final slope and project surface between the upland and shoreline areas to assure avoiding damage to known and undiscovered features such as walls, foundations, bulwark sections, and pilings. The monitor will record and evaluate any features or artifacts exposed during project construction.

Damage from grubbing and clearing of vegetation can be minimized by confining access to existing routes and generally avoiding use of machinery in areas where district features are visible either in the form of standing remains or outlines and depressions that may contain subsurface resources. Within historic features, particularly within building remains, removal of vegetation should proceed with small machinery or by hand in order to avoid damaging foundation walls and other internal structures. Roots should be cut, not pulled, as they may be intertwined or imbedded in foundations and other structures. At all times, equipment should be used with caution around the historic district features, with outside direction used when backing up in close proximity to structures that could be damaged. Once grubbing and clearing of vegetation has been completed and prior to commencing the next construction activities, a qualified archaeologist should examine the exposed area to document and evaluate any newly exposed resources as well as any debris encountered during site preparation.

Once work has been completed in the intertidal sediment and slag removal area, archaeologists should replace remains of the charcoal kilns (Features 5-8) that were removed prior to construction on the surface to preserve their locations and alignment. Removal of the above ground concrete storage tank should also be monitored as remains of additional kilns or other resources may be in the area and will need to be documented.

NWAA recommends that the archaeologist also monitor backfilling and capping to minimize burial of features. The project should consider methods of capping and filling that retain the outlines of features such as tops of foundations, internal divisions and structures, visible walls and timbers, and remaining depressions and surface markers that would help to convey a sense of the form and function of the features and their relationships.

All archaeological monitoring for the Irondale cleanup work should be carried out by a professional archaeologist under the auspices of the Archaeological Monitoring and Discovery Plan (Appendix A). The plan will provide guidance for project personnel by defining communication roles, monitoring protocols, and protocols to be followed in the inadvertent discovery of archaeological or human remains.

Mitigation for Continuing and Long-term Effects to the Historic District

In addition to the above measures, NWAA recommends a mitigation program that includes ongoing adverse effects to the district that were observed during the 2010 conditions investigation (Smith 2011b). The conditions assessment report described other ongoing effects that will have long-term implications for the integrity of the historic district (Smith 2010)(Table 1). These include

- Vandalism
- Looting/scavenging (bricks or scrap metal)
- Effects of weathering
- Vegetation (penetration by roots)
- Mass wasting of hillside
- Coastal erosion

In order to protect the historic district from potential long-term or cumulative adverse effects, NWAA recommends the development of an HPMP by Jefferson County in consultation with DOE, the Corps, the Jamestown S'Klallam Tribe, the Port Gamble S'Klallam Tribe, and the Suquamish Tribe, and other interested parties. The plan should include programmatic measures that address actions related to the future development of the park as well as the management needs related to continuing and long-term adverse effects identified in conditions assessment, including vandalism, looting/scavenging (brick and scrap metal), vegetation (root penetration), mass wasting, and coastal erosion. It should also include a protocol for inadvertent discovery to guide project personnel of actions to be taken in the event that cultural resources are identified during the course of any future activities within the historic district.

Additional recommended mitigation measures include a project to search and catalog Irondale-related documents and photographs at the Jefferson County Historical Society Archives. Jefferson County might also solicit other archival materials from the public. These records and photos should be digitized for use in public history projects and should be addressed in HPMP .

Public history projects might take the form of onsite interpretation, an Irondale website, a brochure or book about the historic town and plant, and public lectures. Interpretation should include information of the historic of the town of Irondale, the Irondale Iron and Steel Plant, and should include a component related to Native American presence in the area.

Details of the interpretive program should be considered as part of development of the park and as part of a public outreach program related to preservation of the historic district in consultation with DAHP, the representative Jefferson County Historical Museum, affected tribes, and other interested parties, as well as the public.

To complete identification of other elements of the historic district, NWAA recommends that data recovery be completed, including survey of the underwater portion of the project identified in 2010. The Ironwood Jail and remaining houses should be documented to complete the HABS record. Archaeological investigation of areas within and near the historic plant and former townsite, as well as historic building recording and evaluation within the existing town of Irondale, would provide more interpretive context for the historic district and enhance understanding of its relationship to development of the town of Irondale.

CONCLUSION

Some elements of the environmental cleanup and restoration project would have adverse effects to the Irondale Iron and Steel Plant Historic District through damage or destruction to its components. To minimize and mitigate for these effects, NWAA recommends pre-construction documentation, monitoring and documentation during construction, and a mitigation program for ongoing adverse effects to the historic district. Pre-construction mitigation would complete documentation of the historic district, including those components identified in 2010 field survey Smith 2011b). Long-term mitigation recommendations include those proposed for ongoing effects that were observed during the 2010 conditions monitoring investigation.

NWAA recommends monitoring during construction for all ground disturbing activities, including grubbing and clearing, excavation, capping, and grading. Any newly discovered resources will be documented. The project engineering design plan calls for debris encountered during site preparation work to be set aside for observation and documentation by a qualified archaeologist. All construction monitoring should be done by a professional archaeologist under the auspices of the project Monitoring and Discovery Plan to be finalized in consultation between the Corps, DOE, DAHP and the Jamestown S'Klallam Tribe, the Port Gamble S'Klallam Tribe, the Lower Elwha Tribe, the Skokomish Tribe, and the Suquamish Tribe.

The DOE and ACE should continue to inform the Jamestown S'Klallam Tribe, the Port Gamble S'Klallam Tribe, and the Suquamish Tribe on the project and to coordinate with Jefferson County

The ACE has jurisdiction over the shoreline portion of the project. To complete the federal process, the Corps will need to conclude a Memorandum of Agreement (MOA) with DAHP ensuring the state concurs with the determination of adverse effects and measures recommended to resolve them.

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APPENDIX A: MONITORING AND DISCOVERY PLAN

CULTURAL RESOURCES MONITORING AND DISCOVERY PLAN FOR THE IRONDALE IRON AND STEEL PLAN HISTORIC DISTRICT REMEDIATION AND RESTORATION PROJECT, JEFFERSON COUNTY, WASHINGTON

Report Prepared for

Washington Department of Ecology
&
U.S. Army Corps of Engineers, Seattle District

By

Northwest Archaeological Associates / SWCA

March 21, 2012

CONTAINS CONFIDENTIAL INFORMATION – NOT FOR GENERAL DISTRIBUTION

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INTRODUCTION

Jefferson County Public Works plans to develop a county park in the future at the site of the Irondale Iron and Steel Plant site (45JE358), the major component of the Irondale Historic District (DT128), which is listed on the National Register of Historic Places and operated from 1881 until 1919 (Figure 1; Figure 2). (Smith 2011a; Stalheim 1983a). An incomplete cleanup of the iron and steel plant in 1919 left waste material and debris from the steel making process on site, contaminating localized areas that have been identified by Washington State Department of Ecology (DOE) through a series of investigations (GeoEngineers 2009 a, 2009b, 2011).

To assist Jefferson County Public Works in cleanup of the site, DOE is planning to carry out environmental remediation in the Iron and Steel Plant area. In addition to DOE cleanup efforts, restoration work will be carried out along the shoreline forming the western boundary of the project in order to enhance fish habitat and restore other environmental values. The objective of DOE's cleanup action is to eliminate, reduce, or otherwise control to the extent feasible and practicable, unacceptable risks to human health and the environment posed by petroleum hydrocarbons and metals in upland soil and marine sediment at the Site in accordance with MTCA (WAC 173-340) and other applicable regulatory requirements (GeoEngineers 2011b). The remediation and restorations efforts must be completed prior to development of the park.

Northwest Archaeological Associates, Inc. (NWAA) previously conducted a conditions assessment of the remnants of the Irondale Iron and Steel Plant facilities to assist the DOE in the permitting process that was required to allow additional contaminant testing (Smith 2011) and to conduct a cultural resources assessment of the proposed DOE project (Piper 2011).

The purpose of this Monitoring and Discovery Plan is to provide a coordinated program among federal, state, tribal and city governments to avoid adverse effects to cultural resources resulting from the implementation of the DOE remediation and restoration. Northwest Archaeological Associates/SWCA Environmental Associates (NWAA) was retained to develop this plan to monitor construction activities carried out for the DOE cleanup project.

Project Location and Description

The Irondale Iron and Steel Plant (45JE358) is located on an 11 acre parcel in Section 35 of Township 30 North, Range 1 West and Section 2 of Township 29 North, Range 1 West, Willamette Meridian, in Southeast Jefferson County within the boundaries of Irondale townsite (Figure 1). The Irondale Iron and Steel Plant was partially encompassed within the boundaries of the Irondale Historic District. The historic district was found eligible for the National Register of Historic Places (NRHP) in 1983 because of its association with the development of the iron and steel production industry on the west coast of North America in the late 1800s and early 1900s (NRHP 2010). It is also listed on the Washington State heritage register and the Nairtonal Park Service Historic Engineering Record (Britton and Britton 1983).

The property was acquired by Jefferson County in 2002 for use as a county park (Madrona Planning 2004). Following this acquisition, the DOE and SAIC contracted GeoEngineers to conduct remedial investigation of metal and hydrocarbon contamination on the property (GeoEngineers 2009 a, 2009b, 2011, Morton et al. 2009). Concentrations of contaminants were identified in sediment samples at several locations, including within the footprint of the former Steel Production Building and the Power House Complex in the uplands area of the project, and around an above ground fuel storage tank (AST) located near the shoreline.

Before the property can be developed as a county park, the property will require remediation of contaminants identified in the soil, surface water and underlying sediments associated with

particular components of the iron and steel plant activity areas. Several remediation options were considered, resulting in selection of the current remediation plan.

Regulatory Setting

The cleanup area is partially encompassed within the boundaries of the Irondale National Historic District, listed on the National Register of Historic Places in 1983 because of the significance of the iron and steel plant to development of the iron and steel industry on the west coast in the 1800s and early 1900s (NRHP 2010).

The shoreline portion of the project will be carried out under a Corps of Engineers Joint Aquatic Resources Permit (JARPA). Because of the federal permit, the project will be subject to the National Historic Preservation Act (NHPA), 1966, as amended. Section 106 of the National Historic Preservation Act (NHPA) requires agencies to identify and assess the effects of federally permitted or approved undertakings on historic resources, archaeological sites, and traditional cultural properties (TCPs), and to consult with others to find acceptable ways to avoid or mitigate adverse effects. Resources protected under Section 106 are those listed, or eligible for listing, in the National Register of Historic Places (NRHP). Eligible properties must be at least 50 years old, possess integrity of physical characteristics, and meet at least one of four criteria of significance. Historic properties may include archaeological sites, buildings, structures, districts, traditional cultural properties, or objects.

For the purposes of this report, terminology of the Section 106 of the NHPA will be used for consistency, although the non-Corps (uplands) portion of the project is not subject to the federal jurisdiction. The term “adverse effect” used for the Corps portion of the project will also be used to refer to impacts from project actions in the uplands portion.

Archaeological Background and Potential for Discovery

The project is within the Irondale Iron and Steel Plant Historic District, where components, activity areas and associated features related to steel production in the late 1800 to early 1900s have been identified (Smith 2011a). Historic documents and descriptions of the plant, along with HAER documentation completed in 1983, show that other remains may be present within project fill in the intertidal zone or obscured by vegetation in adjacent uplands. In addition, later structures may obscure the remains or earlier plant features. Remains of known resources as well as other historic remains and artifacts could be exposed by ground disturbing activities during the remediation and restoration project.

Due to the presence of contaminated soils, archaeological testing was not conducted in the remediation area and the use of construction monitoring was therefore recommended to avoid or minimize adverse effects associated with the potential exposure or damage to elements of the historic district during project construction. Mapping of known features and activity areas of the former iron and steel plant provides an overview of where remains might be expected, including areas in the around the charcoal kilns and the former bulkhead and pier (Figure 3) (Britton and Britton 1983; Smith 2011a, b; Piper 2011).

Due to the disturbance that occurred in the project area during construction and operation of the iron and steel plant, which included placement of deep layers of fill over the original narrow intertidal beach, the potential for encountering pre-contact resources is considered extremely low.

Identification of Cultural Resources

As a general policy, and as far as practically feasible, all cultural resources, pre-contact and historical, and buried human remains, will be avoided and actively protected in place with the exception of those elements scheduled for removal. Collection of artifacts by employees, construction personnel, or others with access to the construction zone is prohibited. Typical markers of pre-contact activity include discarded shell, fire-modified rock, animal bone, lithic debitage, flaked or ground stone and bone tools, cordage, fibers, burned earth, charcoal, ash, and exotic rocks and minerals.

Markers of historical period activity (prior to the 1960s) may include milled lumber, masonry features, concrete, glass, ceramic, brick, metal fragments or other evidence of early historic occupation and industry. In those instances where modification of the project to accommodate avoidance of an archaeological resource is not possible, the resource in question will be treated in the manner described below.

Briefing

Prior to construction, the *Monitoring Coordinator* will brief the *Construction Supervisor* and construction crew members on cultural resource issues. The briefing will include information on the legal context of cultural resources protection and on the pre-contact, ethnographic, and historic cultural resources likely to be present in the construction area. The primary goals of this briefing are to familiarize construction personnel with the procedures to be followed in the event there is discovery of cultural material (see below), and to provide contact protocols and information to construction supervisors

Personnel Qualifications and Chain of Communications

This monitoring plan establishes policies, describes the pre-construction briefing, states responsibilities and chain of command, and provides procedures to ensure that any cultural resources or human remains encountered during construction are properly identified and appropriately treated. Contact information for the personnel referenced in the following sections is provided at the back of this plan.

The *Monitor* will communicate with the onsite *Construction Supervisor* to make general requests about equipment movement. The *Monitor* will also need to communicate with excavation equipment operators to stop excavation or modify excavation, but will notify the *Construction Supervisor* prior to communicating excavation procedures directly to the equipment operator.

The DOE *Project Coordinator (Project Coordinator)* will insure that the provisions of this document are carried out, and the *Supervising Professional Archaeologist* will report to the *Project Coordinator*. The *Supervising Professional Archaeologist's* designated *Monitoring Coordinator* will schedule the monitoring activities. (A minimum of 48 hours notification of the need for a monitor is required if monitoring becomes intermittent as construction progresses.) The archaeological monitor will be present whenever ground-disturbing construction activities occur within sensitive areas.

The *Monitor* will have the authority to temporarily halt construction while examining possible discoveries, and will also be responsible for notifying the DOE *Project Coordinator* and *Construction Superintendent* immediately of any discoveries, as well as for notifying the Construction Supervisor when activity can be resumed. The DOE *Project Coordinator* is then responsible for notifying the appropriate officials including the US Army Corps of Engineers, Department of Archaeology and Historic Preservation (DAHP), and if necessary, the and the

Jamestown S'Klallam Tribe, the Port Gamble S'Klallam Tribe, and the Suquamish Tribe, and the Jefferson County Coroner. The *Monitor* will be responsible for maintaining daily work records and documentation of any discoveries.

UNMONITORED DISCOVERY

If for any reason an archaeologist is not on site during construction of the DOE Remediation and Restoration project and suspected archaeological deposits, human remains, or isolated artifacts are discovered, it will be the responsibility of the applicable *Construction Supervisor* to alert the *on-site DOE Representative* or the DOE *Project Coordinator* of any potential cultural resource discovery. The DOE *Project Coordinator* will proceed with the steps outlined in the section above.

Collection of any archaeological materials by employees, construction personnel or others with access to the project is prohibited by federal law

MONITORED DISCOVERY

An archaeologist will monitor construction excavation during the following activities in the sensitive areas as identified in the cultural resources assessment (Piper 2011) where historic elements of the project may be exposed. The purpose of observation is to identify archaeological resources and to assess the significance of resources in a rapid, cost-effective manner.

General

The *Monitor* will ensure that all construction equipment is used with caution at all time around the historic district features and that access is confined to existing routes.

Vegetation Clearing

Prior to construction, the *Monitor* will observe vegetation grubbing and removal to insure that the use of machinery is avoided in areas where district features are visible either in the form of standing remains or outlines and depressions that may contain subsurface resources. The Monitor will specifically ensure that caution is used in and adjacent to building remains, with removal of vegetation proceeding with small machinery or by hand in order to avoid damaging foundation walls and other internal structures; and that roots are cut, not pulled, as they may be intertwined or imbedded in foundations and other structures.

Once grubbing and clearing of vegetation has been completed and prior to commencing the next construction activities, a qualified archaeologist will examine the exposed area to document and evaluate any newly exposed resources as well as any debris encountered during site preparation.

Capping and Backfilling of Features

The Monitor will be present during capping and backfilling to ensure that whenever possible construction personnel are using methods of capping and filling that retain the outlines of features such as tops of foundations, internal divisions and structures, visible walls and timbers,

and remaining depressions and surface markers that would help to convey a sense of the form and function of the features and their relationships.

Excavation of contaminated sediments and removal of slag deposits

The archaeologist will monitor excavation of contaminated sediments and removal of slag deposits in the intertidal area to avoid damage to fragile remains such as bulkhead timbers and pilings. This includes removal of sediments in area of charcoal kilns. Remains are to be preserved in-situ by backfilling and replacing them where possible.

NWAA has recommended archaeologist fully document kiln features in this area (the northern portion of Feature 5 and all of Features 6-8) prior to the construction activity. The location of kiln features will be recorded with GPS and drawings; kiln elements will be numbered and marked on a corresponding key map, and removed for storage in protected location until completion of this portion of the project, at which time an archaeologist will supervise their replacement with use of the recorded information. Note that remains may be fragile, and at a minimum outlines or representations can be placed on the surface to mark their locations in order to preserve location and spatial information for interpretive potential in the future. If subsurface portions of the kilns are exposed during sediment and slag removal, the archaeologist will record them to the degree possible given the contaminated nature of the deposits.

Removal of Above-Ground Concrete Storage Tank

The archaeologist will monitor removal of above-ground concrete storage tank in the area of the kilns to avoid damage to subsurface remains of kilns no longer represented by surface remains that may be present beside and beneath the tank. If remains are discovered, they will be documented prior to commencing work and where possible, representations can be placed on the surface to mark their locations in order to preserve location and spatial information.

Shoreline Filling and Grading

The archaeologist will monitor shoreline filling and grading to avoid damage to intertidal resources by heavy machinery and obscuring of features by infilling. Wherever possible, as guided by the Monitor, full burial of these features will be avoided, leaving some portion or outline to convey their relation to the historic area. Any newly exposed features will be recorded prior to re-commending work.

The Monitor will:

- Examine cleared and graded surfaces exposed by grading or in auger spoils to identify any previously undocumented pre-contact or historical period archaeological materials. The *Monitor* will observe construction equipment work from multiple perspectives around and in front of working equipment, requiring close communication with construction supervisors and equipment operator.
- Examine excavation spoils, if the material is placed on the ground prior to removal. Note that such examination will be limited due to the contaminated nature of the project area.
- Identify buffer areas around archaeological sites or project features that must be avoided until evaluation is completed (Attachment 1).

Discovery Procedures

The *Archaeological Monitor* will ensure that every reasonable effort is made to protect and record archaeological resources affected by the project. The Monitor will be positioned to have a clear view of surfaces exposed by excavation and spoils piles while adhering to the project safety protocols.

Cultural Resources

There is some potential for historical archaeological materials to be those encountered within fill. These materials will be documented and may be collected at the discretion of the archaeologist, as they may be important for the study of Irondale history. There is little expectation for finding pre-contact materials, with the possible exception of lithic isolates that have been incorporated in the fill. It is expected that project activity will be confined to filled surfaces; however, in the event that the project encounters native surface at any time during the project, it will be inspected for archaeological materials. If pre-contact artifacts or midden is encountered within this context, the archaeologist will follow the procedures outlined in step 1 below for finding of significant or potentially significant archaeological resources.

The Monitor will document the discovery of pre-contact and historical archaeological materials during construction activities within the project area. Documentation will include stratigraphic profiles, photographs, sketches and measurements, as appropriate.

In instances where archaeological resources are encountered during the project, but additional project effects to the resource are not anticipated, the project may continue elsewhere while cultural resource documentation and assessment proceed.

When necessary, the Monitor will ask the *Construction Supervisor* to request equipment operators to modify construction excavation procedures to provide exposures of subsurface stratigraphy in order to confirm the presence of resources in an area. Work will be stopped in an area sufficient to assess resources discovered. No screening of materials will be conducted due to the presence of contaminated soils. To the degree possible, depending on project requirements for sediment removal in a given area, any newly exposed elements of the historic district will be buried in place.

1. If intact archaeological resources are identified during construction, the *Monitor* will inform the *Construction Supervisor.* The *Construction Supervisor* will halt activity in the area of discovery large enough to ensure the integrity of the find is not compromised. The *Construction Supervisor* will contact the DO*E Project Coordinator*.
2. DOE *Project Coordinator* will contact the USACE, DAHP, and the affected tribes within one (1) working day.
3. DOE shall arrange for the parties, including the *Supervising Professional Archaeologist,* to conduct a joint viewing of the discovery within forty-eight (48) hours of the notification, or, if that is not feasible, at the earliest time thereafter.
4. The USACE shall consult with DOE, DAHP, and affected tribes on treatment of the discovery. Resumption of work in the area of the discovery will be consistent with the results of the consultation.

Human Remains

In accordance with RCW. 27.44, RCW 68.60, and RCW 68.50, if any construction activity exposes anything that appears to be human remains, either burials or isolated teeth or bones, or other mortuary items, construction in the vicinity of the find will halt and the following protocol shall be used:

1. All persons shall immediately halt ground-disturbing activities around the discovery and it shall be secured with a perimeter of not less than thirty (30) feet (Area of Discovery).
2. The *Supervising Professional Archaeologist* will immediately notify the *DOE Project Coordinator*.
3. Upon receiving notice, the DO*E Project Coordinator* shall immediately notify the appropriate County Coroner, who will take jurisdiction over the human skeletal remains and make a determination whether those remains are forensic (RCW 27.44; 68:50; 68:60). Contemporaneous with notifying local law enforcement and the Coroner, the DO*E Project Coordinator* shall also notify the USACE, Jamestown S'Klallam Tribe, the Port Gamble S'Klallam Tribe, and the Suquamish Tribe, and DAHP of the discovery.
4. If the Coroner determines the remains are non-forensic, the DAHP will take jurisdiction over the remains. (RCW 27.44; 68:50; 68:60). The State Physical Anthropologist will make a determination if the remains are Indian or non-Indian and report that finding to the affected parties (RCW 27.44; 68:50; 68:60).
5. The DAHP will handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains.
6. The USACE as the federal agency will handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains.
7. The Monitor will prepare a final report that describes the discovery, notification of concerned parties, steps taken in response to the discovery, and the final disposition of the remains.

CONFIDENTIALITY

All parties recognize that archaeological properties are of a sensitive nature, and sites where cultural resources are discovered can become targets of vandalism and illegal removal activities.

All parties shall keep and maintain as confidential all information regarding any discovered cultural resources, particularly the location of known or suspected archaeological property, and exempt all such information from public disclosure consistent with RCW 42.56.300 and the NHPA. All information indicating the location of known suspected archaeological properties from this Project shall be turned over to DAHP. While any party is in possession of this confidential information, such party shall limit access to these records to authorized persons with a need to know the information.

All parties shall ensure that its personnel, contractors, and permittees keep the discovery of any found or suspected human remains, other cultural items, and potential historic properties confidential, including but not limited to, refraining such persons from contacting the media or any third party or otherwise sharing information regarding the discovery with any member of the public. All parties shall require its personnel, contractors, and permittees to immediately notify DOE of any inquiry from the media or public.

REPORTING

The archaeological firm monitoring the project will prepare a letter report documenting the results of the archaeological monitoring within 60 days of the conclusion of monitoring activities. The report will include the following elements, and will be provided to the USACE:

- Inventory of cultural resources results, if any;
- Analysis of cultural resources, including a discussion of the integrity of the resources and determination of whether a resource is eligible for inclusion on the National Register of Historic Places or the Washington Heritage Register

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CONTACTS

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Steve Teel, Project Coordinator ..... (360) 407-6247

Jefferson County Coroner:
Juelie Dalzell, Coroner ..... (360) 385-9180

Jefferson County Sheriff
Tony Hernandez ..... (360) 385-3831

Non-Emergency 24 hour ..... (360) 428-3211

Construction Contractor:
xxx, Project Manager ..... TBD

Construction Supervisor TBD

US Army Corps of Engineers, Seattle District:
Lance Lundquist, Archaeologist ..... (206) 764-6909

Jamestown S'Klallam Tribe:
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Mike Shong, Monitor / Monitoring Coordinator .....(206 781-1909

Figure 1. Project limits.

Figure 2. Irondale Iron and Steel Plant work areas.

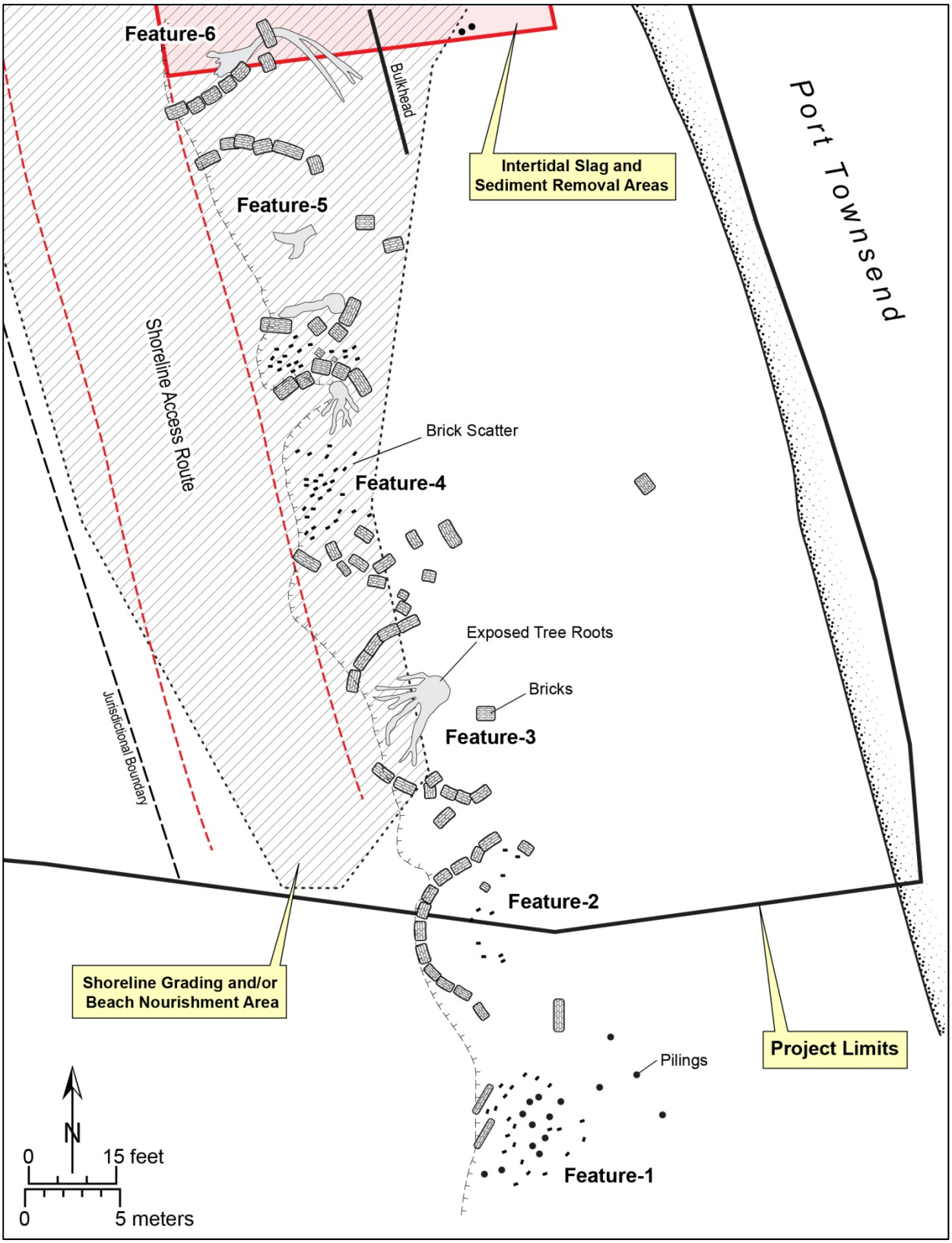

Figure 3. Irondale Iron and Steel Plant charcoal kiln features south of soil and slag removal.

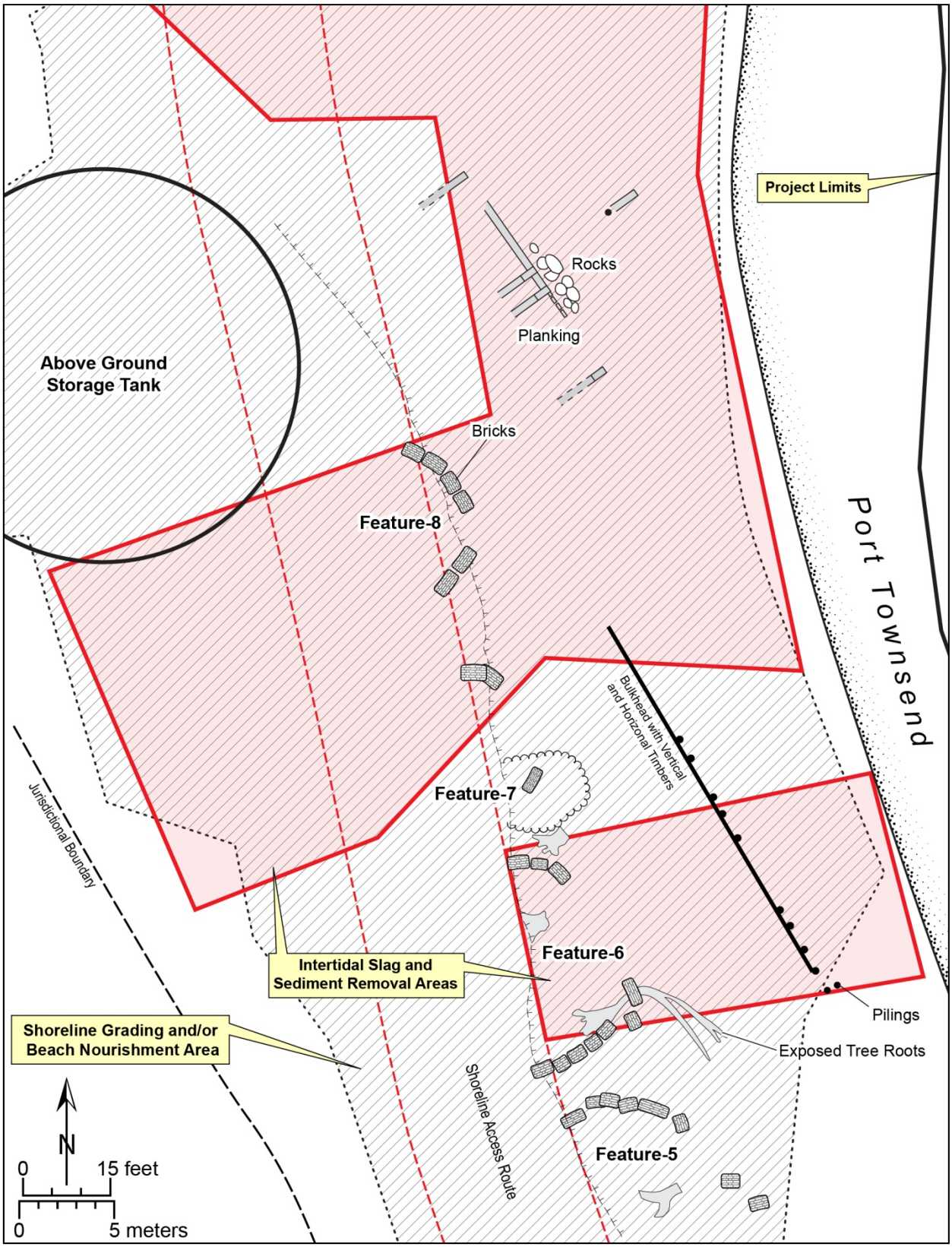

Figure 4. Charcoal kiln Features 5-8 in area of contaminated soil and slag removal.

APPENDIX B: SITE RECORD 45JE358 FORM AND HAER

Appendix Redacted