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7 November 2016

RECEIVED
By Alameda County Environmental Health 9:49 am, Nov 14, 2016

Mark Detterman, P.G., CEG
Senior Hazardous Materials Specialist
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502

Subject: Work Plan Addendum for Soil and Groundwater Investigation
Former Horton Street Underground Storage Tank
In Public Right-of-Way on Horton Street Adjacent to 5679 Horton Street,
Emeryville, California

Dear Mr. Detterman:

I declare, under penalty of perjury, the information and/or recommendations contained in the attached document or report is/are true and correct to the best of my knowledge.

If you have any questions or need additional information, please contact me at 510-596-4380.

Sincerely,

Michael A. Guina
City Attorney
City of Emeryville

Attachment: Work Plan Addendum for Soil and Groundwater Investigation

Erler & Kalinowski, Inc.

Consulting Engineers and Scientists

1870 Ogden Drive
Burlingame, CA 94010
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7 November 2016

Mark Detterman P.G., C.E.G.
Alameda County Health Agency
Department of Environmental Health
1131 Harbor Parkway
Alameda, California 94502

Subject: Work Plan Addendum for Soil and Groundwater Investigation
Former Horton Street Underground Storage Tank
In Public Right-of-Way on Horton Street Adjacent to 5679 Horton Street,
Emeryville, California 94608
(EKI B20006.00 T7)

Dear Mr. Detterman:

Erler & Kalinowski, Inc. ("EKI") is pleased to submit this *Work Plan Addendum for Soil and Groundwater Investigation* ("Work Plan Addendum") on behalf of our client, the City of Emeryville as the Successor Agency to the Emeryville Redevelopment Agency ("Successor Agency"), for the Former Horton Street Underground Storage Tank ("Horton Street UST", "Site"; see Figure 1) in the Public Right-of-Way on Horton Street Adjacent to 5679 Horton Street.

The Horton Street UST was discovered in May 2015 while retraction grouting a direct-push grab groundwater sampling location for off-site groundwater investigation activities associated with the Former Marchant/Whitney ("FMW") Site in Emeryville, California, which is under the regulatory oversight of the Department of Toxic Substances Control ("DTSC") (EKI, 2016a and 2016b). The tank was apparently associated with the former FMW operations. The UST at the Site was removed on 17 June 2015 in accordance with the Alameda County Department of Environmental Health ("ACDEH") approved *Underground Storage Tank Closure Plan, 5679 Horton Street, Emeryville, California,* dated 8 June 2015 ("Closure Plan"; EKI, 2015a). Removal activities and analytical results are summarized in the *Underground Storage Tank Closure Report, In Public Right-of-Way on Horton Street Adjacent to 5679 Horton Street, Emeryville, California,* dated 17 August 2015 ("Closure Report"; EKI, 2015b). In response to the Closure Report, ACDEH issued a letter, dated 7 October 2015, that evaluated the Site in light of the Low Threat Closure Policy ("LTCP") (SWRCB, 2012) criteria and requested a data gap investigation work plan and focused site conceptual model ("SCM"). EKI submitted the *Data Gap Investigation Work Plan and Focused Site Conceptual Model* ("Work Plan"; EKI 2016c), dated 29 July 2016, which proposed a data gap scope of work for investigation of soil

vapor. After reviewing the Work Plan, ACDEH issued a letter dated 27 September 2016 ("ACDEH letter"), requesting an addendum to address technical comments.

RESPONSE TO TECHNICAL COMMENTS IN THE 27 SEPTEMBER 2016 ACDEH LETTER

As requested, EKI's response to technical comments in the 27 September 2016 ACDEH letter is summarized by gray shading in Table 1 and presented below. For ease of review, an excerpt for each ACDEH Technical Comment is repeated below in *italic typeface*. The response is shown in non-italic font.

1. LTCP Media Specific Criteria for Groundwater

a. Extent of Groundwater and LNAPL Plumes

"At present it does not appear that the extent of the groundwater contaminant plume, and potentially the LNAPL plume, derived from the former UST, has been defined in shallow groundwater stated to be approximately six to eight feet bgs."

Response to Comment

See SCM Elements 8, 9, and 11 on Table 1. The proposed scope of work to address these data gaps includes collecting shallow grab groundwater samples at 5 boring locations. In relation to the UST excavation, proposed grab groundwater sampling locations are located downgradient to the west and southwest, cross-gradient to the north and south, and within the UST excavation. Water levels from nearby monitoring wells at the FMW Site, immediately to the west/southwest of the Site, were measured on 2 November 2016 and shallow groundwater was approximately 6 to 8 feet below ground surface ("bgs"). Therefore, grab groundwater samples will be collected from 5 to 15 feet below ground surface ("bgs"). Table 1 summarizes the proposed analyses. Field methods for sampling are provided in Attachment 1.

2. LTCP Media Specific Criteria for Direct Contact and Outdoor Air Criteria

a. Extent of Soil Contamination

"The extent of soil contamination, and thus Direct Contact exposure, has not been defined below appropriate regulatory goals at present. Tank sidewall samples HUST-SW03-7.0 and HUST-SW04-7.0 remain above generic regulatory goals defined by the ESLs for direct contact for TPH-d at a commercial property, of 1,100 mg/kg."

Response to Comment

See SCM Element 9 on Table 1. The proposed scope of work to address this data gap includes collecting soil samples at 3 boring locations. Soil sampling locations are located to the west, southwest, and south of the UST excavation where total petroleum hydrocarbons as diesel ("TPH-d") in sidewall soil samples were detected at concentrations greater than the San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels ("ESL"; RWQCB, 2016) (Table 2). Soil samples will be collected at 3.5 to 4 feet bgs and 7 to 7.5 feet bgs. Table 1 summarizes the proposed analyses. Field methods for sampling are provided in Attachment 1.

3. Data Gap Investigation Work Plan Addendum and Focused Site Conceptual Model

Response to Comment
The revised SCM in this Work Plan Addendum is provided in tabular form (Table 1) in accordance with the ACDEH's recommendation. Updated items in the revised SCM are shown in gray. Due to the presence of underground utilities in the sidewalk to the east of the UST excavation, the location of the proposed one soil vapor described in the Work Plan was modified to be located on the eastern edge of the UST excavation.

4. Electronic Report and Data Upload Compliance – Missing Documents and Data

As of 17 October 2016, EKI has uploaded the following documents and data to GeoTracker: UST Closure Report, electronic laboratory data, site map, and boring/cone penetrometer ("CPT") logs.

SCHEDULE AND REPORTING

Pending ACDEH approval of this Work Plan Addendum, this investigation will likely occur in early January 2017. These dates are approximate and may be affected by adverse weather, access limitations, encountered field conditions, or other conditions. The results of this investigation will be included in a letter report for ACDEH review within 60 days of completion of investigation activities.

Please call if you have any questions or wish to discuss these matters in greater detail.

Very truly yours,

ERLER & KALINOWSKI, INC.

Earl James, P.G.
Vice President

REGISTERED GEOLOGIST
EARL D. JAMES
No. 4544
Exp. 10/2010
STATE OF CALIFORNIA

Joy Su, P.E.
Project Manager

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Project Geologist

cc: Michael Guina, City Attorney
Michael G. Biddle, Burke, Williams & Sorrensen, LLP
Karen Toth, DTSC

TABLES

Table 1	Site Conceptual Model
Table 2	Summary of Analytical Results for TPH and Metals in Soil Samples

FIGURES

Figure 1	Site and Neighboring Properties
Figure 2	Proposed Sampling Locations

ATTACHMENTS

Attachment 1	Field Methods and Procedures

REFERENCES

ACDEH, 2016. *Request for Data Gap Work Plan Addendum*; Fuel Leak Case No. RO0003185 and GeoTracker Global ID T10000007323, Horton Street UST, 5679 Horton Street, Emeryville, CA 94608, 27 September 2016.

EKI, 2012. *Final Subsurface Environmental Investigations Report*, 5679 Horton Street, Former Marchant/Whitney Site, Emeryville, California, Erler & Kalinowski, Inc., August, 2012.

EKI, 2015a. *Underground Storage Tank Closure Plan*, 5679 Horton Street, Emeryville, California, 14 April 2015.

EKI, 2015b. *Underground Storage Tank Closure Report*, In Public Right-of-Way on Horton Street Adjacent to 5679 Horton Street, Emeryville, California, 17 August 2015.

EKI, 2016a. *Final Additional Groundwater Investigation and Groundwater Monitoring Report*, Site B Project Area, Emeryville, California, June 2016.

EKI, 2016b. *Final Remedial Investigation Report, Former Marchant/Whitney Site*, 5679 Horton Street, Emeryville, California, June 2016.

EKI, 2016c. *Data Gap Investigation Work Plan and Focused Site Conceptual Model Former Horton Street Underground Storage Tank*, In Public Right-of-Way on Horton Street Adjacent to 5679 Horton Street, Emeryville, California, 29 July 2016.

DTSC, 2016. *Human Health Risk Assessment (HHRA) Note 3*, January 2016.

RWQCB, 2016, *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*, Interim Final, California Regional Water Quality Control Board, San Francisco Bay Region, February 2016.

SWRCB, 2012. *Low-Threat Underground Storage Tank Case Closure Policy*. Adopted in Resolution No. 2012-0016, 1 May 2012.

U.S. EPA, 2015. *Regional Screening Levels*, November 2015, May 2016 Update.

TABLE 1
SITE CONCEPTUAL MODEL
Former Horton Street UST
5679 Horton Street, Emeryville, California

SCM Element	SCM Sub-Element	Description	Data Gap (a)	How to Address (a)
1. Current Land Use		The Site is located in the public right-of-way on Horton Street within the northbound lane. The Site is adjacent to 5679 Horton Street in Emeryville, California. Industrial/commercial buildings are located along both sides of Horton Street. (Figure 1)	None	NA
2. Site History		The origin, use, and ownership of the former Horton Street UST are not currently known. The former Horton Street UST may have been installed as part of the former Marchant Calculating Machine Company facility (late 1910s to late 1950s) or subsequent light industrial businesses that historically occupied the area. The former Horton Street UST appears to have been utilized as a diesel fuel tank based on analytical results of the tank contents prior to removal. Subsequent redevelopment of the area likely resulted in the tank being left in place beneath Horton Street. (Reference: EKI, 2015b) (Figure 1)	None	NA
3. UST	**a. Contents Prior to Removal**	The contents of the former Horton Street UST were likely diesel, based on chemical analysis of a separate phase liquid sample (H-H-6.5-9) previously collected from inside the in-place UST on 5 May 2015 (Table 1). Prior to UST removal, approximately 800 gallons of the oily liquid contents were vacuumed out of the in-place UST and disposed off-site in accordance with applicable laws and regulations. (Reference: EKI, 2015b)	None	NA
	b. Removal	The former Horton Street UST at the Site was removed on 17 June 2015 in accordance with the Alameda County Department of Environmental Health ("ACDEH") approved Underground Storage Tank Closure Plan ("Closure Plan"), 5679 Horton Street, Emeryville, California, dated 8 June 2015 and prepared by EKI. The final extents of the UST excavation were approximately 9 feet wide and 12 feet long, extending to approximately 9.5 feet below ground surface ("ft bgs"; see Figure 1). The top of the tank was at approximately 5.5 ft bgs, and the bottom of the tank was at approximately 8.5 ft bgs. (Reference: EKI, 2015a; 2015b)	None	NA
4. Geology	**a. Regional**	The Site is located on the East Bay Plain, approximately 1,500 feet east of the current San Francisco Bay shoreline, and approximately 3 miles west of the Hayward Fault. The ground surface elevation at the Site is approximately 12 feet above mean sea level ("feet msl"), based on the City of Emeryville datum. The historical San Francisco Bay shoreline was located approximately 1,000 feet west of the Site (USGS, 1899). Fill and development activities conducted since the early 1900's created the westward migration of the shoreline. (Reference: EKI, 2012)	None	NA
	b. Site & Vicinity	Stratigraphy at the Site & Vicinity (Figures 3 to 4b): • <u>S10 Unit (beneath fill material to -10 feet msl):</u> The S10 Unit is an unconsolidated clayey layer containing sparse thin, discontinuous sandy and gravelly intervals within a fine-grained matrix. Two coarse-grained channels, trending generally east-west, are located to the north and south of the Site (Figure 4a). • <u>1032 Unit (-10 to -32 feet msl):</u> The 1032 Unit contains thick and prevalent sand and gravel intervals within a finer-grained clayey matrix. • <u>3243 Unit (-32 to -43 feet msl):</u> The 3243 Unit is a predominantly fine-grained clay-rich unit. It contains relatively rare discontinuous intervals of sand and gravels. The bottom elevation of the 3243 Unit generally coincides with a geologic unconformity. • <u>4360 Unit (-43 to -60 feet msl) and deeper:</u> The 4360 Unit is a predominantly fine-grained clay-rich unit. It contains a coarser-grained laterally-extensive, tabular sandy layer that is approximately 2 to 8 feet thick that occurs at an approximate elevation of -45 feet msl to the east of the Site, dipping to an elevation of approximately -55 feet msl to the west of the Site along Shellmound Street. Where data could be collected deeper than the 4360 Unit, the data indicate that the sediments encountered below -60 feet msl are predominantly fine grained with local intervals of sandier material, similar to the 4360 Unit. (Reference: EKI, 2016b)	None	NA
	c. Within UST excavation pit	Stratigraphy Within the UST Excavation Pit: • 0.0 to 1.0 ft bgs – Asphalt • 1.0 to 1.5 ft bgs – Baserock • 1.5 to 7.0 ft bgs – Black and green, silty clay, fill material • 7.0 to 9.5 ft bgs – Brown and gray, clayey silt, native material (Reference: EKI, 2015b)	None	NA
5. Hydrogeology	**a. Regional**	The Site is located within the East Bay Plain Groundwater Sub-basin of the Santa Clara Valley Groundwater Basin of the San Francisco Bay Hydrologic Region (DWR, 2003). The region has a Mediterranean-type climate with a distinct division between a wet season from November to April, and a dry season during the rest of the year. Normal annual precipitation is about 24 inches (1981-2011 normals, WRCC, 2012). Recharge to the groundwater system is mostly via infiltration from small streams at the valley margins near the western bounding Diablo Range, and through infiltration occurring in stream channels in the valley floor (Planert & Williams, 1995). Lateral flow from coarse alluvium at the basin margin into local aquifers is restricted by the north-northwest striking Hayward Fault, located approximately 3 miles northeast of the Site (RWQCB, 2003). (Reference: EKI 2012)	None	NA
	b. Site & Vicinity	The apparent hydraulic gradient direction is generally to the southwest in the S10, 1032, 3243 and 4360 Units based on data from the adjacent FMW Site to the west of the Site (Figures 5a to 5d). A slight upward hydraulic gradient was also observed between co-located wells in the S10/1032 Units, 1032/3243 Units, and the 3243/4360 Units on the FMW Site. (EKI, 2016b) Groundwater was not encountered within the 9.5 feet deep UST excavation pit at the Site. (Reference: EKI 2015b)	None	NA

TABLE 1
SITE CONCEPTUAL MODEL
Former Horton Street UST
5679 Horton Street, Emeryville, California

SCM Element	SCM Sub-Element	Description	Data Gap (a)	How to Address (a)
6. Surface Water Bodies		The nearest perennial surface drainage to the Site is Temescal Creek, located approximately 1,300 feet to the south. Temescal Creek originates at Lake Temescal in the Berkeley hills, flows partially underground through Berkeley and Emeryville in an engineered channel, and empties into San Francisco Bay near Ohlone Way. (Reference: EKI 2012)	None	NA
7. Nearby Wells		A historical monitoring well, MW-2, was located adjacent to the former Horton Street UST. The well was installed in 1993, and the well was approximately 14 feet deep. Well MW-2 was destroyed on 22 June 2015 in accordance with an Alameda County Public Works Agency ("ACPWA") water resources well permit. Well MW-2 was located within the footprint of the UST excavation. (Reference: EKI 2015b) There are 41 groundwater monitoring wells located to the west of the Site at the adjacent Former Marchant/Whitney ("FMW") Site. Well depths range from approximately 17 to 70 feet bgs. (Reference: EKI, 2016b) The City of Emeryville Municipal Code Title 6 Chapter 9 prohibits the use of groundwater within the limits of the City of Emeryville as a potable water supply or for any residential, commercial, or industrial use.	None	NA
8. Presence of Free Product		During installation of the historical monitoring well, MW-2, the presence of free product was noted at approximately 4 feet bgs on the boring log. However, free product and groundwater were not observed in the UST excavation pit in June 2015 that extended to 9.5 feet bgs and the extent of the UST excavation encompassed the location of MW-2. (Reference: EKI, 2015b)	Additional investigation for the presence of free product is needed.	Drill in the center of the backfilled former excavation at TC (Figure 2) and observe if free product is present.
9. Chemicals of Concern ("COCs")	**a. Soil**	COCs in soil associated with the former Horton Street UST at the Site include total petroleum hydrocarbons ("TPH") as diesel ("TPH-d") and other TPH related compounds based on analytical results from soil samples at the perimeter of the UST excavation pit (Tables 2 to 3b and Figure 2a). The highest concentrations of COCs in soil detected above San Francisco Bay Regional Water Quality Control Board ("SFRWQCB") Environmental Screening Levels ("ESLs") at the Site are 4,440 milligrams per kilogram ("mg/kg") TPH-d, 5.42 mg/kg naphthalene (VOC), 2.15 mg/kg naphthalene (SVOC), and 8.28 mg/kg 2-methlynaphthalene. (Reference: EKI, 2015b)	TPH-d concentrations above ESLs in the west and south sidewall confirmation samples.	Collect additional soil samples to the west, southwest, and south of the UST excavation at depth intervals 3.5 to 4.0 and 7 to 7.5 ft bgs (Figure 2). Proposed Sample Locations: TW, TS, and TSW (Figure 2). Proposed Analyses: TPH-g, TPH-d, TPH-mo, and VOCs (includes MTBE, benzene, toluene, ethylbenzene, total xylenes, and naphthalene)
	b. Groundwater	COCs in groundwater associated with the former Horton Street UST at the Site include TPH-d and other TPH related compounds based on analytical results from grab groundwater samples at sampling location H-H (Table 4 and Figure 2a). The highest concentrations of COCs in groundwater detected above SFRWQCB ESLs at the Site are 2.92 micrograms per liter ("ug/L") benzene and 35.9 ug/L naphthalene. Chlorinated volatile organic compounds ("CVOCs") detected in groundwater at the Site appear to be associated with other sites in the vicinity (see below). Detected concentrations of TPH as gasoline ("TPH-g") in groundwater did not resemble gasoline and was indicative of CVOCs. (Reference: EKI, 2015b)	Shallow groundwater (appx. 6-8 ft bgs) immediately downgradient, crossgradient, and within the UST excavation has not been investigated.	Collect shallow grab groundwater samples to the north, west, southwest, south, and within the center of the UST excavation from 5 to 15 ft bgs (Figure 2). Proposed Sample Locations: TN, TW, TS, TSW and TC (Figure 2). Proposed Analyses: TPH-g, TPH-d, TPH-mo, and VOCs (includes MTBE, benzene, toluene, ethylbenzene, total xylenes, and naphthalene)
	c. Soil Vapor	Soil vapor at the Site has not been investigated.	Presence of these COCs in soil vapor has not been investigated.	Install a soil vapor probe at the eastern edge of the UST excavation and conduct 2 rounds of sampling. (Figure 2)
10. Other Contaminant Release Sites in Vicinity	**a. West and Southwest of Site (Downgradient)**	The FMW Site at 5679 Horton Street is located immediately to the west and southwest of the Site. The former Marchant Calculating Company manufacturing facility was located on the FMW Site and extended eastward across the Site to Peladau Street. The FMW Site is immediately downgradient of the Site and is a voluntary cleanup site overseen by the Department of Toxic Substances Control ("DTSC"). COCs in the subsurface include TPH, TPH related compounds, and CVOCs. The highest concentrations of primary COCs detected include: (1) Soil - 6,590 mg/kg total extractable petroleum hydrocarbons ("TEPH") and 4,270 mg/kg trichloroethene ("TCE"), (2) Groundwater - 963 ug/L TEPH and 838,000 ug/L TCE, and (3) Soil Vapor - 32,400,000 micrograms per cubic meter ("ug/m^{3}") TCE. (Reference: EKI, 2016b)	None	NA
	b. Northwest of Site (Crossgradient)	The Michel & Pelton ("M&P") Site at 5743 Horton Street is located to the northwest of the Site and was the location of a former agricultural insecticide and disinfectants business. The M&P Site is crossgradient of the Site and is an inactive Spills, Leaks, Investigations, & Cleanups ("SLIC") site overseen by the San Francisco Bay Regional Water Quality Control Board ("SFRWQCB"). COCs in the subsurface include TPH, TPH related compounds, phthalates, phenols, and other VOCs such as CVOCs. (Reference: EKI, 2012; 2016a)	None	NA
	c. East of Site (Upgradient)	The Schwabacher-Frey Inc. Site at 5733 Peleadeau Street is located immediately to the east and was the location of a former stationary distributor. The Schwabacher-Frey Site is upgradient of the Site and is a leaking underground storage tank ("LUST") site overseen by ACDEH. COCs in the subsurface include TPH-d and TPH related compounds. (Reference: EKI, 2015c)	None	NA

TABLE 1
SITE CONCEPTUAL MODEL
Former Horton Street UST
5679 Horton Street, Emeryville, California

SCM Element	SCM Sub-Element	Description	Data Gap (a)	How to Address (a)
11. Extent of Groundwater Impacts	**a. Beneath Site**	Sampling location H-H is located in Horton Street immediately adjacent to the former Horton Street UST (Figure 2a). Grab groundwater sampling at this location was conducted as part of investigation activities for other sites in the vicinity. Grab groundwater sampling activities at H-H were completed prior to discovery of the former Horton Street UST. Available data indicate that: (1) TPH-d was detected at a concentration of 403 ug/L in H-H-19-24 but TPH-related VOCs were not detected, (2) benzene (2.92 ug/L) and naphthalene (35.9 ug/L) were detected at concentrations above the SFRWQCB ESLs in a deeper grab groundwater (H-H-28-32), and (3) TPH-related VOCs were not detected in the deepest grab groundwater sample (H-H-58-62). (Reference: EKI, 2016a)	Shallow groundwater (appx. 6-8 ft bgs) within the UST excavation has not been investigated.	Collect shallow grab groundwater sample within the UST excavation from 5 to 15 ft bgs (Figure 2). Proposed Sample Locations: TC (Figure 2). Proposed Analyses: TPH-g, TPH-d, TPH-mo, and VOCs (includes MTBE, benzene, toluene, ethylbenzene, total xylenes, and naphthalene)
	b. Southwest (Downgradient)	Sampling location PW-P is located along the upgradient property boundary of the adjacent FMW Site (Figure 2b). Grab groundwater sampling at this location was conducted as part of investigation activities for the FMW Site. Based on the southwest hydraulic gradient direction, PW-P is located approximately 50 feet directly downgradient of the former Horton Street UST. Available data indicate that: (1) TEPH and TPH-related VOCs were not detected in in shallow grab groundwater samples at PW-P-20-24 and (2) TPH-related VOCs were also not detected in deeper grab groundwater samples at this location (PW-P-29-33 and PW-P-38-42) (Attachment 3). (Reference: EKI, 2016b)	Shallow groundwater (appx. 6-8 ft bgs) immediately downgradient of the UST excavation has not been investigated.	Collect shallow grab groundwater samples to the west and southwest of the UST excavation from 5 to 15 ft bgs (Figure 2). Proposed Sample Locations: TW and TSW (Figure 2). Proposed Analyses: TPH-g, TPH-d, TPH-mo, and VOCs (includes MTBE, benzene, toluene, ethylbenzene, total xylenes, and naphthalene)
	c. North & South	Along Horton Street, sampling locations H-G and H-I are located approximately 70 feet to the north and 60 feet to the south, respectively, of the former Horton Street UST (Figure 2b). Grab groundwater sampling at these locations was conducted as part of investigation activities for other sites in the vicinity. Available data indicate that: (1) TPH-d and TPH-related VOCs were not detected in shallow grab groundwater samples at these locations (H-G-19-22 and H-I-22-26) and (2) TPH-related VOCs were also not detected in deeper grab groundwater samples at these locations (H-G-36-40, H-G-60-65, H-I-29-33, H-I-42-46, and H-I-58-62) (Attachment 3). (Reference: EKI, 2016a)	Shallow groundwater (appx. 6-8 ft bgs) immediately crossgradient of the UST excavation has not been investigated.	Collect shallow grab groundwater samples to the north and south of the UST excavation from 5 to 15 ft bgs (Figure 2). Proposed Sample Locations: TN and TS (Figure 2). Proposed Analyses: TPH-g, TPH-d, TPH-mo, and VOCs (includes MTBE, benzene, toluene, ethylbenzene, total xylenes, and naphthalene)

Abbreviations:
ACDEH = Alameda County Department of Environmental Health
ft bgs = feet below ground surface
MTBE = methyl tertiary butyl ether
TPH-(g/d/mo) = total petroleum hydrocarbons as (gasoline/diesel/motor oil)
UST = underground storage tank
VOCs = volatile organic compounds

Notes:
(a) Gray shaded cells are updates to address technical comments from ACDEH in letter dated 27 September, 2016.

References:

(1) ACDEH, 2016. *Request for Data Gap Work Plan Addendum* ; Fuel Leak Case No. RO0003185 and GeoTracker Global ID T10000007323, Horton Street UST, 5679 Horton Street, Emeryville, CA 94608, 27 September 2016.
(2) DWR, 2003. California's Groundwater: Bulletin 118, Update 2003. California Department of Water Resources, Sacramento, CA.
(3) EKI, 2012. *Final Subsurface Environmental Investigations Report* , Former Marchant/Whitney Site, 5679 Horton Street, Emeryville, California, August 2012.
(4) EKI, 2015a. *Underground Storage Tank Closure Plan* , 5679 Horton Street, Emeryville, California, 14 April 2015.
(5) EKI, 2015b. *Underground Storage Tank Closure Report* , In Public Right-of-Way on Horton Street Adjacent to 5679 Horton Street, Emeryville, California, 17 August 2015.
(6) EKI, 2015c. *Results of Soil and Groundwater Investigation* , Schwabacher-Frey Site, 5733 Peladeau Street, Emeryville, California, 5 October 2015.
(7) EKI, 2016a. *Final Additional Groundwater Investigation and Groundwater Monitoring Report* , Site B Project Area, Emeryville, California, June 2016.
(8) EKI, 2016b. *Final Remedial Investigation Report* , Former Marchant/Whitney Site, 5679 Horton Street, Emeryville, California, June 2016.
(9) RWQCB, 2003, A Comprehensive Groundwater Protection Evaluation for the South San Francisco Bay Basins. Report prepared by the Groundwater Committee of the California Regional Water Quality Control Board, San Francisco Bay Region.
(10) WRCC, 2012, Period of Record Monthly Climate Summary: 10/1/1970 to 2/26/2012, Oakland Museum, California, Station ID No. 046336, accessed March 2012. (http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6336)
(12) USGS, 1899, San Francisco Quadrangle. U.S. Geological Survey Topographic Map Series, February 1899 edition, scale 1:62,500.
(13) *Request for Data Gap Work Plan Addendum* ; Fuel Leak Case No. RO0003185 and GeoTracker Global ID T10000007323, Horton Street UST, 5679 Horton Street, Emeryville, CA, 27 September 2016.

TABLE 2

Summary of Analytical Results for TPH and Metals in Soil Samples

Former Horton Street UST

5679 Horton Street, Emeryville, California

Sample ID	Sample Date	Sample Depth (ft bgs)	Analytical Results in mg/kg dry weight (a)(b)							
			TPH			Metals				
			TPH-g	TPH-d	TPH-mo	Cadmium	Chromium	Lead	Nickel	Zinc
Piping-related Samples (c)										
~~HUST-PPNG01-2.5~~	~~6/17/2015~~	~~2.5~~	~~<1.00~~	~~180 (AC)~~	~~252~~	~~<3.14~~	~~27.8~~	~~10.1~~	~~35.6~~	~~43.3~~
~~HUST-PPNG02-2.0~~	~~6/17/2015~~	~~2.0~~	~~4.92~~	~~225 (AC)~~	~~330~~	~~3.16~~	~~31.1~~	~~46.1~~	~~47.6~~	~~971~~
~~HUST-PPNG03-2.0~~	~~6/17/2015~~	~~2.0~~	~~13.1~~	~~1,020~~	~~232~~	~~<2.92~~	~~37.8~~	~~37.2~~	~~53.4~~	~~134~~
HUST-PPNG04-2.5	6/17/2015	2.5	<1.00	350 (AC)	427	6.82	29.1	121	190	2,620
UST Sidewall Samples										
HUST-SW01-7.0	6/17/2015	7.0	2.96	1,080	164	<2.94	32.0	6.13	34.5	35.4
HUST-SW02-7.0	6/17/2015	7.0	4.66	267	53.3	**7.97**	36.0	15.8	38.5	84.2
HUST-SW03-7.0	6/17/2015	7.0	5.70	**1,290**	120	<2.71	32.2	26.1	37.7	53.1
HUST-SW04-7.0	6/17/2015	7.0	6.31	**4,440**	534	<2.92	31.3	5.37	25.7	31.2
UST Floor Samples										
HUST-F01-9.5	6/17/2015	9.5	<1.00	<12.0	<12.0	<3.01	42.7	7.39	58.1	66.1
HUST-F02-9.5	6/17/2015	9.5	<1.00	<11.8	<11.8	<2.96	45.6	8.54	56.1	65.3
RWQCB ESL - Comm./Ind. - Direct Exposure (d)			***2,800***	***1,100***	***5,100***	***43***	***na***	***160***	***86***	***110,000***
U.S. EPA RSL - Ind. (e)			***na***	***na***	***na***	***980***	***na***	***800***	***22,000***	***350,000***
DTSC HERO HHRA Note 3 - Comm./Ind. (f)			***na***	***na***	***na***	***7.3***	***na***	***320***	***3,100***	***na***

TABLE 2

Summary of Analytical Results for TPH and Metals in Soil Samples

Former Horton Street UST

5679 Horton Street, Emeryville, California

Abbreviations

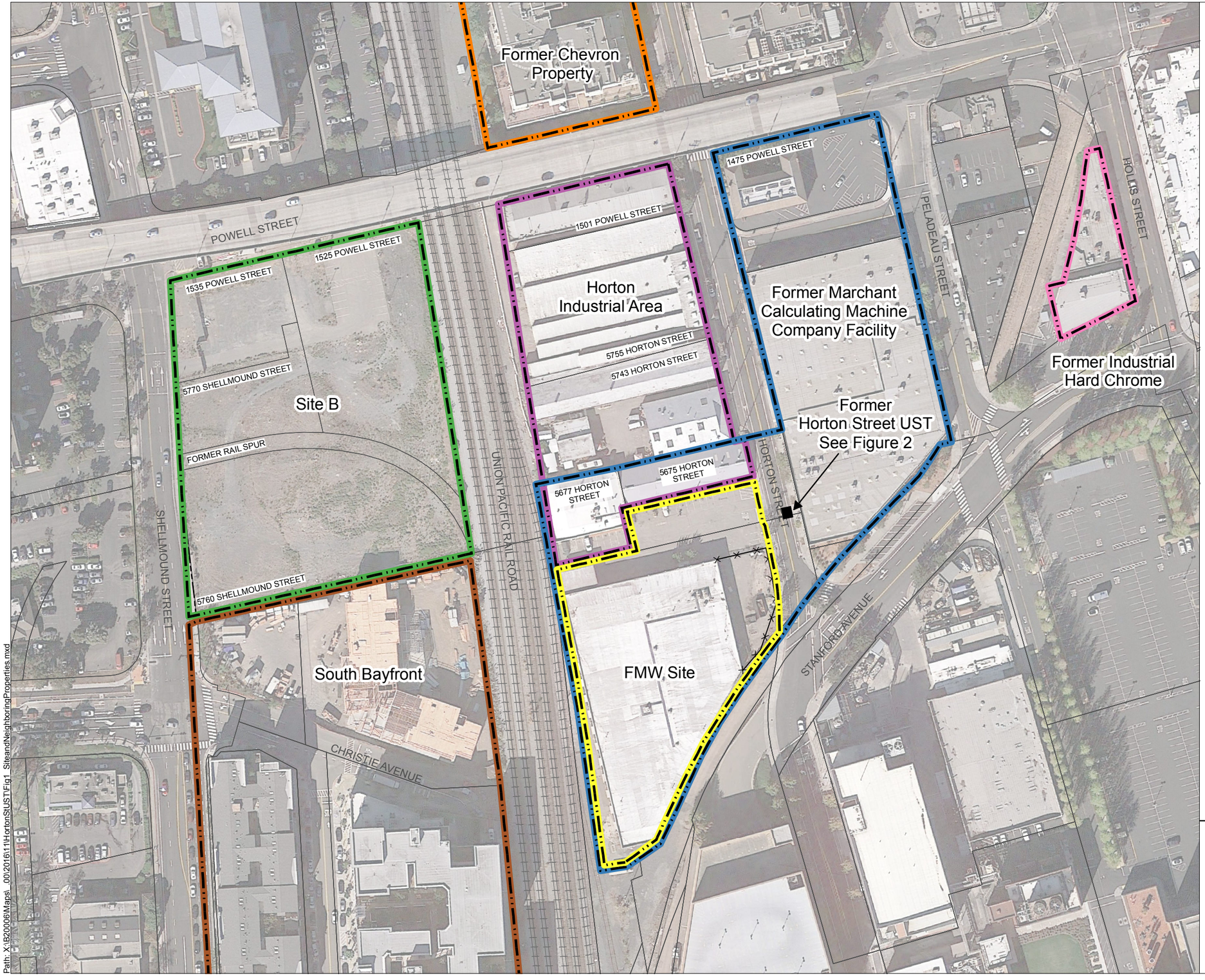
<2.96 = not detected at or above laboratory detection limit
AC = Heavier hydrocarbons contributing to diesel range quantification
DTSC = Department of Toxic Substances Control
ESL = environmental screening level
ft bgs = feet below ground surface
mg/kg = milligrams per kilogram
na = not applicable
RSL = regional screening level
RWQCB = Regional Water Quality Control Board, San Francisco Bay region
TPH-(g/d/mo) = total petroleum hydrocarbons as (gasoline/diesel/motor oil)
U.S. EPA = United States Environmental Protection Agency

Notes

(a) Samples analyzed by K-Prime, Inc., Santa Rosa, CA using EPA Method 8015B for TPH-g/-d/-mo, and EPA Method 6020 for metals.
(b) **Bold** value indicates detected concentration exceeds one or more soil screening criteria.
(c) Grayed out confirmation soil sample locations have been over-excavated during UST demolition activities.
(d) Selected screening levels are the most stringent ESL found in Table S-1 (RWQCB, 2016), excluding ESLs based on residential land use.
(e) Screening levels based on U.S. EPA's RSLs for industrial land use (TR=1E-6, HQ=1).
(f) Screening levels based on DTSC's Human Health Risk Assessment (HERO HHRA) Guidance for commercial/industrial land use, as listed in Note 3, table 1.

References

(1) DTSC HERO, 2016. Human Health Risk Assessment Note Number: 3, January 2016.
(2) RWQCB, 2016. ESLs from User's Guide: Derivation and Application of Environmental Screening Levels (ESLs), Interim Final 2016, San Francisco Bay Regional Water Quality Control Board, February 2016, Revision 3.
(3) US EPA, 2016. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, RSL Table Update, May 2016.



N

0 120 240

(Approximate Scale in Feet)

Legend

- FMW Site Property Boundary
- Site B Property Boundary
- South Bayfront Property Boundary
- Approximate Extent of Former Marchant Calculating Machine Company Facility
- Former Chevron Property
- Former Industrial Hard Chrome Facility
- Horton Industrial Area

Abbreviations

FMW = Former Marchant/Whitney
UST = underground storage tank

Notes

1. All property boundaries are approximate.

Source

Aerial photograph provided by Google Earth Pro, dated October 2015, obtained March 2016.

Erler & Kalinowski, Inc.

Site and Neighboring Properties

Former Horton Street UST
Emeryville, CA
November 2016
EKI B20006.00 T7

Figure 1

Path: X:\B20006\Maps_00\2016\11\HortonStUST\Fig1_SiteandNeighboringProperties.mxd

N

0 20 40

(Approximate Scale in Feet)

Legend

- Former UST
- Former UST Excavation Area
- Proposed Grab Groundwater Sampling Location
- Proposed Grab Groundwater and Soil Sampling Location
- Proposed Soil Vapor Probe
- CPT
- CPT, HPT, and MIP
- CPT and MIP
- HPT

Surveyed Utilities

- Electrical
- Gas
- Sanitary Sewer & Storm Drain
- Water
- Street Light
- Storm Drain MH
- Sanitary MH
- Water Vault
- Water valve
- Vault Box
- Catch Basin

Abbreviations

CPT	=	Cone Penetrometer Test
FMW	=	Former Marchant/Whitney
GPR	=	Ground Penetrating Radar
HPT	=	Hydraulic Profiling Tool
MH	=	Manhole
MIP	=	Membrane Interface Probe
UST	=	Underground Storage Tank

Notes

1. All locations are approximate.
2. Utilities located on 18 October 2016 by Subdynamic Locating Services, San Jose.
3. Survey conducted on 18 October 2016 by PLS Surveys, Inc., Oakland.

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Proposed Sampling Locations

Former Horton Street UST
Emeryville, CA
November 2016
EKI B20006.00 T7

Figure 2

Path: X:\B20006\Maps_00\2016\11\HortonStUST\Fig2_ProposedSampleLocs.mxd

ATTACHMENT 1

Field Methods and Procedures

ATTACHMENT 1
FIELD METHODS AND PROCEDURES

Former Horton Street UST
Emeryville, California

TABLE OF CONTENTS

TABLES

ATTACHMENT

1 FIELD METHODS AND PROCEDURES

Proposed grab groundwater and soil sample locations are shown on Figure 2 and are summarized on Table 1 of the Work Plan Addendum.

1.1 Utility Clearance and Permitting

On 18 October 2016, EKI notified Underground Services Alert ("USA") and contracted Subdynamic Locating Services ("SLS") and PLS Surveys ("PLS") to identify, locate, and survey utilities in the vicinity of the Site (Figure 1). Selected sampling locations were proposed based on utility clearance results (Figure 2).

An encroachment permit was obtained from the City of Emeryville, and Horton Street will be closed during implementation of the work described below. Remaining preparatory activities to be performed prior to drilling include obtaining a drilling permit from Alameda County Public Works Agency ("ACPWA").

1.2 Soil Sampling

Under the supervision of an EKI geologist, soil samples will be collected at three locations (Figure 2) at two proposed depth intervals in each borehole (approximately 3.5 to 4 and 7 to 7.5 feet below ground surface ("bgs")). Soil borings will be drilled by hand auger, and soil samples will be collected in stainless steel liners, or equivalent, using a soil core sampler with slide hammer. Soil collected in the stainless steel liners will be sub-sampled into the appropriate sample containers listed in Table 1-1. Sampling locations, depth intervals, and methods are subject to modifications based on field observations.

1.3 Grab Groundwater Sampling

Under the supervision of an EKI geologist, grab groundwater samples will be attempted at five locations (Figure 2). Each borehole will be drilled by hand auger to 5 feet below ground surface ("bgs") for utility clearance, and by 5.5-inch hollow-stem auger to a maximum total depth of 15 feet bgs. For locations where both soil and grab groundwater sampling will be conducted, these samples will be collected within the same borehole.

Cone penetrometer ("CPT") data in the vicinity of the Site indicates that the upper 22 feet bgs is tight fine-grained clayey and silty material. Shallow grab groundwater samples in the vicinity of the Site have been difficult to collect based on EKI's previous experience in the area. A temporary 1-inch diameter Schedule 40 PVC with 0.01-inch continuously-slotted screen will be installed with #2/12 Monterey silica (or equivalent) sand emplaced in the annular space, and backfilled with hydrated bentonite chips to the surface. If sufficient groundwater is still not present at the end of the work day, the borehole will be covered by a steel plate overnight and will be sampled the following day if sufficient groundwater is present. ACPWA has pre-approved this temporary PVC screen method.

Groundwater will be screened for the presence of free product using a disposable or a pre-cleaned stainless steel bailer, and recorded in the field notes. Grab groundwater samples

will be collected using a peristaltic pump with disposable polyethylene tubing or a pre-cleaned stainless steel bailer. After sample collection, any temporary PVC screens and annular materials will be abandoned by drilling out and backfilling with neat cement to 4 inches below grade. As requested by City of Emeryville Public Works inspector, an asphalt contractor will repair the road surface to grade using hot-patch.

1.4 Grab Groundwater and Soil Analysis

Grab groundwater and soil samples will be collected in laboratory-supplied containers and sent to a State of California certified analytical laboratory for analysis. Grab groundwater and soil samples will be analyzed for total petroleum hydrocarbons as gasoline ("TPH-g"), TPH as diesel ("TPH-d"), TPH as motor oil ("TPH-mo") volatile organic compounds ("VOCs") (includes benzene, toluene, ethylbenzene, total xylenes, and naphthalene), and methyl tert-butyl ether ("MTBE").

Required sample containers are listed in Table 1-1. Sample containers will be transported to the analytical laboratory under chain-of-custody and maintained at a sample temperature of 4 (±2) ^{o}C. Sample handling and transport procedures are described in Section 1.8.3.

1.5 Investigation Derived Wastes ("IDWs")

IDWs such as soil cuttings, decontamination water, and purge water will be containerized in Department of Transportation ("DOT")-approved containers such as 55-gallon drums. The IDW containers will be labeled with respect to their contents, date generated, site address, and generator information. The IDW containers will be temporarily stored in a secure location on-site as designated by the City of Emeryville as the Successor Agency to the Emeryville Redevelopment Agency ("Successor Agency"). Appropriate composite waste characterization samples, as described below, will be collected, and IDW containers will be disposed of by the Successor Agency in accordance with applicable laws and regulations.

1.6 Surveying

Following completion of fieldwork, horizontal coordinates and elevations of any new in-situ testing locations will be surveyed by a California-licensed land surveyor. Vertical elevations will be surveyed relative to mean sea level based on the National Geodetic Vertical Datum ("NGVD") 1929. Horizontal coordinates will be surveyed relative to the California Coordinate System North American Datum ("NAD") 1927, Zone 3.

1.7 Health and Safety Plan

Fieldwork will be performed in accordance with the site-specific health and safety plan (see Attachment 2 in Work Plan; EKI 2016).

1.8 Quality Assurance and Quality Control Procedures

This section describes field quality assurance/quality control ("QA/QC") procedures.

1.8.1 Equipment Decontamination

In-situ testing and sampling equipment items used during the investigation will be cleaned prior to and during their use. The supervising engineer or geologist will inspect the subcontractor's down-hole drilling equipment for cleanliness.

Sampling equipment that will be reused shall be washed after each use using either: 1) a Liquinox (or equivalent non-phosphate detergent) solution in water or 2) a steam cleaner. After washing, sampling equipment shall be double rinsed with clean potable water, prior to initial use and between each subsequent use.

Decontamination water will be collected and contained at all times and will be transferred to drums at the end of each workday for temporary storage in a predefined location approved by the Successor Agency, until disposal can be arranged in accordance with applicable laws and regulations.

1.8.2 Field Instrument Calibration and Maintenance

Field instruments such as photoionization detectors ("PID") will be calibrated daily prior to their use according to the procedures described by the manufacturer. Calibration records will be noted on the daily field sheets. All personnel performing instrument calibrations will be trained in its proper operation and calibration. Instruments that fail calibration or become inoperable during use will be repaired or replaced.

1.8.3 Sample Handling and Transport Procedures

A sample label will be attached to each sample container following sample collection. The label will include the following information:

1. Client and project number;
2. Unique sample identification number;
3. Date and time the sample collected;
4. Initials of sample collector;
5. Preservatives used, if any; and
6. Analyses requested.

After labeling, filled soil and groundwater sample containers for chemical analysis will be placed in zip-closure plastic bags and in a cooler with blue ice or wet ice to maintain a sample temperature of 4 (±2) ºC.

Sample containers will be transported to the analytical laboratory under chain-of-custody, as described in the following subsection. Completed chain-of-custody records will be placed in a sealable plastic bag and placed inside the shipping package used for sample transport. Each cooler or box will be sealed with a custody seal that consists of a security tape or label with the date and initial of the sampler. The tape or label will be placed such that the seal must be broken to gain access to the contents of the transport container.

1.8.4 Field Documentation

1.8.4.1 Field Forms

The following field forms will be used to document specific field activities:

- Daily field record sheets
- Groundwater sampling form
- Chain-of-custody

The field forms should be filled out in their entirety, and any necessary information gaps should be explained in the remarks section. More detailed explanation of data collection events should be included in the daily field record sheets.

1.8.4.2 Chain-of-Custody

Sample containers will be transported to the analytical laboratory under chain-of-custody. Field personnel will record the following information on the chain-of-custody record in waterproof, permanent ink:

1. Client and project number;
2. Site name;
3. Name or initials and signature of sampler;
4. Name of analytical laboratory;
5. Field sampling identification number for each sample;
6. Date and time of collection for each sample;
7. Number and type of sample containers for each sample;
8. Analysis requested for each sample;
9. Preservatives used, if any, for each sample;
10. Sample matrix for each sample;
11. Signatures of all persons involved in possession of the samples; that is, "relinquished by" and "received by";
12. Dates and times of transfers of sample possession;
13. Shipping company airbill number, if applicable; and
14. Any remarks by either sample collector or laboratory.

1.8.5 Field QA/QC Samples

Field QA/QC samples will be collected during sampling to quantitatively measure and ensure the quality of the sampling effort and the analytical data. Field QA/QC samples include field duplicates, equipment blanks, and trip blanks. QA/QC samples are to be handled in the same manner as the environmental samples collected. Proposed analyses of the field QA/QC samples are summarized in Table 1-2. Brief descriptions of the field QA/QC samples are provided below.

- Field Duplicates: Field duplicates are a second sample collected at the same time as the original sample using identical sampling techniques. Field duplicate

sample results will be used to assess the precision of the sample collection process and to help determine the representativeness of the sample. One duplicate sample will be collected for the grab groundwater sampling event. The field duplicate will analyze for the same compounds as the original sample.

- Equipment Blanks: Equipment blank results will be used to assess the effectiveness of equipment decontamination. An equipment blank consists of distilled water poured over or pumped through equipment and into sample containers. One equipment blank will be collected and will be analyzed for VOCs, TPH-g, TPH-d, and TPH-mo.
- Trip Blanks: Trip blanks are prepared by the analytical laboratory and consist of VOA vials filled with laboratory water in the laboratory. The trip blanks are sent to the sampling site with the sample containers, kept with samples during sample collection, and shipped back to the laboratory for analysis with the collected samples. Trip blanks are used to assess the potential introduction of contaminants resulting from sample handling or shipment. One trip blank will be submitted and will be analyzed for VOCs and TPH-g.

REFERENCES

EKI, 2016. *Data Gap Investigation Work Plan and Focused Site Conceptual Model Former Horton Street Underground Storage Tank*, In Public Right-of-Way on Horton Street Adjacent to 5679 Horton Street, Emeryville, California, 29 July 2016.

TABLE 1-1
SAMPLE CONTAINERS, PRESERVATIVES, AND HOLD TIMES FOR SOIL AND GRAB GROUNDWATER SAMPLES
Former Horton Street Underground Storage Tank
Horton Street, Emeryville, California

Sample Type	Analyte	Analytical Method	Sample Container	No. of Sample Containers Needed	Hold Time
Soil	TPH-g	EPA Method 8015m	5 gram Encore samplers	5	48-hours for extraction 14-days from extraction to analysis
	VOCs and MTBE	EPA Method 8260B			
	TPH-d	EPA Method 8015m	8-ounce glass jar	1	14-days for extraction 40-days from extraction to analysis
	Percent Moisture	ASTM-D2216			Not Applicable
Grab Groundwater	TPH-g	EPA Method 8015m	40 ml glass VOA vial with HCl preservative	6	14-days
	VOCs and MTBE	EPA Method 8260B			
	TPH-d	EPA Method 8015m	1 liter amber glass bottle, no preservative	1	14-days for extraction 40-days from extraction to analysis
	TPH-mo				

Abbreviations:
ASTM - American Society for Testing and Materials Standards
EPA - Environmental Protection Agency
MTBE - Methyl Tert-butyl Ether
TPH-d - Total Petroleum Hydrocarbons, diesel range
TPH-g - Total Petroleum Hydrocarbons, gasoline range
TPH-mo - Total Petroleum Hydrocarbons, motor oil range
VOCs - Volatile Organic Compounds

TABLE 1-2
SUMMARY OF PROPOSED ANALYSES FOR
DUPLICATE, EQUIPMENT BLANK, AND TRIP BLANK SAMPLES
Former Horton Street Underground Storage Tank
Emeryville, California

	Proposed Analyses (a)			
Sample Type	VOCs	TPH-g	TPH-d	TPH-mo
Equipment Blank	X	X	X	X
Field Duplicate - GW	X	X	X	X
Trip Blank	X	X		

Abbreviations:
GW = groundwater
TPH = Total Petroleum Hydrocarbons
TPH-d = Total Petroleum Hydrocarbons, diesel range
TPH-g = Total Petroleum Hydrocarbons, gasoline range
TPH-mo = Total Petroleum Hydrocarbons, motor oil range
VOCs = Volatile Organic Compounds

Notes:
(a) Samples will be analyzed by K-Prime, Inc., Santa Rosa, California. using the following methods:
VOCs using EPA Method 8260B;
TPH-g/d/mo with silica gel cleanup using EPA Method 8015 (modified).

ATTACHMENT A

Example Chain-of-Custody Form

Erler & Kalinowski, Inc. **CHAIN OF CUSTODY RECORD** PAGE _____ OF _____

CONSULTING ENGINEERS AND SCIENTISTS 1870 Ogden Drive, Burlingame CA 94010 PHONE: 650-292-9100 FAX: 650-552-9012

Project Name Former Marchant/Whitney	**Project No.** B20006.00
Location: Emeryville, California	**Sampled By:**
Reporting: (circle all that apply) Hard Copy Format: PDF FAX Electronic Format: EDD EDF (CA State) Provide Chromatograms: YES NO EPA Data Report Level: II Other: _____ Report results to (email or fax no.): (1) (2)	**Laboratory:** (Address/Phone No./Contact Person)

ANALYSES REQUESTED

EKI COC No.:

Revision: _____ (A, B, C, D, etc.)

Field Sample Identification	Lab Sample No.	Date	Time	Matrix	No./Type of Containers and Preservative	Method No. / Analyte Group								EXTRACT AND HOLD	PLACE ON HOLD	EXPECTED TURNAROUND TIME	Remarks

Special Instructions/Notes:

Relinquished by:	(Signature/Affiliation)	Date	Time	**Received by:**	(Signature/Affiliation or Carrier/Air Bill No.)
Relinquished by:	(Signature/Affiliation)	Date	Time	**Received by:**	(Signature/Affiliation)
Relinquished by:	(Signature/Affiliation)	Date	Time	**Received by:**	(Signature/Affiliation)