TECHNICAL MEMORANDUM

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ENVIRONMENTAL | GEOTECHNICAL | NATURAL RESOURCES

TO: Jing Liu, Washington State Department of Ecology

CC: Sonia Fernandez, Washington State Department of Ecology
Mike Stoner, Port of Bellingham

FROM: Jeremy Davis, P.E., C.H.M.M., and Larry Beard, P.E., L.G.

DATE: February 4, 2014

RE: PHASE I MARINE SEDIMENT DATA SUMMARY
WESTMAN MARINE INC. SITE
BLAINE, WASHINGTON

INTRODUCTION

This technical memorandum presents the results of the Phase I marine sediment characterization conducted as part of the remedial investigation (RI) for the Westman Marine Site (Site) in Blaine, Washington (Figure 1). The RI is being conducted under Agreed Order No. DE-9001 (AO) between the Port of Bellingham (Port) and the Washington State Department of Ecology (Ecology). A technical memorandum summarizing the initial RI results for the upland investigation will be submitted separately.

Phase I of the marine sediment investigation was conducted in October 2013 to characterize surface sediment quality. The deeper subsurface sediment will be characterized during Phase II of the marine sediment investigation. This phased approach was implemented so that surface sediment data could be used to evaluate whether a strong Site-specific correlation exists between tributyltin (TBT) in porewater and TBT bulk concentrations so that a bulk TBT preliminary screening level (PSL) can be developed based on the TBT porewater PSL. Bulk TBT is more efficient and less expensive to analyze for in sediment core samples because of the large sample volume required for porewater TBT analysis, so the development of the bulk TBT PSL would significantly reduce the cost of RI at locations where sediment core sampling is conducted.

The sections below describe the activities conducted as part of the marine surface sediment characterization and present a summary of the analytical results as compared to applicable Sediment Management Standards (SMS; WAC 173-204; Ecology 2013) criteria. Conclusions and recommendations drawn from this phase of the investigation, including proposed bulk TBT PSLs and proposed strategies to address existing data gaps, are also presented.

SITE DESCRIPTION

The Westman Marine Site is located in Blaine, Washington, within Blaine Harbor. Blaine Harbor was created within Drayton Harbor in the 1950s to provide moorage and other supporting services for the

commercial marine industry. Westman Marine leased approximately 1.5 acres of upland property at 218 McMillan Avenue from the Port from 1989 until January 2011 (Figure 2). Westman Marine and previous tenants conducted boatyard activities at this location. RI activities began in October 2013 and are ongoing to determine the nature and extent of contamination in the upland and marine portions of the Site. With the exception of the vicinity map presented as Figure 1, the figures in this technical memorandum are oriented to the northwest at the top of the page, which is used as *project north* for the Site. Descriptions of direction in this memorandum will be in reference to project north, consistent with the alignment of Figures 2 through 6.

SAMPLE COLLECTION AND ANALYSIS

The scope of work for the Phase I marine sediment RI consisted of collecting and analyzing 15 surface sediment samples. Samples were collected and handled in accordance with Appendix D of the *Westman Marine Site RI Work Plan* (Work Plan; Landau Associates 2013).

Marine surface sediment samples were collected with a pneumatic power grab system provided by the subcontractor, Research Support Services, Inc. of Bainbridge Island, Washington. All sample locations were surveyed in the field with an onboard GPS unit that was mounted on the hydraulic winch system during sample collection. Vertical position was measured using a weighted tape to measure from the water surface to the sediment surface. Mudline elevations at each sample location, as well as station coordinates, are provided in Table 1. Sample locations are shown on Figure 2. No sampling locations were modified significantly from the locations proposed in the Work Plan.

All surface sediment samples were collected from the predominantly biologically active zone (uppermost 10 centimeters of the sediment) from an area large enough to provide adequate sample volume while excluding portions that were in contact with the sampler. Large, unrepresentative material (e.g., shells, woody debris) was excluded from the sample. Sediment samples collected for total sulfide analysis were taken directly from the grab sampler, prior to homogenization. The remaining sediment sample was then homogenized to obtain a smooth consistency (based on color and texture) in stainless steel bowls, using a stainless steel spoon. After homogenization, the sediment was placed into laboratory-supplied containers, placed on ice, and stored in coolers at approximately 4°C. Samples were transported to the laboratory under typical chain-of-custody procedures. All field sampling equipment, including the pneumatic power grab sampler, stainless steel bowls, and stainless steel spoons were decontaminated between sampling locations. A record of field activities was prepared during the investigation, including field notes, sampling forms, and sample chain-of-custody forms.

Surface sediment in samples collected at the Site ranged in consistency from primarily dark gray, sandy silt to silty fine to medium sand. Shells and shell fragments were prevalent in the samples. No strong chemical odors or visible evidence of contamination were observed. A small number of live clams and one anemone were brought up within the sampler during collection.

Each sample was analyzed for the SMS marine sediment analytes, including metals (arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc), semivolatile organic compounds (SVOCs), TBT (both bulk and porewater samples), and polychlorinated biphenyls (PCBs). Samples were also analyzed for conventional parameters including grain size, total organic carbon (TOC), total volatile solids, total solids, ammonia, and total sulfides. The sampling and analysis methodologies were consistent with the Puget Sound Estuary Program guidelines (PSEP 1997a,b,c) and protocols required by SMS (Ecology 1995) and described in the *Sediment Sampling and Analysis Plan Appendix* (Ecology 2008), as applicable.

ANALYTICAL RESULTS

This section describes the analytical results for Phase I of the marine sediment RI, compares the analytical results to applicable SMS standards, and evaluates the correlation between bulk and porewater TBT concentrations.

TBT Porewater/Bulk Correlation

Surface sediment samples were analyzed for both porewater and bulk TBT to evaluate whether a strong statistical correlation exists between the two analytical methods. Ecology believes that TBT porewater concentrations correlated better to impacts on marine benthic organisms than TBT bulk concentrations. However, a large volume of sediment (three to four subsurface sediment cores) is usually required to obtain sufficient porewater volume to conduct this analysis. Consequently, conducting TBT porewater analysis on sediment core samples significantly increases the complexity and cost of a sediment investigation. If a strong statistical correlation exists between Site porewater and bulk TBT concentrations, it is more cost-effective to develop a bulk TBT PSL equivalent to the porewater TBT PSL so further Site characterization can be accomplished using only bulk TBT analysis for sediment core samples.

After validating Site TBT data, a linear regression analysis was conducted on 15 co-located porewater and bulk TBT data points to evaluate the strength of correlation. As shown on Figure 5, a correlation was determined, with an R^2 value of 0.94. An R^2 value of 1.0 represents a perfect correlation and a value of 0 represents no correlation. An R^2 value of 0.85 is generally considered a strong correlation, so the R^2 value of 0.94 for the correlation of bulk/porewater TBT concentrations represents a

very strong correlation and is appropriate for use in developing a bulk TBT PSL based on the TBT porewater PSL. The linear regression correlation between bulk and porewater TBT concentrations is:

$$TBT_{bulk}\ (\mu g/kg) = [TBT_{porewater}\ (\mu g/L) - 0.0024]/0.0002$$

Based on this correlation, the TBT bulk PSLs equivalent to the TBT porewater PSLs of 0.05 and 0.15 micrograms per liter (µg/L) are 238 and 738 micrograms per kilogram (µg/kg), respectively. The use of these bulk TBT PSLs for future TBT testing of sediment core samples during the RI is discussed further in the Conclusions and Recommendations section of this technical memorandum.

General Sediment Quality

To evaluate sediment quality, the analytical results for the surface sediment samples were compared to the marine sediment PSLs established in the Work Plan, which are based on the SMS Sediment Quality Standards (SQS) and Cleanup Screening Levels (CSLs). The analytical results with exceedances of the PSLs highlighted are shown in Table 2. Figure 3 presents the analytical results for constituents of potential concern (COPCs) that were detected at concentrations greater than the marine sediment PSL in at least one sample. The PSLs are normalized to TOC for polycyclic aromatic hydrocarbons (PAHs), SVOCs, and PCBs, so dry-weight analytical results for these compounds have been normalized to TOC for comparison to the PSLs.

As indicated on Figure 3, COPCs that were detected at concentrations greater than PSLs consist of metals (chromium, copper, mercury, and zinc), TBT, PCBs, high molecular weight PAHs (HPAHs), bis(2-ethylhexyl)phthalate, and phenol.

Surface sediment at eight of the 15 sample locations had no exceedances of the PSLs. Five of these locations (WM-SG-08, WM-SG-09, WM-SG-11, WM-SG-12, and WM-SG-13) were at the outer perimeter of the sampling area, while two locations (WM-SG-04 and WM-SG-07) were close to shore, in the eastern portion of the Site and one location (WM-SG-05) is near the shore west of the marine railway. COPC concentrations are generally highest near the marine railway and decrease with distance from the railway. Except in the northeast corner of the Site, analytical results for samples collected at the limits of the Site indicate COPC concentrations drop to below the marine sediment PSLs, as indicated on Figure 3.

Phenol was detected in one sample (WM-SG-06) in the northwestern corner of the in-water portion of the Site at a concentration greater than the SQS. This is the only location where the phenol concentration exceeds the Site PSL, and the concentration detected is less than half the associated CSL. Based on the isolated nature of the phenol exceedance and the lack of elevated phenol concentrations in the vicinity of the marine railway and other locations adjacent to the Site uplands, the elevated phenol

concentration at WM-SG-06 does not appear to be related to Site releases and does not appear to be a Site COPC for marine sediment.

In sample WM-SG-15, metals concentrations (chromium, copper and zinc) were above both SQS and CSL criteria. Because a sediment sample without any PSL exceedances (WM-SG-07) was collected between the Site uplands and WM-SG-15, and the relative concentrations of metals in the sample collected from WM-SG-15 are not consistent with other samples closer to the marine railway (e.g., low TBT concentrations, with high metals concentrations), the elevated concentrations detected in WM-SG-15 may not be related to Site releases.

The highest concentrations of TBT (porewater, 0.71 µg/L), mercury [0.91 milligrams per kilogram (mg/kg)], zinc (1,980 mg/kg), and bis(2-ethylhexyl)phthalate (86.96 mg/kg normalized to TOC) are all located within the marine railway area. High concentrations of copper (between 1,670 and 6,930 mg/kg) were also detected within the marine railway area, although the highest copper concentration (13,100 mg/kg) was detected at sample location WM-SG-15, east of the sawtooth dock and east of the uplands portion of the Site. Sample location WM-SG-15 is also the only place where the chromium concentration (estimated at 663 mg/kg) exceeds the PSL; the chromium concentration at this location is more than nine times higher than chromium concentrations detected elsewhere at the Site.

Persistent Bioaccumulative Toxins

Several of the COPCs detected in the Site surface sediment are considered persistent bioaccumulative toxins (PBTs) or PBT metals of concern (i.e., potential PBTs), per WAC 173-333. These COPCs include PCBs (Aroclors 1248, 1254, and 1260), carcinogenic PAHs [cPAHs; chrysene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene, benzo(g,h,i)perylene, benzo(a)pyrene, and benzofluoranthenes], lead, mercury, and cadmium. Table 3 presents the analytical results for PBTs or potential PBTs in Site surface sediment.

Although the PSLs developed in the Work Plan are generally considered protective of human health, these criteria do not consider the bioaccumulative effects on humans and other higher trophic-level species. As a result, COPCs that are considered PBTs require the development of screening levels that consider bioaccumulative effects if the COPC is present at concentrations greater than the natural background concentrations. Guidance for addressing PBTs in marine sediment is provided in the draft *Sediment Cleanup Users Manual (SCUM) II* (Ecology 2012). The SCUM II guidance is currently under revision by Ecology, so guidance on developing cleanup levels for PBTs may change in the future.

Under the current draft of SCUM II, cleanup levels for PBTs can be based on the following:

- Natural background concentrations
- Regional background concentrations

- The practical quantitation limit (PQL) for the PBT
- A risk-based cleanup level using a Site-specific biota-sediment accumulation factor (BSAF).

The natural background concentrations for PBTs in Puget Sound marine sediments shown in Table 3 are pending finalization by Ecology in the forthcoming update to the SCUM II guidance. Regional background concentrations for PBTs have not been established for the Site vicinity, and are unlikely to be established in the foreseeable future. The PQL has been established for all analytes based on laboratory reporting limits except for PCBs. For PCBs, the PQL is 6 µg/kg based on Ecology's recommendation (Ecology 2012). Establishment of a Site-specific risk-based screening level would require determining a Site-specific BSAF based on bioaccumulation testing, which has not been conducted.

Distribution of Persistent Bioaccumulative Toxins

Detectable concentrations of three PBTs (cPAHs, PCBs, and mercury) and two PBT metals of concern (lead and cadmium) are present in Site marine surface sediment. PCBs and cPAHs are present at concentrations greater than PBT-based PSLs in surface sediment samples collected throughout the Site, while the distribution of other PBTs at concentrations greater than the PSLs are more limited.

The only location at which cadmium was detected above the natural background concentration (1 mg/kg) in surface sediment (1.5 mg/kg) was in the sample collected from WM-SG-15, located adjacent to the sawtooth dock. As previously discussed, the elevated concentration of cadmium detected at WM-SG-15 does not appear to be related to Site releases. As a result, cadmium does not appear to be a COPC for the Site. The highest concentrations of lead were primarily detected in the vicinity of the marine railway and travel lift haul-out area, and as such, it is considered a COPC for Site marine sediment. However, lead concentrations decrease rapidly from the shoreline and the samples with COPC concentrations greater than the PSLs (based on the natural background concentration of 21 mg/kg) are in close proximity to the shoreline within the preliminary Site boundary. The exception to this distribution is the elevated concentration of lead in WM-SG-15, which contained the highest concentration of lead detected in Phase I surface sediment samples. Similar to cadmium, additional characterization of surface sediment between the Site uplands and WM-SG-15 will be conducted to further assess whether the lead is related to releases at the Site.

Mercury was detected at its highest concentrations in the vicinity of the marine railway, and as such, is considered a COPC for Site marine sediment. The three locations in the immediately vicinity of the marine railway are the only locations where mercury exceeds the natural background concentration of 0.2 mg/kg and mercury was below the natural background concentration for Puget Sound at all sample

locations around the Site perimeter. As a result, additional characterization is not needed to assess the extent of mercury in marine surface sediment.

Both PCBs and cPAHs were detected at concentrations greater than the laboratory reporting limits in all RI Phase I marine surface sediment samples. The highest concentrations of PCBs and cPAHs were detected in the vicinity of the marine railway, and both of these analytes are considered Site marine sediment COPCs. Natural background concentrations for cPAHs and PCBs, based on the natural background values pending finalization by Ecology in the forthcoming update to the SCUM II guidance are 16 µg/kg and 3.5 µg/kg, respectively.

All TEQ cPAH concentrations detected in Phase I samples are greater than the PBT PSL based on the natural background concentration. However, cPAHs are ubiquitous in the marine environment, and concentrations are typically greater in marinas and other working waterfront areas due to the presence of creosoted pilings, bulkheads and other marine structures. The PCB natural background concentration is based on PCB congener analysis, so it is not directly comparable to the RI Phase I data. However, the natural background concentration of 3.5 µg/kg is less than the PCB PQL of 6 µg/kg, so the PQL represents the best currently available screening level for PCBs for protection of human health. The concentration of PCBs in all Phase I surface sediment samples was greater than the PQL.

As a result, cPAH and PCB concentrations above natural background concentrations in marine sediment are not necessarily associated with Site releases.

CONCLUSIONS AND RECOMMENDATIONS

This section provides conclusions and recommendations regarding the results for the Phase I RI marine sediment characterization. Conclusions include an assessment of the adequacy of the marine surface sediment characterization, and any impact the results have on the scope of the Phase II marine sediment characterization. Recommendations consist of proposed additional activities for Phase II of the marine sediment RI beyond those already included in the Work Plan.

Conclusions

The following conclusions are based on the Phase I marine sediment RI results.

- The concentrations of COPCs detected in surface sediment are greater than the Site marine sediment PSLs at sample location WM-SG-15 in the northeastern portion of the in-water investigation area. However, based on the distribution of these COPCs, and specifically the results from sample location WM-SG-07, it does not appear that the impacts at WM-SG-15 are the result of releases at the Site.
- PBTs have been identified in Site surface sediment. Because the Site PSLs in the Work Plan were developed based on SMS criteria, which do not address human health for PBTs, additional characterization is required to assess the extent of Site-related PBTs in relation to

area background concentrations in Blaine Harbor arising from other historical sources of PCBs and cPAHs, and to evaluate the potential impact to human health and other higher trophic-level species.

- A strong statistical correlation exists between bulk and porewater TBT analytical results, and supports the use of Site-specific bulk TBT PSLs based on applicable TBT porewater criteria. The proposed bulk TBT criteria for evaluating sediment core samples are 238 µg/kg and 738 µg/kg, for SQS- and CSL-equivalent PSLs, respectively.
- Revision to the subsurface marine sediment characterization scope is not required based on the Phase I results, other than limiting TBT analysis to bulk TBT testing.

Recommendations

The following are recommendations for additional characterization during Phase II of the marine sediment RI. These recommendations involve additional surface sediment characterization to determine if COPCs in marine surface sediment in the northeastern portion of the Site are related to Site activities, and additional characterization to better assess the distribution of PBTs in the Harbor, in order to provide sufficient information to establish a Site-specific background concentration to develop cleanup levels for this Site.

General Characterization

Surface sediment at the proposed sample location WM-SG-16 will be evaluated to better delineate the Site boundary in the northeastern and eastern in-water portions of the Site for cadmium, chromium, copper, lead and zinc. Table 4 provides a summary of the rationale for sample collection and the proposed analyses, and Figure 6 shows the proposed location. Collection of this surface sediment sample and subsequent testing will be conducted in accordance with procedures described in the Work Plan.

Additional PBT Characterization

It is necessary to better delineate the extent of PBTs in marine surface sediment to determine the best approach in assessing the risk to human health and higher trophic-level species. Benthic sessile marine aquatic organisms (e.g., clams, polychaete worms) are the organisms with the greatest potential for bioaccumulation of PBTs present in marine sediment because of their constant contact with the affected sediment. As a result, consumption of sessile species represents the greatest risk of exposure to PBTs present in marine sediment for humans and other higher trophic-level species. The potential for human and higher trophic-level species exposure to sessile species is limited within Blaine Harbor due to the lack of appropriate habitat and opportunity for shellfish harvesting. As a result, the potential for

human and higher trophic-level species exposure to PBTs originating from the Site is limited, particularly if those PBTs do not extend beyond the limits of Blaine Harbor at concentrations exceeding the PSLs.

The Site is partially isolated from adjacent marine areas, Drayton Harbor and Semiahmoo Bay, where a greater potential exists for activities that could result in exposure to aquatic organisms affected by PBTs, such as shellfish gathering. Consequently, it may not be necessary to develop Site-specific BSAFs or conduct a detailed human health risk assessment if PBTs do not exceed PBT-based PSLs beyond the limits of Blaine Harbor. As a result, the proposed scope for Phase II marine sediment RI activities related to characterization of PBTs consists of further characterization of PBT distribution in Blaine Harbor and its immediate vicinity. If the concentrations of one or more PBTs exceed PSLs beyond the limits of Blaine Harbor, additional discussion with Ecology will be needed to develop an approach for evaluating the risk of PBTs to human health and higher trophic-level species.

Because PCBs and cPAHs are present in all Phase I marine sediment samples at concentrations greater than their PBT-based PSLs, these COPCs will be analyzed for in all PBT characterization samples until detected concentrations are less than their PSLs, or all Phase II marine surface sediment samples collected for PBT characterization have been analyzed. Contingent on confirming that the elevated metals concentrations at WM-SG-15 are not related to Site releases, the extent of cadmium, lead, and mercury in marine surface sediment at concentrations greater than the PBT PSL were adequately delineated during Phase I based on the natural background concentration for Puget Sound, so additional testing for these metals will not be conducted for PBT characterization during the Phase II marine sediment RI.

Figure 7 shows the locations of Phase II marine sediment RI surface samples proposed to further characterize the distribution of PBTs in sediment in the Site vicinity. PCBs and cPAHs will be tested for as indicated in Table 4 and on Figure 7. Surface sediment samples from proposed locations WM-SG-17 through WM-SG-19 will be the initial samples analyzed for PCBs and cPAHs. Samples from locations WM-SG-20 through WM-SG-26 will be archived then sequentially analyzed for PCBs and/or PAHs moving outward if a COPC is detected at a concentration greater than its PSL in the sample nearer to the Site uplands as summarized in Table 4. Two of these locations (WM-SG-24 and WM-SG-26) are outside the entrances to Blaine Harbor; samples from these locations will be analyzed for PCBs and/or cPAHs only if PBTs are detected at concentrations greater than their PSLs in the nearest sample collected within Blaine Harbor.

REPORTING

The results for Phase II of the marine sediment RI will be presented to Ecology in a data report. The report will include figures and tables summarizing the results of the investigation, identify any remaining data gaps, and provide recommendations regarding additional characterization, if applicable.

USE OF THIS TECHNICAL MEMORANDUM

This technical memorandum has been prepared for the use of the Port of Bellingham and the Washington State Department of Ecology for specific application to the Westman Marine Inc. Site. None of the information, conclusions, and recommendations included in this document can be used for any other project without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the Pacific Northwest under similar conditions as this project. We make no other warranty, either express or implied.

JMD/LDB/ccy

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ATTACHMENTS

Figure 1: Vicinity Map
Figure 2: Sediment Sample Locations – October 2013
Figure 3: Constituents of Potential Concern in Surface Sediment Above Marine Sediment Preliminary Screening Levels
Figure 4: Persistent Bioaccumulative Toxins
Figure 5: Tributyltin Ion Porewater/Bulk Concentrations
Figure 6: Proposed Surface Sediment Sample Locations
Figure 7: Surface Sediment Sample Locations – Persistent Bioaccumulative Toxins

Table 1: Sample Location Coordinates/Mudline Elevation
Table 2: Surface Sediment Analytical Results
Table 3: Persistent Bioaccumulative Toxins
Table 4: Proposed Surface Sediment Sample Locations and Rationale

Data Source: Esri 2012

G:\Projects\001\035\010\0015\Westman Marine Sediment RI Data Report\Figure_01_VicMap.mxd 12/23/2013 NAD 1983 StatePlane Washington North FIPS 4601 Feet

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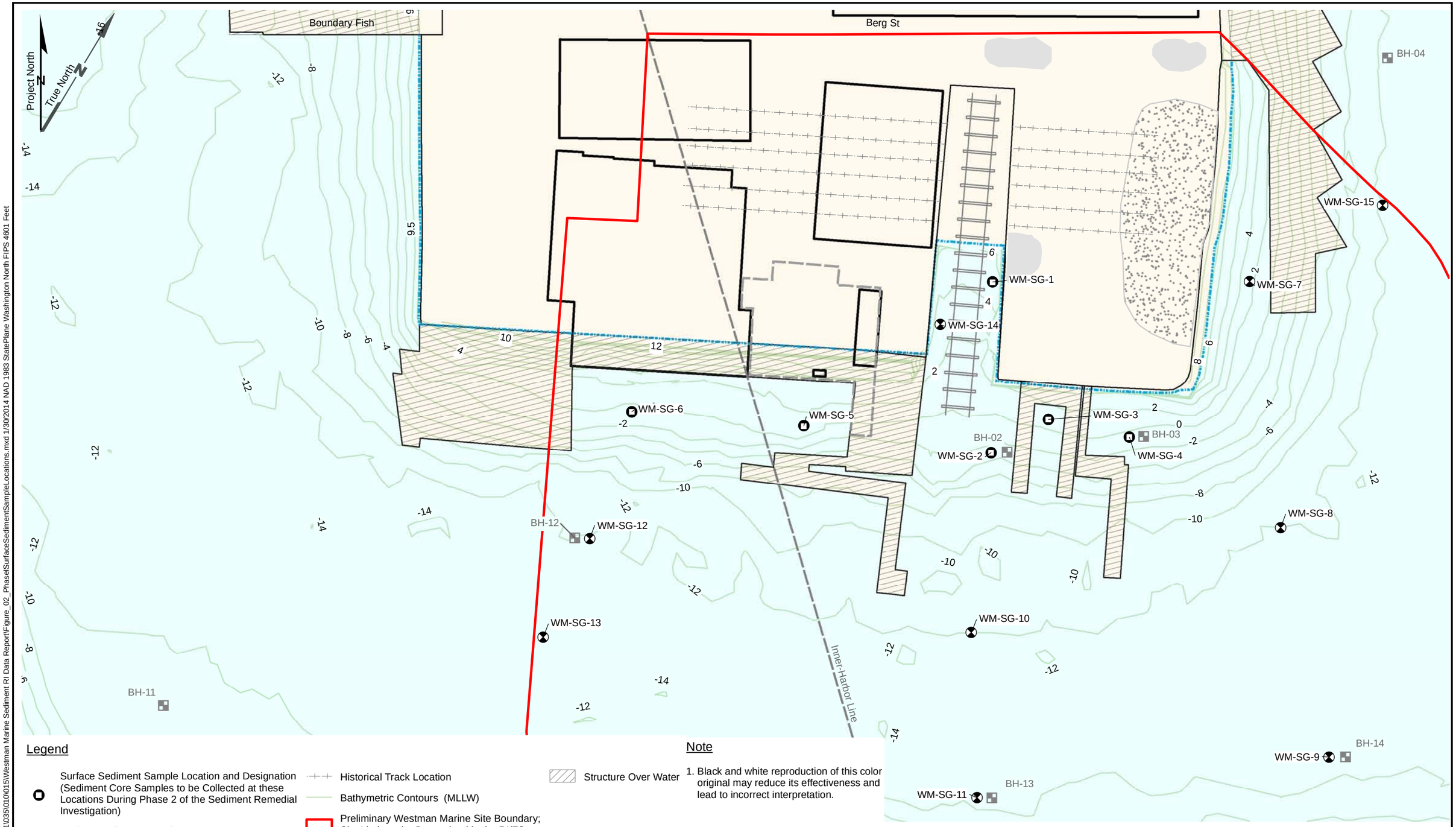
Westman Marine Blaine Harbor Blaine, Washington	**Vicinity Map**	Figure 1



Legend

- Surface Sediment Sample Location and Designation (Sediment Core Samples to be Collected at these Locations During Phase 2 of the Sediment Remedial Investigation)
- Surface Sediment Sample Location and Designation
- Historical Surface Sediment Sample
- Historical Track Location
- Bathymetric Contours (MLLW)
- Preliminary Westman Marine Site Boundary; Site Limits to be Determined in the RI/FS
- Potential Surface Contamination - Paint Chips (1993)
- Potential Surface Contamination - Staining (1993)
- Structure Over Water

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 50 100

Scale in Feet

Source: Wilson Engineering 2011, Port of Blaine 2011, Walker and Associates, Inc.

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Westman Marine Blaine Harbor Blaine, Washington	**Sediment Sample Locations October 2013**	Figure 2

G:\Projects\001035\010015\Westman Marine Sediment RI Data Report\Figure_02_PhaseISurfaceSedimentSampleLocations.mxd 1/30/2014 NAD 1983 StatePlane Washington North FIPS 4601 Feet

WM-SG-02	10/8/2013
Chromium (mg/kg)	27.7
Copper (mg/kg)	**715**
Mercury (mg/kg)	0.32
Zinc (mg/kg)	263
Tributyltin Ion (µg/L)	**0.084**
PCBs (mg/kg OC)	152
HPAH (mg/kg OC)	346
bis(2-Ethylhexyl)phthalate (mg/kg OC)	2100
Phenol (µg/kg)	170

WM-SG-14	10/8/2013
Chromium (mg/kg)	69
Copper (mg/kg)	**6930**
Mercury (mg/kg)	0.32
Zinc (mg/kg)	**1980**
Tributyltin Ion (µg/L)	**0.70**
PCBs (mg/kg OC)	3.06
HPAH (mg/kg OC)	**1018**
bis(2-Ethylhexyl)phthalate (mg/kg OC)	**66.33**
Phenol (µg/kg)	110

WM-SG-01	10/8/2013
Chromium (mg/kg)	25
Copper (mg/kg)	**1670**
Mercury (mg/kg)	**0.91**
Zinc (mg/kg)	**1250**
Tributyltin Ion (µg/L)	**0.71**
PCBs (mg/kg OC)	**44.93**
HPAH (mg/kg OC)	713
bis(2-Ethylhexyl)phthalate (mg/kg OC)	**86.96**
Phenol (µg/kg)	24 J

WM-SG-03	10/8/2013
Chromium (mg/kg)	14
Copper (mg/kg)	**609**
Mercury (mg/kg)	0.15
Zinc (mg/kg)	**443**
Tributyltin Ion (µg/L)	**0.27**
PCBs (mg/kg OC)	4.57
HPAH (mg/kg OC)	138
bis(2-Ethylhexyl)phthalate (mg/kg OC)	5.04
Phenol (µg/kg)	36

WM-SG-07	10/8/2013
Chromium (mg/kg)	10
Copper (mg/kg)	47.0
Mercury (mg/kg)	0.12
Zinc (mg/kg)	64
Tributyltin Ion (µg/L)	0.005
PCBs (mg/kg OC)	0.37
HPAH (mg/kg OC)	34
bis(2-Ethylhexyl)phthalate (mg/kg OC)	6.57
Phenol (µg/kg)	19

WM-SG-05	10/8/2013
Chromium (mg/kg)	17.7
Copper (mg/kg)	173
Mercury (mg/kg)	0.08
Zinc (mg/kg)	90 J
Tributyltin Ion (µg/L)	0.022
PCBs (mg/kg OC)	1.83
HPAH (mg/kg OC)	310 J
bis(2-Ethylhexyl)phthalate (mg/kg OC)	4.68
Phenol (µg/kg)	45 J

WM-SG-15	10/8/2013
Chromium (mg/kg)	**663 J**
Copper (mg/kg)	**1310 0 J**
Mercury (mg/kg)	0.14 J
Zinc (mg/kg)	**1170 J**
Tributyltin Ion (µg/L)	0.006
PCBs (mg/kg OC)	1.68
HPAH (mg/kg OC)	162
bis(2-Ethylhexyl)phthalate (mg/kg OC)	3.58 J
Phenol (µg/kg)	19 U

WM-SG-06	10/8/2013
Chromium (mg/kg)	15.0
Copper (mg/kg)	105
Mercury (mg/kg)	0.05
Zinc (mg/kg)	89
Tributyltin Ion (µg/L)	0.009
PCBs (mg/kg OC)	0.63
HPAH (mg/kg OC)	114
bis(2-Ethylhexyl)phthalate (mg/kg OC)	4.87
Phenol (µg/kg)	**510**

WM-SG-04	10/8/2013
Chromium (mg/kg)	13.7
Copper (mg/kg)	95.4
Mercury (mg/kg)	0.07
Zinc (mg/kg)	59
Tributyltin Ion (µg/L)	0.011
PCBs (mg/kg OC)	0.68
HPAH (mg/kg OC)	29
bis(2-Ethylhexyl)phthalate (mg/kg OC)	1.81
Phenol (µg/kg)	20

WM-SG-12	10/8/2013
Chromium (mg/kg)	28.0
Copper (mg/kg)	122
Mercury (mg/kg)	0.08
Zinc (mg/kg)	127
Tributyltin Ion (µg/L)	0.024
PCBs (mg/kg OC)	1.85
HPAH (mg/kg OC)	216
bis(2-Ethylhexyl)phthalate (mg/kg OC)	8.80
Phenol (µg/kg)	42

WM-SG-08	10/8/2013
Chromium (mg/kg)	27
Copper (mg/kg)	144
Mercury (mg/kg)	0.12
Zinc (mg/kg)	108
Tributyltin Ion (µg/L)	0.032
PCBs (mg/kg OC)	1.09
HPAH (mg/kg OC)	124
bis(2-Ethylhexyl)phthalate (mg/kg OC)	6.97
Phenol (µg/kg)	39

WM-SG-13	10/8/2013
Chromium (mg/kg)	18.8
Copper (mg/kg)	31.1
Mercury (mg/kg)	0.05
Zinc (mg/kg)	50
Tributyltin Ion (µg/L)	0.029
PCBs (mg/kg OC)	0.66
HPAH (mg/kg OC)	158
bis(2-Ethylhexyl)phthalate (mg/kg OC)	12.28
Phenol (µg/kg)	11J

WM-SG-10	10/8/2013
Chromium (mg/kg)	26.4
Copper (mg/kg)	**795**
Mercury (mg/kg)	0.12
Zinc (mg/kg)	308
Tributyltin Ion (µg/L)	**0.19**
PCBs (mg/kg OC)	6.86
HPAH (mg/kg OC)	247
bis(2-Ethylhexyl)phthalate (mg/kg OC)	11.32
Phenol (µg/kg)	49

WM-SG-11	10/8/2013
Chromium (mg/kg)	23.2
Copper (mg/kg)	47.2
Mercury (mg/kg)	0.06
Zinc (mg/kg)	72
Tributyltin Ion (µg/L)	0.014
PCBs (mg/kg OC)	2.17
HPAH (mg/kg OC)	598
bis(2-Ethylhexyl)phthalate (mg/kg OC)	3.18 J
Phenol (µg/kg)	17 J

WM-SG-09	10/8/2013
Chromium (mg/kg)	28
Copper (mg/kg)	51.9
Mercury (mg/kg)	0.07
Zinc (mg/kg)	81
Tributyltin Ion (µg/L)	0.015
PCBs (mg/kg OC)	3.72
HPAH (mg/kg OC)	84
bis(2-Ethylhexyl)phthalate (mg/kg OC)	3.02 J
Phenol (µg/kg)	22

Project North
True North
Berg St
Inner-Harbor Line
BH-01
BH-02
BH-03
BH-04
BH-11
BH-12
BH-13
BH-14

Legend

- Surface Sediment Sample and Proposed Sediment Core Location
- Surface Sediment Sample Location
- Historical Surface Sediment Sample
- Preliminary Westman Marine Site Boundary; Site Limits to be Determined in the RI/FS
- Historical Track Location (1966)
- Bathymetric Contours (MLLW)
- Potential Surface Contamination - Paint Chips (1993)
- Potential Surface Contamination - Staining (1993)
- Structure Over Water

0 100 200
Scale in Feet

Sediment Management Standards		
Constituent	SQS	CSL
Chromium (mg/kg)	260	270
Copper (mg/kg)	390	390
Mercury (mg/kg)	0.41	0.59
Zinc (mg/kg)	410	960
Tributyltin Ion (µg/L) * (Porewater)	0.05	0.15
PCBs (mg/kg OC)	12	65
HPAH (mg/kg OC)	960	5300
bis(2-Ethylhexyl)phthalate (mg/kg OC)	47	78
Phenol (µg/kg)	420	1200

Notes

1. Sample locations and concentrations in brown exceed the SQS criteria only.
2. Sample locations and concentrations in red exceed the CSL criteria.
3. Where "OC" is indicated data are normalized to total organic carbon by dividing the dry weight concentration of the constituent by the fraction of total organic carbon present.
4. The HPAH values represents the sum of the following HPAH 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.
5. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Abbreviations

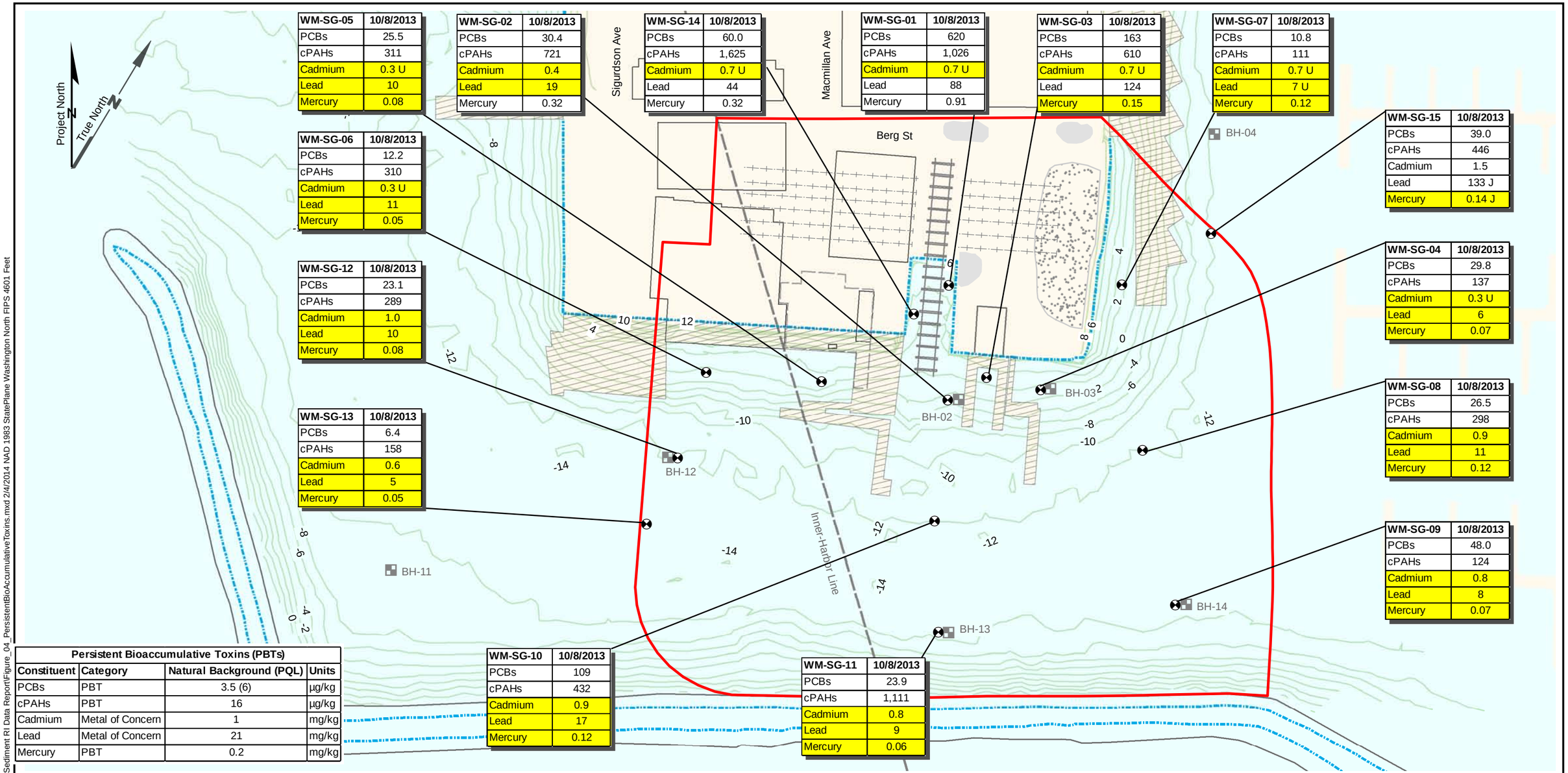
U = Not detected above reporting limit
J = Estimated Concentration
(µg/kg) = micrograms per kilogram (organotins)
(mg/kg) = milligrams per kilogram (metals)
PCBs = Polychlorinated Biphenyls
HPAH = High Molecular Weight Polycyclic Aromatic Hydrocarbons
COPCs = Constituents of Potential Concern
MLLW = Mean Lower Low Water
OC = Carbon Normalized

Source: Wilson Engineering 2011, Port of Blaine 2011, Walker and Associates, Inc.

LANDAU ASSOCIATES

Westman Marine Blaine Harbor Blaine, Washington	**COPCs in Surface Sediment Above Marine Sediment PSLs**	Figure 3

G:\Projects\001\0035\010\015\Westman Marine Sediment RI Data Report\Figure_03_ManagementStandardExceedFullList.mxd 1/30/2014 NAD 1983 StatePlane Washington North FIPS 4601 Feet



Persistent Bioaccumulative Toxins (PBTs)

Constituent	Category	Natural Background (PQL)	Units
PCBs	PBT	3.5 (6)	µg/kg
cPAHs	PBT	16	µg/kg
Cadmium	Metal of Concern	1	mg/kg
Lead	Metal of Concern	21	mg/kg
Mercury	PBT	0.2	mg/kg

Legend

- Surface Sediment Sample and Proposed Sediment Core Location
- Surface Sediment Sample Location
- Historical Surface Sediment Sample
- Preliminary Westman Marine Site Boundary; Site Limits to be Determined in the RI/FS
- Historical Track Location (1966)
- Bathymetric Contours (MLLW)
- Potential Surface Contamination - Paint Chips (1993)
- Potential Surface Contamination - Staining (1993)
- Structure Over Water

Notes

1. Highlighted constituents are present at concentrations less than the natural background.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Abbreviations

U = Not detected above reporting limit
J = Estimated Concentration
(µg/kg) = Micrograms per Kilogram
(mg/kg) = Milligrams per Kilogram
PCBs = Polychlorinated Biphenyls
cPAHs = Carcinogenic Polycyclic Aromatic Hydrocarbons (TEQ)
MLLW = Mean Lower Low Water
PQL = Practical Quantitation Limit

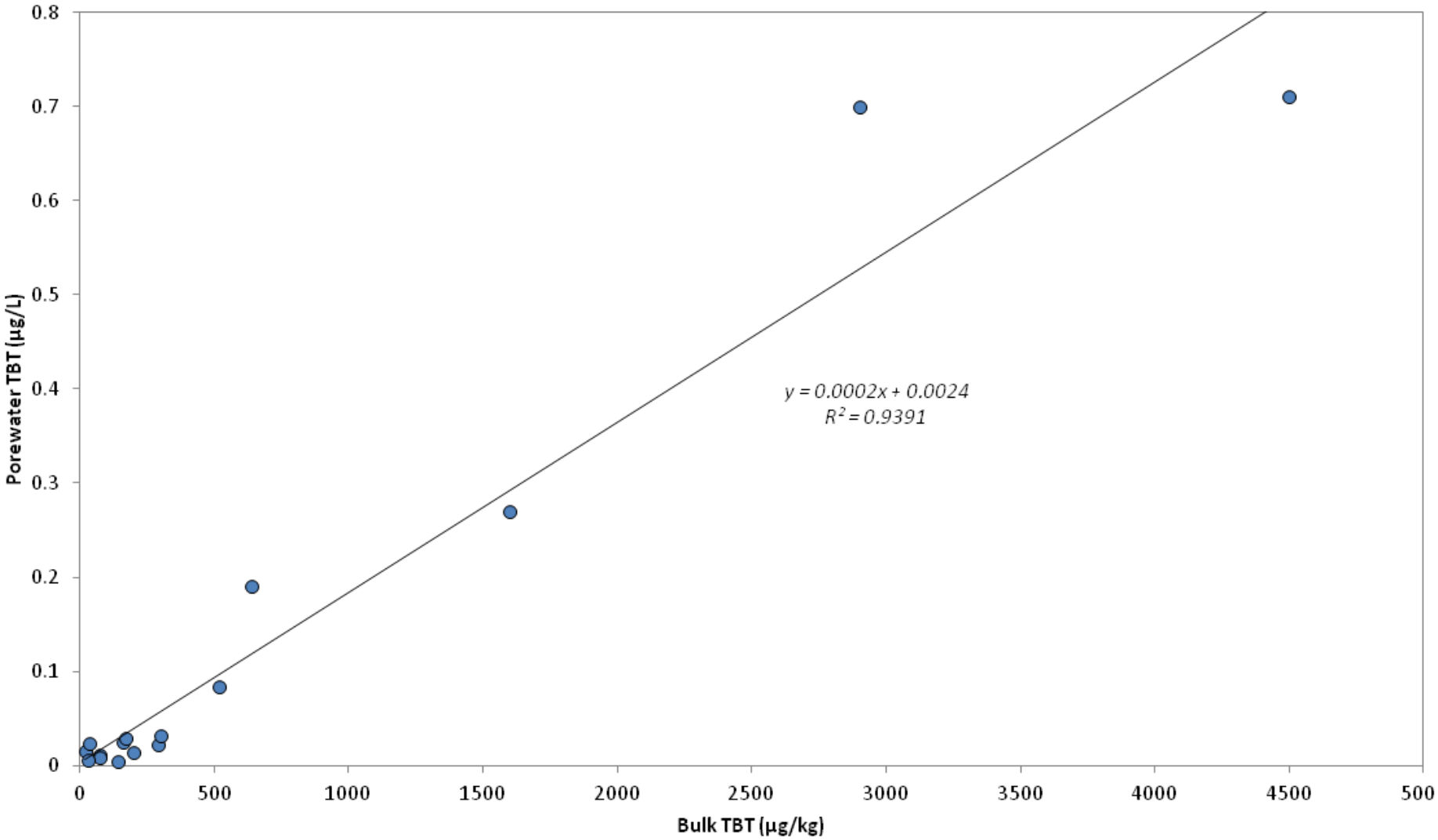
0 80 160
Scale in Feet

Source: Wilson Engineering 2011, Port of Blaine 2011, Walker and Associates, Inc.

LANDAU ASSOCIATES

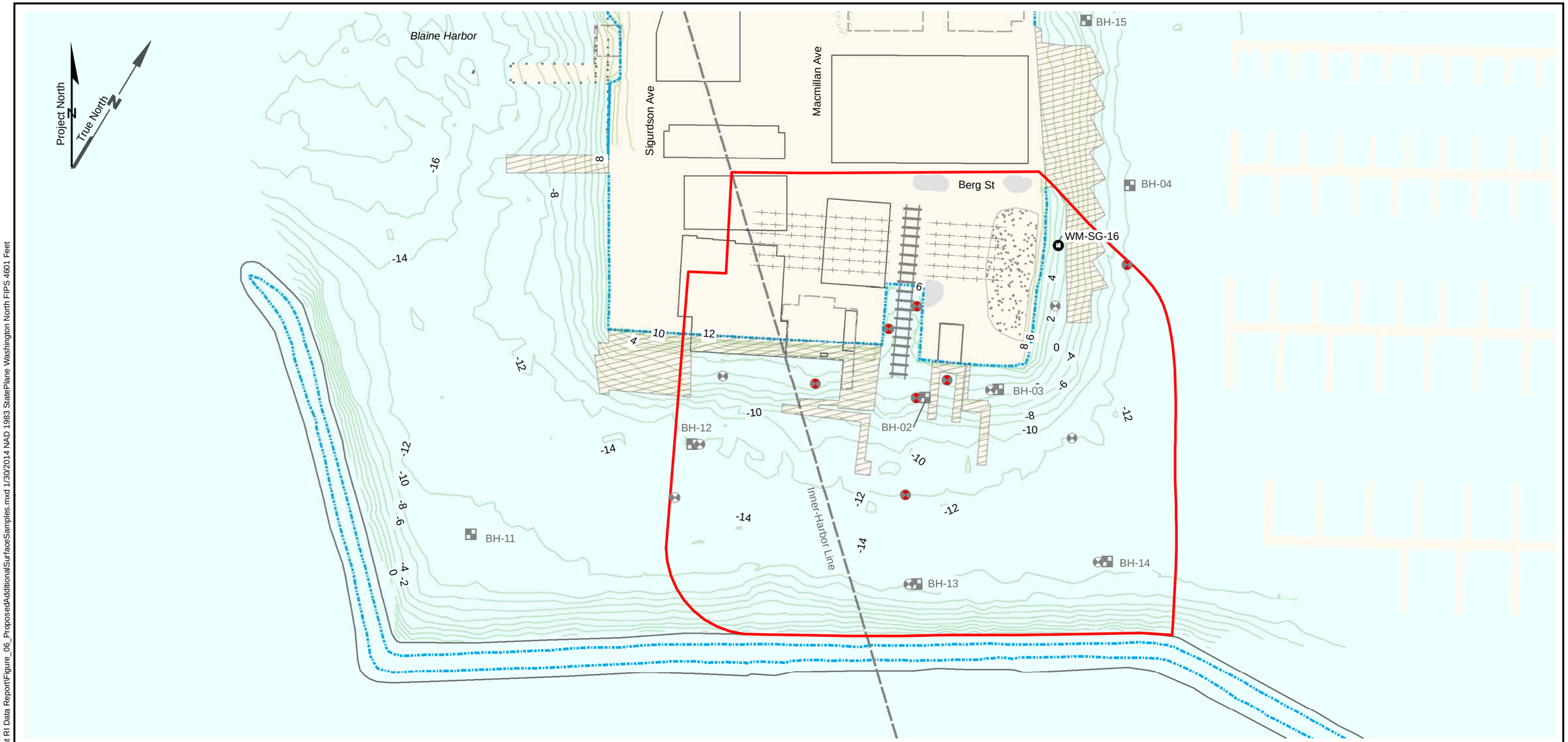
Westman Marine Blaine Harbor Blaine, Washington	**Persistent Bioaccumulative Toxins**	Figure 4

G:\Projects\0010035\010\0015\Westman Marine Sediment RI Data Report\Figure_04_PersistentBioAccumulativeToxins.mxd 2/4/2014 NAD 1983 StatePlane Washington North FIPS 4601 Feet



LANDAU ASSOCIATES

Westman Marine Blaine Harbor Blaine, Washington	**Tributyltin Ion Porewater/ Bulk Concentration**	Figure 5



Legend

- Proposed Surface Sediment Sample Location
- Phase I Surface Sediment Sample Location
- Historical Surface Sediment Sample
- Preliminary Westman Marine Site Boundary; Site Limits to be Determined in the RI/FS
- Historical Track Location (1966)
- Bathymetric Contours (MLLW)
- Potential Surface Contamination - Paint Chips (1993)
- Potential Surface Contamination - Staining (1993)
- Structure Over Water

Notes

1. Sample locations and concentrations in red exceed the site screening levels.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 100 200

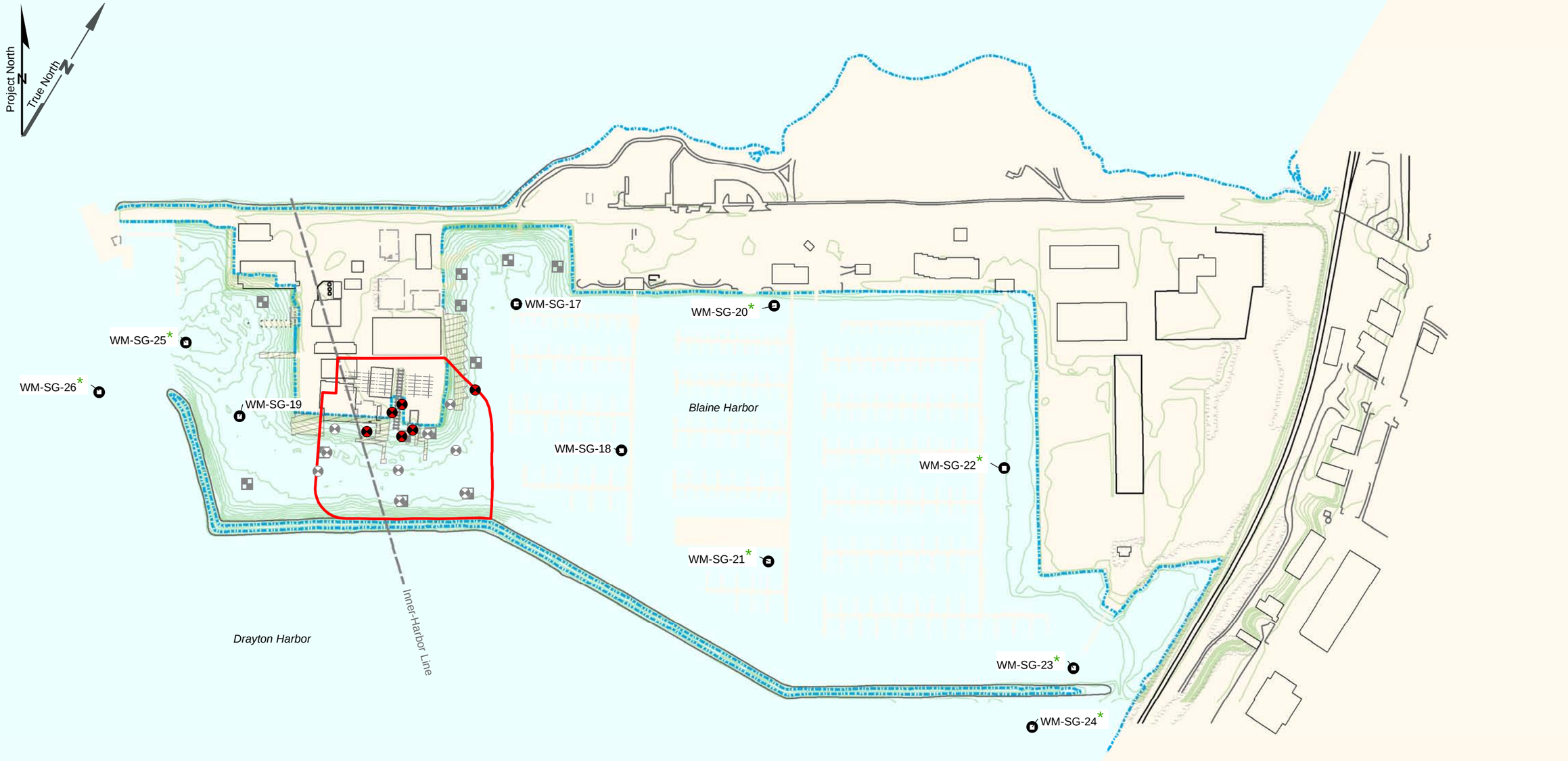
Scale in Feet

Source: Wilson Engineering 2011, Port of Blaine 2011, Walker and Associates, Inc.

LANDAU ASSOCIATES

Westman Marine Blaine Harbor Blaine, Washington	**Proposed Surface Sediment Sample Locations**	Figure 6

G:\Projects\001\035\010\015\Westman Marine Sediment RI Data Report\Figure_06_ProposedAdditionalSurfaceSamples.mxd 1/30/2014 NAD 1983 StatePlane Washington North FIPS 4601 Feet



Legend

- Proposed Surface Sediment Sample Location
- Phase I Surface Sediment Sample Location
- Historical Surface Sediment Sample
- Preliminary Westman Marine Site Boundary; Site Limits to be Determined in the RI/FS
- Historical Track Location (1966)
- Bathymetric Contours (MLLW)
- Structure Over Water

Notes

1. Sample locations in red exceed the site screening levels.
2. * Samples taken from these locations will be archived at the laboratory pending review of other analytical results.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 300 600
Scale in Feet

Source: Wilson Engineering 2011, Port of Blaine 2011, Walker and Associates, Inc.

LANDAU ASSOCIATES

Westman Marine Blaine Harbor Blaine, Washington	**Surface Sediment Sample Locations - Persistent Bioaccumulative Toxins**	Figure 7

G:\Projects\001\035\010\0015\Westman Marine Sediment RI Data Report\Figure_07_SurfaceSedimentSampleLocations-PBT.mxd 2/4/2014 NAD 1983 StatePlane Washington North FIPS 4601 Feet

TABLE 1
SAMPLE LOCATION COORDINATES/MUDLINE ELEVATION
WESTMAN MARINE INC. SITE
BLAINE HARBOR – BLAINE, WASHINGTON

	Sample Location	Mudline Elevation (MLLW) (a)	Northing (b)	Easting (b)
Surface Sediment Samples				
	WM-SG-01	4.5	732419	1177332
	WM-SG-02	-4.6	732338	1177379
	WM-SG-03	0.8	732370	1177396
	WM-SG-04	-3.9	732385	1177439
	WM-SG-05	-1.5	732298	1177283
	WM-SG-06	-1.1	732256	1177199
	WM-SG-07	2.3	732491	1177452
	WM-SG-08	-10.7	732385	1177536
	WM-SG-09	-13.5	732291	1177623
	WM-SG-10	-11.9	732248	1177420
	WM-SG-11	-11.7	732172	1177470
	WM-SG-12	-13.7	732185	1177215
	WM-SG-13	-14.4	732125	1177221
	WM-SG-14	2.9	732384	1177319
	WM-SG-15	-12.7	732565	1177493

(a) Approximate elevation calculated from water depth and tide level datum
(b) Washington State Plane North Zone NAD 83, survey feet

TABLE 2
SURFACE SEDIMENT ANALYTICAL RESULTS
WESTMAN MARINE INC. SITE
BLAINE HARBOR – BLAINE, WASHINGTON

	SQS (a)	CSL (b)	WM-SG-01 XJ39D 10/08/2013	WM-SG-02 XJ39K 10/08/2013	WM-SG-03 XJ39L 10/08/2013	WM-SG-04 XJ39B 10/08/2013	WM-SG-05 XJ39E 10/08/2013	Dup of WM-SG-05 WM-SG-DUP XJ39P 10/08/2013	WM-SG-06 XJ39F 10/08/2013	WM-SG-07 XJ39A 10/08/2013	WM-SG-08 XJ39N 10/08/2013	WM-SG-09 XJ39M 10/08/2013	WM-SG-10 XJ39J 10/08/2013	WM-SG-11 XJ39I 10/08/2013	WM-SG-12 XJ39G 10/08/2013	WM-SG-13 XJ39H 10/08/2013	WM-SG-14 XJ39C 10/08/2013	WM-SG-15 XJ39O 10/08/2013
TOTAL METALS (mg/kg-dry wt)																		
Methods SW6010C/SW7471A																		
Arsenic	57	93	**30**	**12**	20 U	6 U	7 U	7 U	7 U	20 U	**10**	**10**	**12**	**10**	**12**	8 U	**20**	**40**
Cadmium	5.1	6.7	0.7 U	**0.4**	0.7 U	0.3 U	0.3 U	0.3 U	0.3 U	0.7 U	**0.9**	**0.8**	**0.9**	**0.8**	**1.0**	**0.6**	0.7 U	**1.5**
Chromium	260	270	**25**	**27.7**	**14**	**13.7**	**17.7**	**14.6**	**15.0**	**10**	**27**	**28**	**26.4**	**23.2**	**28.0**	**18.8**	**69**	**663** J
Copper	390	390	**1,670**	**715**	**609**	**95.4**	**173**	**209** J	**105**	**47.0**	**144**	**51.9**	**795**	**47.2**	**122**	**31.1**	**6,930**	**13,100** J
Lead	450	530	**88**	**19**	**124**	**6**	**10**	**12**	**11**	7 U	**11**	**8**	**17**	**9**	**10**	**5**	**44**	**133** J
Mercury	0.41	0.59	**0.91**	**0.32**	**0.15**	**0.07**	**0.08**	**0.10**	**0.05**	**0.12**	**0.12**	**0.07**	**0.12**	**0.06**	**0.08**	**0.05**	**0.32**	**0.14** J
Silver	6.1	6.1	1 U	0.6 U	1 U	0.4 U	0.4 U	0.4 U	0.4 U	1 U	0.6 U	0.6 U	0.6 U	0.5 U	0.6 U	0.5 U	1 U	1 U
Zinc	410	960	**1,250**	**263**	**443**	**59**	**90** J	**249** J	**89**	**64**	**108**	**81**	**308**	**72**	**127**	**50**	**1,980**	**1,170** J
BULK ORGANOTINS (µg/kg-dry wt)																		
KRONE88																		
Tributyltin Ion	238 (c)	738 (c)	**4,500**	**520**	**1,600**	**72**	**290** J	**160** J	**74**	**140**	**300**	**20**	**640**	**200**	**34**	**170**	**2,900**	**31**
Dibutyltin Ion	---	---	**2,200**	**290**	**2,100**	**45**	**80**	**65** J	**66**	**86**	**95**	**41**	**720**	**82**	**61**	**50**	**1,300**	**30** J
Butyltin Ion	---	---	**240**	**47**	**400**	**20**	**26**	**23** J	**16**	**22**	**14**	**10**	**190**	**13**	**11**	**12**	**170**	**8.7** J
POREWATER ORGANOTINS (µg/L)																		
KRONE88																		
Tributyltin Ion	0.05 (d)	0.15 (d)	**0.71**	**0.084**	**0.27**	**0.011**	**0.022**	**0.025**	**0.009**	**0.005** J	**0.032**	**0.015**	**0.19**	**0.014**	**0.024**	**0.029**	**0.70**	**0.006**
Dibutyltin Ion	---	---	**0.078**	**0.011**	**0.12**	**0.012**	**0.021**	**0.023**	**0.011**	**0.006** J	**0.014**	**0.014**	**0.027**	**0.006** J	**0.010**	**0.007** J	**0.067**	**0.005** J
Butyltin Ion	---	---	**0.025** J	**0.023** J	**0.056** J	0.015 UJ	**0.044** J	**0.041** J	0.012 UJ	0.010 UJ	0.020 UJ	**0.023** J	0.020 UJ	0.014 UJ	**0.025** J	**0.022** J	**0.025** J	0.016 UJ
PAHs (mg/kg OC) (e)																		
Method SW8270D																		
Naphthalene	99	170	**3.84**	**2.10**	**0.56**	**0.23** J	**3.17**	**2.75**	**0.82** J	**0.59** J	**2.05**	**3.41**	**6.92**	**6.36**	**6.96**	**5.12**	**2.86**	**3.19**
Acenaphthylene	66	66	**3.99** J	**2.10** J	**0.70** J	**0.21** J	**2.09** J	**1.26** J	**0.67** J	**0.55** J	**1.68** J	**1.24** J	**3.02** J	**5.36** J	**3.52** J	**1.84** J	**5.61** J	**1.03** J
Acenaphthene	16	57	**3.84**	**1.05**	**1.01**	**0.25** J	**1.94**	**0.99**	0.92 U	0.66 U	**0.61** J	1.55 U	**2.33**	**1.45** J	**1.60**	**1.33** J	**6.12**	**1.16** J
Fluorene	23	79	**3.70**	**1.35**	**0.87**	**0.23** J	**1.94**	**1.26**	**0.56** J	**0.73**	**1.52**	**1.40** J	**0.88** J	**2.09**	**4.40**	**2.87**	**6.63**	**1.90** J
Phenanthrene	100	480	**31.88**	**13.50**	**9.52**	**1.54**	**51.08** J	**7.14** J	**5.64**	**5.19**	**9.02**	**7.75**	**25.16**	**10.91**	**21.60**	**16.38**	**56.12**	**18.53** J
Anthracene	220	1200	**12.32**	**6.00**	**2.55**	**0.61**	**4.10**	**3.08** J	**1.74**	**1.00**	**3.85**	**2.95**	**8.81**	**14.55**	**6.56**	**5.12**	**18.88**	**3.49** J
2-Methylnaphthalene	38	64	**2.75**	1.00 U	**0.34** J	0.41 U	**1.15** J	**1.10**	**0.51** J	**0.35** J	**0.74** J	1.55 U	**1.64**	**1.45** J	**1.92**	**1.84** J	**1.33**	**2.84** J
LPAH (f, g)	370	780	**60**	**26**	**15**	**3.1** J	**64**	**16**	**9.4** J	**8.1** J	**19** J	**17** J	**47** J	**41** J	**45**	**33** J	**96**	**29**
Fluoranthene	160	1200	**101.45**	**70.00**	**25.21**	**5.90**	**100.72** J	**19.78** J	**17.44**	**7.61**	**23.36**	**16.28**	**47.80**	**72.73**	**45.60**	**37.87**	**331.63** J	**34.05** J
Pyrene	1000	1400	**202.90**	**65.00**	**26.05**	**4.99**	**70.50** J	**24.18** J	**13.85**	**7.27**	**25.41**	**17.05**	**58.49**	**74.55**	**51.20**	**33.78**	**178.57** J	**30.60** J
Benzo(a)anthracene	110	270	**36.23**	**27.50**	**10.36**	**1.86**	**10.79**	**7.69** J	**8.21**	**2.77**	**8.20**	**7.21**	**19.50**	**49.09**	**16.00**	**12.28**	**91.84**	**12.93** J
Chrysene	110	460	**79.71**	**50.00**	**17.93**	**4.76**	**36.69** J	**17.58** J	**17.95**	**4.15**	**22.13**	**13.18**	**33.96**	**109.09**	**25.60**	**21.49**	**122.45**	**21.55** J
Total Benzofluoranthenes (f, h)	230	450	**181.16**	**90.00**	**33.61**	**6.35**	**53.24** J	**26.37** J	**25.64**	**6.23**	**28.69**	**17.05**	**49.06**	**163.64**	**42.40**	**27.64**	**178.57**	**36.64** J
Benzo(a)pyrene	99	210	**47.83**	**22.50**	**11.76**	**2.06**	**14.39**	**8.79** J	**11.28**	**2.70**	**7.79**	**6.67**	**18.87**	**75.45**	**16.00**	**11.26**	**51.02**	**13.36** J
Indeno(1,2,3-cd)pyrene	34	88	**28.99**	**9.50**	**5.60**	**1.25**	**10.07** J	**3.68** J	**8.21**	**1.52**	**3.77**	**2.79**	**8.18**	**22.73**	**8.00**	**5.73**	**27.55**	**5.17** J
Dibenz(a,h)anthracene	12	33	**7.25**	**3.05**	**1.62**	**0.41** J	**2.52**	**1.37** J	**2.26**	**0.48** J	**1.02**	**0.85** J	**2.52**	**9.09**	**2.40**	**1.74** J	**8.16**	**1.77** J
Benzo(g,h,i)perylene	31	78	**27.54**	**8.50**	**5.60**	**1.43**	**10.79**	**5.27**	**9.23**	**1.76**	**3.65**	**2.79**	**8.18**	**21.82**	**8.80**	**5.73**	**28.06**	**5.60** J
HPAH (f, i)	960	5300	**713**	**346**	**138**	**29**	**310** J	**115** J	**114**	**34**	**124**	**84**	**247**	**598**	**216**	**158**	**1,018**	**162**
SVOCs (mg/kg OC) (e)																		
1,2-Dichlorobenzene	2.3	2.3	0.34 U	0.25 U	0.13 U	0.10 U	0.33 U	0.25 U	0.24 U	0.16 U	0.19 U	0.38 U	0.30 U	0.45 U	0.38 U	0.49 U	0.24 U	0.21 U
1,3-Dichlorobenzene	---	---	0.34 U	0.25 U	0.13 U	0.10 U	0.33 U	0.25 U	0.24 U	0.16 U	0.19 U	0.38 U	0.30 U	0.45 U	0.38 U	0.49 U	0.24 U	0.21 U
1,4-Dichlorobenzene	3.1	9	0.34 U	0.25 U	0.13 U	0.10 U	0.33 U	0.25 U	0.24 U	0.16 U	0.19 U	0.38 U	0.30 U	0.45 U	0.38 U	0.49 U	0.24 U	0.21 U
1,2,4-Trichlorobenzene	0.81	1.8	0.34 U	0.25 U	0.13 U	0.10 U	0.33 U	0.25 U	0.24 U	0.16 U	0.19 U	0.38 U	0.30 U	0.45 U	0.38 U	0.49 U	0.24 U	0.21 U
Hexachlorobenzene	0.38	2.3	0.34 U	0.25 U	0.13 U	0.10 U	0.33 U	0.25 U	0.24 U	0.16 U	0.19 U	0.38 U	0.30 U	0.45 U	0.38 U	0.49 U	0.24 U	0.21 U
Dimethylphthalate	53	53	**4.06**	**3.00**	**0.42**	**0.23**	**0.94**	**0.47**	**0.14** J	**0.25**	**0.61**	**0.50**	**2.33**	**0.73**	**1.04**	**0.44** J	**3.57**	**5.17** J
Diethylphthalate	61	110	2.75 U	1.00 U	0.53 U	0.41 U	1.29 U	0.99 U	0.92 U	0.66 U	9.43 U	6.12 U	1.32 U	1.82 U	3.52 U	1.94 U	0.97 U	1.08 U
Di-n-Butylphthalate	220	1700	**2.97**	**0.60** J	**3.64**	**0.43**	**0.86** J	0.99 U	0.92 U	**0.45** J	**0.66** J	1.55 U	1.19 U	1.82 U	1.52 U	1.94 U	**3.37**	0.82 U
Butylbenzylphthalate	4.9	64	**1.01**	**0.70**	**0.39**	**0.07** J	**0.79**	**0.34**	**0.29**	**0.31**	0.19 U	0.38 U	**0.35**	0.45 U	**0.67**	0.49 U	**1.12**	**0.56**
bis(2-Ethylhexyl)phthalate	47	78	**86.96**	**21.00**	**5.04**	**1.81**	**4.68**	**6.04** J	**4.87**	**6.57**	**6.97**	**3.02** J	**11.32**	**3.18** J	**8.80**	**12.28**	**66.33**	**3.58** J
Di-n-Octyl phthalate	58	4500	2.75 U	1.00 U	0.53 U	0.41 U	1.29 U	0.99 U	**0.82** J	0.66 U	0.78 U	1.55 U	1.19 U	1.82 U	**1.20** J	1.94 U	0.97 U	0.82 U
Dibenzofuran	15	58	**3.12**	**1.00**	**0.48** J	0.41 U	**2.01**	**1.15**	0.92 U	0.66 U	**0.90**	**0.93** J	**2.64**	**1.91**	**2.16**	**1.84** J	**3.37**	**1.55** J
Hexachlorobutadiene	3.9	6.2	0.34 U	0.25 U	0.13 U	0.10 U	0.33 U	0.25 U	0.24 U	0.16 U	0.19 U	0.38 U	0.30 U	0.45 U	0.38 U	0.49 U	0.24 U	0.21 U
N-Nitrosodiphenylamine	11	11	**2.03**	**0.23** J	**0.39**	0.10 U	0.33 U	0.25 U	0.24 U	0.16 U	0.19 U	0.38 U	0.30 U	0.45 U	0.38 U	0.49 U	**1.12**	0.21 UJ

TABLE 2
SURFACE SEDIMENT ANALYTICAL RESULTS
WESTMAN MARINE INC. SITE
BLAINE HARBOR – BLAINE, WASHINGTON

	SQS (a)	CSL (b)	WM-SG-01 XJ39D 10/08/2013	WM-SG-02 XJ39K 10/08/2013	WM-SG-03 XJ39L 10/08/2013	WM-SG-04 XJ39B 10/08/2013	WM-SG-05 XJ39E 10/08/2013	Dup of WM-SG-05 WM-SG-DUP XJ39P 10/08/2013	WM-SG-06 XJ39F 10/08/2013	WM-SG-07 XJ39A 10/08/2013	WM-SG-08 XJ39N 10/08/2013	WM-SG-09 XJ39M 10/08/2013	WM-SG-10 XJ39J 10/08/2013	WM-SG-11 XJ39I 10/08/2013	WM-SG-12 XJ39G 10/08/2013	WM-SG-13 XJ39H 10/08/2013	WM-SG-14 XJ39C 10/08/2013	WM-SG-15 XJ39O 10/08/2013
cPAHs (µg/kg)																		
Method SW8270D																		
Benzo(a)anthracene	---	---	**500**	**550**	**370**	**82**	**150**	**140** J	**160**	**80**	**200**	**93**	**310**	**540**	**200**	**120**	**1,800**	**300** J
Chrysene	---	---	**1,100**	**1,000**	**640**	**210**	**510** J	**320** J	**350**	**120**	**540**	**170**	**540**	**1,200**	**320**	**210**	**2,400**	**500** J
Benzo(a)pyrene	---	---	**660**	**450**	**420**	**91**	**200**	**160** J	**220**	**78**	**190**	**86**	**300**	**830**	**200**	**110**	**1,000**	**310** J
Indeno(1,2,3-cd)pyrene	---	---	**400**	**190**	**200**	**55**	**140** J	**67** J	**160**	**44**	**92**	**36**	**130**	**250**	**100**	**56**	**540**	**120** J
Dibenz(a,h)anthracene	---	---	**150**	**68**	**64**	**17** J	**33**	**33**	**44**	**14** J	**30**	**11** J	**44**	**100**	**31**	**14** J	**170**	**42** J
Total Benzofluoranthenes	---	---	**2,500**	**1,800**	**1,200**	**280**	**740** J	**480** J	**500**	**180**	**700**	**220**	**780**	**1,800**	**530**	**270**	**3,500**	**850** J
cPAHs	---	---	**1,026**	**721**	**610**	**137**	**311**	**235**	**310**	**111**	**298**	**124**	**432**	**1,111**	**289**	**158**	**1,625**	**446**
SVOCs (ug/kg)																		
Phenol	420	1200	**24** J	**170**	**36**	**20**	**45** J	**190** J	**510**	19 U	**39**	**22**	**49**	**17** J	**42**	**11** J	**110**	19 U
2-Methylphenol	63	63	**3.6** J	**4.7** J	4.7 U	4.6 U	4.6 U	4.6 U	4.6 U	4.7 U	**4.4** J	**3.1** J	**4.6** J	5.0 U	4.7 U	4.8 U	**16**	**4.3** J
4-Methylphenol	670	670	38 U	**24**	**82**	18 U	**16** J	**41**	**15** J	19 U	**43**	**46**	**86**	**130**	**74**	**27**	**24**	**43**
2,4-Dimethylphenol	29	29	24 U	24 U	23 U	23 U	23 U	23 U	23 U	24 U	24 U	24 U	24 U	25 U	24 U	24 U	**11** J	24 U
Pentachlorophenol	360	690	**58** J	**54** J	19 UJ	18 UJ	18 UJ	**12** J	18 UJ	19 UJ	**13** J	20 UJ	**35** J	20 UJ	**14** J	19 UJ	**270** J	**20** J
Benzyl Alcohol	57	73	**16** J	**41**	19 U	18 U	18 U	18 U	18 U	19 U	**12** J	**14** J	**19**	20 U	**21**	19 U	**50**	19 U
Benzoic Acid	650	650	380 U	200 UJ	190 UJ	180 UJ	180 UJ	180 U	180 UJ	190 UJ	**160** J	200 UJ	**150** J	200 UJ	**200** J	190 UJ	**280** J	190 U
PCBs (µg/kg)																		
Method SW8082A																		
Aroclor 1016			3.9 U	4.0 U	3.9 U	3.7 U	3.8 U	3.8 U	3.8 U	3.8 U	3.9 U	3.9 U	3.9 U	4.0 U	3.9 U	3.8 U	3.8 U	4.0 U
Aroclor 1242			3.9 U	4.0 U	3.9 U	3.7 U	3.8 U	3.8 U	3.8 U	3.8 U	3.9 U	3.9 U	3.9 U	4.0 U	3.9 U	3.8 U	3.8 U	4.0 U
Aroclor 1248			**380**	16 U	39 U	9.2 U	9.5 U	5.7 U	4.7 U	3.8 U	5.9 U	9.8 U	**46**	6.0 U	7.8 U	4.8 U	19 U	12 U
Aroclor 1254			**240**	**22**	**130**	**22**	**18**	**14**	**7.1**	**7.0**	**12**	**32**	**49**	**17**	**15**	**6.4**	**43**	**24**
Aroclor 1260			20 U	**8.4**	**33** P	**7.8**	**7.5**	**7.5**	**5.1**	**3.8**	**8.3**	**16**	**14**	**6.9**	**8.1**	3.8 U	**17**	**15**
Aroclor 1221			3.9 U	4.0 U	3.9 U	3.7 U	3.8 U	3.8 U	3.8 U	3.8 U	3.9 U	3.9 U	3.9 U	4.0 U	3.9 U	3.8 U	3.8 U	4.0 U
Aroclor 1232			3.9 U	4.0 U	3.9 U	3.7 U	3.8 U	3.8 U	3.8 U	5.6 U	3.9 U	3.9 U	3.9 U	4.0 U	3.9 U	3.8 U	3.8 U	4.0 U
Aroclor 1262			3.9 U	4.0 U	3.9 U	3.7 U	3.8 U	3.8 U	3.8 U	3.8 U	**6.2**	3.9 U	3.9 U	4.0 U	3.9 U	3.8 U	3.8 U	4.0 U
Aroclor 1268			3.9 U	4.0 U	3.9 U	3.7 U	3.8 U	3.8 U	3.8 U	3.8 U	3.9 U	3.9 U	3.9 U	4.0 U	3.9 U	3.8 U	3.8 U	4.0 U
Total PCBs			**620**	**30.4**	**163**	**29.8**	**25.5**	**21.5**	**12.2**	**10.8**	**26.5**	**48.0**	**109**	**23.9**	**23.1**	**6.4**	**60.0**	**39.0**
Total PCBs (f) (mg/kg OC)																		
Method SW8082A																		
Total PCBs	12	65	**44.93**	**1.52**	**4.57**	**0.68**	**1.83**	**1.18**	**0.63**	**0.37**	**1.09**	**3.72**	**6.86**	**2.17**	**1.85**	**0.66**	**3.06**	**1.68**
CONVENTIONALS																		
Total Solids (%) (SM2540B)	---	---	**71.90**	**55.49**	**73.42**	**71.88**	**71.42**	**72.30**	**54.71**	**73.94**	**53.90**	**49.21**	**52.71**	**63.26**	**53.94**	**67.16**	**69.00**	**49.48**
Preserved Total Solids (%) (SM2540B)	---	---	**72.10**	**52.28**	**76.57**	**73.62**	**71.19**	**71.86**	**74.41**	**74.63**	**49.95**	**46.71**	**49.12**	**57.87**	**54.12**	**65.30**	**62.54**	**43.85**
Total Volatile Solids (%) (SM2540E)	---	---	**2.08**	**4.73**	**1.96**	**1.76**	**2.01**	**1.99**	**4.75**	**1.48**	**4.34**	**4.77**	**4.78**	**3.39**	**4.56**	**2.52**	**3.72**	**5.80**
Ammonia (NH3) as Nitrogen (mg/kg) (EPA350.1M)	---	---	**1.68**	**6.33**	**2.12**	**3.58**	**5.59**	**5.63**	**19.2**	**5.07**	**7.20**	**10.9**	**11.4**	**3.99**	**7.96**	**3.29**	**7.34**	**11.1**
Sulfide (mg/kg) (EPA376.2)	---	---	**1,480**	**1,490**	**33.8**	**387**	**132**	**138**	**200**	**15.1**	**835**	**866**	**960**	**530**	**585**	**369**	**656**	**2,710** J
Total Organic Carbon (%) (PLUMB81TC)	---	---	**1.38**	**2.00**	**3.57**	**4.41**	**1.39**	**1.82**	**1.95**	**2.89**	**2.44**	**1.29**	**1.59**	**1.10**	**1.25**	**0.977**	**1.96**	**2.32** J
GRAIN Size (%)																		
PSEP-PS																		
Particle/Grain Size, Phi Scale <-1	---	---	**2.6**	**2.2**	**20.8**	**11.1**	**7.1**	**8.9**	**17.8**	**13.4**	**3.3**	**0.5**	**0.8**	**1.5**	**1.2**	**0.3**	**15.0**	**12.3**
Particle/Grain Size, Phi Scale -1 to 0	---	---	**3.5**	**2.1**	**7.5**	**3.6**	**2.7**	**2.7**	**6.3**	**3.8**	**2.0**	**1.4**	**1.4**	**1.1**	**1.6**	**0.4**	**7.4**	**4.0**
Particle/Grain Size, Phi Scale 0 to 1	---	---	**8.1**	**2.2**	**5.7**	**2.5**	**2.6**	**2.5**	**5.1**	**2.7**	**1.7**	**1.6**	**1.7**	**1.0**	**1.6**	**0.7**	**11.8**	**2.5**
Particle/Grain Size, Phi Scale 1 to 2	---	---	**11.9**	**4.1**	**5.8**	**4.2**	**6.5**	**6.4**	**7.7**	**5.2**	**2.0**	**1.9**	**2.7**	**1.4**	**2.0**	**2.0**	**14.4**	**2.9**
Particle/Grain Size, Phi Scale 2 to 3	---	---	**31.3**	**34.4**	**31.6**	**36.4**	**45.4**	**44.7**	**34.5**	**47.3**	**20.4**	**15.0**	**17.3**	**24.0**	**19.8**	**36.5**	**18.3**	**16.2**
Particle/Grain Size, Phi Scale 3 to 4	---	---	**25.3**	**29.8**	**17.2**	**30.4**	**25.4**	**24.6**	**17.0**	**21.3**	**32.7**	**32.9**	**38.3**	**44.1**	**34.6**	**39.5**	**16.3**	**14.6**
Particle/Grain Size, Phi Scale 4 to 5	---	---	**6.8**	**4.9**	**3.1**	**3.5**	**3.4**	**2.6**	**3.5**	**1.4**	**8.1**	**11.8**	**8.7**	**7.6**	**11.1**	**6.3**	**5.3**	**6.5**
Particle/Grain Size, Phi Scale 5 to 6	---	---	**2.4**	**2.9**	**0.8**	**1.1**	**1.0**	**1.2**	**1.2**	**0.7**	**4.6**	**5.2**	**5.0**	**3.4**	**4.7**	**2.3**	**2.5**	**6.1**
Particle/Grain Size, Phi Scale 6 to 7	---	---	**2.2**	**2.5**	**0.8**	**1.0**	**0.9**	**1.4**	**1.0**	**0.6**	**4.6**	**5.6**	**4.0**	**2.5**	**4.1**	**2.2**	**1.4**	**6.8**
Particle/Grain Size, Phi Scale 7 to 8	---	---	**1.5**	**2.9**	**2.0**	**1.2**	**1.1**	**1.0**	**1.2**	**1.0**	**4.2**	**5.7**	**4.0**	**2.7**	**3.8**	**2.0**	**1.8**	**6.5**
Particle/Grain Size, Phi Scale 8 to 9	---	---	**1.5**	**2.7**	**1.0**	**1.3**	**0.8**	**1.1**	**1.2**	**0.7**	**3.0**	**4.2**	**4.1**	**2.2**	**3.2**	**1.7**	**1.5**	**5.0**
Particle/Grain Size, Phi Scale 9 to 10	---	---	**0.6**	**2.7**	**1.2**	**1.2**	**1.2**	**1.1**	**1.1**	**0.6**	**4.3**	**3.9**	**2.9**	**2.4**	**3.4**	**1.7**	**1.4**	**5.0**
Particle/Grain Size, Phi Scale >10	---	---	**2.2**	**6.6**	**2.5**	**2.7**	**2.0**	**1.9**	**2.5**	**1.3**	**9.1**	**10.2**	**9.0**	**6.2**	**8.8**	**4.5**	**2.9**	**11.8**
Particle/Grain Size, Fines (Silt/Clay)	---	---	**17.3**	**25.2**	**11.5**	**11.9**	**10.4**	**10.3**	**11.5**	**6.4**	**37.9**	**46.7**	**37.8**	**26.9**	**39.2**	**20.6**	**16.9**	**47.7**

TABLE 2
SURFACE SEDIMENT ANALYTICAL RESULTS
WESTMAN MARINE INC. SITE
BLAINE HARBOR – BLAINE, WASHINGTON

U = Indicates the compound was not detected at the reported concentration.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Bold = Detected compound.
Box = Exceedance of cleanup level.

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) 238 µg/kg is the equivalent bulk sediment screening level based on Site-specific correlation to porewater TBT SQS. 738 µg/kg is the equivalent bulk sediment screening level based on Site-specific correlation to porewater TBT CSL.
(d) TBT porewater screening level established by PSDDA.
(e) 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.
(f) 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.
(g) The LPAH criterion represents the sum of the following "low molecular weight polycyclic 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.
(h) The total benzofluoranthenes criterion represents the sum of the concentrations of the "B," "J," and "K" isomers.
(i) The HPAH criterion represents the sum of the following "high molecular weight polycyclic 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.

TABLE 3
PERSISTENT BIOACCUMULATIVE TOXINS
WESTMAN MARINE INC. SITE
BLAINE HARBOR – BLAINE, WASHINGTON

	Natural Background Concentration (a)	Practical Quantitation Limit	WM-SG-01 XJ39D 10/08/2013	WM-SG-02 XJ39K 10/08/2013	WM-SG-03 XJ39L 10/08/2013	WM-SG-04 XJ39B 10/08/2013	WM-SG-05 XJ39E 10/08/2013	Dup of WM-SG-05 WM-SG-DUP XJ39P 10/08/2013	WM-SG-06 XJ39F 10/08/2013	WM-SG-07 XJ39A 10/08/2013	WM-SG-08 XJ39N 10/08/2013	WM-SG-09 XJ39M 10/08/2013	WM-SG-10 XJ39J 10/08/2013	WM-SG-11 XJ39I 10/08/2013	WM-SG-12 XJ39G 10/08/2013	WM-SG-13 XJ39H 10/08/2013	WM-SG-14 XJ39C 10/08/2013	WM-SG-15 XJ39O 10/08/2013
TOTAL METALS (mg/kg)																		
Methods SW6010C/SW7471A																		
Cadmium	1	0.1	0.7 U	**0.4**	0.7 U	0.3 U	0.3 U	0.3 U	0.3 U	0.7 U	**0.9**	**0.8**	**0.9**	**0.8**	**1.0**	**0.6**	0.7 U	**1.5**
Lead	21	0.1	**88**	**19**	**124**	**6**	**10**	**12**	**11**	7 U	**11**	**8**	**17**	**9**	**10**	**5**	**44**	**133** J
Mercury	0.2	0.025	**0.91**	**0.32**	**0.15**	**0.07**	**0.08**	**0.10**	**0.05**	**0.12**	**0.12**	**0.07**	**0.12**	**0.06**	**0.08**	**0.05**	**0.32**	**0.14** J
PAHs (µg/kg)																		
Method SW8270D																		
TEQ cPAHs	16	0.76	**1,026**	**721**	**610**	**137**	**311**	**235**	**310**	**111**	**298**	**124**	**432**	**1,111**	**289**	**158**	**1,625**	**446**
PCBs (µg/kg)																		
Method SW8082A																		
Total PCBs	3.5 (c)	6 (c)	**620**	**30.4**	**163**	**29.8**	**25.5**	**21.5**	**12.2**	**10.8**	**26.5**	**48.0**	**109**	**23.9**	**23.1**	**6.4**	**60.0**	**39.0**

U = Indicates the compound was not detected at the reported concentration.
J = Indicates the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ = The analyte was not detected in the sample; the reported sample reporting limit is an estimate.
Bold = Detected compound.

Boxed results exceed the natural background concentrations.

(a) Natural Background Concentrations pending finalization in the updated Sediment Cleanup Users Manual II.
(b) Practical Quantitation Limits presented in the RI Work Plan (Landau Associates 2012) except as noted for PCBs.
(c) Background concentration of total PCBs calculated from sum of congeners using the Kaplan Meier approach; Site Total PCB data is sum of Aroclors.
(d) Practical Quantitation Limit recommended in Ecology's guidance *Draft Sediment Cleanup Users Manual II* (Ecology 2012).

TABLE 4
PROPOSED SURFACE SEDIMENT SAMPLE LOCATIONS AND RATIONALE
WESTMAN MARINE INC. SITE
BLAINE HARBOR – BLAINE, WASHINGTON

Location ID	Location Description (a)	Rationale for Sample Collection	Sediment Analytical Testing
Surface Sediment Samples - General Chracterization			
WM-SG-16	WM-SG-16 is in the northwest corner of the in-water portion of the Site between previous sample location WM-SG-15 and the shoreline near the sawtooth dock. Sample collection may be revised in the field based on the presence of rip-rap but will be collected as close to the indicated location as possible.	Evaluate sediment quality between the Site uplands and WM-SG-15 to evaluate whether metals at WM-SG-15 are related to Site releases	Metals (cadmium, chromium, copper, lead, and zinc) and conventional parameters
Surface Sediment Samples - PBT Chracterization			
WM-SG-17, WM-SG-18, and WM-SG-19	WM-SG-17 is northeast of the preliminary Site boundary near the historical tide grid; WM-SG-18 is east of the Site; WM-SG-19 is west of the preliminary Site boundary	Evaluate PBTs.	PAHs, PCBs, and conventional parameters
WM-SG-20 and WM-SG-21	Northeast and southeast of the preliminary Site boundary in the greater Blaine Harbor area	Archive Samples: Evaluate PBTs at both of these locations if PBT PSL exceeded in WM-SG-17 or WM-SG-18	PAHs, PCBs, and conventional parameters
WM-SG-22 and WM-SG-23	East of the preliminary Site boundary near the eastern boundary of Blaine Harbor (WM-SG-22) and southest of the preliminary Site boundary just inside the southeast corner of Blaine Harbor (WM-SG-23)	Archive Samples: Evaluate PBTs at both of these locations if PBT PSL exceeded in WM-SG-20 or WM-SG-21	PAHs, PCBs, and conventional parameters
WM-SG-24	Southeast of the preliminary Site boundary; outside the southeast corner of Blaine Harbor	Archive Samples: Evaluate PBTs if PBT PSL exceeded in WM-SG-23	PAHs, PCBs, and conventional parameters
WM-SG-25 and WM-SG-26	West of the preliminary Site boundary just inside (WM-SG-25) and just outside (WM-SG-25) the western entrance of Blaine Harbor	Archive Samples: Evaluate PBTs in WM-SG-25 if PBT PSL exceeded in WM-SG-19 Evaluate PBTs in WM-SG-26 if PBT PSL exceeded in WM-SG-25	PAHs, PCBs, and conventional parameters
Sediment Core Samples (b)			
WM-SC-1 (and WM-SG-1)	In the sediment along the eastern boundary of the marine railway inlet	Evaluate sediment conditions within the marine railway well	Metals, SVOCs, PCBs, conventional parameters, bulk organotins (c)
WM-SC-2 (and WM-SG-2)	Along the marine railway, approximately 100 ft south of WM-SC-1; near historical sampling location BH-02	Evaluate sediment conditions along the marine railway alignment outside of the marine railway well; evaluate changes in conditions over time by comparing results to historical data from BH-02	Metals, SVOCs, PCBs, conventional parameters, bulk organotins (c)
WM-SC-3 (and WM-SG-3)	At the travel lift pier	Evaluate sediment conditions associated with the activity at the travel lift pier	Metals, SVOCs, PCBs, conventional parameters, bulk organotins (c)
WM-SC-4 (and WM-SG-4)	Near southeast corner of the uplands; east of the travel lift; near historical sampling location BH-03	Evaluate sediment conditions near the shore; evaluate changes in sediment conditions over time by comparing results to historical data from BH-03	Metals, SVOCs, PCBs, conventional parameters, bulk organotins (c)
WM-SC-5 (and WM-SG-5)	South of the upland area of the Site; near the former shop	Evaluate sediment conditions near the shore associated with historical Site uses	Metals, SVOCs, PCBs, conventional parameters, bulk organotins (c)
WM-SC-6 (and WM-SG-6)	South of the upland area of the Site; west of the former shop	Evaluate sediment conditions near the shore associated with historical Site uses	Metals, SVOCs, PCBs, conventional parameters, bulk organotins (c)

Notes:
(a) Directions in this table are provided in reference to "Map North." Figures for this work plan are oriented to the northwest.
(b) Surface sediment samples already collected at these sediment core locations. Proposed samples and analyses remain unchanged from RI Work Plan.
(c) Organotin analyses from sediment core sample locations will be analyzed from bulk samples.

SVOCs = Semivolatile organic compounds
PCBs = Polychlorinated biphenyls
Metals = Arsenic, cadmium, chromium, copper, lead, mercury, silver, zinc except where otherwise noted
PAHs = Polycyclic aromatic hydrocarbons
Conventional Parameters = Grain size, total organic carbon, total volatile solids, total solids, ammonia, and total sulfides