TECHNICAL MEMORANDUM

LANDAU ASSOCIATES
ENVIRONMENTAL | GEOTECHNICAL | NATURAL RESOURCES

TO: Andy Kallus, Washington State Department of Ecology

FROM: Lawrence D. Beard, P.E., L.G., and Kathryn F. Hartley

DATE: May 24, 2013

RE: ADDENDUM NO. 3 - RI/FS WORK PLAN
SUPPLEMENTAL RI
NORTH MARINA AMERON/HULBERT SITE
EVERETT WASHINGTON

This technical memorandum presents Addendum No. 3 to the Remedial Investigation/Feasibility Study (RI/FS) Work Plan (Work Plan; Landau Associates 2010) 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)] are conducting an RI/FS at the Site under Agreed Order DE 6677 (AO) with the Washington State Department of Ecology (Ecology). This Work Plan addendum addresses data gaps identified following completion of the initial and supplemental RI field activities, as presented in the 2nd Ecology Review Draft RI/FS Report (Landau Associates 2013), and subsequent comments received from Ecology (Ecology 2013), and discussed in an April 29, 2013 meeting between the PLPs and Ecology. Specifically, additional investigation is needed to further define the boundaries of Cleanup Areas G-2 and M-2 identified in the RI/FS report. The remainder of this technical memorandum presents the proposed scope of work and procedures for conducting supplemental RI activities to address these data gaps.

PROPOSED SCOPE OF WORK

The proposed scope of work to further refine the boundaries of Cleanup Areas G-2 and M-2 is presented in the following sections. The field procedures, analytical methods, and quality assurance/quality control (QA/QC) procedures presented in the Work Plan (Landau Associates 2010) will be used for implementation of these supplemental RI activities.

Additional explorations are proposed to complete delineation of the nature and extent of soil contamination for the RI. The proposed additional soil quality characterization consists of the following elements:

- Advance six soil borings (G-FA-101a, G-FA-101b, G-FA-101c, G-FA-101d, G-FA-101e, and G-FA-101f) in the western portion of Proposed Cleanup Area G-2 to evaluate the horizontal and vertical extent of metals soil contamination in the vicinity of G-FA-101.

- Advance two soil borings (G-FA-103a and G-FA-103b) in the eastern portion of Proposed Cleanup Area G-2 to evaluate the horizontal extent of metals soil contamination in the vicinity of G-FA-103.
- Advance six soil borings (M-FA-102i, M-FA-102j, M-FA-102k, M-FA-102l, M-FA-102m, and M-FA-102n) in the southeastern portion of Proposed Cleanup Area M-2 to evaluate the horizontal extent of metals and cPAHs soil contamination in the vicinity of M-FA-102 and M-FA-102h.

The locations for these 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 Supplemental RI will be advanced using direct-push drilling equipment. Soil samples will be analyzed for the parameters identified below unless field screening (conducted in accordance with the RI 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 RI Work Plan. All samples will be collected and preserved consistent with the method-specific requirements presented in Table F-2 for the Final RI/FS Work Plan. Analyses will be conducted within the specified holding times, also presented in Table F-2 of the Final RI/FS Work Plan. In addition, the analyses will be conducted consistent with the quantitation limit goals identified in Table F-3 of the Final RI/FS Work Plan.

Additional borings 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. As outlined below, the sampling plan includes collection of soil samples from primary borings, and step-out borings in the M-FA-102 area, with samples from the step-out borings archived at the laboratory pending the results of the initial samples. Step-out borings are planned for the M-FA-102 area because soil contamination is not as consistently associated with visual evidence of contamination as it is in Area G-2. To expedite the receipt of analytical results, soil samples from the step-out borings may be analyzed concurrently with the initial samples.

Area G-2 Soil Investigation

Soil borings will be advanced to the south, southwest, west, and southeast of RI borings G-FA-101 and G-FA-115a and to the south and east of RI boring G-FA-103 to determine the horizontal and vertical extent of metals concentrations exceeding the soil screening levels at these locations. Soil borings G-FA-101a and G-FA-103b will be advanced to the south of G-FA-101 and G-FA-103, respectively, approximately 5 ft north of the 1973 pavement line (Figure 1). Soil borings G-FA-101b and G-FA-101d will be advanced at the western limits of the Area G-2 boundary, approximately 30 ft from G-FA-101, and boring G-FA-103a will be advanced at the eastern limit of the Area G-2 boundary, approximately 30

ft from G-FA-103. Soil boring G-FA-101c will be advanced to the south of RI boring G-FA-114, about halfway between G-FA-101a and G-FA-103b, to confirm that Area G-2 is adequately bounded to the south. Soil boring G-FA-101e will be advanced adjacent to boring G-FA-2 because no analytical data was collected from the G-FA-2 boring. An additional boring (G-FA-101f) will be advanced directly adjacent to G-FA-101 to confirm the vertical extent of silt-like material observed to 10 ft below ground surface (BGS) at that location.

Borings in the G-2 area will be advanced to approximately 12 ft BGS. Soil samples will be collected from the silt-like material with a concrete odor previously observed at G-FA-101, G-FA-103, and G-FA-115a, if present. If the silt-like material is not encountered, soil samples from borings G-FA-101a, -101b, -101c, -101d, and -101e with be collected from targeted depths of 3 to 3.5 ft BGS and 4.5 to 5.5 ft BGS, which are the depth intervals that the silt-like material was observed and arsenic was detected at concentrations above the Site screening level (20 mg/kg) in borings G-FA-101 and G-FA-115a. Samples will not be collected from boring G-FA-101f unless conditions are substantively different from those observed during drilling and sampling at boring G-FA-101. Samples from borings G-FA-103a and G-FA-103b will be collected from depths of 1 to 2 ft BGS and 5.5 to 6.5 ft BGS, which are the depth intervals that silt-like material was observed and arsenic was detected at concentrations above the screening level in boring G-FA-103. One additional sample will be collected from each boring at an interval below the affected area. If no evidence of contamination is observed, samples will be collected from the 5.5- to 6.5-ft interval in the G-FA-101 borings and from an interval of 7 to 8-ft BGS in the G-FA-103 borings. Additional soil samples may be collected if field screening indicates affected material at additional intervals.

Step-out borings will be advanced outside of locations G-FA-101b, -101d, and G-FA-103a if the silt-like material is observed at these locations, until the limits of the material is adequately delineated. Step-out borings will not be advanced to the south of G-FA-101a, -101c, or G-FA-103b if the silt-like material or other visual evidence of potentially contaminated soil is observed (e.g., petroleum sheen, construction debris). Step-out borings are not needed in this area because the silt-like material is adequately bounded to the south by the 1973 edge of pavement, which is clearly visible on historic aerial photographs and predates the manufacture of decorative concrete poles, and because soil contamination in Area G has not been encountered at locations that did not exhibit visual evidence of contamination. More specifically, with the exception of samples collected from Area G-2 and G-3 (former settling ponds), soil samples collected during the RI from paved portions of Area G did not exhibit contaminant concentrations exceeding the screening levels.

All soil samples collected from these locations will be submitted for analysis of arsenic. In addition, samples containing silt-like material will also be analyzed for pH. Soil samples collected from

additional intervals and all soil samples collected from the step-out borings will be archived at the laboratory and will only be tested if arsenic concentrations exceed the screening level in the initial samples analyzed.

Area M-2 Soil Investigation

Soil borings will be advanced to the south, east, and southeast of M-FA-102 and M-FA-102h to better delineate the horizontal extent of metals and cPAHs concentrations that exceed the screening levels at these locations. Soil borings M-FA-102i, M-FA-102j, and M-FA-102k will be advanced near the estimated southeast limits of Area M-2, as shown on Figure 1. Step-out soil boring M-FA-102l will be advanced south of M-FA-102i, at the estimated Site boundary. Step-out borings M-FA-102m and M-FA-102n will be advanced southeast of M-FA-102j, and east of M-Fa-102k, respectively, just east (outside of) of the current edge of the parking lot pavement.

All 4 borings will be advanced to approximately 12 ft BGS. It is anticipated that soil samples will be collected from depths of 5 to 6 ft and 7 to 7.5 ft BGS, which are the depth intervals that cPAHs, lead, and arsenic were detected at concentrations above the screening level in boring M-FA-102h and M-FA-102, respectively. However, soil samples will instead be collected from intervals of potential soil contamination, if visual or olfactory evidence of contamination is observed. Conditions observed at M-FA-102 that were indicative of soil contamination were the presence of apparent sand blast grit and brick debris. One additional sample will be collected from each boring at an interval below the affected area, or at the 9- to10-ft interval if no evidence of contamination is observed. Additional soil samples may be collected if field screening indicates potential contamination at additional intervals.

Soil samples collected from G- M-FA-102i, M-FA-102j, and M-FA-102k will be submitted for analysis for arsenic, lead, and cPAHs. Soil samples collected from the step-out borings will be archived at the laboratory and will only be tested if metal or cPAHs concentrations exceed the screening Site levels in the initial samples.

DATA EVALUATION AND REPORTING

Upon receipt of the analytical data, the data will be validated using the procedures described in the Final RI/FS Work Plan and evaluated and reported in conjunction with other RI data in the Draft Final RI/FS report. 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.

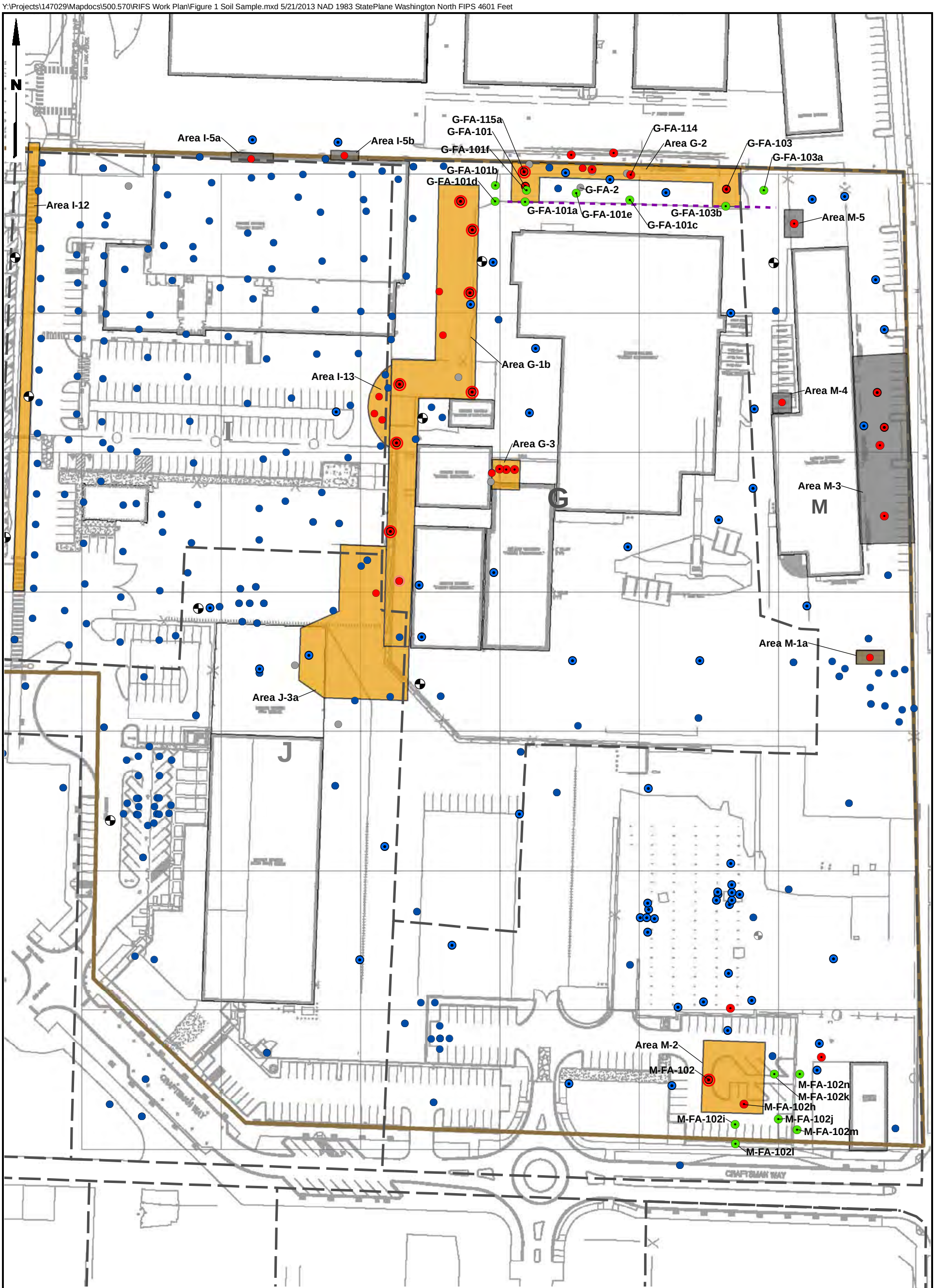
REFERENCES

Landau Associates. 2013 Draft Report: *2nd Ecology Review Draft, Remedial Investigation/Feasibility Study, North Marina Ameron/Hulbert Site, Everett, Washington*. Prepared for Port of Everett. January 25.

Ecology. 2013. Email from Andy Kallus, Washington State Department of Ecology to Larry Beard, Landau Associates, re: *Ameron/Hulbert 2nd Draft RI/FS Ecology comments*. March 18.

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

Y:\Projects\147029\Mapdocs\500.570\RIFS Work Plan\Figure 1 Soil Sample.mxd 5/21/2013 NAD 1983 StatePlane Washington North FIPS 4601 Feet



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
- Monitoring Well to be Included in Compliance Monitoring
- Previous Soil Sample Exceeded Preliminary Screening Level - Constituent that exceeds is noted below sample name - Represents Soil Remaining
- Previous Soil Sample Below Preliminary Screening Levels - Represents Soil Remaining
- 1973 Pavement Line (Approximate)
- Cleanup Areas
- Single Exceedence Areas to be Addressed Under Soil Management Plan

0 100 200

Scale in Feet

Note

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

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

Addendum Number 3
Existing and Proposed
Soil Sample Locations

Figure
1

TABLE 1
SOIL SAMPLING AND ANALYSIS PLAN
RI/FS WORK PLAN ADDENDUM #2

Exploration	Exploration Depth (ft)	Soil Sample Depth Interval (ft)	Analysis[1]
G-FA-101a	12	sample affected area; if no evidence of contamination, sample 3-3.5 and 4.5-5.5	Arsenic
		sample below affected area; if no evidence of contamination, sample 5.5-6.5	Arsenic
G-FA-101b	12	sample affected area; if no evidence of contamination, sample 3-3.5 and 4.5-5.5	Arsenic
		sample below affected area; if no evidence of contamination, sample 5.5-6.5	Arsenic
G-FA-101c	12	sample intervals sampled at G-FA-101a	Archive - metals
G-FA-101d	12	sample intervals sampled at G-FA-101b	Archive - metals
G-FA-101e	12	sample affected area; if no evidence of contamination, sample 3-3.5 and 4.5-5.5	Arsenic
		sample below affected area; if no evidence of contamination, sample 5.5-6.5	Arsenic
G-FA-101f	12	No samples planned	--
G-FA-103a	12	sample affected area; if no evidence of contamination, sample1-2 and 5.5-6.5	Arsenic
		sample below affected area; if no evidence of contamination, sample 7-8	Arsenic
G-FA-103b	12	sample affected area; if no evidence of contamination, sample1-2 and 5.5-6.5	Arsenic
		sample below affected area; if no evidence of contamination, sample 7-8	Arsenic
M-FA-102i	12	sample affected area; if no evidence of contamination, sample 5-6 and 7-7.5	Arsenic, Lead, cPAHs
		sample below affected area; if no evidence of contamination, sample 9-10	Arsenic, Lead, cPAHs
M-FA-102j	12	sample affected area; if no evidence of contamination, sample 5-6 and 7-7.5	Arsenic, Lead, cPAHs
		sample below affected area; if no evidence of contamination, sample 9-10	Arsenic, Lead, cPAHs
M-FA-102k	12	sample affected area; if no evidence of contamination, sample 5-6 and 7-7.5	Arsenic, Lead, cPAHs
		sample below affected area; if no evidence of contamination, sample 9-10	Arsenic, Lead, cPAHs
M-FA-102l	12	sample intervals samples at M-FA-102i	Archive - metals, cPAHs
M-FA-102m	12	sample intervals samples at M-FA-102j	Archive - metals, cPAHs
M-FA-102n	12	sample intervals samples at M-FA-102k	Archive - metals, cPAHs

1. In addition to the parameters listed, samples will be analyzed for VOCs and/or TPH based on field screening, and for pH where there is evidence of silt-like material.