Westman Marine
Site Overview
Blaine, Washington

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Prepared for

Port of Bellingham
Bellingham, Washington

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WESTMAN MARINE SITE OVERVIEW
BLAINE, WASHINGTON

INTRODUCTION

This document presents a brief overview of the Westman Marine Site (Site) to support discussions between the Washington State Department of Ecology (Ecology) and the Port of Bellingham (Port) regarding implementation of an agreed order for conduct of a remedial investigation/feasibility study (RI/FS) for the Site. The Site is currently listed on the Ecology Hazardous Sites List (FSID 66519819) and ranked 1 out of 5 on its priority list for cleanup, with a ranking of 1 being the highest priority for cleanup.

The Site is located within Blaine Harbor in Blaine, Washington (Figure 1). More specifically, the Site is located in the southeastern portion of the Blaine Harbor industrial area, as shown on Figure 2. All or most of the Site uplands and tidelands are owned by the Port. The Inner Harbor Line shown on Figure 2 defines the boundary between Port property and State land managed by the Washington Department of Natural Resources (DNR), with State land located to the west of the Inner Harbor Line. Sufficient data are not currently available to determine whether the extent of contamination associated with the Site extends onto State lands in either the upland or aquatic portion of the Site.

The following sections of this Site overview provide a brief Site history, present available environmental data, and identify anticipated constituents of concern (COCs) based on the available environmental data.

SITE HISTORY

Blaine Harbor is located within the northern portion of Drayton Harbor at the entrance to Semiahmoo Bay, as shown on Figure 1. A small boat harbor and marina were created when aquatic lands were dredged prior to 1949. The upland industrial area was created at that time and was generally constructed of hydraulic fill with timber bulkheads along the shoreline, although in some areas riprap was used instead of, or in conjunction with, the bulkheads to establish the shoreline. Industrial area features are shown on the Blaine Harbor Industrial Area Site Plan (Figure 2). The marina was expanded several times since its original construction, but the footprint of the upland industrial area has remained largely unchanged.

The boatyard/shipyard operations at the Site were initiated with Berg Shipbuilding Company and Andrew Berg in 1949. The Site has been leased by several tenants since that time, including Westman Marine from 1989 to 2011. Between 1961 and 1969, a dock was constructed and the area where the current travel lift exists was dredged. A marine railway was constructed at the Site in about 1981 to allow the upland maintenance and repair of larger vessels at the Site (see attached photograph). The current

leasehold boundary for the Site is shown on Figure 2, although boatyard activities may have extended farther west during historical operations. The Site is currently leased by Walsh Marine.

KNOWN ENVIRONMENTAL CONDITIONS

Previous environmental investigation activities at the Site were limited to surface sediment quality characterization originating from a marina-wide investigation conducted in 2001 by the Port. Surface sediment samples BH-02, BH-03, and BH-11 through BH-14, were collected in the Site vicinity during the 2001 sediment investigation, as shown on Figure 3. The analytical results for these samples are summarized in Table 1. As indicated in the table, samples collected from locations BH-2, BH-3, BH-12, BH-13, and BH-14 exceeded the sediment screening level used for bulk tributyltin of 73 micrograms per kilogram (µg/kg). Additionally, the detected concentration of copper in the surface sediment sample collected from BH-02, the sample location closest to the marine railway and travel lift piers, exceeded the Sediment Quality Standard (SQS) and the Cleanup Screening Level (CSL), established in the Sediment Management Standards (WAC 173-204). These surface sediment samples were collected 10 years ago, so current surface sediment quality is unknown.

Sediment core samples have not been collected at the Site, so sediment quality at depth has not been determined. The Port intends to redevelop the Site in the future, which will likely result in the removal of the marine railway and dredging the associated aquatic area to the authorized dredge depth for Blaine Harbor. As a result, the quality of deeper sediment will need to be evaluated as part of future environmental characterization activities.

Upland soil and groundwater quality have not been characterized. However, Westman Marine was a listed small quantity generator of hazardous material during its operations, and several Site visits in the 1990s by Ecology revealed that housekeeping was an ongoing issue for this facility. Reportedly, there was evidence of numerous minor spills on the ground surface. So, while there is no existing analytical data for the Site uplands, it is anticipated that at least localized areas of affected soil are present. Based on conditions encountered at other boatyards, anticipated COCs for upland soils would include heavy metals, petroleum hydrocarbons and possibly polycyclic aromatic hydrocarbons (PAHs). At many boatyard sites, soil contamination is limited to near-surface soil and groundwater is largely unaffected.

ATTACHMENTS

Figure 1: Vicinity Map
Figure 2: Blaine Harbor Industrial Area Site Plan
Figure 3: Westman Marine Site Plan
Table 1: Summary of Sediment Analytical Results – Previous Investigation
Photo 1: Photograph of Marine Railway

Data Source: ESRI 2008

V:\0011033\Figure 1 Westman Marine.mxd

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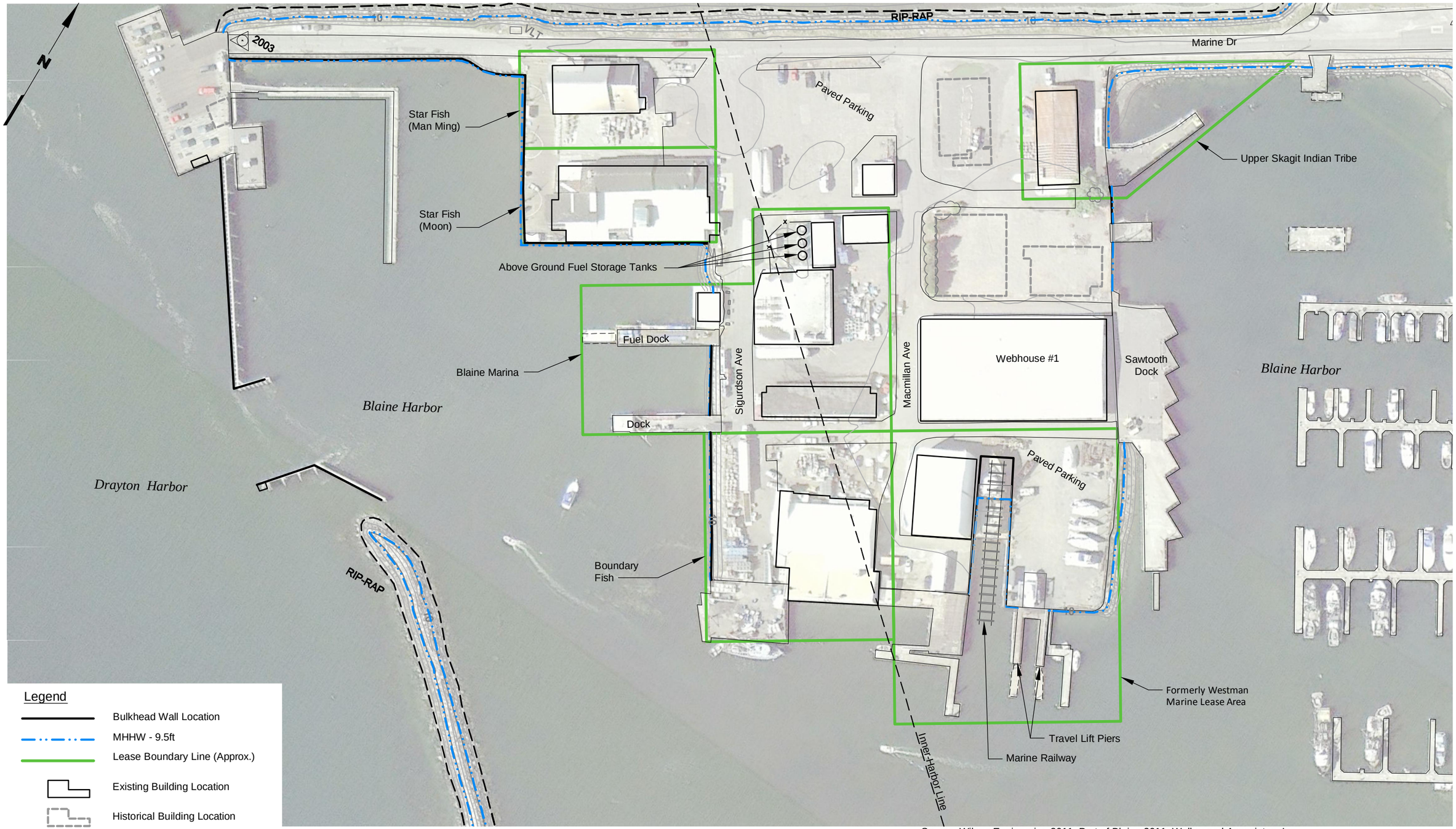
Westman Marine Blaine Harbor Blaine, Washington	**Vicinity Map**	Figure 1



Legend

- Bulkhead Wall Location
- MHHW - 9.5ft
- Lease Boundary Line (Approx.)
- Existing Building Location
- Historical Building Location

Source: Wilson Engineering 2011, Port of Blaine 2011, Walker and Associates, Inc.
Aerial Photo Source: Google Earth Professional 2011

Note

Explorations shown in Red indicates contaminant levels exceed preliminary screening levels.

0 100 200
Scale in Feet

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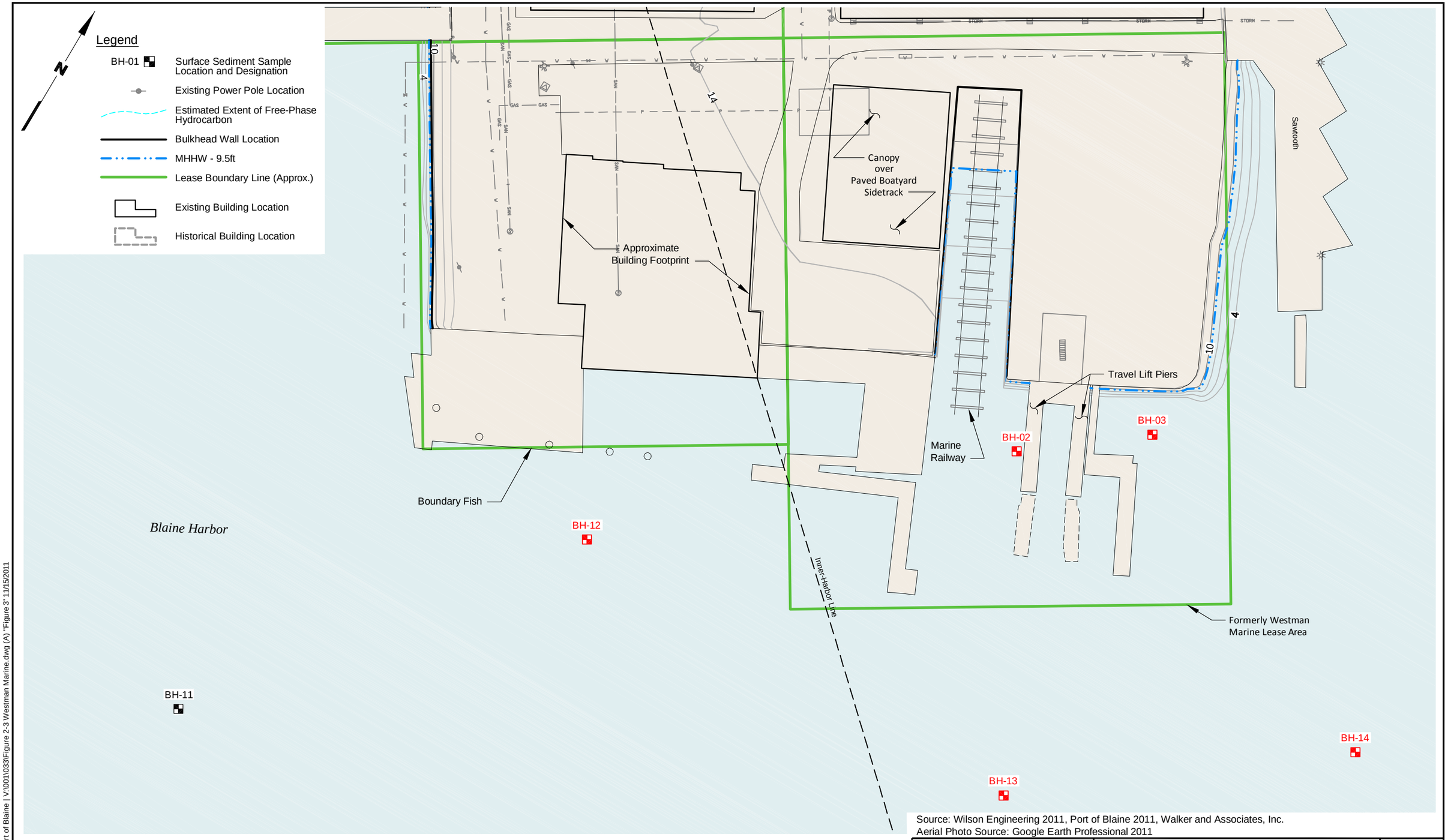
Westman Marine Blaine Harbor Blaine, Washington	**Blaine Harbor Industrial Area Site Plan**	Figure 2

Port of Blaine | V:\001\033\Figure 2-3 Westman Marine.dwg (A) "Figure 2" 11/15/2011



Source: Wilson Engineering 2011, Port of Blaine 2011, Walker and Associates, Inc.
Aerial Photo Source: Google Earth Professional 2011

Note

Explorations shown in Red indicates contaminant levels exceed preliminary screening levels.

0 50 100
Scale in Feet

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Westman Marine Blaine Harbor Blaine, Washington	**Westman Marine Site Plan**	Figure 3

Port of Blaine | V:\001\033\Figure 2-3 Westman Marine.dwg (A) "Figure 3" 11/15/2011

TABLE 1
SUMMARY OF SEDIMENT ANALYTICAL RESULTS - PREVIOUS INVESTIGATION
WESTMAN MARINE - BLAINE HARBOR, WASHINGTON

Sample ID			BH-02	BH-03	BH-04	BH-11	BH-12	BH-13	BH-14
Sample Date	SQS (a)	CSL (b)	9/27/2001	9/27/2001	9/27/2001	9/27/2001	9/27/2001	9/27/2001	9/27/2001
Metals (mg/kg)									
Arsenic	57	93	5	3	8		14	12	14
Cadmium	5.1	6.7	0.5	0.3	1.1		0.7	0.6	0.4
Chromium	260	270	16.3	13.2	44.6		22.5	21.5	19.6
Copper	390	390	521 J	77.5 J	145 J		95.8	53	61
Lead	450	530	20 J	21 J	32 J		12	9	7
Mercury	0.41	0.59	0.3 J	0.07 J	0.16 J		0.09 U	0.08 U	0.15
Silver	6.1	6.1	0.3	0.2 U	0.6		0.5 U	0.5 U	0.5 U
Zinc	410	960	184	67.2	1,690		113 J	80 J	69.3 J
PCBs (mg/kg OC) (c)									
Aroclor 1016	N/A	N/A	2.3 U	7.0 U	1.5 U				
Aroclor 1242	N/A	N/A	2.3 U	7.0 U	1.5 U				
Aroclor 1248	N/A	N/A	3.5	7.0 U	1.5 U				
Aroclor 1254	N/A	N/A	2.9	7.0 U	1.5 U				
Aroclor 1260	N/A	N/A	2.3 U	7.0 U	1.5 U				
Aroclor 1221	N/A	N/A	4.5 U	14.1 U	3.0 U				
Aroclor 1232	N/A	N/A	2.3 U	7.0 U	1.5 U				
Total PCBs (d)	12	65	6.3	14.1 U	3.0 U				
PAHs (mg/kg OC) (c)									
Naphthalene	99	170	2.3 U	7.0 U	2.2		0.9 J	1.2 U	0.9 J
Acenaphthylene	66	66	5.2	7.0 U	4.0		3.3	1.7	2.4
Acenaphthene	16	57	4.5	7.0 U	7.6		1.9	0.8 J	1.3 J
Fluorene	23	79	5.5	7.0 U	7.5		3.0	1.2	2.4
Phenanthrene	100	480	40.5	19.6	70.0		35.0	12.5	27.1
Anthracene	220	1,200	14.3	10.0	20.0		11.4	4.8	6.0
2-Methylnaphthalene	38	64	2.3 U	7.0 U	1.5		0.7 J	1.2 U	1.4 U
LPAH (d)(e)	370	780	70.0	29.6	111.2		55.5	20.9	40.2
Fluoranthene	160	1,200	142.9	81.5	184.6		85.7	27.5	47.1
Pyrene	1,000	1,400	101.2	59.3	100.0		71.4	28.1	43.6
Benzo(a)anthracene	110	270	42.9	28.9	46.2		31.4	13.8 M	15.7
Chrysene	110	460	86.9	81.5	72.3		55.7	21.9	30.0
Benzo(b)fluoranthene	N/A	N/A	54.8	48.1	54.6		40.0	16.3	21.4
Benzo(k)fluoranthene	N/A	N/A	45.2	37.0	43.8		32.1	15.0	17.1
Total Benzofluoranthenes (f)	230	450	100.0	85.2	98.5		72.1	31.3	38.6
Benzo(a)pyrene	99	210	33.3	28.1	43.8		27.1	12.5	15.0
Indeno(1,2,3-c,d)pyrene	34	88	16.7	14.1	20.0		11.4	5.7	7.9
Dibenz(a,h)anthracene	12	33	4.4	7.0 U	4.8		3.2	1.6	2.1

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Sample ID			BH-02	BH-03	BH-04	BH-11	BH-12	BH-13	BH-14
Sample Date	SQS (a)	CSL (b)	9/27/2001	9/27/2001	9/27/2001	9/27/2001	9/27/2001	9/27/2001	9/27/2001
Benzo(g,h,i)perylene	31	78	14.3	10.0	12.3		8.6	4.4	6.0
HPAH (d)(g)	960	5,300	542.5	388.5	582.5		366.8	146.8	206.0
SVOCs (mg/kg OC) (c)									
1,2-Dichlorobenzene	2.3	2.3	2.3 U	7.0 U (h)	1.5 U		1.4 U	1.2 U	1.4 U
1,3-Dichlorobenzene	N/A	N/A	2.3 U	7.0 U	1.5 U		1.4 U	1.2 U	1.4 U
1,4-Dichlorobenzene	3.1	9	2.3 U	7.0 U (h)	1.5 U		1.4 U	1.2 U	1.4 U
1,2,4-Trichlorobenzene	0.81	1.8	2.3 U (h)	7.0 U (h)	1.5 U (h)		1.4 U (h)	1.2 U (h)	1.4 U (h)
Hexachlorobenzene	0.38	2.3	0.1 U	0.3 U	0.1 U		1.4 U (h)	1.2 U (h)	1.4 U (h)
Dimethylphthalate	53	53	2.5	7.0 U	2.6		1.6	1.0 J	2.9
Diethylphthalate	61	110	2.3 U	7.0 U	1.5 U		1.4 U	1.2 U	1.4 U
Di-n-Butylphthalate	220	1,700	2.3 U	7.0 U	1.5 U		1.4 U	0.7 J	1.4 U
Butylbenzylphthalate	4.9	64	2.3 U	7.0 U (h)	6.0		1.2 MJ	1.0 J	1.4 U
bis(2-Ethylhexyl)phthalate	47	78	26.2	29.6	30.8		17.1	8.8	6.6
Di-n-octyl phthalate	58	4,500	2.3 U	7.0 U	1.5 U		1.4 MJ	1.2 U	1.4 U
Dibenzofuran	15	58	2.9	7.0 U	4.1		1.4 M	1.2 U	1.3 MJ
Hexachlorobutadiene	3.9	6.2	0.1 U	0.3 U	0.1 U		1.4 U	1.2 U	1.4 U
N-Nitrosodiphenylamine	11	11	2.3 U	7.0 U	1.5 U		1.4 U	1.2 U	1.4 U
SVOCs (µg/kg)									
Phenol	420	1,200	20	28	72		14 MJ	78	53
2-Methylphenol	63	63	19 U	19 U	19 U		19 U	19 U	19 U
4-Methylphenol	670	670	19 U	19 U	19 U		15 J	19 U	19 U
2,4-Dimethylphenol	29	29	19 U	19 U	19 U		19 U	19 U	19 U
Pentachlorophenol	360	690	100	96 U	97 U		97 U	93 U	94 U
Benzyl Alcohol	57	73	19 U	19 U	19 U		19 U	19 U	19 U
Benzoic Acid	650	650	190 U	190 U	190 U		190 U	190 U	190 U
Organotins (µg/kg)									
Tributyltin (as chloride)	N/A	N/A	420	160	54	32	160	110	140
Tributyltin (as TBT ion)	73 (i)	N/A	370	140	48	28	140	100	130
Conventionals									
Total Organic Carbon (percent)	N/A	N/A	0.84	0.27	1.3		1.4	1.6	1.4
Total Solids (percent)	N/A	N/A	59.7	70.2	58		56.6	51.9	57.6
Preserved Total Solids (percent)	N/A	N/A	60.9	67.8	54.7				
N-Ammonia (mg-N/kg)	N/A	N/A	8.8	12	18				
Sulfide (mg/kg)	N/A	N/A	790	110	1,300				
Fecal Coliform (CFU/g)	N/A	N/A	36 U	28 U	39 U				

TABLE 1
SEDIMENT SAMPLE ANALYTICAL RESULTS
WESTMAN MARINE - BLAINE HARBOR, WASHINGTON

OC = Organic Carbon
N/A = Not available.
U = Indicates compound was analyzed for, but was not detected at the given detection limit.
J = Estimated value.
M = Indicates an estimated value of analyte detected and confirmed by analyst with low spectral match parameters.
Boxed results exceed the SQS.
Shaded results exceed the CSL.
(a) SMS sediment quality standard (Chapter 173-204 WAC).
(b) SMS cleanup screening level (Chapter 173-204 WAC).
(c) Where chemical criteria in this table represent the sum of individual compounds or isomers, the following methods shall be applied:
  (i) Where chemical analyses identify an undetected value for every individual compound/isomer, then the single highest detection limit shall represent the sum of the respective compounds/isomers.
  (ii) Where chemical analyses detect one or more individual compounds/isomers, only the detected concentrations will be added to represent the group sum.
(d) All organic data (except phenols, benzyl alcohol, and benzoic acid) are normalized to total organic carbon; this involves dividing the dry weight concentration of the constituent by the fraction of total organic carbon present.
(e) The LPAH criterion represents the sum of the following "low molecular weight polynuclear aromatic hydrocarbon" compounds: naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene. The LPAH criterion is not the sum of the criteria values for the individual LPAH compounds listed.
(f) The total benzofluoranthenes criterion represents the sum of the concentrations of the "B," "J," and "K" isomers.
(g) The HPAH criterion represents the sum of the following "high molecular weight polynuclear aromatic hydrocarbon" compounds: fluoranthene, pyrene, benzo(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene, and benzo(g,h,i)perylene. The HPAH criterion is not the sum of the criteria values for the individual HPAH compounds as listed.
(h) Method detection limits exceed the SQS or CSL criteria.
(i) TBT bulk sediment screening level established by Ecology, which is conceptually equivalent to the SQS.

Photograph 1: View of marine railway at Westman Marine, August 24, 2011.

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Blaine Harbor Blaine, Washington	**Westman Marine**	Photo 1