By Alameda County Environmental Health at 3:05 pm, Sep 26, 2013

September 24, 2013

Mr. Keith Nowell Alameda County Health Care Services Environmental Health Services Environmental Protection 1131 Harbor Bay Parkway, Suite 250 Alameda, CA 94502-6577

Subject: RO#2933_Supplemental Closure Confirmation Borings Workplan 1409 – 1417 12th Street, Oakland, California

Dear Mr. Nowell:

Attached is the Supplemental Closure Confirmation Borings Workplan for the property located at 1409 – 1417 12th Street, Oakland, California.

Certification

I certify under penalty of law that this document and attachments are prepared under my direction or supervision in accordance with the system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing the violations.

Please contact Joseph Cotton at (510)703-5420 if you have questions or comments.

Sincerely,

Shuley & Thompson

Shirley E. Thompson Property Owner



Impact Environmental Services 39120 Argonaut Way, Suite 223 Fremont, CA 94538 Telephone: (510) 703-5420 Fax: (510) 791-0271

SUPPLEMENTAL SITE CLOSURE SOIL SAMPLING WORKPLAN 1409-1417 12TH STREET OAKLAND CALIFORNIA ACEH File No. RO2933

On behalf of Mrs. Shirley E. Thompson, Impact Environmental Services (IES) is presenting this Supplemental Site Closure Soil Sampling Work Plan for 1409-1417 12th Street in Oakland, California (Figure 1). According to the Alameda County Environmental Health (ACEH) soil analytical data from two of the initial site closure confirmation samples did not appear to be supported by the data from the adjacent wells. This work plan presents the methods and procedures to reevaluate the presence petroleum hydrocarbons and associated aromatic compounds in soil in these two locations. The work plan is being prepared in response to a request from the ACEH for a remediation work plan¹.

SITE CONTACT INFORMATION

The site address and contact information for the subject property is as follows:

Site Address: 1409-1417 12th Street Oakland, CA APN 004-063-06

Contact Information: Mrs. Shirley E. Thompson Edward C. & Shirley E. Thompson Trust 1155 Hopkins Street Berkeley, CA 94702-1359

¹ Alameda County Environmental Health, "Fuel Leak Case No. RO2933, 1409-1417 12th Street, Oakland, California CA 94607-2003_Electronic Communication from Keith Nowell", August 21, 2013.

SITE BACKGROUND

Site Description

The Subject Property is located in a predominately residential area in the western section of the city of Oakland, Alameda County, California (Figure 1). The subject Property comprises the Alameda County assessor parcel 004-063-06 and is bordered to the north by 12th Street and residential development, to the south by a vacant lot, on the east by Mandela Parkway, and to the west by a residential development (Figure 2). The property is located approximately 1-mile southeast of San Francisco Bay and 1-mile north of Oakland Inner Harbor. The elevation of the site is approximately 17 feet above mean sea level (USGS West Oakland 7.5 Minute Quadrangle). Portions of the site are paved with asphalt and the remainder is covered by grass and soil. Several mounds of soil up to 2 feet high are present in the southeast portion of the subject property.

Historical Site Operation

Historical records indicate that the property was occupied by a service station from circa 1957 to the circa 1969. The subject property was either vacant or occupied by residential dwellings from at least 1902 to circa 1956. Sanborn maps from 1957, 1958, 1961 and 1967 appear to show three underground fuel storage tanks (USTs) located in the southeast corner of the service station. The 1961 Sanborn map appears to show a fourth UST or AST along the west property boundary. Communications with Oakland Fire Department Hazardous Materials Division, confirmed that no records of UST removal exist for the Subject Property².

Geologic Setting

The Subject Property is located in the East Bay Plain of the San Francisco Bay Area. This region is dominated by northwest trending topography enclosed in the Coast Range Province of California. The site is located in a "Merritt Sand Outcrop" groundwater subarea, which has a maximum thickness of 65 feet, and the local gradient is directed toward the west to southwest³. Soil beneath the property consists primarily of silty-sand to at least 16 feet bgs. Groundwater is first encountered between 10.5 and 13.5 below ground surface (bgs) and stabilizes at

² Personal Communication, LeRoy Griffin, Oakland Fire Department Hazardous Materials Division, May 25, 2006.

³ Hickenbottom and Muir, *Geohydrology and Groundwater Quality Overview of the East Bay Plain Area, Alameda County, California, 205 (J) Report, 1988.*

approximately 11 feet bgs. A perched groundwater zone was present at approximately 5-feet bgs over most of the site. The direction of groundwater flow in the surrounding area is highly variable⁴. The direction of groundwater flow at the site is currently unknown.

Historical Environmental Assessment

The subject property has undergone several phases of soil and groundwater sampling and remediation. The Site Plan presented in Figure 2, shows the locations of former exploratory borings, groundwater monitoring and remediation wells, and soil-vapor wells. Detailed summaries of prior environmental site assessment and remediation at the site are included in the Closure Verification Soil and Soil-Vapor Sampling Report and in previous reports prepared for the subject property. These reports should be referenced for information on previous site assessment and remedial activities.

SCOPE OF WORK FOR SITE VERIFICATION CLOSURE SAMPLING

This workplan describes our methods and procedures to re-evaluate the presence of residual petroleum hydrocarbons in soil in two areas of the site where significant petroleum hydrocarbons have been detected following considerable treatment of soil and groundwater using a dual-phase vacuum enhanced extraction and manual hydrogen peroxide treatment of groundwater. The proposed scope of work for this phase of work includes the following tasks. Impact anticipates petitioning for corrective action closure of the site upon completion of the following scope of work.

Task 1 – Pre-field and Pre-excavation Activities

Pre-field activities include preparing this work plan, scheduling subcontractors, and preparing a site health and safety plan, and obtaining boring installation permits. Exploratory boring locations will be marked and cleared by a private underground utility locating contractor. Impact will obtain the necessary exploratory boring permits from Alameda County Department of Public Works (ACPW). Underground Service Alert (USA) will be notified a minimum of 48-hours before the start of fieldwork. ACEH will be notified at least 5 days in advance of all phases of work.

⁴ Personal Communication, *Steven Plunkett, Alameda County Environmental Health*, March 30, 2007.

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Task 2 – Install Exploratory Borings

Significant concentrations of petroleum hydrocarbons in soil have been previously documented in soil samples collected from site closure confirmation boring CSB-1 and CSB-6. Pursuant to the request by ACEH, Impact will install two exploratory soil borings designated CSB-9 and CSB-10, in the vicinity of former borings CSB-6 and CSB-1. The locations of the proposed borings are shown on Figure 3.

Subsurface Data Collection

Exploratory borings will be advanced using a dual-walled Enviro-Core direct-push drilling and sampling methods. The Enviro-Core system consists of 2.5-inch-diameter steel drive casing and a 1.8-inch-diameter inner sample barrel that are simultaneously pushed, driven, or vibrated into the ground. Continuous soil cores will be collected in butyrate tubes inside the inner sample barrel. After being advanced three feet, the inner sample barrel is retrieved while the drive casing is left in place to prevent borehole collapse. After retrieving the inner core barrel, the samples are removed and stored for chemical analyses or lithologic identification. Sample rods will then be placed at the bottom of the borehole for additional three-foot sample collection runs until the desired borehole depth is achieved. Each boring will be advanced to first anticipated groundwater.

Soil samples for lithologic identification will be collected continuously to the depth of exploration. Soil cores will be logged in accordance with the Unified Soil Classification System (USCS) under the direction of a California Registered Geologist. Periodic soil samples will be screened in the field using an organic vapor meter (OVM) to provide a qualitative estimate of volatile hydrocarbons in the soil.

Soil samples for chemical analysis will be collected from depths 3, 5, 7, 10, 12, and 15 feet bgs. One additional soil sample will be collected from a depth of 18 feet bgs in boring CSB-10. Soil samples will also be collected from intervals where staining, odor or elevated OVM readings occur within the capillary fringe, where groundwater is first encountered, and at distinct changes in lithology.

All soil samples will be properly containerized, labeled, and preserved in ice upon collection. Chain of custody documentation will accompany the samples to the laboratory for analysis. All soil will be contained for proper disposal. All down-hole equipment will be decontaminated Mr. Keith Nowell September 17, 2013 Page 5

before use and between borings. Soil cuttings and decontamination rinsate will be collected in 55-gallon drums for proper disposal. These materials will be properly disposed of consistent with analytical results. Following completion of work at each location, each boring will be grouted to the ground surface with bentonite-cement slurry via tremie pipe.

Soil Sample Analysis

Soil and grab groundwater samples will be analyzed by a State-certified laboratory. Soil samples will be analyzed total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), TPH as motor oil (TPHmo) by EPA Method 8015. Silica gel cleanup will be run on all samples analyzed for TPHd and TPHmo. Soil samples will also be analyzed by benzene, toluene, ethylbenzene, total xylenes (BTEX) and fuel oxygenates methyl tertiary butyl ether (MTBE), diisopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), and tertiary butyl alcohol (TBA), and the lead scavengers 1,2-dibromroethane (EBD) and 1,2-dichloroethane (1,2-DCA) using EPA Method 8260. Soil samples from the upper ten feet in each boring will also be analyzed for naphthalene to satisfy the Low Threat Underground Storage Tank Case Closure Policy (LTCP) ⁵ Media Specific Criteria for Direct Contact and Outdoor Air Exposure.

Task 3 – Prepare Supplemental Site Closure Report

Impact will prepare a Supplemental Site Closure Verification Report describing soil sample collection procedures and presenting the results of the proposed investigation. The results of the investigation will be compared to the State Water Resources Control Board's environmental screening levels⁶ and LTCP to evaluate the site's eligibility for closure as a low-threat site.

⁵ California Regional Water Quality Control Board: San Francisco Bay Region, Low Threat Underground Storage Tank Case Closure Policy Final, May 1, 2012.

⁶ California Regional Water Quality Control Board: San Francisco Bay Region, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater_May 2013.

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Certification

I certify under penalty of law that this document and attachments are prepared under my direction or supervision in accordance with the system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing the violations.

OFESSIONAL GE

JOSEPHA COTTON No. 7378

CALIF

Sincerely,

Impact Environmental Services

Joseph A. Cotton, P.G.7378 President/ Principal Geologist

Attachments: Figure 1 – Site Location Map Figure 2 – Site Plan Figure 3 – Proposed Exploratory Boring Locations

cc: Ms. Shirley E. Thompson, 1155 Hopkins Way. Berkeley, CA



C:\WORK\IES\1409 12th Street\Figure 1.dwg Layout: Fig 2 Sep 22, 2007 - 8:03pm



Impact Environmental Services 39120 Aronaut Way, Suite 223 Fremont, CA 94538 Figure 2 1409 to 1417 12TH STREET OAKLAND, CALIFORNIA

SITE PLAN



eet/Figure 3 - Closure Verification Rsults Prop Confirm Borings.dwg Layout: Fig 3 Sep 16, 2013 - 8:29pm Stre 12th 409-1417 D:\Work\EnviroCAD\IES\1

Table 1 Soil Analytical Results Site Closure Verification Soil Samples 1409-1417 12th Street Oakland, California

			Total Petroleum Hydrocarbons			BTEX				Fuel Oxygenates and Lead Scavengers							
Sample ID	Date	Sample	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Total Xylene	TBA	MTBE	DIPE	ETBE	1,2-DCA	TAME	1,2-DBE	
	Sampled	Depth	(mg/kg)	(mg/kg)	(mg/kg)	(ukg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	
CSB1-5	05/10/12	5	< 0.98	<1.0	<5.0	<4.8	<4.8	<4.8	<4.8	<97	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	
CSB1-7	05/10/12	7	1,900	180Y	<5.0	<1,300	<1,300	3,100	30,900	<25,000	<1,300	<1,300	<1,300	<1,300	<1,300	<1,300	
CSB1-10	05/10/12	10	3,300	550Y	<5.0	<830	<830	990	85,000	<17,000	<830	<830	<830	<830	<830	<830	
CSB1-12	05/10/12	12	2,600	490Y	<5.0	<1,300	<1,300	25,000	105,000	<25,000	<1,300	<1,300	<1,300	<1,300	<1,300	<1,300	
CSB1-12A	05/10/12	12.5	55	40Y	<5.0	<5.0	<5.0	<5.0	<5.0	<99	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
CSB1-15	05/10/12	15	< 0.99	1.3Y	<5.0	<4.8	<4.8	<4.8	<4.8	<96	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	
CSB1-18	05/10/12	18	< 0.95	1.2Y	<5.0	<4.7	<4.7	<4.7	<4.7	<95	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	
CSB2-5	05/10/12	5	<1.1	1.4Y	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
CSB2-7	05/10/12	7	<1.1	1.1Y	<5.0	<4.8	<4.8	<4.8	<4.8	<96	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	
CSB2-10	05/10/12	10	< 0.96	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
CSB2-15	05/10/12	15	<1.0	1.3Y	<5.0	<4.8	<4.8	<4.8	<4.8	<95	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	
CSB2-18	05/10/12	18	< 0.93	<1.0	<5.0	<4.7	<4.7	<4.7	<4.7	<93	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	
CSB3-5	05/10/12	5	< 0.95	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
CSB3-7	05/10/12	7	<1.0	2.6Y	7.4	<4.7	<4.7	<4.7	<4.7	<93	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	
CSB3-10	05/10/12	10	< 0.95	1.0Y	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
CSB3-12	05/10/12	12	13Y	2.9Y	<5.0	<4.9	<4.9	<4.9	<4.9	<98	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	
CSB3-15	05/10/12	15	< 0.98	< 0.99	<5.0	<4.6	<4.6	<4.6	<4.6	<92	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	
CSB3-18	05/10/12	18	< 0.92	<1.0	<5.0	<4.7	<4.7	<4.7	<4.7	<95	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	
CSB4-5	05/10/12	5	<1.0	<1.0	<5.0	<4.9	<4.9	<4.9	<4.9	<98	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	
CSB4-7	05/10/12	7	< 0.94	53Y	<5.0	<4.9	<4.9	<4.9	<4.9	<98	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	
CSB4-10	05/10/12	10	< 0.94	1.1Y	<5.0	<4.9	<4.9	<4.9	<4.9	<98	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	
CSB4-12	05/10/12	12	<0.97	<1.0	<5.0	<4.8	<4.8	<4.8	<4.8	<97	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	
CSB4-13 CSB4-15	05/10/12	15	<0.96	1.0Y	<5.0	<4.8	<4.8	<4.8	<4.8	<95	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	
CSD4-13	03/10/12	15	<0.90	<1.0	<3.0	<4.0	<4.0	<4.0	<4.0	<91	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	
Residential ESL for Shallow Soil (DWS)			100	100	500	44	2,900	3,300	2,300	75	23	No ESL	No ESL	4.5	No ESL	0.33	

Table 1 Soil Analytical Results Site Closure Verification Soil Samples 1409-1417 12th Street Oakland, California

			Total Petroleum Hydrocarbons			BTEX				Fuel Oxygenates and Lead Scavengers						
Sample ID	Date	Sample	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	TBA	MTBE	DIPE	ETBE	1,2-DCA	TAME	1,2-DBE
	Sampled	Depth	(mg/kg)	(mg/kg)	(mg/kg)	(ukg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
CSB5-5	05/10/12	5	<1.0	<1.0	<5.0	<4.9	<4.9	<4.9	<4.9	<97	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9
CSB5-7	05/10/12	7	< 0.93	<1.0	<5.0	<4.9	<4.9	<4.9	<4.9	<97	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9
CSB5-10	05/10/12	10	<1.1	<.99	<5.0	<4.9	<4.9	<4.9	<4.9	<97	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9
CSB5-12	05/10/12	12	< 0.93	<1.0	<5.0	<4.9	<4.9	<4.9	<4.9	<97	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9
CSB5-15	05/10/12	15	< 0.94	<.99	<5.0	<4.7	<4.7	<4.7	<4.7	<95	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7
CSB5-18	05/10/12	18	< 0.99	<.99	<5.0	<4.8	<4.8	<4.8	<4.8	<96	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
CSB6-5	05/10/12	5	<1.0	2.2Y	27	<4.8	<4.8	<4.8	<4.8	<96	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
CSB6-7	05/10/12	7	< 0.99	1.2Y	<5.0	<4.8	<4.8	<4.8	<4.8	<96	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
CSB6-10	05/10/12	10	10,000Y	3,500Y	<100	<13,000	<13,000	<13,000	<13,000	<250,000	<13,000	<13,000	<13,000	<13,000	<13,000	<13,000
CSB6-13	05/10/12	13	12Y	2.0Y	<5.0	<4.7	<4.7	<4.7	<4.7	<95	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7
CSB6-15	05/10/12	15	<1.0	<1.0	<5.0	<4.9	<4.9	<4.9	<4.9	<98	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9
CSB7-5	05/10/12	5	< 0.94	<1.0	<5.0	<4.4	<4.4	<4.4	<4.4	<88	<4.4	<4.4	<4.4	<4.4	<4.4	<4.4
CSB7-7	05/10/12	7	< 0.98	<1.0	<5.0	<4.9	<4.9	<4.9	<4.9	<98	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9
CSB7-10	05/10/12	10	< 0.93	< 0.99	<5.0	<4.8	<4.8	<4.8	<4.8	<97	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8
CSB7-13	05/10/12	13	<1.0	< 0.99	<5.0	<4.4	<4.4	<4.4	<4.4	<88	<4.4	<4.4	<4.4	<4.4	<4.4	<4.4
CSB7-15	05/10/12	15	< 0.95	<1.0	<5.0	<4.5	<4.5	<4.5	<4.5	<91	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5
CSB8-5	05/10/12	5	< 0.97	1.9Y	9.8	<4.4	<4.4	<4.4	<4.4	<89	<4.4	<4.4	<4.4	<4.4	<4.4	<4.4
CSB8-7	05/10/12	7	<1.1	<1.0	<5.0	<4.3	<4.3	<4.3	<4.3	<87	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3
CSB8-10	05/10/12	10	< 0.98	<1.0	<5.0	<4.6	<4.6	<4.6	<4.6	<91	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6
CSB8-12	05/10/12	12	< 0.93	<1.0	<5.0	<4.5	<4.5	<4.5	<4.5	<91	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5
CSB8-15	05/10/12	15	< 0.95	<1.0	<5.0	<4.5	<4.5	<4.5	<4.5	<91	<4.5	<4.5	<4.5	<4.5	<4.5	<4.5
CSB8-18	05/10/12	18	< 0.93	< 0.99	<5.0	<4.6	<4.6	<4.6	<4.6	<92	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6
Residential ESL for Shallow Soil (DWS)			100	100	500	44	2,900	3,300	2,300	75	23	No ESL	No ESL	4.5	No ESL	0.33

TPHg = Total petroleum hydrocarbons as gasoline by EPA Method 8015

TPHd= Total Petroleum Hydrocarbons as diesel by EPA Method 8015

TPHmo= Total Petroleum Hydrocarbons as motor oil by EPA Method 8015 Benzene, methyl-tert-butyl ether, toluene, ethylbenzene, and xylenes by EPA Method 8020

mg/kg = Milligrams per kilogram, equivalent to parts per million (ppm) ESL= San Francisco Bay Regional Water Quality Control Board, Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater, February 2005.

Y= Sample exhibits chromatographic pattern which does not resemble diesel pattern.