

TECHNICAL MEMORANDUM

TO: Andy Kallus, Washington State Department of Ecology

FROM: Lawrence D. Beard, P.E., L.G., and Kathryn F. Hartley *RFH/kfm*

DATE: June 4, 2014

RE: **POST-RI SUPPLEMENTAL SOIL CHARACTERIZATION PLAN
NORTH MARINA AMERON/HULBERT SITE
EVERETT WASHINGTON**

This technical memorandum presents the scope of work for supplemental soil quality characterization for the North Marina Ameron/Hulbert Site (Site). The Port of Everett (Port), Ameron International (Ameron), and the Hulberts [collectively the Potentially Liable Parties (PLPs)] conducted a Remedial Investigation/Feasibility Study (RI/FS) and are preparing a draft cleanup action plan (DCAP) for the Site under Agreed Order DE 6677 (AO) with the Washington State Department of Ecology (Ecology). This scope of work addresses data gaps identified following completion of the RI/FS report, as presented in the Public Review Draft RI/FS Report (Landau Associates 2014), and during the Emergency Action for Areas G-1b and G-3 (EA) that need to be filled prior to preparation of the DCAP. Details regarding the EA will be provided in a separate report that is being prepared by Floyd Snider. Details of the EA and results will also be incorporated into the DCAP.

Additional investigation is needed to further define the southern boundary of Cleanup Area G-2 identified in the RI/FS report, confirm that contaminated soil identified in the former SD-8 area during the EA was removed, define the extent of the sandblast grit observed under the Ameron Lab Building footprint during the EA, and evaluate whether petroleum hydrocarbon contamination is associated with the fuel lines identified on the north side of the Ameron Lab Building during the EA, which apparently terminate under the building.

During the EA, concrete-like waste material was observed beneath the ecology block wall along the western boundary of the G-1b excavation, west of the Ameron pole finishing and dry storage building. Additional investigation in the area immediately west of the observed affected material is not feasible due to the presence of several utilities that run in a north-south direction west of the block wall. The western extent of the affected material is bound by characterization and compliance monitoring samples previously collected in Area I. The area of residual contamination will be addressed by extending Cleanup Area I-13 south to join the north boundary of Cleanup Area J-3a. Additional detail will be provided in the DCAP.

The remainder of this technical memorandum presents the proposed scope of work and procedures for conducting supplemental RI activities to address the data gaps identified above.

PROPOSED SCOPE OF WORK

The proposed scope of work to address the data gaps identified above is presented in the following sections. The field procedures, analytical methods, and quality assurance/quality control (QA/QC) procedures presented in the RI/FS Work Plan (Work Plan; Landau Associates 2010) will be used for implementation of these post-RI activities.

The locations for the additional explorations are shown on Figure 1. Table 1 summarizes the planned depth of exploration, the target sampling intervals, and proposed analyses for each location. Sampling intervals and exploration depths may be modified in the field based on observed conditions. All soil explorations for the additional characterization will be advanced using direct-push drilling equipment, except for shallow borings beneath the Ameron Lab Building, which will be advanced using a hand auger. Soil samples will be analyzed for the parameters identified below unless field screening (conducted in accordance with the Work Plan) indicates additional testing is warranted based on the presence of potential contamination. Blind field duplicate soil samples will be collected and analyzed in accordance with the Work Plan. All samples will be collected and preserved consistent with the method-specific requirements presented in Table F-2 for the Work Plan. Analyses will be conducted within the specified holding times, also presented in Table F-2 of the Work Plan. In addition, the analyses will be conducted consistent with the quantitation limit goals identified in Table F-3 of the Work Plan.

Cleanup Area G-2

Additional explorations are proposed to further delineate the nature and extent of soil contamination along the southern boundary of Cleanup Area G-2. The proposed additional soil quality characterization consists of the following elements:

- Advance four soil borings (G-FA-101h, G-FA-101i, G-FA-101j, G-FA-101k) south of Cleanup Area G-2 to delineate the southern limit of Area G-2 and to confirm that soil below the area paved in 1976 was not contaminated by historical Site activities.
- Advance four additional step-out borings (G-FA-101l, G-FA-101m, G-FA-101n, G-FA-101o) approximately 10 ft south of G-FA-101h, G-FA-101i, G-FA-101j, and G-FA-101k, respectively.

Additional step-out borings, beyond those already planned, may be advanced if visual or olfactory evidence of contamination is observed at the planned exploration locations. Additional borings, if required, would be advanced at a similar spacing and depth as the planned borings.

Soil borings G-FA-101h, G-FA-101i, G-FA-101j, and G-FA-101k will be advanced approximately 5 ft south of the 1976 pavement line, evenly spaced with existing boring G-FA-101g to obtain sufficient east-west coverage along this boundary. Step-out borings G-FA-101l, G-FA-101m,

G-FA-101n, and G-FA-101o will be advanced approximately 10 ft south of boring locations G-FA-101h, G-FA-101i, G-FA-101j, and G-FA-101k, respectively, with similar spacing.

Soil borings will be advanced to a maximum depth of 12 ft below ground surface (BGS); borings may be terminated at 8 ft BGS if no evidence of contamination is observed in the upper 8 ft. Soil samples will be collected from the silt-like material with a concrete odor, if present. Apparent concrete waste material was previously observed at RI borings G-FA-101, G-FA-101c, G-FA-101e, G-FA-101f, G-FA-103, G-FA-103c, G-FA-114, and G-FA-115a, and pre-RI borings G-FA-1, G-FA-2, G-FA-3, G-FA-4, G-FA-6, G-FA-8. One additional sample will be collected from each boring at an interval below the affected area. If the silt-like material is not encountered, soil samples from borings G-FA-101h, G-FA-101i, G-FA-101j, and G-FA-101k will be collected from targeted depths of 3 to 4 ft BGS and 5 to 6 ft BGS, which are the depth intervals at which arsenic was detected at concentrations above the Site screening level [20 milligrams per kilogram (mg/kg)] in borings along the south border of Cleanup Area G-2 (G-FA-101a, G-FA-101c, and G-FA-101d). Soil sample depth intervals at step-out borings G-FA-101l, G-FA-101m, G-FA-101n, and G-FA-101o will match the sample depth intervals at each respective pavement line boring, unless evidence of contamination is observed. If evidence of contamination is observed, soil samples will be collected from within and below the affected interval. Additional soil samples may be collected if field screening indicates affected material at additional intervals.

All soil samples collected from G-FA-101h, G-FA-101i, G-FA-101j, and G-FA-101k will be submitted for analysis of arsenic. If evidence of contamination is observed in any of these borings, all soil samples collected from the adjacent step-out boring will also be analyzed for arsenic. Samples containing silt-like material with a concrete odor will also be analyzed for pH. Additional testing will be conducted, if warranted, based on field screening as follows:

- If field screening indicates the potential presence of petroleum hydrocarbons, samples will be analyzed for total petroleum hydrocarbons (TPH) using the hydrocarbon identification (HCID) method.
- If gasoline-range petroleum hydrocarbons (TPH-G) are identified by HCID, samples will also be analyzed for volatile organic compounds (VOCs) and TPH-G will be quantified.
- If diesel-range petroleum hydrocarbons (TPH-D) are identified by HCID, samples will also be analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and TPH-D will be quantified.
- If oil-range petroleum hydrocarbons (TPH-O) are identified by HCID, samples will also be analyzed for cPAHs and polychlorinated biphenyls (PCBs), and TPH-O will be quantified.
- If field screening identifies evidence of sand blast grit, samples will also be analyzed for antimony and lead.

These field screening procedures will also apply to sampling completed in the former SD-8 area and beneath the Ameron Lab Building described below.

Soil samples collected from step-out borings will be archived (pending the results of the samples from the initial borings) if no evidence of contamination is observed in adjacent borings along the 1976 pavement line. To expedite the receipt of analytical results, soil samples from a step-out boring may be analyzed concurrently with the initial samples if contamination is observed in the corresponding initial boring.

Former SD-8 Area

The western boundary of Cleanup Area G-2, which was not defined prior to the EA, appears to be bounded by samples collected and analyzed from three direct-push soil borings (G1b-SB7, G1b-SB8, and G1b-SB9) completed during the EA activities at the former SD-8 location (Aspect 2014). Additional explorations are proposed to confirm that the excavation completed during the EA around the former location of stormwater catch basin SD-8 removed all soil above site cleanup levels. Samples collected and analyzed during the EA appear to bound the removed contaminated soil to the north, east, and west. However, samples were not collected at the bottom or south sidewall of the former SD-8 excavation due to issues with water entering the excavation and soil mixing due to failed sidewalls. The proposed additional soil quality characterization consists of the following elements:

- Advance one boring (G-FA-116) directly below the former location of SD-8 to confirm the excavation completed in this area during the EA adequately removed contamination in the bottom of the excavation.
- Advance one boring (G-FA-117) at the south limit of the former location of SD-8 to confirm the excavation completed in this area adequately removed contamination at the south sidewall of the excavation.

Soil borings will be advanced to a depth of 12 ft BGS. Soil samples will be collected from affected material, if present. One additional sample will be collected from each boring at an interval below the affected area. At G-FA-116, a sample will also be collected from 10 to 11 ft BGS, which is the maximum depth of the former SD-8 excavation. If affected material is not encountered at G-FA-117, soil samples will be collected from targeted depths of 7 to 8 ft and 8 to 9 ft BGS, which are the depth intervals at which arsenic was detected at concentrations above the Site cleanup level (20 mg/kg) in a boring at the south portion of the former SD-8 excavation (G1b-SB3) prior to the excavation. Additional soil samples may be collected if field screening indicates affected material at additional intervals.

Soil samples collected from affected material or from targeted depth intervals at G-FA-116 and G-FA-117 will be submitted for analysis of antimony, arsenic, and lead. Samples collected from below affected material will be archived pending the analytical results for samples of affected material.

Ameron Lab Building

Additional explorations are proposed to evaluate potential soil contamination associated with fuel lines that were observed to extend underneath the Ameron Lab Building during the EA and to delineate the extent of sandblast grit observed beneath the north side of the Lab Building floor during the EA. Areas where the fuel lines and sand blast grit were observed are depicted on Figure 1. The Lab Building consists of a storage area in the eastern portion and a lab/office area in the western portion. The proposed additional soil quality characterization consists of the following elements:

- Advance one boring (G-FA-118) at the apparent termination of the fuel lines in the northeast corner of the Lab Building, as marked by a utility locator during the EA.
- Advance one boring (G-FA-119) in the north-central portion of the Lab Building, approximately 2 ft south of where sandblast grit was observed during the EA, to determine whether the observed sandblast grit is associated with contamination formerly present outside the building footprint or with fill beneath the building slab.
- Advance two additional step-out soil borings (G-FA-119a, G-FA-119b) in the Lab Building to determine the extent of sandblast grit beneath the Lab Building floor.

Soil boring G-FA-118 will be advanced to the depth of groundwater, which is anticipated to be less than 10 ft BGS. At G-FA-118, soil samples will be collected from affected material, if present, and one additional sample will be collected from an interval below the affected area. If affected material is not encountered, a soil sample will be collected from the 1-ft interval just above the groundwater table. Soil samples collected from G-FA-118 will be submitted for analysis of TPH-G and TPH-D. Samples collected from below affected material, if encountered, will be archived pending the results of the initial sample.

Soil borings G-FA-119 and associated step-out borings (G-FA-119a and G-FA-119b) will be advanced to a maximum depth of 3 ft BGS. Soil boring G-FA-119 will be advanced in the north-central portion of the Lab Building and borings G-FA-119a and G-FA-119b will be advanced within the Lab Building to the southeast and southwest of G-FA-119. If sandblast grit is not observed at G-FA-119, G-FA-119a, or G-FA-119b, no samples will be collected and the investigation will be considered complete. If sandblast grit is observed at any of the locations within the Lab Building, samples will be collected from all locations (i.e., G-FA-119, G-FA-119a, and G-FA-119b), either from sandblast grit, if present, or from soil underlying the concrete floor slab and base course material, if present. One composite sample of sandblast grit collected from all three locations, or where present, will be submitted for laboratory analysis. The boring locations shown within the Lab Building on Figure 1 may be adjusted based on conditions encountered in the field. Soil samples collected from borings G-FA-119 and associated step-out borings (G-FA-119a and G-FA-119b) will be analyzed for antimony, arsenic, and lead. In addition, the sandblast grit sample, if encountered, will be analyzed for the metals mentioned

above and Resource Conservation and Recovery Act (RCRA) metals by the Toxicity Characteristic Leaching Procedure (TCLP).

DATA EVALUATION AND REPORTING

Upon receipt of the analytical data, the data will be validated using the procedures described in the Work Plan (Landau Associates 2014). The data will be evaluated and reported in the DCAP, and used to refine the limits of Cleanup Area G-2 and to determine whether the Lab Building needs to be added as a cleanup area. In accordance with the Agreed Order, data will be submitted to Ecology in electronic format (i.e., EIM) within 45 days following completion of data validation. However, if conditions substantively different than anticipated are encountered, additional reporting and coordination with Ecology will be initiated.

SCHEDULE

The field investigation is anticipated to be completed in late May 2014 to early June 2014, pending concurrence from Ecology, and is anticipated to be completed in 2 days. Note that this is consistent with the date outlined in the current Agreed Order schedule. In accordance with the Agreed Order, Ecology will be notified a minimum of 7 days prior to the field investigation.

REFERENCES

Aspect Consulting. 2014. *Emergency Action Work Plan for Areas G-1B and G-3, North Marina Ameron/Hulbert Site, Everett, Washington*. Prepared for Washington Department of Ecology. February 6.

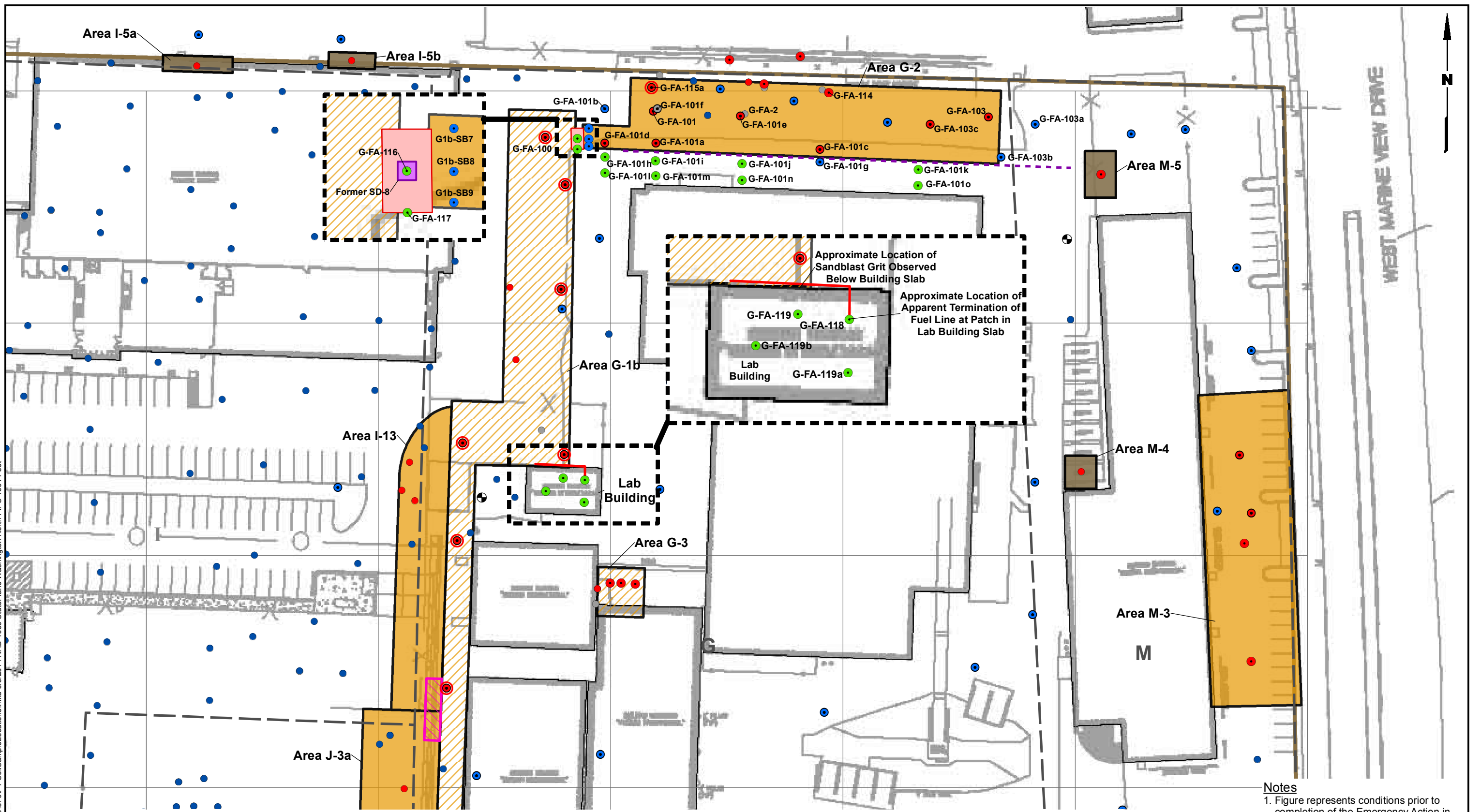
Landau Associates. 2014. Draft Report: *Public Review Draft, Remedial Investigation/Feasibility Study, North Marina Ameron/Hulbert Site, Everett, Washington*. Prepared for Port of Everett. January 17.

Landau Associates. 2010. *Final Work Plan, Remedial Investigation/Feasibility Study, North Marina Ameron/Hulbert Site, Everett, Washington*. Prepared for Port of Everett. November 17.

Attachments:

- Figure 1 Post-RI Additional Characterization Work Plan - Existing and Proposed Soil Sampling Locations
- Table 1 Soil Sampling and Analysis Plan, Post-RI Additional Characterization Sampling

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- Legend**
- Proposed Soil Boring Location
 - Soil Sample with a Concentration Greater than 5x the Preliminary Screening Level
 - Soil Sample Exceeded Preliminary Screening Level - Represents Soil Remaining
 - Soil Sample Below Preliminary Screening Level
 - Previous Soil Sample Exceeded Preliminary Screening Level - Represents Soil Remaining
 - Previous Soil Sample Below Preliminary Screening Levels - Represents Soil Remaining
 - ⊕ Monitoring Well to be Included in Compliance Monitoring

- Isolated Cleanup Areas to be Addressed Under Soil Management Plan
- Cleanup Areas
- Emergency Action Cleanup Area

- Approximate Extent of 2014 SD-8 Area Excavation (Floyd Snider)
- Approximate Area of Concrete-Like Material Observed Beneath Ecology Block Wall
- 1976 Pavement Line (Approximate)

— Approximate Location of Fuel Line Observed During EA



- Notes**
1. Figure represents conditions prior to completion of the Emergency Action in Areas G-1b and G-3.
 2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



North Marina Ameron/Hulbert Site
Supplemental RI/FS Work Plan
Everett, Washington

**Post-RI Supplemental
Soil Characterization Plan
Existing and Proposed
Soil Sampling Locations**

Figure
1

TABLE 1
SOIL SAMPLING AND ANALYSIS PLAN
POST-RI ADDITIONAL CHARACTERIZATION SAMPLING
NORTH MARINA AMERON/HULBERT SITE
EVERETT, WASHINGTON

Exploration	Exploration Depth (ft)	Soil Sample Depth Interval (ft)	Analysis (1)
G-FA-101h	12	sample affected area; if no evidence of contamination, sample 3- to 4- and 5- to 6-ft depth intervals	Arsenic
		sample below affected area; if no evidence of contamination, no additional samples will be collected	Arsenic
G-FA-101i	12	sample affected area; if no evidence of contamination, sample 3- to 4- and 5- to 6-ft depth intervals	Arsenic
		sample below affected area; if no evidence of contamination, no additional samples will be collected	Arsenic
G-FA-101j	12	sample affected area; if no evidence of contamination, sample 3- to 4- ft and 5- to 6-ft depth intervals	Arsenic
		sample below affected area; if no evidence of contamination, no additional samples will be collected	Arsenic
G-FA-101k	12	sample affected area; if no evidence of contamination, sample 3- to 4- and 5- to 6-ft depth intervals	Arsenic
		sample below affected area; if no evidence of contamination, no additional samples will be collected	Arsenic
G-FA-101l	12	sample affected area; if no evidence of contamination, sample the same depth intervals as G-FA-101h	Archive (2)
		sample below affected area; if no evidence of contamination, no additional samples will be collected	Archive (2)
G-FA-101m	12	sample affected area; if no evidence of contamination, sample the same depth intervals as G-FA-101i	Archive (2)
		sample below affected area; if no evidence of contamination, no additional samples will be collected	Archive (2)
G-FA-101n	12	sample affected area; if no evidence of contamination, sample the same depth intervals as G-FA-101j	Archive (2)
		sample below affected area; if no evidence of contamination, no additional samples will be collected	Archive (2)
G-FA-101o	12	sample affected area; if no evidence of contamination, sample the same depth intervals as G-FA-101k	Archive (2)
		sample below affected area; if no evidence of contamination, no additional samples will be collected	Archive (2)
G-FA-116	12	sample affected area; if no evidence of contamination, sample 10- to 11-ft depth interval	Antimony, Arsenic, Lead
		sample below affected area; if no evidence of contamination, no additional samples will be collected	Archive
G-FA-117	8	sample affected area; if no evidence of contamination, sample 7- to 8- and 8- to 9-ft depth intervals	Antimony, Arsenic, Lead
		sample below affected area; if no evidence of contamination, no additional samples will be collected	Archive

TABLE 1
SOIL SAMPLING AND ANALYSIS PLAN
POST-RI ADDITIONAL CHARACTERIZATION SAMPLING
NORTH MARINA AMERON/HULBERT SITE
EVERETT, WASHINGTON

Exploration	Exploration Depth (ft)	Soil Sample Depth Interval (ft)	Analysis (1)
G-FA-118	12	sample affected area; if no evidence of contamination, sample 1-ft interval just above the groundwater table sample below affected area; if no evidence of contamination, no additional samples will be collected	TPH-G, TPH-D Archive
G-FA-119 (3)	3	sample affected area, if present, or soil underlying floor slab; if no evidence of contamination at G-FA-119, G-FA-119a, and G-FA-119b, no samples will be analyzed	Antimony, Arsenic, Lead
G-FA-119a (3)	3	sample affected area, if present, or soil underlying floor slab; if no evidence of contamination at G-FA-119, G-FA-119a, and G-FA-119b, no samples will be analyzed	Antimony, Arsenic, Lead
G-FA-119b (3)	3	sample affected area, if present, or soil underlying floor slab; if no evidence of contamination at G-FA-119, G-FA-119a, and G-FA-119b, no samples will be analyzed	Antimony, Arsenic, Lead

VOCs = Volatile Organic Compounds

cPAHs = carcinogenic Polycyclic Aromatic Hydrocarbons

PCBs = Polychlorinated Biphenols

TPH = Total Petroleum Hydrocarbons

RCRA = Resource Conservation and Recover Act

TCLP = Toxicity Characteristic Leaching Procedure

TPH-G = Gasoline-range TPH

TPH-D = Diesel-range TPH

1. In addition to the parameters listed, samples will be analyzed for 8260 VOCs, cPAHs, PCBs, additional metals, and/or TPH based on field screening, and for pH where there is evidence of silt-like material with concrete odor.
2. Boring samples will be analyzed if contamination is observed/detected in the adjacent pavement line boring
3. If sandblast grit is encountered at G-FA-119, G-FA-119a, or G-FA-119b, one sample of sandblast grit will be submitted for laboratory analysis for total antimony, arsenic, and lead, and for RCRA metals by TCLP.