TECHNICAL MEMORANDUM

LANDAU ASSOCIATES
ENVIRONMENTAL | GEOTECHNICAL | NATURAL RESOURCES

TO: Andy Kallus, Washington State Department of Ecology

FROM: Larry Beard, P.E., L.G.
Kathryn Hartley

DATE: November 7, 2011

RE: EMERGENCY ACTION CLEANUP
CRAFTSMAN DISTRICT BOATYARD EXPANSION AREA
NORTH MARINA AMERON/HULBERT SITE
EVERETT, WASHINGTON

This technical memorandum presents the results of the emergency cleanup action conducted at the Port of Everett (Port) North Marina Ameron/Hulbert site (Site) to address petroleum hydrocarbon soil contamination in a portion of the Site that is being redeveloped by the Port as an expansion of the Port's existing Craftsman District boatyard. A remedial investigation/feasibility study (RI/FS) is currently underway for the Site under Agreed Order No. 6677 between the Port, Ameron International, and the Hulberts [the potentially liable parties (PLPs)], and the Washington State Department of Ecology (Ecology).

The boatyard expansion is being constructed over the next few months on an expedited schedule within the area shown on Figure 1. Ecology determined that, based on factors including the schedule for construction of the boatyard expansion, an emergency action for partial cleanup of the boatyard expansion area was needed to adequately protect human health and the environment in advance of the cleanup action to be completed following the RI/FS. The emergency cleanup action was conducted in accordance with the Emergency Action Cleanup Plan dated May 3, 2011, and approved by Ecology in May 5, 2011 letter directing the PLPs to implement an emergency action consistent with the May 3, 2011 plan.

This technical memorandum provides a brief summary of the boatyard expansion area investigation results, emergency action activities, and the results of post-excavation compliance monitoring. These data will also be incorporated into the RI report, which will be prepared following completion of the supplement RI sampling.

BOATYARD EXPANSION AREA INVESTIGATION RESULTS

Based on the results of the initial RI, diesel- and oil-range petroleum hydrocarbons were present in shallow soil at concentrations greater than the Site preliminary screening levels (PSLs) in two areas within the boatyard expansion: 1) an approximately 20-ft by 30-ft area in the western portion of the

boatyard expansion area (West Area), and 2) an approximately 15-ft by 20-ft area in the eastern portion of the boatyard expansion area (East Area).

West Area soil contamination consisted of a surficial layer of black, petroleum hydrocarbon-cemented sand and woodchips extending to a depth of approximately 0.5 ft below ground surface (BGS) and soil immediately below the surficial material to a depth of about 1.5 ft BGS that exceeded the diesel- and heavy oil-range petroleum hydrocarbons PSLs. East Area soil contamination consisted of petroleum hydrocarbons in shallow soil directly beneath a concrete pad and a layer of crushed rock that had been placed during the field investigation to provide access for sampling in an area of ponded water.

EMERGENCY ACTION ACTIVITIES

Excavation activities were completed on August 22, 2011. Based on visual observation compliance monitoring (discussed in the next section), the West Area excavation extended to 2 to 3 ft BGS within the visually affected area. The total volume of soil removed from this area was approximately 44 cubic yards.

Prior to East Area excavation, clean overburden material (crushed rock) was removed and stockpiled for reuse as excavation backfill. Additionally, a concrete slab located on top of the affected material was demolished and transported to an offsite recycling facility. Petroleum hydrocarbon soil contamination in the East Area was initially excavated to a depth of about 1.5 ft BGS. However, because petroleum hydrocarbons were observed during field screening and sheen was observed in water that collected at the base of the excavation, the excavation was continued to a depth of about 2.5 ft BGS, at which point field screening no longer indicated the presence of petroleum hydrocarbons and sheen was no longer observed to be present. Compliance monitoring (discussed in t he next section) confirmed that concentrations of petroleum hydrocarbons were below the Site PSLs. The total volume of soil removed from this area was about 35 cubic yards.

The impacted soil from these areas was excavated and directly loaded into trucks for transport to Cemex in Everett, Washington for treatment using thermal desorption. Prior to backfilling the West Area excavation, a second concrete pad was demolished and transported to an offsite recycling facility. The excavations were backfilled with a combination of quarry spalls, clean overburden soil removed from the East Area, and imported select borrow fill material that had been previously tested for metals (arsenic, cadmium, chromium, copper, lead, mercury, and zinc) to confirm that the import fill met Site PSLs.

COMPLIANCE MONITORING

Compliance monitoring in the West Area consisted of collecting one soil sample from the approximate center of each of the excavation sidewalls and one soil sample from the center of the base of

the excavation (Figure 1). The samples were analyzed for diesel- and heavy oil-range petroleum hydrocarbons by Method NWTPH-Dx. Petroleum hydrocarbons were not detected in any of the compliance monitoring samples in the West Area at concentrations greater than the laboratory reporting limits. Results of compliance monitoring sampling in the West Area are presented in Table 1.

Compliance monitoring in the East Area was originally planned to consist of collection of one soil sample from the center of the base of the excavation (lateral extent of contamination was bound by characterization soil borings); however, field screening identified localized areas of petroleum hydrocarbon-impacted soil during the excavation, mainly in the western portion of the East Area. The excavation was extended to a depth of 2.5 ft and field screening no longer indicated the presence of petroleum hydrocarbons. Ecology then requested the collection of four compliance monitoring samples, one from each corner of the base of the excavation, rather than the originally planned single sample. East Area confirmation sample locations are shown on Figure 1. The confirmation samples were analyzed for diesel- and heavy oil-range petroleum hydrocarbons by Method NWTPH-Dx. Petroleum hydrocarbons were not detected at concentrations greater than the laboratory reporting limits in any of the compliance monitoring samples in the East Area. Results of compliance monitoring sampling in the East Area are presented in Table 1.

SUMMARY

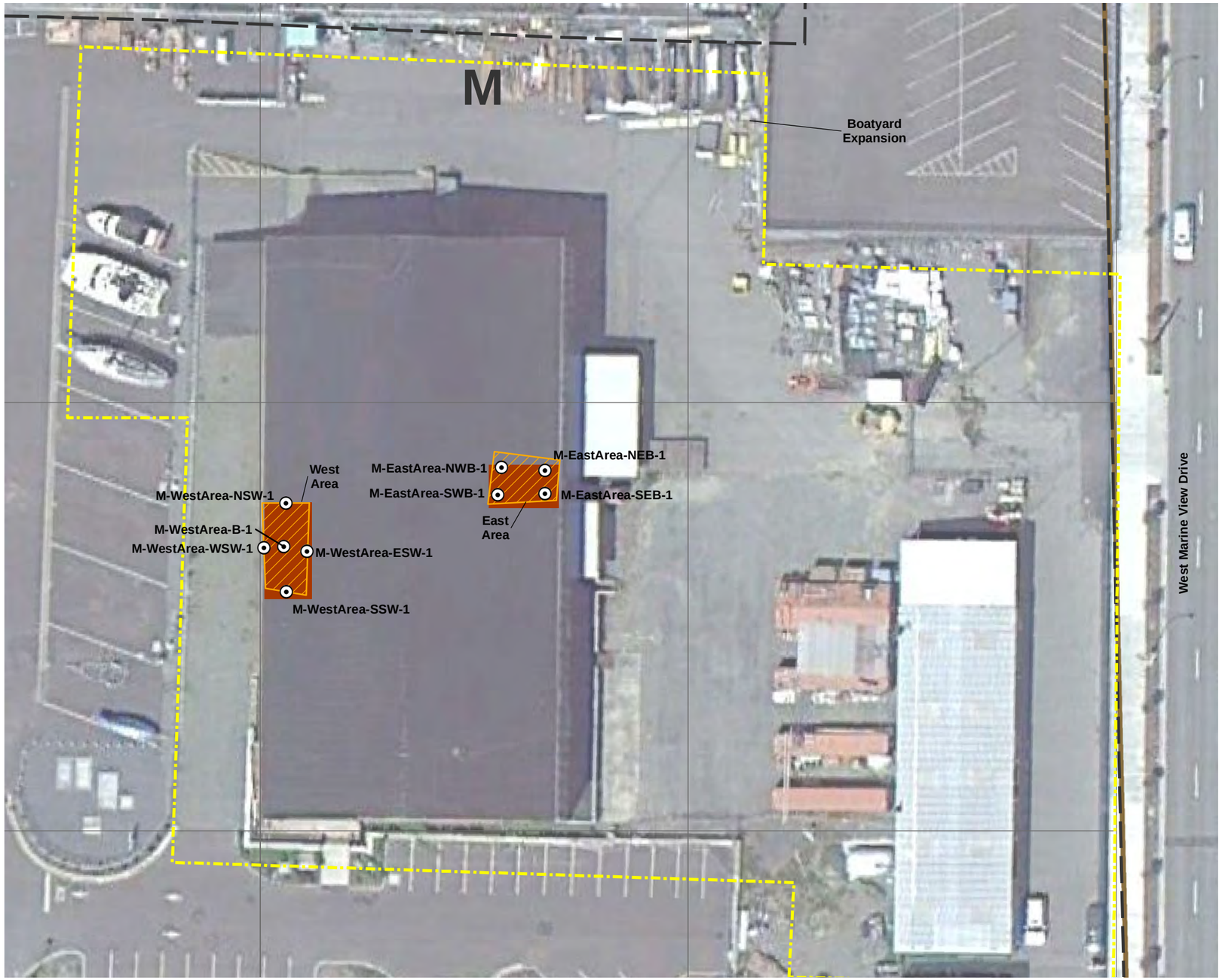
An emergency action cleanup was conducted to address petroleum hydrocarbon contamination in shallow soil in two areas (East Area and West Area) within the Port's Craftsman District boatyard expansion area. Approximately 79 cubic yards of soil were removed from the two areas and transported off-site for treatment. Diesel-range and heavy oil-range petroleum hydrocarbons were not detected in any of the compliance monitoring samples at concentrations greater than the laboratory reporting limits, demonstrating that the emergency action achieved the Site PSLs. The compliance monitoring results from the emergency action will be used to represent current conditions in the boatyard expansion area in the RI/FS report.

LIMITATIONS

This document was prepared for the exclusive use of the Port of Everett for specific application to the Craftsman District Boatyard Expansion Emergency Action. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of the Port and 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 the Port and 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 same locality under similar conditions as this project. We make no other warranty, either express or implied.

Attachments: Figure 1: Emergency Action Cleanup Areas and Sample Locations
Table 1: Soil Analytical Results



Legend

- Excavation Soil Sample Location
- Cleanup Areas
- Planned Cleanup Areas
- Boatyard Expansion
- Approximate Ameron/Hulbert Site Boundary
- M - Area Designation

Note

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

Data Source: Google Earth Pro (2011 Image)

0 40 80

Scale in Feet

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North Marina Ameron/Hulbert Site Boatyard Expansion Emergency Action Port of Everett, Washington	**Emergency Action Cleanup Areas and Compliance Monitoring Sample Locations**	Figure 1

Y:\Projects\147029\Mapdocs\Boatyard Expansion Emergency Act\Fig1 EmergencyActionAreas.mxd 11/7/2011 NAD 1983 StatePlane Washington North FIPS 4601 Feet

TABLE 1
SOIL ANALYTICAL RESULTS
COMPLIANCE MONITORING SAMPLES
PORT OF EVERETT - AMERON HULBERT

			TOTAL PETROLEUM HYDROCARBONS Method NWTPH-Dx (mg/kg)	
Location	Sample ID	Date Collected	Diesel	Oil
M-East Area-NWB-1	1108095-01	08/22/2011	25 U	50 U
M-East Area-SWB-1	1108095-02	08/22/2011	25 U	50 U
M-East Area-NEB-1	1108095-03	08/22/2011	25 U	50 U
M-East Area-SEB-1	1108095-04	08/22/2011	25 U	50 U
M-West Area-ESW-1	1108095-05	08/22/2011	25 U	50 U
M-West Area-B-1	1108095-06	08/22/2011	25 U	50 U
M-West Area-SSW-1	1108095-07	08/22/2011	25 U	50 U
M-West Area-NSW-1	1108095-08	08/22/2011	25 U	50 U
M-West Area-WSW-1	1108095-09	08/22/2011	25 U	50 U
Preliminary Screening Level			2,000	2,000

U = Indicates the compound was not detected at the reported concentration.

DRAFT