Xtra OIL COMPANY
2307 PACIFIC AVENUE
ALAMEDA, CA 94501
(510) 865-9503 FAX (510) 865-1889

RECEIVED
By Alameda County Environmental Health at 9:44 am, Aug 06, 2014

August 4, 2014

Ms. Karel Detterman
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

SUBJECT: DATA GAP EVALUATION AND SUBSURFACE INVESTIGATION WORK PLAN CERTIFICATION
(B1 THROUGH B7)
County LOP Case Number RO 0002990
Auto Depot
4171 Broadway
Oakland, California

Dear Ms. Detterman**:**

You will find enclosed one copy of the following draft document prepared by P&D Environmental, Inc. for the subject site

- Data Gap Evaluation and Subsurface Investigation Work Plan dated August 4, 2014 (document 0398.W1).

I declare under penalty of perjury that the contents and conclusions in the document are true and correct to the best of my knowledge.

Should you have any questions, please do not hesitate to contact me at (510) 865-9506.

Sincerely,

Xtra Oil Company

Keith Simas

Enclosure

0398.L2

P&D ENVIRONMENTAL, INC.

55 Santa Clara Avenue, Suite 240
Oakland, CA 94610
(510) 658-6916

August 4, 2014
Work Plan 0398.W1

Ms. Karel Detterman
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

SUBJECT: DATA GAP EVALUATION AND
SUBSURFACE INVESTIGATION WORK PLAN
(B1 THROUGH B7)
County LOP Case Number RO 0002990
Auto Depot/Xtra Oil
4171 Broadway
Oakland, California

Dear Ms. Detterman:

P&D Environmental, Inc. (P&D) has prepared this data gap evaluation and subsurface investigation work plan for evaluation of a petroleum hydrocarbon release associated with soil samples collected following the removal of four former 12,000-gallon capacity gasoline Underground Storage Tanks (USTs) at the subject site. At the time that the soil samples were collected on December 10, 1986 for evaluation of the former 12,000-gallon capacity gasoline USTs, soil samples were also collected associated with one former 10,000-gallon capacity diesel UST, and one former 500-gallon waste oil UST at the subject site. No evidence of sample collection associated with the facility dispensers or UST piping was reviewed. This work plan is prepared in response to an email from Ms. Karel Detterman of the Alameda County Environmental Health Department (ACDEH) dated June 30, 2014 requesting evaluation of the site with State Water Resources Control Board (SWRCB) Low Threat Closure Policy (LTCP) case closure criteria in an effort to identify steps necessary to move the case to closure.

This data gap evaluation compares available information for the site with LTCP case closure criteria to identify additional information that is needed to complete a LTCP evaluation of the site. Based on the data gap evaluation, the proposed work scope includes the determination of the presence and location of the former UST piping, and the collection of soil and groundwater grab samples. All work will be performed under the direct supervision of a California professional geologist.

A Site Location Map is attached as Figure 1 and a Site Map showing former UST locations and proposed sample collection locations is attached as Figure 2. A Site Aerial Photograph is attached as Figure 3.

BACKGROUND

Review of available documents for the site obtained at the ACDEH LOP website, at the GeoTracker website, and in response to a request to the property owner for available documents related to USTs and subsurface investigation has identified the following document related to sample collection following removal of the site USTs.

- December 31, 1986 Removal and Disposal of One Underground Diesel Tank, Five Underground Gasoline Tanks, and One Underground Waste Oil Tank Report prepared by Aqua Science Engineers, Inc.

A complete copy of the report is attached with this work plan as Appendix A. The 1986 underground storage tank closure report described soil sample collection from the bottom of each UST pit as follows: two soil samples were collected from both ends of each of the four gasoline and the one diesel UST at a depth of approximately 12.0 feet below the ground surface (bgs), and one soil sample was collected beneath the former waste oil UST at a depth of approximately 8.0 feet bgs. The report does not mention encountering groundwater in any of the excavations, and does not mention sample collection or analysis associated with the UST piping or dispensers. It is unknown if the UST piping was removed.

All of the soil samples were analyzed as follows:

- The diesel UST pit soil samples (2) were analyzed for Total Petroleum Hydrocarbons (TPH)- Diesel,
- The gasoline UST pit soil samples (8) were analyzed for TPH-Gasoline, benzene, toluene, and total xylenes,
- The waste oil UST pit soil sample (1) was analyzed for TPH-Motor Oil.

None of the samples were analyzed for methyl-tert-butyl ether (MTBE) or any other Volatile Organic Compounds (VOCs) including ethylbenzene, or for lead. The sample results are summarized in Table 1 attached with this work plan.

DATA GAP EVALUATION

The LCTP addresses general criteria for case closure consideration as follows:

(a) The unauthorized release is located within the service area of a public water system;
(b) The unauthorized release consists only of petroleum;
(c) The unauthorized release from the UST system has been stopped;
(d) Free Product has been removed to the maximum extent practicable;
(e) A conceptual site model that assesses the nature, extent, and mobility of the release has been developed;
(f) Secondary source removal has been removed to the extent practicable;

(g) Soil or groundwater has been tested for MTBE and results reported in accordance with Health and Safety Code section 25296.15; and
(h) Nuisance as defined by Water Code section 13050 does not exist at the site.

The LTCP general criteria have been addressed as follows:

(a) The subject site is located within the municipal water supply service area of the East Bay Municipal Utilities District (EBMUD),
(b) The only detected unauthorized release constituents (TPH-G, benzene, toluene, and xylenes) consists only of petroleum,
(c) The unauthorized release has been stopped because the USTs were removed,
(d) No free product has been identified at the site,
(e) A site conceptual model is attached with this work plan as Appendix B.
(f) Based on the low concentrations detected in the gasoline UST pit soil samples, secondary source removal is presently not necessary (none of the detected analyte concentrations exceed current applicable regulatory agency screening levels, see Table 1),
(g) MTBE was not tested for in soil samples collected from under the former USTs, (recommendations included in this work plan include analysis of samples for MTBE).
(h) No conditions were identified in the report documenting the UST sample results that identify a nuisance at the site as defined by Water Code section 13050.

LTCP general criteria data gaps are as follows:

- Analysis for MTBE has not been performed.

The LTCP also addresses three media-specific criteria: 1) groundwater, 2) vapor intrusion to indoor air, and 3) direct contact and outdoor air exposure. The data gaps associated with the media-specific criteria are as follows:

1) groundwater
    a. Impact to groundwater is unknown because groundwater samples have not yet been collected in the vicinity of the former gasoline UST pit where petroleum hydrocarbons were detected.

2) vapor intrusion to indoor air
    a. Groundwater has not yet been assessed to determine if groundwater petroleum hydrocarbon concentrations are present that could pose a potential vapor intrusion concern.

3) direct contact and outdoor air exposure
    a. Analytes were not included in the 1986 sample analysis such as ethylbenzene or Polynuclear Aromatic Hydrocarbons (PAHs) (including naphthalene). For this reason additional sample collection and laboratory

analysis is required to determine if analytes are present at concentrations exceeding regulatory threshold criteria (see Table 1).

b. Only one soil sample was collected at a depth of less than 10 feet bgs, and was only analyzed for TPH-MO, which was not detected. Additional sample collection and analysis is required at a depth of less than 5 feet bgs for comparison with LTCP criteria.

All of the detected soil sample concentrations of TPH-G and benzene, toluene, and total xylenes are below their respective San Francisco Bay Regional Water Quality Control Board (SF-RWQCB) December 2013 Table A-1 and Table A-2 residential or commercial/industrial Environmental Screening Levels (ESLs) for shallow soil and Table C-1 and Table C-2 residential or commercial/industrial ESLs for deep soil.

SCOPE OF WORK

To evaluate the extent of petroleum hydrocarbons at and near the subject site and to address LTCP data gaps, P&D will perform the following activities.

- Obtain drilling permits and site access.
- Prepare a health and safety plan and mark drilling locations for Underground Service Alert.
- Locate UST piping trenches.
- Observe drilling for soil and groundwater grab sample collection at up to seven locations associated with the former UST pits and dispenser islands. Additional soil samples will be collected based on the identified locations of the UST piping trenches.
- Arrange for sample analysis.
- Prepare a report.

Each of these is discussed below.

Obtain Permits and Site Access

Permits will be obtained from the Alameda County Public Works Agency for borehole drilling. All necessary permit-related notifications will be made to the permitting agencies prior to drilling. In addition, notification will be provided to the ACDEH of the scheduled drilling dates. Site access will be obtained and arrangements will be made to move vehicles that are presently parked at the property.

Prepare a Health and Safety Plan

A health and safety plan will be prepared for the scope of work identified in this work plan. In addition, the drilling locations will be marked with white paint and Underground Service Alert will be notified for underground utility location.

Locate UST Piping Trenches

A magnetometer will be used to locate UST system pipes in pipe trenches. If the magnetometer is not successful in identifying the pipe trenches, exploratory excavation will be performed to identify the locations of the UST piping trenches.

Drilling Observation and Sample Collection

Boreholes B1 through B7 will be drilled at locations shown in Figures 2 and 3. All of the boreholes will be continuously cored by Vironex, Inc. of Concord, California (Vironex) using Geoprobe direct-push technology to drive a 2.5-inch outside diameter Geoprobe macrocore lined with transparent PVC sleeves. The soil from the borings will be logged in the field in accordance with standard geologic field techniques and the Unified Soil Classification System. All soil from the boreholes will be evaluated with a PID equipped with a 10.6 eV bulb and calibrated using a 100 ppm isobutylene standard.

Based on a depth to groundwater of approximately 10 to 15 feet at the adjacent Downtown Toyota site, all of the boreholes will be drilled to a depth of approximately 15 feet bgs for groundwater sample collection. Soil samples will be collected for laboratory analysis as follows:

- In boreholes B1, B2 and B3 at a depth of 10 feet bgs.
- In borehole B4 through B7 at a depth of 5 and 10 feet bgs.
- Additional soil samples will be collected based on the identified locations of the UST piping trenches.

Soil samples will be retained from each of the borings for laboratory analysis by selecting the interval to be sampled and cutting a 6-inch section of the liner corresponding to the sample collection depth. In addition, soil samples will be collected in boreholes where evidence of contamination is encountered based on odors, PID values, staining, and discoloration. The ends of the tubes will be sequentially capped with aluminum foil and plastic endcaps. The samples will then be labeled and stored in a cooler with ice pending delivery to a State-accredited hazardous waste testing laboratory. Chain of custody procedures will be observed for all sample handling.

Once groundwater is encountered in each borehole, a 1-inch diameter temporary slotted PVC pipe will be placed in each borehole and a groundwater sample will be collected at each location using polyethylene tubing and a peristaltic pump. The groundwater samples will be transferred directly from the discharge tubing to 40-millileter VOA bottles, all of which will be supplied by the laboratory and contain hydrochloric acid preservative. In addition, water samples will be collected into preserved and also into unpreserved 1-liter amber glass bottles at location B4. The sample bottles will be labeled and placed in a cooler with ice pending delivery to the laboratory. Chain of custody procedures will be observed for all sample handling.

Soil samples will be collected from the UST piping trenches at a depth of approximately two feet beneath the piping at 20 foot intervals along the piping trenches and at elbows in the piping. The samples will be collected by hand augering to a depth of two feet below the piping and using a slide hammer to drive a stainless steel sampler lined with a 2-inch diameter 6-inch long stainless steel tube. Following sample collection the tube will be removed from the sampler and the ends of the tube sequentially covered with aluminum foil and plastic endcaps. The sample will be labeled and placed in a cooler with ice pending delivery to the laboratory. Chain of custody procedures will be observed for all sample handling.

All drilling and sampling equipment will be cleaned by steam cleaning or with an Alconox solution followed by a clean water rinse prior to use in each borehole. Following completion of logging and sample collection activities, the boreholes will be filled with neat cement grout. All soil and water generated during subsurface investigation will be stored in 55-gallon drums at the site and labeled pending characterization and proper disposal.

Sample Analysis

All of the soil samples will be analyzed for TPH-G using EPA Method 5030B in conjunction with EPA Method 8021B and/or modified EPA Method 8015B, for TPH-D and TPH-MO using EPA Method 3550B in conjunction with EPA Method 8015B, for VOCs (including ethylbenzene, MTBE, other fuel oxygenates, lead scavengers, and naphthalene) using EPA Method 8260B, and lead. Additionally, the soil samples collected from borehole B4 (adjacent to the former waste oil tank) for PAHs using EPA Method 8270.

All of the groundwater samples will be analyzed at McCampbell Analytical, Inc. (McCampbell) in Pittsburg, California for Total Petroleum Hydrocarbons as Gasoline (TPH-G), using EPA Method 5030B in conjunction with EPA Method 8021B and modified EPA Method 8015B, for TPH-D and Total Petroleum Hydrocarbons as Motor Oil (TPH-MO) by EPA Method 3510 in conjunction with EPA Method 8015B, and for VOCs (including ethylbenzene, MTBE, other fuel oxygenates, lead scavengers, and naphthalene) by EPA Method 8260B.

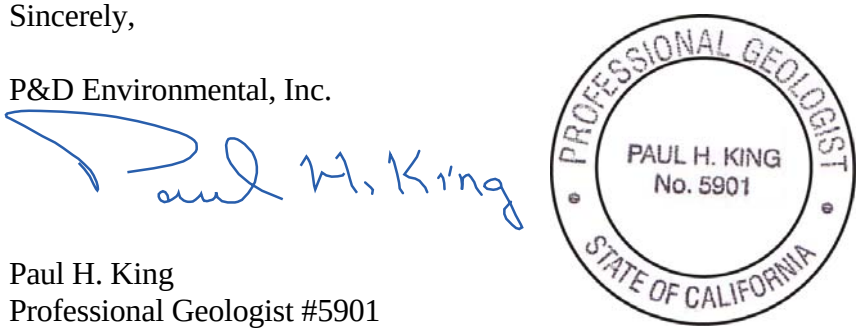
Report Preparation

Upon receipt of the laboratory analytical results for the soil and groundwater samples, a report will be prepared. The report will document soil and groundwater sample collection procedures and sample results. The report will include a site map showing the drilling locations, tables summarizing the sample results, an updated site conceptual model, recommendations based on the results, and the stamp of an appropriately registered professional. Copies of the report will be uploaded to the County ftp site and to the SWRCB GeoTracker site.

Should you have any questions, please do not hesitate to contact us at (510) 658-6916.

Sincerely,

P&D Environmental, Inc.



Paul H. King
Professional Geologist #5901
Expires: 12/31/15

Attachments:

Table 1 - Summary of Historical UST Pit Bottom Soil Sample Analytical Results

Figure 1 - Site Location Map
Figure 2 - Site Map Showing Proposed Sample Collection Locations
Figure 3 - Site Aerial Photograph Showing Proposed Sample Collection Locations

Appendix A - December 31, 1986 Removal and Disposal of One Underground Diesel Tank, Five Underground Gasoline Tanks, and One Underground Waste Oil Tank Report prepared by Aqua Science Engineers, Inc.

Appendix B - Site Conceptual Model

PHK/sjc
0398.W1

TABLES

Table 1
Summary of Historical UST Pit Bottom Soil Sample Analytical Results

Sample ID	Sample Date	Sample Location	Sample Depth (feet)	TPH-G	TPH-D	TPH-MO	MTBE	Benzene	Toluene	Ethylbenzene	Total Xylenes
Soil A1	12/10/1986	North end of Former Diesel UST	12.0	NA	ND<10	NA	NA	NA	NA	NA	NA
Soil A2	12/10/1986	South end of Former Diesel UST	12.0	NA	ND<10	NA	NA	NA	NA	NA	NA
Soil B3	12/10/1986	Center of Former Waste Oil Tank	8.0	NA	NA	ND<50	NA	NA	NA	NA	NA
Soil C5	12/10/1986	West end of Former Gasoline UST Tank C	12.0	1.2	NA	NA	NA	0.002	0.014	NA	0.057
Soil C6	12/10/1986	East end of Former Gasoline UST Tank C	12.0	54	NA	NA	NA	0.001	0.008	NA	0.64
Soil D7	12/10/1986	West end of Former Gasoline UST Tank D	12.0	ND<0.050	NA	NA	NA	ND<0.001	ND<0.001	NA	ND<0.001
Soil D8	12/10/1986	East end of Former Gasoline UST Tank D	12.0	6.2	NA	NA	NA	0.041	0.25	NA	1.9
Soil F9/E9	12/10/1986	West end of Former Gasoline UST Tank E	12.0	0.15	NA	NA	NA	ND<0.001	0.004	NA	0.012
Soil E10	12/10/1986	East end of Former Gasoline UST Tank E	12.0	1.0	NA	NA	NA	ND<0.001	0.007	NA	0.043
Soil F11	12/10/1986	West end of Former Gasoline UST Tank F	12.0	0.080	NA	NA	NA	ND<0.001	0.003	NA	0.001
Soil F12	12/10/1986	East end of Former Gasoline UST Tank F	12.0	ND<0.050	NA	NA	NA	ND<0.001	ND<0.001	NA	ND<0.001
LTCP[1]								0-5' = 1.9		0-5' = 21	
								5-10' = 2.8		5-10' = 32	
LTCP[2]								0-5' = 8.2		0-5' = 89	
								5-10' = 12		5-10' = 134	
								0-10' = 14		0-10' = 314	
ESL[1]				100	100	100	0.023	0.044	2.9	3.3	2.3
ESL[2]				500	110	500	0.023	0.044	2.9	3.3	2.3
ESL[3]				500	110	500	0.023	0.044	2.9	3.3	2.3
ESL[4]				770	110	1,000	0.023	0.044	2.9	3.3	2.3

NOTES:
TPH-G = Total Petroleum Hydrocarbons as Gasoline.
TPH-D = Total Petroleum Hydrocarbons as Diesel.
TPH-MO = Total Petroleum Hydrocarbons as Motor Oil.
MTBE = Methyl tertiary-butyl ether.
ND = Not detected.
NA = Not analyzed.
a = Laboratory note: heavier gasoline range compounds are significant (aged gasoline?).
b = Laboratory note: gasoline range compounds are significant; no recognizable pattern.
c = Laboratory note: gasoline range compounds are significant.
LTCP[1] = Low Threat Closure Policy, by State Water Resources Control Board, effective August 17, 2012, from Table 1 - Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health. Residential Land Use.
LTCP[2] = Low Threat Closure Policy, by State Water Resources Control Board, effective August 17, 2012, from Table 1 - Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health. Commercial/Industrial Land Use and Utility Worker.
ESL[1] = Environmental Screening Level, by San Francisco Bay – Regional Water Quality Control Board, updated December 2013 from Table A-1 – Shallow Soil Screening Levels, Groundwater is a current or poten drinking water source. Residential Land Use.
ESL[2] = Environmental Screening Level, by San Francisco Bay – Regional Water Quality Control Board, updated December 2013 from Table A-2 – Shallow Soil Screening Levels, Groundwater is a current or poten drinking water source. Commercial/Industrial Land Use.
ESL[3] = Environmental Screening Level, by San Francisco Bay – Regional Water Quality Control Board, updated December 2013 from Table C-1 – Deep Soil Screening Levels, Groundwater is a current or potential drinking water source. Residential Land Use.
ESL[4] = Environmental Screening Level, by San Francisco Bay – Regional Water Quality Control Board, updated December 2013 from Table A-2 – Deep Soil Screening Levels, Groundwater is a current or potential drinking water source. Commercial/Industrial Land Use.
Results, LTCP criteria, and ESLs in milligrams per kilogram (mg/kg) unless otherwise specified.

FIGURES

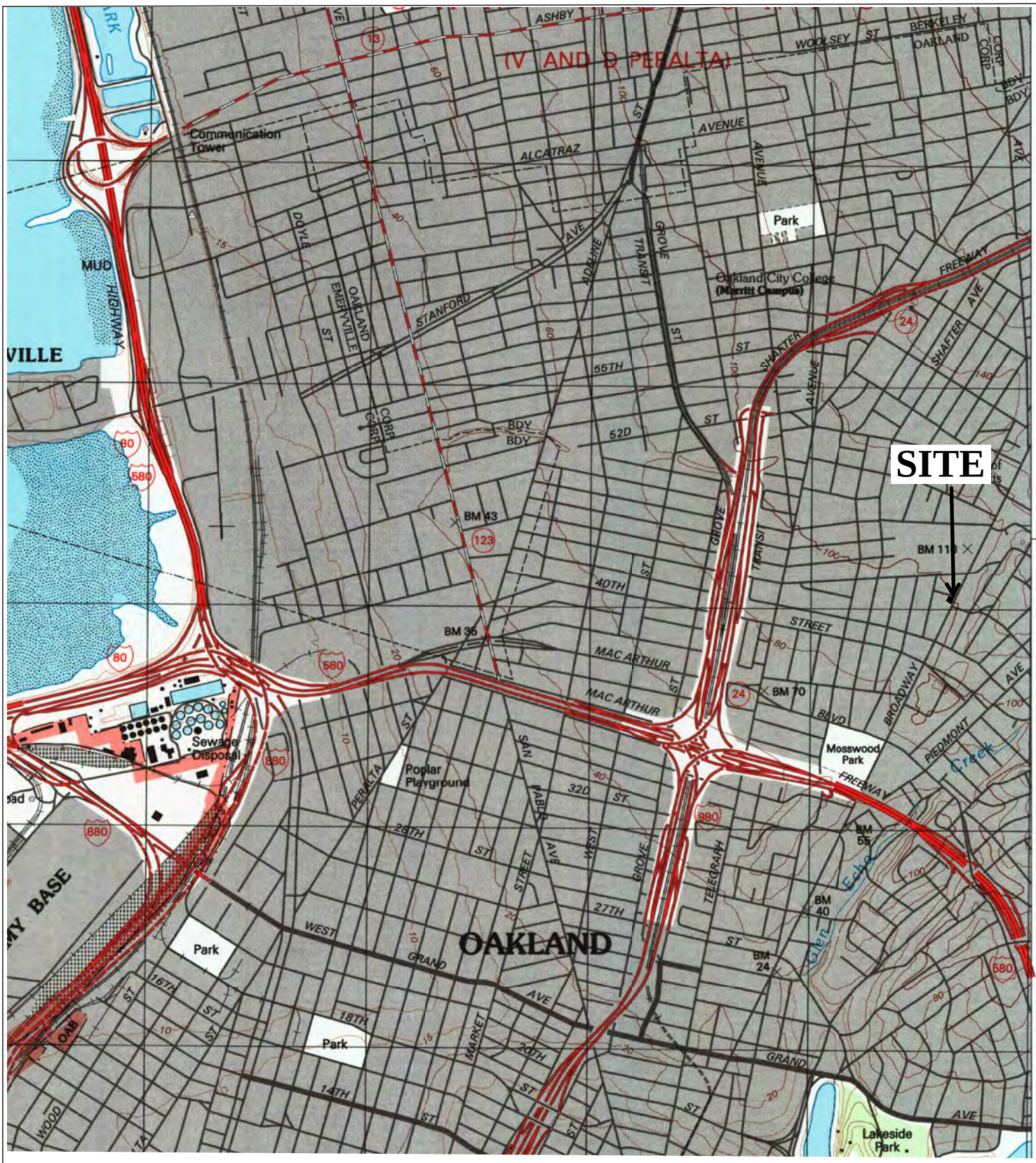


Figure 1
Site Location Map
Auto Depot
4171 Broadway
Oakland, California

Base Map From:
US Geological Survey Oakland West, California 7.5-Minute Quadrangles
Map updated 1996

P&D Environmental, Inc.
55 Santa Clara Avenue, Suite 240
Oakland, CA 94610

0 1000 2000
Approximate Scale in Feet

N

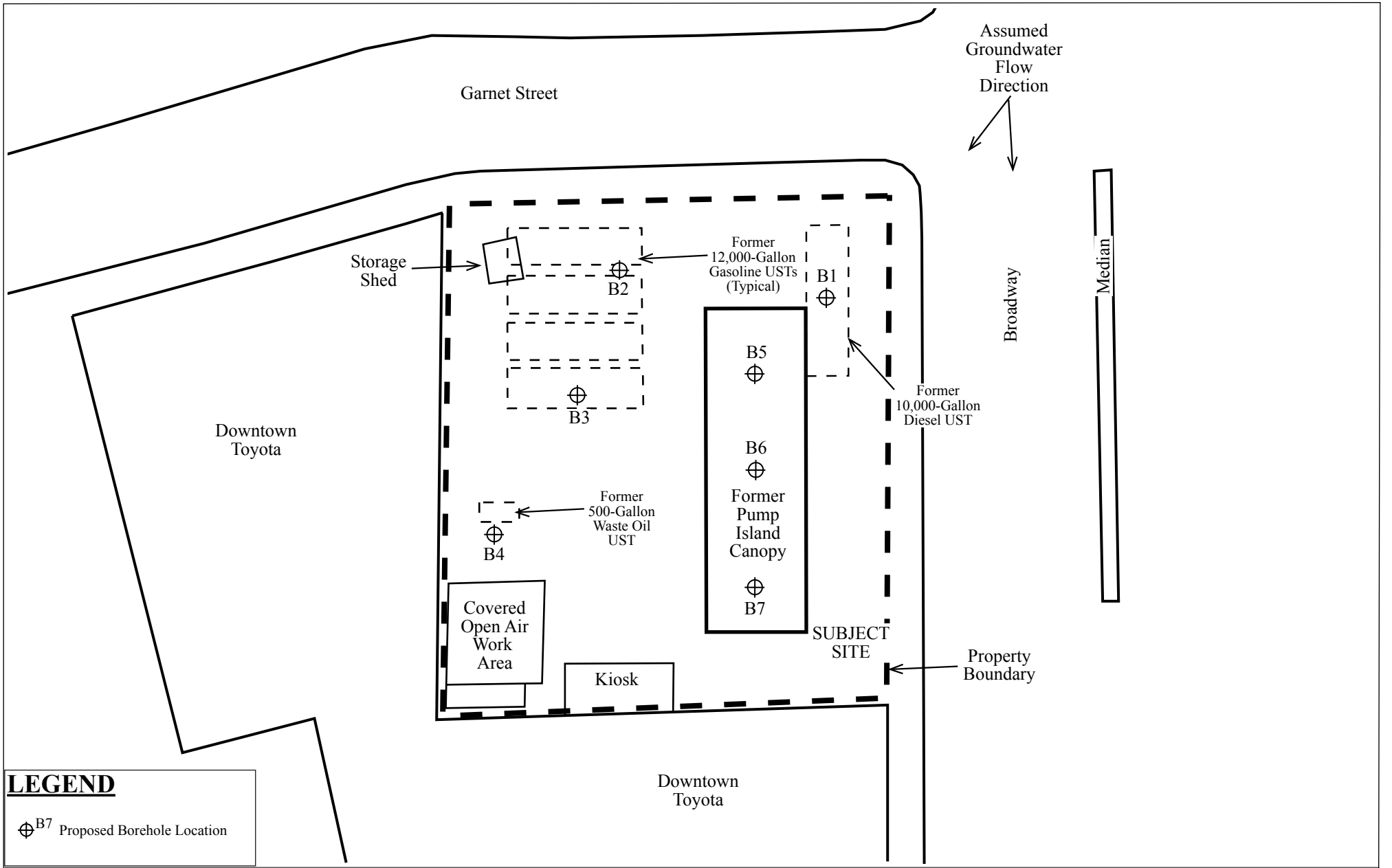


Figure 2
Site Map Showing Proposed Sample Collection Locations
Auto Depot
4171 Broadway
Oakland, California

Base Map from: Auqua Science Engineers, Inc., dated 12/31/1986, Google Earth, 2014	P&D Environmental, Inc. 55 Santa Clara Avenue, Suite 240 Oakland, CA 94610	0 15 30 Approximate Scale in Feet N

Figure 3
Site Aerial Photograph Showing Proposed Sample Collection Locations
Auto Depot
4171 Broadway
Oakland, California

Base Map from:
Auqua Science Engineers, Inc., dated 12/31/1986,
Google Earth, 2014

P&D Environmental, Inc.
55 Santa Clara Avenue, Suite 240
Oakland, CA 94610

0 15 30
Approximate Scale in Feet

N

APPENDIX A

December 31, 1986 Removal and Disposal of One Underground Diesel Tank, Five Underground Gasoline Tanks, and One Underground Waste Oil Tank Report prepared by Auqua Sceince Engineers, Inc.

aqua science engineers inc.

December 31, 1986

RECEIVED
JAN 5 1987
ENVIRONMENTAL HEALTH
ADMINISTRATION

Mr. Ted Gerow
Environmental Health Dept.
470 27th Street, Room 324
Oakland, CA 94612

RE: REMOVAL AND DISPOSAL OF ONE UNDERGROUND DIESEL TANK, FIVE UNDERGROUND GASOLINE TANKS AND ONE UNDERGROUND WASTE OIL [redacted], 4171 Broadway, Oakland, 94611

Dear Mr. Gerow,

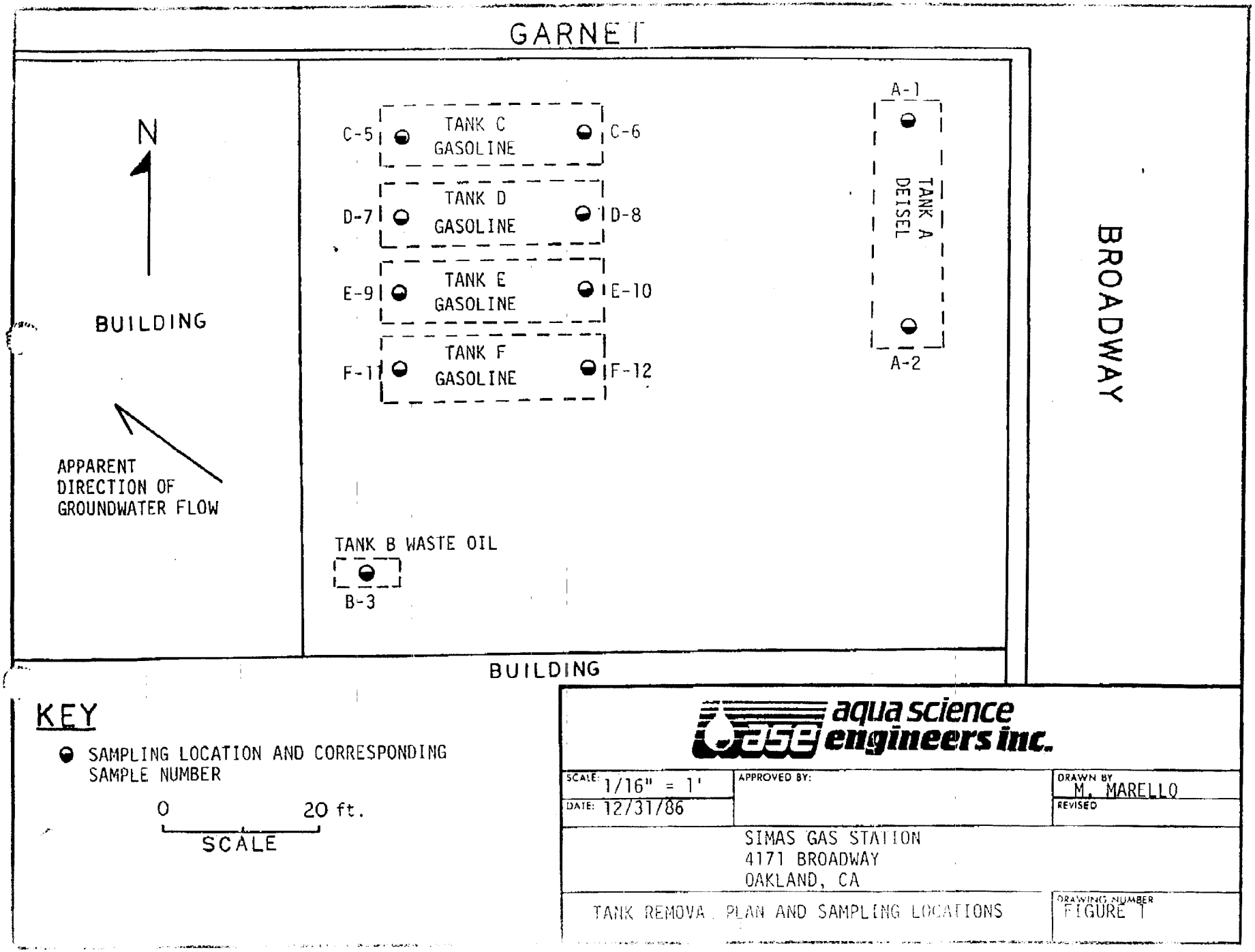
On December 10, 1986 one 12,000 gal. diesel tank, four 10,000 gal. gasoline tanks and one 500 gal. waste oil tank were excavated and removed from the Xtra Oil Co. property at 4171 Broadway, Oakland. Aqua Science was commissioned to collect soil samples from beneath each of the tanks (fig. 1). Two soil samples were collected from beneath the diesel tank and each of the gasoline tanks at approximately twelve feet below grade. One sample was taken from beneath the waste oil tank at approximately eight feet below grade. The samples were collected in six inch by two inch brass tubes approximately eighteen inches below the bottom of each tank, and sealed with aluminum foil and duct (vapor tight) tape. The apparent native soil was classified as a highly plastic red-brown sandy clay containing approximately 20% to 25% medium grained sand. The apparent direction of groundwater flow in this area is northwest, towards the bay.

The samples were analyzed by WESCO Laboratories of Novato, CA (see attached chart). The gasoline, diesel and BTX (Benzene, Toluene and Xylene) values are well below concentrations requiring any further action. Instruction for backfilling the excavation was approved by the Oakland Fire Prevention Office on December 30, 1986.

Sincerely,

Michael Marello

Michael Marello
Hydrogeologist


GARNET
N
BUILDING
APPARENT
DIRECTION OF
GROUNDWATER FLOW
C-5
TANK C
GASOLINE
C-6
D-7
TANK D
GASOLINE
D-8
E-9
TANK E
GASOLINE
E-10
F-11
TANK F
GASOLINE
F-12
A-1
TANK A
DEISEL
A-2
BROADWAY
TANK B WASTE OIL
B-3
BUILDING
KEY
SAMPLING LOCATION AND CORRESPONDING
SAMPLE NUMBER
0
20 ft.
SCALE
aqua science
engineers inc.
SCALE: 1/16" = 1'
APPROVED BY:
DRAWN BY
M. MARELLO
DATE: 12/31/86
REVISED
SIMAS GAS STATION
4171 BROADWAY
OAKLAND, CA
TANK REMOVAL PLAN AND SAMPLING LOCATIONS
DRAWING NUMBER
FIGURE 1

WESCO Laboratories

Date: December 30, 1986

Client: AquaScience Engineers

Submitted by: Mike Marello

Report to: Bill Rusk

WESCO Job #: AQS 86140

Client Job/P.O. #: Simas Bros., Oakland

Date collected: 12-10-86

Date submitted: 12-12-86

& type of sample(s): 11 Soil

Lab No.	Client ID	Benzene (mg/kg)	Toluene (mg/kg)	Xylene (mg/kg)	Gasoline (mg/kg)	Diesel (mg/kg)	Motor Oil (mg/kg)
6568	Soil A1	N/A	N/A	N/A	N/A	< 10	N/A
6569	Soil A2	N/A	N/A	N/A	N/A	< 10	N/A
6570	Soil B3	N/A	N/A	N/A	N/A	N/A	< 50
6571	Soil C5	0.002	0.014	0.057	1.2	N/A	N/A
6572	Soil C6	0.001	0.008	0.64	54	N/A	N/A
6573	Soil D7	< 0.001	< 0.001	< 0.001	< 0.050	N/A	N/A
6574	Soil D8	0.041	0.25	1.9	6.2	N/A	N/A
6575	Soil F9/E9	< 0.001	0.004	0.012	0.15	N/A	N/A
6576	Soil E10	< 0.001	0.007	0.043	1.0	N/A	N/A
6577	Soil F11	< 0.001	0.003	0.001	0.080	N/A	N/A
6578	Soil F12	< 0.001	< 0.001	< 0.001	< 0.050	N/A	N/A
	METHOD(S):	Note 1	Note 1	Note 1	Note 1	Note 2	Note 2

NOTES:

Note 1 - EPA Methods 5020/8015/8020.
Note 2 - EPA Methods 3550/8015.

Analytical Supervisor

RECEIVED
JAN 02 1986
AQUA SCIENCE ENG.

14 Galli Drive, Suite A
Novato, California 94947 415 883-6425
A Division of Western Ecological Services Company

APPENDIX B

Site Conceptual Model

Site Conceptual Model
Auto Depot / Xtra Oil
4171 Broadway
Oakland, California

SCM Element	SCM Sub-Element	Description	Figures & Tables Reference	Data Gap	How to Address Data Gap
Geology & Hydrogeology	Regional	U. S. Geological Survey Professional Paper 943, "Flatland Deposits - Their Geology and Engineering Properties and Their Importance to Comprehensive Planning," by E. J. Helley and K. R. Lajoie, 1979, identifies the subsurface materials at the subject site as consisting of Late Pleistocene Alluvium (Qpa), which is described as weakly consolidated slightly weathered poorly sorted irregularly interbedded clay, silt, sand, and gravel. U.S. Geologic Survey Miscellaneous Field Studies map MF-2342, Version 1.0 identifies the site as underlain by Holocene alluvial fan and fluvial deposits (Qhaf) that are described as either gravelly sand or sandy gravel that grades upwards to sandy or silty clay, or as sand that fines upward to sandy or silty clay.	n/a	None	n/a
	Site	**Geology:** Review of boring logs for a petroleum hydrocarbon release investigation at the adjacent downgradient Downtown Toyota site (RO 509 located at 4145 Broadway) identified subsurface materials that were predominantly clay and silt materials with coarse-grained layers measuring approximately 0.5 to 5.0 feet thick consisting of silty sand with gravel, silty sand, or clayey gravel. The subject site is located on the western side of an interfluvial ridge. To the west of the subject site the surface topography slopes to the southwest. To the immediate east of the subject site the surface topography slopes to the northwest on the west flank of the interfluvial ridge. **Hydrology:** There are no groundwater monitoring wells at or adjacent to the site to provide historical groundwater level measurements or groundwater flow direction. Groundwater was not reported to be present in 1986 in any of the UST pits at the subject site where soil samples were collected following UST removal at a maximum depth of 12 feet below the ground surface (bgs). Groundwater was encountered in the UST pit at the adjacent Downtown Toyota site in 1992 at a depth of 10 feet bgs. Groundwater was reported to have been encountered in 1994 in boreholes at the adjacent Downtown Toyota site at a depth of 11 feet bgs in October 1999 at depths ranging from 9.5 to 13.8 feet bgs, with the depth to water subsequently reported on the boring logs at depths ranging from 8.7 to 12.8 feet bgs. In September and October 2008 groundwater was encountered at the site during drilling at depths of 10.5 and 25.0 feet bgs, and water levels were subsequently measured in the boreholes after completion of drilling at depths of 9.6 and 8.7 feet bgs. At the nearby site at 3943 Broadway (located approximately 1,000 feet south of the subject site), water level measurements reported between November 2001 and June 2008 in 12 groundwater monitoring wells typically ranged between approximately 8 and 11 feet bgs, with most measurements between either 8 and 10 feet bgs or 9 and 11 feet bgs. The range of groundwater levels from approximately 9 to 11 feet bgs encompasses the more approximate range of water levels measured in the site vicinity and at the subject site. Based on water level measurements in the groundwater monitoring wells at 3943 Broadway, the groundwater flow direction calculated by others in the vicinity of the subject site has ranged from the west-southwest to the southwest. This west-southwest to southwest groundwater flow direction is consistent with the expected groundwater flow direction at the subject site based on the surface topography in the immediate vicinity of the subject site.	Figure 1	None	n/a
Surface Water Bodies		Nearby surface water bodies that are located downgradient from the subject property include Glen Echo Creek, located approximately 2,200 feet to the southeast of the site and Lake Merritt, located approximately 8,200 feet to the south.	Figure 1	None	n/a

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Nearby Wells		The results of a 2,000-foot radius survey using 2008 well agency data to identify wells and sensitive receptors in the vicinity of the subject site is documented in RGA Environmental, Inc.'s February 23, 2010 Well Survey Report for the adjacent Downtown Toyota site. None of the wells identified during the survey were identified as being located downgradient of the subject site. Similarly, no sensitive receptors were identified as being impacted by impacted groundwater at the subject site. The closest downgradient sensitive receptor was identified at a distance of 1,000 feet from the subject site.	n/a	None	n/a
Potential Source(s)	On Site	**Former Diesel Underground Storage Tank**: Two soil samples were collected 12/10/86 from beneath the former 12,000-gallon diesel UST at depths of 12.0 feet bgs and analyzed for TPH-D, with no TPH-D detected in either of the samples (the detection limits for the samples were 10 mg/kg). **Former Gasoline Underground Storage Tanks**: Two soil samples were collected 12/10/86 from beneath each of the 4 former 10,000-gallon gasoline USTs at depths of 12.0 feet bgs and analyzed for TPH-G and BTX, with TPH-G detected in 6 of the 8 samples with a maximum concentration of 54 mg/kg, and benzene was detected in 3 of the 8 samples with a maxiumu concentration of 0.041 mg/kg. **Former Waste Oil Underground Storage Tank:** One soil sample was collected 12/10/86 from beneath the former 500-gallon waste oil UST at a depth of 8.0 feet bgs and analyzed for TPH-MO, with no TPH-MO detected in the sample (the detection limit for the sample was 50 mg/kg. **Dispenser Islands and Piping Trenches:** The dispenser islands and piping trenches were not sampled. It is unknown if the UST system piping was removed.	See December 31, 1986 Aqua Science Engineers, Inc. Report	**Former Diesel Underground Storage Tank:** BTEX and MTBE were not analyzed in either of the soil samples. **Former Gasoline Underground Storage Tanks:** Ethylbenzene, MTBE and lead were not analyzed in any of the soil samples. Also, based on the detected presence of petroleum in the soil, groundwater samples need to be collected and analyzed. **Former Waste Oil Underground Storage Tank:** Analysis of the soil sample was not performed for the following analytes: TPH-G, TPH-D, VOCs (including fuel oxygenates and lead scavengers) by EPA Method 8260, SVOCs (including PAHs) by EPA Method 8270, LUFT 6 metals (Cd, Cr, Pb, Ni, Zn, Cu). **Dispenser Islands and Piping Trenches:** The dispenser islands and piping trenches were not sampled. It is unknown if the UST system piping was removed. The location of the UST piping trenches is unknown.	**Former Diesel Underground Storage Tank:** Collect soil samples from the former UST pit and analyze the samples for TPH-D by EPA Method 8015 and for BTEX and naphthalene using EPA Method 8260. **Former Gasoline Underground Storage Tanks:** Collect soil and groundwater samples from the former UST pit and analyze the samples for BTEX, fuel oxygenates and lead scavengers using EPA Method 8260, and analyze the soil samples for total lead. **Former Waste Oil Underground Storage Tank:** Collect a soil sample from the former UST pit and analyze the soil sample for the following analytes: TPH-G, TPH-D, VOCs by EPA Method 8260, SVOCs (including PAHs) by EPA Method 8270, LUFT 6 metals (Cd, Cr, Pb, Ni, Zn, Cu). **Dispenser Islands and Piping Trenches:** Collect soil samples adjacent to each of the three dispenser islands and analyze the samples for TPH-D and TPH-G by EPA Method 8015, and for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260. Use a magnetometer to determine if the pipe trenches can be located. If the magnetometer is not effective, perform exploratory trenching to locate the piping trenches. Collect soil samples at 20 foot intervals along the length of the piping trenches and at elbows in the piping trenches. Analyze the soil samples for TPH-D and TPH-G by EPA Method 8015, and for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260.

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Potential Source(s)	Off Site	The Downtown Toyota site (RO 509 located at 4145 Broadway in Oakland) is located adjacent and immediately downgradient to the subject site. Based on borehole soil and groundwater sample results, the extent of the petroleum release at the Downtown Toyota site does not impact the subject site. Additionally, no offsite upgradient fuel release sites are located in the vicinity of the subject site.	GeoTracker ACEH website	None	n/a
Release Occurrence	USTs	**Former Diesel Underground Storage Tank:** No release was detected. **Former Gasoline Underground Storage Tanks:** TPH-G and BTX were detected in soil samples. **Former Waste Oil Underground Storage Tank:** No TPH-MO was detected in soil. No other analysis was performed. **Dispenser Islands and Piping Trenches:** The dispenser islands and piping trenches were not sampled.	See December 31, 1986 Aqua Science Engineers, Inc. Report	**Former Diesel Underground Storage Tank:** BTEX and MTBE were not analyzed in either of the soil samples. **Former Gasoline Underground Storage Tanks:** Ethylbenzene, MTBE and lead were not analyzed in any of the soil samples. Also, based on the detected presence of petroleum in the soil, groundwater samples need to be collected and analyzed. **Former Waste Oil Underground Storage Tank:** Analysis of the soil sample was not performed for the following analytes: TPH-G, TPH-D, VOCs (including fuel oxygenates and lead scavengers) by EPA Method 8260, SVOCs (including PAHs) by EPA Method 8270, LUFT 6 metals (Cd, Cr, Pb, Ni, Zn, Cu). **Dispenser Islands and Piping Trenches:** The dispenser islands and piping trenches were not sampled.	**Former Diesel Underground Storage Tank:** Collect soil samples from the former UST pit and analyze the samples for TPH-D by EPA Method 8015 and for BTEX and naphthalene using EPA Method 8260. **Former Gasoline Underground Storage Tanks:** Collect soil and groundwater samples from the former UST pit and analyze the samples for BTEX, fuel oxygenates and lead scavengers using EPA Method 8260, and analyze the soil samples for total lead. **Former Waste Oil Underground Storage Tank:** Collect a soil sample from the former UST pit and analyze the soil sample for the following analytes: TPH-G, TPH-D, VOCs by EPA Method 8260, SVOCs (including PAHs) by EPA Method 8270, LUFT 6 metals (Cd, Cr, Pb, Ni, Zn, Cu). **Dispenser Islands and Piping Trenches:** Collect soil samples adjacent to each of the three dispenser islands and analyze the samples for TPH-D and TPH-G by EPA Method 8015, and for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260. Use a magnetometer to determine if the pipe trenches can be located. If the magnetometer is not effective, perform exploratory trenching to locate the piping trenches. Collect soil samples at 20 foot intervals along the length of the piping trenches and at elbows in the piping trenches. Analyze the soil samples for TPH-D and TPH-G by EPA Method 8015, for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260, and for total lead.

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Constituents of Potential Concern		**Former Diesel Underground Storage Tank:** TPH-D by EPA Method 8015 and for BTEX and naphthalene using EPA Method 8260. **Former Gasoline Underground Storage Tanks:** TPH-G by EPA Method 8015, BTEX, fuel oxygenates and lead scavengers using EPA Method 8260, and total lead. **Former Waste Oil Underground Storage Tank:** TPH-G, TPH-D, VOCs by EPA Method 8260, SVOCs (including PAHs) by EPA Method 8270, LUFT 6 metals (Cd, Cr, Pb, Ni, Zn, Cu). **Dispenser Islands and Piping Trenches:** TPH-D and TPH-G by EPA Method 8015, for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260, and total lead.		**Former Diesel Underground Storage Tank:** BTEX and MTBE were not analyzed in either of the soil samples. **Former Gasoline Underground Storage Tanks:** Ethylbenzene, MTBE and lead were not analyzed in any of the soil samples. Also, based on the detected presence of petroleum in the soil, groundwater samples need to be collected and analyzed. **Former Waste Oil Underground Storage Tank:** Analysis of the soil sample was not performed for the following analytes: TPH-G, TPH-D, VOCs (including fuel oxygenates and lead scavengers) by EPA Method 8260, SVOCs (including PAHs) by EPA Method 8270, LUFT 6 metals (Cd, Cr, Pb, Ni, Zn, Cu). **Dispenser Islands and Piping Trenches**: Soil samples adjacent to each of the three dispenser islands with analysis of the samples for TPH-D and TPH-G by EPA Method 8015, and for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260. Locate the pipe trenches and collect soil samples at 20 foot intervals along the length of the piping trenches and at elbows in the piping trenches. Analyze the soil samples for TPH-D and TPH-G by EPA Method 8015, for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260, and for total lead.	**Former Diesel Underground Storage Tank:** Collect soil samples from the former UST pit and analyze the samples for TPH-D by EPA Method 8015 and for BTEX and naphthalene using EPA Method 8260. **Former Gasoline Underground Storage Tanks:** Collect soil and groundwater samples from the former UST pit and analyze the samples for TPH-G by EPA Method 8015, BTEX, fuel oxygenates and lead scavengers using EPA Method 8260, and analyze the soil samples for total lead. **Former Waste Oil Underground Storage Tank:** Collect a soil sample from the former UST pit and analyze the soil sample for the following analytes: TPH-G, TPH-D, VOCs by EPA Method 8260, SVOCs (including PAHs) by EPA Method 8270, LUFT 6 metals (Cd, Cr, Pb, Ni, Zn, Cu). **Dispenser Islands and Piping Trenches:** Collect soil samples adjacent to each of the three dispenser islands and analyze the samples for TPH-D and TPH-G by EPA Method 8015, and for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260. Use a magnetometer to determine if the pipe trenches can be located. If the magnetometer is not effective, perform exploratory trenching to locate the piping trenches. Collect soil samples at 20 foot intervals along the length of the piping trenches and at elbows in the piping trenches. Analyze the soil samples for TPH-D and TPH-G by EPA Method 8015, for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260, and for total lead.

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Nature and Extent of Impacts	Impacts in Soil	**Former Diesel Underground Storage Tank:** No release was detected. **Former Gasoline Underground Storage Tanks:** TPH-G and BTX were detected in soil samples and appear to be limited to the vicinity of of samples C6 and D8 (the northeastern corner of the former gasoline UST pit). Impact to groundwater is unknown. **Former Waste Oil Underground Storage Tank:** No TPH-MO was detected in soil. No other analysis was performed. **Dispenser Islands and Piping Trenches:** The dispenser islands and piping trenches were not sampled.	See December 31, 1986 Aqua Science Engineers, Inc. Report	**Former Diesel Underground Storage Tank:** BTEX and MTBE were not analyzed in either of the soil samples. **Former Gasoline Underground Storage Tanks:** Ethylbenzene, MTBE and lead were not analyzed in any of the soil samples. Also, based on the detected presence of petroleum in the soil, groundwater samples need to be collected and analyzed. **Former Waste Oil Underground Storage Tank:** Analysis of the soil sample was not performed for the following analytes: TPH-G, TPH-D, VOCs (including fuel oxygenates and lead scavengers) by EPA Method 8260, SVOCs (including PAHs) by EPA Method 8270, LUFT 6 metals (Cd, Cr, Pb, Ni, Zn, Cu). **Dispenser Islands and Piping Trenches**: Soil samples adjacent to each of the three dispenser islands with analysis of the samples for TPH-D and TPH-G by EPA Method 8015, and for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260. Locate the pipe trenches and collect soil samples at 20 foot intervals along the length of the piping trenches and at elbows in the piping trenches. Analyze the soil samples for TPH-D and TPH-G by EPA Method 8015, for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260, and for total lead.	**Former Diesel Underground Storage Tank:** Collect soil samples from the former UST pit and analyze the samples for TPH-D by EPA Method 8015 and for BTEX and naphthalene using EPA Method 8260. **Former Gasoline Underground Storage Tanks:** Collect soil and groundwater samples from the former UST pit and analyze the samples for TPH-G by EPA Method 8015, BTEX, fuel oxygenates and lead scavengers using EPA Method 8260, and analyze the soil samples for total lead. **Former Waste Oil Underground Storage Tank:** Collect a soil sample from the former UST pit and analyze the soil sample for the following analytes: TPH-G, TPH-D, VOCs by EPA Method 8260, SVOCs (including PAHs) by EPA Method 8270, LUFT 6 metals (Cd, Cr, Pb, Ni, Zn, Cu). **Dispenser Islands and Piping Trenches:** Collect soil samples adjacent to each of the three dispenser islands and analyze the samples for TPH-D and TPH-G by EPA Method 8015, and for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260. Use a magnetometer to determine if the pipe trenches can be located. If the magnetometer is not effective, perform exploratory trenching to locate the piping trenches. Collect soil samples at 20 foot intervals along the length of the piping trenches and at elbows in the piping trenches. Analyze the soil samples for TPH-D and TPH-G by EPA Method 8015, for BTEX, fuel oxygenates and lead scavengers, and naphthalene using EPA Method 8260, and for total lead.

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	Impacts in Groundwater	Unknown - No groundwater samples collected to date.	n/a	**Former Diesel Underground Storage Tank:** Evaluate soil sample results to determine if groundwater needs to be evaluated. **Former Gasoline Underground Storage Tanks:** Based on the detected presence of petroleum in the soil, groundwater samples need to be collected and analyzed. **Former Waste Oil Underground Storage Tank:** Evaluate soil sample results to determine if groundwater needs to be evaluated. **Dispenser Islands and Piping Trenches:** Evaluate soil sample results to determine if groundwater needs to be evaluated.	**Former Diesel Underground Storage Tank:** Evaluate soil sample results to determine if groundwater needs to be evaluated. **Former Gasoline Underground Storage Tanks:** Based on the detected presence of petroleum in the soil, groundwater samples need to be collected and analyzed. Collect groundwater samples from the former UST pit and analyze the samples for TPH-G by EPA Method 8015, BTEX, fuel oxygenates and lead scavengers using EPA Method 8260, and analyze the soil samples for total lead. **Former Waste Oil Underground Storage Tank:** Evaluate soil sample results to determine if groundwater needs to be evaluated. **Dispenser Islands and Piping Trenches:** Evaluate soil sample results to determine if groundwater needs to be evaluated.
	Impacts in Vapor Phase	No soil gas sample collection has been performed to date.		Following collection of soil and groundwater samples and evaluation of sample results, determine if soil gas sample collection is warranted.	Following collection of soil and groundwater samples and evaluation of sample results, determine if soil gas sample collection is warranted.
Migration Pathways	Preferential Pathways / Conduits	The results of a preferential pathway survey to identify underground utilities in the vicinity of the subject site is documented in RGA's February 23, 2010 Preferential Pathway Survey Report. Based on evaluation of the depths of utilities and their proximity to the subject site, and also based on the seasonal depth to groundwater, the only utility trench that appears to be a potential conduit in the vicinity of the site is the sanitary sewer trench located on the west side of Broadway. The extent of subsurface petroleum impact is presently unknown at the subject site, and for this reason it is not possible to determine at this time if any conduits have been impacted associated with the subject site.		None	n/a
Potential Receptors & Risks	On Site	The only buildings onsite are a small storage shed located near the western edge of the property and a small kiosk located near the southern edge of the property.	n/a	Evaluate potential vapor intrusion concerns if vapors are identified at the site.	Install a soil gas well next to the kiosk if potential vapor intrusion concerns are identified in the vicinity of the kiosk.

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	Off Site		The Downtown Toyota site building is located at the property line on the west and south sides of the subject property. Garnet Street is located to the north and Broadway is located to the east. Based on the anticipated groundwater flow direction at the site, any potential offsite vapor intrusion concerns will first be identified for the Downtown Toyota building. The portion of the Downtown Toyota building adjacent to the west and south sides of the subject site is an automotive repair area, and is usually ventilated during the day with open floor to ceiling roll up doors that are at multiple locations in the Downtown Toyota building.		n/a	Evaluate potential vapor intrusion concerns if vapors are identified at the site.	Install soil gas wells adjacent to the Downtwon Toyota building between soil vapor sources and the Downtown Toyota building.