



July 9, 2015

Mr. Andrew Cooper  
State Water Resources Control Board  
1001 I Street, 16<sup>th</sup> Floor  
Sacramento, CA 95814

Dear Mr. Cooper:

Subject: Comment Letter Petre Industries UST Case Closure Summary  
428 E. Haley Street, Santa Barbara, California  
**LUFT #90089**  
**UST Cleanup Fund Claim #16959**  
**Geotracker ID #T0608323816**

The Santa Barbara County Public Health Department, Environmental Health Services Division (EHS) Leaking Underground Fuel Tank (LUFT) Program has reviewed the State Water Resources Control Board (SWRCB), Underground Storage Tank Cleanup Fund's (USTCF) April 16, 2015 *UST Case Closure Review Summary Report (Report)* and the June 10, 2015 *Notice of Opportunity for Public Comment (Notice)*. This letter constitutes Santa Barbara County EHS's response to the *Report* and the *Notice*.

The *Report* and *Notice* state that this site meets all closure criteria based upon the Low Threat Closure Policy (LTCP) and recommend case closure. After careful review of the *Report*, the *Notice*, and the site file, EHS does not concur that the site meets the LTCP criteria and, thus, case closure is not warranted at this time. Below are EHS's comments regarding the *Report* and the *Notice*:

### Summary

- The *Report* states that the site is an active warehouse.
  - The site also includes a retail business and light industrial manufacturing.
  - Adjacent to the west of the site is a mixed use parcel with a residence (Attachment 1).
  - EHS was also informed that some of the buildings may be used as residences (Personal communication, TKO Enviroservices, December 3, 2014). The parcel is zoned C-M, which allows for residential occupancy (Santa Barbara City Zoning Code Chapters 28.21, 28.48, 28.51, 28.54, 28.66, and 28.69).

- The *Report* states that four USTs were removed in 1985 and an unknown volume of impacted soil was excavated to a depth of 8 feet and disposed offsite.
  - No documentation exists in EHS files or on Geotracker that any soil was removed from the site during the tank removal. Thus, EHS contends that no source removal occurred at that time.
- The *Report* states that corrective actions have been implemented at the site with a soil vapor extraction and ozone sparging system installed in September 2012.
  - Prior to December 2013, the only corrective action that was performed at the site was free product bailing (from wells MW-3 and MW-5).
  - Air sparging began in December 2013 and continues to operate (as noted in the 4<sup>th</sup> Quarter 2014 monitoring report). However full operation of the system (including ozone sparging and soil vapor extraction) was not implemented at the site because the system installation was not completed prior to the Fund's December 12, 2013 review which stated that case closure was warranted. While the consultant noted an initial increase in vapor concentrations in the wells within the system's radius of influence since the air sparging began, vapor concentrations have since decreased. These data, along with other indicator parameters (i.e. DO, ORP), suggest that the air sparging is reducing the contaminant mass (TKO Enviroservices, Fourth Quarter 2014 – Site Remediation and Monitoring Progress Report, February 10, 2015).

#### **Rationale for Closure under the Policy**

- **General Criteria:** The *Report* states that all eight Policy general criteria have been met.
  - EHS has no record of source removal at the site. The EHS tank abandonment permit application from 1985 indicates that the tank was removed from the ground prior to filing the application (Attachment 2). No documentation of soil disposal exists in the EHS files. No additional excavation has occurred at the site with respect to this release since the original tank removal. Furthermore, soil data collected in 2012 during the installation of the sparging system verifies that soil from 1.5 feet to 11 feet below grade remains contaminated (Attachment 3). Thus, EHS contends that no source removal has occurred at this site.
- **Vapor Intrusion to Indoor Air:**
  - The *Report* states that a professional assessment of site specific risk from potential exposure to petroleum constituents was performed by Fund staff. The *Report* states that the onsite buildings are industrial and commercial facilities with multiple rollup doors that would prevent the accumulation of soil vapors in the building. Therefore, the pathway is incomplete.
    - Ten of the thirteen locations sampled in 2012 have TPH in upper five feet at concentrations ranging from 150 to 15,000 mg/kg, which is above the LTCP criteria 100 mg/kg for bioattenuation zones. The significant amount of soil contamination in the top five feet documents that a bioattenuation zone is not present at the site. (Attachments 3). Thus, the site is more likely to be subject to vapor intrusion and outdoor air exposure issues. This information suggests that a soil vapor survey should be conducted at the site to further evaluate this pathway.
    - Vapor samples were collected from four wells in 1Q14 (Attachment 4). Naphthalene was detected in each of these wells at 2,600 to 2,800 ug/m<sup>3</sup>,

which is an order of magnitude above the Policy's criteria of 310 ug/m<sup>3</sup>. Benzene was detected at 380 ug/m<sup>3</sup> in one of these wells, which is above the LTCP criteria of 280 ug/m<sup>3</sup>. In discussing the vapor results with the Fund staff, the Fund did not consider these results valid because they were "J-Flagged" by the laboratory and suggested that the results could mean that the constituents were not present. (Robert Trommer, SWRCB, personal communication, August 14, 2014). "J-Flag" results indicate that the compound is present, but its value cannot be determined to a 99% confidence level and is an estimated value. The US EPA states that J-Flag result can be used in making decisions and has guidance documents on using such data.

- The vapor samples required dilution (332-335 times) due to the high concentrations of TPH and other VOCs present in the samples, indicating a significant amount of soil vapor in the vadose zone. This, in conjunction with a 5 foot vadose zone that is significantly impacted with hydrocarbons suggests that bioattenuation is not likely to prevent vapor intrusion at the site.
- The Fund staff stated that operation of the HVAC system would provide sufficient air exchanges to prevent vapor intrusion (Robert Trommer, SWRCB, personal communication, August 14, 2014). Whereas the new building would have an HVAC system that is installed to current code requirements, the other buildings were built in the 1950's/1960's and it is unlikely that they meet the current air exchange requirements.
- Of the six buildings on site, only the garage and the newest building have one roll up door each. The other buildings that surround or are over the vapor plume do not have rollup doors and are more likely to be subject to vapor intrusion.

### **Objections to Closure**

- General Criteria – It is EHS's opinion that the site meets seven of the eight criteria. Based upon a review of the available data, the secondary source has not yet been removed to the extent practicable. As seen in the December 2012 Site Conceptual Model (Attachment 4), significant contamination exists at this site. This report estimates that over 21,000 pounds of TPH and 17.5 pounds of Naphthalene are present in shallow soil at the site (Attachment 5). Operation of the air sparging system suggests that significant mass removal/destruction can occur with full operation of the remediation system.
- Media-Specific Criteria: Petroleum Vapor Intrusion to Indoor Air – It is EHS's opinion that the site has not yet met this criterion. Soil vapor samples collected from four of the site wells had benzene and/or naphthalene at concentrations that were above the LTCP criteria. Given the significant soil contamination present in the upper 5 feet, there is likely little to no bioattenuation occurring at the site. Most of the site buildings do not have roll up doors, thereby increasing the potential for vapor accumulation. In addition, a residence is located at the parcel adjacent to site and within 20 feet of the estimated lateral extent of soil contamination. EHS has been informed that the site may be used for residential purposes, which is allowed under Santa Barbara City Zoning Code.
- Media-Specific Criteria: Direct Contact and Outdoor Air Exposure – Despite meeting the numerical values for Direct Contact and Outdoor Air Exposure, significant soil

contamination is present within the upper 5 feet at the site. Any subsurface work will likely result in direct contact and exposure to contaminated soil. Although the site is current paved, any future subsurface work would have a high probability of encountering contaminated soil.

Based upon the above information, it is EHS's opinion that this site does not meet the Low Threat Closure Policy Criteria. EHS recommends the following path forward:

- The treatment system has been installed, but is not yet fully operational. EHS recommends operating the system until the source has been removed to the extent practicable. EHS recommends operating the system and evaluating its performance over the next year. This recommendation is consistent with the LTCP general criteria "f" as it represents "...a cost-effective corrective action which removes or destroys the most readily available fraction of source-area mass."
- Perform a soil vapor survey and Human Health Risk Assessment for the site. Evaluate the need, if any, for vapor intrusion mitigation.
- Require that a soils management plan be established for any future subsurface work.

EHS respectfully requests that based upon the above information, you reconsider case closure for this site and require the Responsible Party to proceed with site remediation.

If you have any questions regarding the aforementioned, please call me at (805) 346-8216 or Paul McCaw at 805-346-8359. Written correspondence regarding this matter should be sent to EHS at 2125 S. Centerpointe Parkway, Room 333, Santa Maria, CA 93455 or via facsimile to (805) 346-8485.

Sincerely,



Thomas M. Rejzek  
Professional Geologist #6461  
Certified Hydrogeologist #601  
SMU/LUFT Program



Lawrence Fay  
Director of Environmental Health

Attachment

ec: *Geotracker* Database  
Estate of Mr. Phillip Petre, Responsible Party  
Mr. Kurt Hayden, TKO Environmental

06\_2015 90089






# **ATTACHMENT 1**

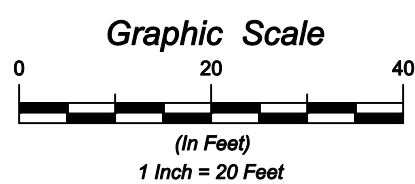
# EAST HALEY STREET



Home Improvement  
(Display/Storage Yard)

## LEGEND

-  Former UST Area
-  Property Line
-  Footprint Former Brick Building



TKO  
EnviroServices

# SITE MAP

FORMER PETRE INDUSTRIES  
428 East Haley Street  
Santa Barbara, California  
PROJECT NO. 0110-01

FIGURE 2

## **ATTACHMENT 2**



COUNTY OF SANTA BARBARA • HEALTH CARE SERVICES

315 CAMINO DEL REMEDIO • SANTA BARBARA, CALIFORNIA 93110 • (805) 964-8848

APPLICATION FOR PERMIT TO ABANDON OR REMOVE AN UNDERGROUND STORAGE TANK FOR HAZARDOUS MATERIALS

LAWRENCE HART, M.D., F.A.C.P.M.  
Director and Health Officer

Tank Owner: Philip C Petre Tel: 9621919<sup>00</sup>9627361

Mailing Address: 428 E Haley St

Tank Address: Santa Barbara Ca

Contact Person's name & title at tank site: Philip C Petre

Phone number for contact at tank site: 9621919

Depth to groundwater: 6-8 ft Basis of determination: visual

Reason(s) for abandonment: don't use never have

Please describe your abandonment plans here: it is in they are out on top of ground now

The following section must be completed for EACH tank involved.

Please provide detailed information on the tank's history here:

Tank UL number: (if no UL number is found, substitute a unique identification number) none

Date tank was installed: 1930-1940 Proposed abandonment date: Apr 1985

Tank site: 428 E Haley St Tank Composition: Steel

Tank manufacturer: unknown Date(s) of any repair work: none

Was this the first tank at this site? If no, please explain: \_\_\_\_\_

List all substances previously or currently stored in this tank from present to past:  
Stoddard Solvent

You must notify the Fire Department having jurisdiction of your plans. Submit certifiable findings of all soils and/or groundwater sampling and analysis done to date to determine extent of any contamination. All Clean-Up Proposals must be submitted in report form to the Environmental Health Division before any actual work is begun. Appropriate fees must be paid at time of permit application. Attach a detailed plot plan drawn to scale which locates the tanks and all existing buildings, sewer lines, water lines, etc. on the property.

June 1984

BRANCH OFFICES

500 West Foster Rd.  
Santa Maria, CA 93454  
(805) 937-6365

401 E. Cypress St.  
Lompoc, CA 93436  
(805) 736-2995

1745 Mission Dr.  
Solvang, CA 93463  
(805) 688-5544

## **ATTACHMENT 3**



**TABLE 3A**  
**SOIL ANALYTICAL RESULTS**  
**(VOC's/TPH)**

Sample Number/ ID	Depth (feet below grade)	Soil Type (USCS)	EPA Test Method 8260B										Cal DHS Method GC/MS	EPA Method 8015M		
			Benzene	Toluene	Ethylbenzene	Xylenes	EDC	TAME	TBA	DIPE	ETBE	MTBE	TPH (C <sub>4</sub> -C <sub>12</sub> )	TPH (C <sub>13</sub> -C <sub>22</sub> )	TPH (C <sub>23</sub> -C <sub>40</sub> )	
<b>OS-5</b>																
5-2	7.5	CL/ML	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.72	nd	15	
<b>OS-6</b>																
6-1	3.5	SC/SM	nd	nd	0.083	nd	nd (0.019)	nd	nd	nd	nd	nd	680	52	29	
6-2	6.0	SM/SP	nd (0.17)	nd	0.89	nd	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	7,800	77	37	
6-3	7.5	CL/ML	0.0011	nd	0.0049	0.019	nd	nd	nd	nd	nd	nd	2.0	nd	nd	
6-4	9.5	ML	nd	nd	0.0017	0.0085	nd	nd	nd	nd	nd	nd	0.52	nd	nd	
<b>OS-7</b>																
7-1	6.0	SM/SP	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	3.3	nd	nd	
7-2	7.5	SM/SP	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.14)	1,100	12	nd	
7-3	9.5	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.6	nd	nd	
7-4	11	SM/SP	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	
<b>OS-8</b>																
8-1	3.0	SC/SM	nd (0.17)	nd	nd	nd	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	2,800	170	460	
8-2	6.0	SM/SP	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.15)	15,000	110	130	
8-3	7.5	ML/CL	nd (0.17)	nd	nd	nd	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	290	nd	nd	
8-4	9.5	ML/CL	nd (0.17)	nd	nd	nd	nd	nd	nd (0.59)	nd	nd	nd (0.15)	400	nd	nd	
8-5	11	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	
<b>OS-9</b>																
9-1	6.0	SP	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.15)	17,000	98	100	
9-2	8.0	CL/ML	nd	nd	nd	nd	nd (0.019)	nd	nd	nd	nd	nd	610	23	17	
<b>OS-10</b>																
10-1	3.5	SC/SM	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	
10-2	6.0	SP	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.14)	3,800	36	nd	
10-3	8.0	CL/ML	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.57)	nd	nd	nd (0.14)	1,800	34	nd	
<b>OS-11</b>																
11-1	6.5	SM/SP	nd (0.17)	nd	nd	nd	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	360	nd	nd	
11-2	8.0	CL/ML	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	
MDLs			0.0007	0.0005	0.0006	0.0013	0.0008	0.0008	0.0024	0.0013	0.0008	0.0006	0.2	7.6	15	
FPD LUFT ILs			0.1	15	70	175	0.005	NL	0.12	NL	NL	0.05	100	100	100	

Results presented in mg/kg (parts per million).

See Footnotes at end of Table 2 for explanation of abbreviations.

**TABLE 3A (Continued)**  
**SOIL ANALYTICAL RESULTS**  
**(VOC's/TPH)**

Sample Number/ ID	Depth (feet below grade)	Soil Type (USCS)	EPA Test Method 8260B										Cal DHS Method GC/MS	EPA Method 8015M		
			Benzene	Toluene	Ethylbenzene	Xylenes	EDC	TAME	TBA	DIPE	ETBE	MTBE	TPH (C <sub>4</sub> -C <sub>12</sub> )	TPH (C <sub>13</sub> -C <sub>22</sub> )	TPH (C <sub>23</sub> -C <sub>40</sub> )	
<b>OS-12</b>																
12-1	4.0	SC/SM	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
12-2	6.5	SM/SP	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.8	nd	nd
12-3	8.0	ML	nd	nd	nd	nd	nd (0.019)	nd	nd	nd	nd	nd	nd	190	10	nd
12-4	9.5	CL/ML	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
<b>OS-13</b>																
13-1	4.5	SM	nd (0.17)	nd	nd	nd	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	15,000	82	89	
13-2	7.0	SP	nd (0.17)	nd	nd	nd	nd (0.2)	nd	nd (0.6)	nd	nd	nd (0.15)	5,700	50	nd	
13-3	9.0	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	3.0	nd	nd	
13-4	11	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	
<b>OS-14</b>																
14-1	1.5	SM	nd (0.17)	nd	nd	12	nd (0.2)	nd	nd (0.6)	nd	nd	nd (0.15)	6,000	160	170	
14-2	7.0	SP	nd (0.17)	nd	1.3	10	nd (0.2)	nd	nd (0.6)	nd	nd	nd (0.15)	6,400	370	200	
14-3	9.0	ML	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.15)	1,000	nd	nd	
14-4	11	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.4	nd	nd	
14-5	12.5	CL/ML	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.9	nd	nd	
<b>OS-15</b>																
15-1	4.0	SC/SM	nd (0.17)	nd	2.4	3.6	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.15)	8,500	63	54	
15-2	7.5	ML	nd (0.17)	nd	nd	nd	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	980	21	nd	
<b>OS-16</b>																
16-1	6.5	SC/SM	nd	nd	nd	nd	nd (0.02)	nd	nd	nd	nd	nd	16,000	170	130	
16-2	7.5	SM	nd	nd	nd	nd	nd (0.019)	nd	nd	nd	nd	nd	3,000	70	50	
16-3	9.5	CL/ML	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	4.8	nd	nd	
16-4	11	ML	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	
<b>OS-17</b>																
17-1	3.5	SM	nd (0.17)	nd	1.9	16	nd (0.2)	nd	nd (0.6)	nd	nd	nd (0.15)	15,000	120	87	
17-2	6.0	SM/SP	nd (0.17)	nd	2.3	15	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.15)	9,700	85	79	
17-3	7.5	CL/ML	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.14)	1,500	22	nd	
17-4	9.5	ML	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.57)	nd	nd	nd (0.14)	960	nd	nd	
17-5	11.25	SM	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.6	nd	nd	
17-6	12.5	CL/SC	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	
MDLs			0.0007	0.0005	0.0006	0.0013	0.0008	0.0008	0.0024	0.0013	0.0008	0.0006	6.8	7.6	15	
FPD LUFT ILs			0.1	15	70	175	0.005	NL	0.12	NL	NL	0.05	100	100	100	

Results presented in mg/kg (parts per million).

See Footnotes at end of Table 2 for explanation of abbreviations.

**TABLE 3A (Continued)**  
**SOIL ANALYTICAL RESULTS**  
**(VOC's/TPH)**

Sample Number/ ID	Depth (feet below grade)	Soil Type (USCS)	EPA Test Method 8260B										Cal DHS Method GC/MS	EPA Method 8015M	
			Benzene	Toluene	Ethylbenzene	Xylenes	EDC	TAME	TBA	DIPE	ETBE	MTBE	TPH (C <sub>4</sub> -C <sub>12</sub> )	TPH (C <sub>13</sub> -C <sub>22</sub> )	TPH (C <sub>23</sub> -C <sub>40</sub> )
<b>OS-18</b>															
18-1	6.0	SM/SP	nd (0.17)	nd	7.1	34	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	<b>6,500</b>	<b>230</b>	<b>180</b>
18-2	7.5	SM/SP	nd (0.17)	nd	6.0	30	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	<b>7,900</b>	<b>170</b>	<b>140</b>
18-3	9.5	ML/CL	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.15)	<b>630</b>	28	nd
18-4	11	ML/CL	nd	nd	nd	0.011	nd	nd	nd	nd	nd	nd	1.3	nd	nd
18-5	12.5	CL/SC	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
<b>OS-19</b>															
19-1	4.5	SM	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	2.0	nd	nd
19-2	6.0	SM/SP	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.15)	<b>6,400</b>	<b>130</b>	81
19-3	7.5	ML/CL	nd (0.17)	nd	nd	nd	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	<b>630</b>	22	nd
19-4	9.5	CL	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.55	nd	nd
19-5	11	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
<b>OS-20</b>															
20-1	6.5	SM/SP	<b>0.11</b>	nd	nd	nd	nd (0.02)	nd	nd	nd	nd	nd	<b>19,000</b>	<b>240</b>	<b>160</b>
20-2	8.0	ML	0.025	nd	nd	nd	nd (0.019)	nd	nd	nd	nd	nd	<b>4,900</b>	42	32
20-3	9.5	CL/ML	nd	nd	nd	nd	nd (0.02)	nd	nd	nd	nd	nd	<b>1,500</b>	14	nd
20-4	11	ML/CL	0.0011	nd	nd	0.021	nd	nd	nd	nd	nd	nd	34	nd	nd
<b>OS-21</b>															
21-1	<b>3.5</b>	SC/SM	nd (0.16)	nd	nd	nd	nd (0.19)	nd	nd (0.56)	nd	nd	nd (0.14)	<b>6,400</b>	67	<b>150</b>
21-2	6.5	SP	nd (0.17)	nd	0.19	nd	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.14)	<b>5,000</b>	nd	nd
21-3	7.5	SP	<b>0.16</b>	nd	2.7	2.2	nd (0.02)	nd	nd	nd	nd	nd	<b>11,000</b>	66	51
21-4	9.5	CL/ML	nd	nd	nd	nd	nd (0.02)	nd	nd	nd	nd	nd	<b>1,900</b>	11	27
21-5	11	CL/ML	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.63	nd	nd
<b>OS-22</b>															
22-1	<b>4.5</b>	SM	nd	nd	nd	nd	nd (0.019)	nd	nd	nd	nd	nd	<b>700</b>	23	75
22-2	6.0	SM/SP	nd	nd	nd	nd	nd (0.019)	nd	nd	nd	nd	nd	<b>150</b>	21	nd
22-3	7.5	CL/ML	nd	nd	1.3	3.1	nd (0.019)	nd	nd	nd	nd	nd	<b>1,900</b>	nd	nd
22-4	9.5	ML/CL	nd	nd	nd	0.17	nd (0.019)	nd	nd	nd	nd	nd	<b>560</b>	nd	nd
22-5	11	ML/CL	nd (0.17)	nd	nd	4.0	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.15)	<b>2,500</b>	nd	nd
22-6	12.5	SC	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.53	nd	nd
MDLs			0.0007	0.0005	0.0006	0.0013	0.0008	0.0008	0.0024	0.0013	0.0008	0.0006	6.8	7.6	15
FPD LUFT ILs			0.1	15	70	175	0.005	NL	0.12	NL	NL	0.05	100	100	100

Results presented in mg/kg (parts per million).  
See Footnotes at end of Table 2 for explanation of abbreviations.

**TABLE 3A (Continued)**  
**SOIL ANALYTICAL RESULTS**  
**(VOC's/TPH)**

Sample Number/ ID	Depth (feet below grade)	Soil Type (USCS)	EPA Test Method 8260B										Cal DHS Method GC/MS	EPA Method 8015M		
			Benzene	Toluene	Ethylbenzene	Xylenes	EDC	TAME	TBA	DIPE	ETBE	MTBE	TPH (C <sub>4</sub> -C <sub>12</sub> )	TPH (C <sub>13</sub> -C <sub>22</sub> )	TPH (C <sub>23</sub> -C <sub>40</sub> )	
<b>OS-23</b>																
23-1	6.5	SP	0.044	nd	nd	nd	nd (0.019)	nd	nd	nd	nd	nd	nd	<b>11,000</b>	79	60
23-2	8.0	SM/SP	nd	nd	nd	nd	nd (0.038)	nd	nd	nd	nd	nd	nd	94	20	nd
23-3	9.5	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	31	nd	nd
23-4	11	CL/ML	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.56	nd	nd
<b>OS-25</b>																
25-1	6.0	SC/SM	nd (0.17)	nd	nd	nd	nd (0.2)	nd	nd (0.6)	nd	nd	nd (0.15)	nd	<b>700</b>	26	nd
25-2	7.5	SC/SM	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.14)	nd	<b>9,900</b>	74	<b>100</b>
25-3	9.5	ML	nd (0.17)	nd	nd	nd	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	nd	<b>3,100</b>	nd	nd
25-4	11	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<b>270</b>	nd	nd
25-5	12.5	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
<b>OS-26</b>																
26-1	6.0	SM	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.3	nd	nd
26-2	7.5	SM	nd (0.16)	nd	nd	nd	nd (0.19)	nd	nd (0.56)	nd	nd	nd (0.14)	nd	<b>9,600</b>	74	78
26-3	9.5	ML/CL	nd (0.16)	nd	nd	nd	nd (0.19)	nd	nd (0.56)	nd	nd	nd (0.14)	nd	<b>3,200</b>	17	nd
26-4	11	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	27	nd	nd
<b>VE-5</b>																
5-1	2.0	SC/SM	nd	nd	nd	nd	nd (0.02)	nd	nd	nd	nd	nd	nd	<b>130</b>	nd	20
5-2	7.0	SM	nd	nd	nd	nd	nd (0.019)	nd	nd	nd	nd	nd	nd	<b>11,000</b>	59	55
<b>VE-7</b>																
7-1	3.5	SC/SM	nd (0.17)	nd	2.7	24	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	nd	<b>4,500</b>	78	72
7-2	6.0	SM/SP	nd (0.17)	nd	4.9	30	nd (0.19)	nd	nd (0.58)	nd	nd	nd (0.15)	nd	<b>7,200</b>	<b>280</b>	<b>170</b>
<b>MW-13</b>																
13-1	7.0	SM	nd (0.17)	nd	nd	nd	nd (0.2)	nd	nd (0.59)	nd	nd	nd (0.15)	nd	<b>6,800</b>	25	15
<b>MW-14</b>																
14-1	7.0	SM/SP	nd	nd	nd	nd	nd (0.02)	nd	nd	nd	nd	nd	nd	<b>8,700</b>	83	82
14-2	9.5	CL/ML	nd	nd	nd	nd	nd (0.02)	nd	nd	nd	nd	nd	nd	<b>200</b>	nd	nd
14-3	11	ML/CL	nd	nd	nd	0.0013	nd	nd	nd	nd	nd	nd	nd	4.7	nd	nd
<b>MW-15</b>																
15-1	4.0	SM	nd (0.17)	nd	nd	nd	nd (0.19)	nd	nd (0.57)	nd	nd	nd (0.14)	nd	<b>670</b>	34	nd
MDLs			0.0007	0.0005	0.0006	0.0013	0.0008	0.0008	0.0024	0.0013	0.0008	0.0006	6.8	7.6	15	
FPD LUFT ILs			0.1	15	70	175	0.005	NL	0.12	NL	NL	0.05	100	100	100	

Results presented in mg/kg (parts per million).

See Footnotes at end of Table 2 for explanation of abbreviations.

**TABLE 3B**  
**SOIL ANALYTICAL RESULTS**  
**(Recalcitrant Hydrocarbons)**

Sample Number/ ID	Depth (feet below grade)	Soil Type (USCS)	EPA Test Method 8260B							
			n-Butyl benzene	sec-Butyl benzene	tert-Butyl benzene	Isopropyl benzene	Naphthalene	n-Propyl benzene	1,2,4-Trimethyl benzene	1,3,5-Trimethyl benzene
<b>OS-5</b>										
5-2	7.5	CL/ML	nd	0.0073	0.0035	0.0038	nd	nd	nd	nd
<b>OS-6</b>										
6-1	3.5	SC/SM	2.2	3.0	0.25	1.4	1.2	3.1	nd	nd
6-2	6.0	SM/SP	12	13	1.5	13	<b>5.8</b>	<b>27</b>	nd	nd
6-3	7.5	CL/ML	0.017	0.025	0.0051	0.015	0.0059	0.021	0.12	0.026
6-4	9.5	ML	0.0081	0.011	0.004	0.0059	nd	0.001	0.024	0.0091
<b>OS-7</b>										
7-1	6.0	SM/SP	nd	0.012	0.0059	nd	0.02	nd	nd	nd
7-2	7.5	SM/SP	nd	1.5	nd	nd	<b>3.9</b>	nd	nd	nd
7-3	9.5	ML/CL	nd	0.0064	0.0053	nd	0.0096	nd	nd	nd
7-4	11	SM/SP	nd	nd	nd	nd	nd	nd	nd	nd
<b>OS-8</b>										
8-1	<b>3.0</b>	SC/SM	3.2	3.2	nd	2.5	<b>2.1</b>	2.2	nd	1.2
8-2	6.0	SM/SP	11	18	1.8	1.9	<b>8.8</b>	nd	nd	nd
8-3	7.5	ML/CL	nd	nd	nd	nd	<b>1.9</b>	nd	nd	nd
8-4	9.5	ML/CL	nd	nd	nd	nd	1.4	nd	nd	nd
8-5	11	ML/CL	0.005	nd	nd	nd	nd	nd	nd	nd
<b>OS-9</b>										
9-1	6.0	SP	10	14	1.9	2.2	<b>8.2</b>	nd	0.65	nd
9-2	8.0	CL/ML	nd	1.3	0.26	0.079	<b>1.7</b>	nd	nd	nd
<b>OS-10</b>										
10-1	3.5	SC/SM	0.0053	nd	nd	nd	nd	nd	nd	nd
10-2	6.0	SP	6.0	6.9	1.4	nd	<b>6.0</b>	nd	nd	nd
10-3	8.0	CL/ML	4.8	5.1	1.2	nd	<b>5.7</b>	nd	nd	nd
<b>OS-11</b>										
11-1	6.5	SM/SP	1.8	1.8	nd	nd	<b>1.9</b>	nd	nd	nd
11-2	8.0	CL/ML	nd	nd	nd	nd	nd	nd	nd	nd
MDLs			0.0007	0.0006	0.00091	0.0007	0.0008	0.0008	0.0007	0.0008
FPD LUFT ILs			26	26	26	77	1.7	26	33	21

Results presented in mg/kg (parts per million).

See Footnotes at end of Table 2 for explanation of abbreviations.



**TABLE 3B (Continued)**  
**SOIL ANALYTICAL RESULTS**  
**(Recalcitrant Hydrocarbons)**

Sample Number/ ID	Depth (feet below grade)	Soil Type (USCS)	EPA Test Method 8260B							
			n-Butyl benzene	sec-Butyl benzene	tert-Butyl benzene	Isopropyl benzene	Naph thalene	n-Propyl benzene	1,2,4- Trimethyl benzene	1,3,5- Trimethyl benzene
<b>OS-12</b>										
12-1	4.0	SC/SM	nd	nd	nd	nd	nd	nd	nd	nd
12-2	6.5	SM/SP	nd	0.0048	0.0078	nd	0.023	nd	nd	nd
12-3	8.0	ML	nd	0.70	0.18	nd	1.4	nd	nd	nd
12-4	9.5	CL/ML	nd	nd	nd	nd	nd	nd	nd	nd
<b>OS-13</b>										
13-1	4.5	SM	13	23	2.0	3.6	12	nd	nd	nd
13-2	7.0	SP	2.3	3.5	nd	nd	3.1	nd	nd	nd
13-3	9.0	ML/CL	nd	0.0075	0.0066	nd	0.015	nd	nd	nd
13-4	11	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd
<b>OS-14</b>										
14-1	1.5	SM	6.3	6.1	1.2	3.6	1.8	6.9	100	28
14-2	7.0	SP	24	23	2.0	21	11	30	270	89
14-3	9.0	ML	3.8	3.4	nd	nd	5.1	nd	nd	nd
14-4	11	ML/CL	nd	0.0059	nd	nd	0.0065	nd	nd	0.013
14-5	12.5	CL/ML	nd	0.0093	0.006	nd	0.01	nd	nd	0.0064
<b>OS-15</b>										
15-1	4.0	SC/SM	24	18	1.3	16	7.8	25	120	22
15-2	7.5	ML	2.3	1.5	nd	1.2	2.8	nd	nd	nd
<b>OS-16</b>										
16-1	6.5	SC/SM	3.6	25	1.9	0.88	19	nd	nd	nd
16-2	7.5	SM	nd	3.6	nd	0.25	3.3	nd	nd	nd
16-3	9.5	CL/ML	nd	nd	0.0029	nd	0.0093	nd	nd	nd
16-4	11	ML	nd	nd	0.00099	nd	nd	nd	nd	nd
<b>OS-17</b>										
17-1	3.5	SM	27	24	1.4	25	6.2	41	230	68
17-2	6.0	SM/SP	21	19	nd	24	5.4	40	260	86
17-3	7.5	CL/ML	2.8	2.4	nd	1.2	3.8	nd	nd	nd
17-4	9.5	ML	nd	nd	nd	nd	1.8	nd	nd	nd
17-5	11.25	SM	nd	0.0057	0.0048	nd	0.006	nd	0.0051	0.0062
17-6	12.5	CL/SC	nd	nd	nd	nd	nd	nd	nd	0.0056
MDLs			0.0007	0.0006	0.00091	0.0007	0.0008	0.0008	0.0007	0.0008
FPD LUFT ILs			26	26	26	77	1.7	26	33	21

Results presented in mg/kg (parts per million).

See Footnotes at end of Table 2 for explanation of abbreviations.

**TABLE 3B (Continued)**  
**SOIL ANALYTICAL RESULTS**  
**(Recalcitrant Hydrocarbons)**

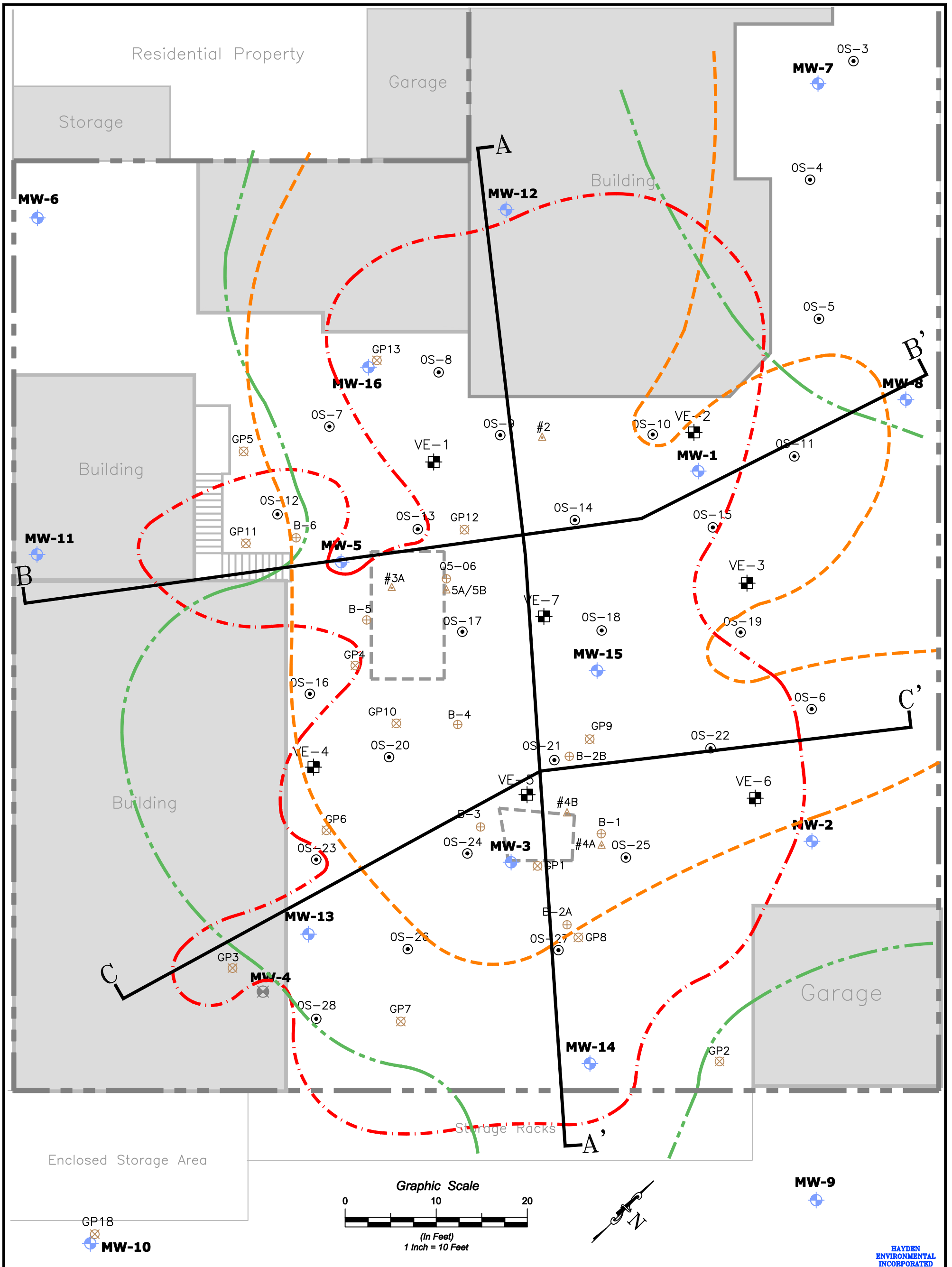
Sample Number/ ID	Depth (feet below grade)	Soil Type (USCS)	EPA Test Method 8260B							
			n-Butyl benzene	sec-Butyl benzene	tert-Butyl benzene	Isopropyl benzene	Naph thalene	n-Propyl benzene	1,2,4- Trimethyl benzene	1,3,5- Trimethyl benzene
<b>OS-18</b>										
18-1	6.0	SM/SP	20	16	1.7	27	<b>9.0</b>	<b>31</b>	<b>210</b>	<b>49</b>
18-2	7.5	SM/SP	<b>26</b>	25	2.3	22	<b>15</b>	<b>48</b>	<b>270</b>	<b>79</b>
18-3	9.5	ML/CL	1.8	2.0	nd	nd	<b>1.8</b>	nd	nd	nd
18-4	11	ML/CL	0.0082	0.0087	nd	0.0062	0.0066	0.016	nd	0.033
18-5	12.5	CL/SC	0.0067	0.0057	nd	nd	nd	0.012	0.007	0.016
<b>OS-19</b>										
19-1	4.5	SM	0.0056	nd	nd	nd	nd	nd	nd	nd
19-2	6.0	SM/SP	14	14	1.6	13	<b>7.5</b>	<b>27</b>	nd	nd
19-3	7.5	ML/CL	2.7	2.7	1.3	2.7	<b>3.5</b>	3.8	nd	nd
19-4	9.5	CL	0.01	0.0087	nd	0.0066	0.0065	0.02	nd	0.0092
19-5	11	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd
<b>OS-20</b>										
20-1	6.5	SM/SP	24	<b>40</b>	2.2	20	<b>19</b>	18	17	2.7
20-2	8.0	ML	3.5	5.4	0.52	1.3	<b>1.7</b>	0.76	0.11	1.3
20-3	9.5	CL/ML	nd	nd	nd	nd	0.34	nd	nd	nd
20-4	11	ML/CL	nd	0.049	nd	0.036	0.017	0.06	0.19	0.07
<b>OS-21</b>										
21-1	<b>3.5</b>	SC/SM	9.2	11	0.68	5.7	<b>8.3</b>	6.1	0.25	nd
21-2	6.5	SP	11	14	0.85	8.7	<b>8.5</b>	14	nd	1.2
21-3	7.5	SP	<b>50</b>	<b>48</b>	1.8	50	<b>20</b>	<b>90</b>	<b>120</b>	<b>45</b>
21-4	9.5	CL/ML	1.9	3.5	0.42	0.25	<b>3.2</b>	nd	0.60	0.24
21-5	11	CL/ML	0.0064	0.0058	0.0057	0.0038	0.0093	0.002	0.0082	0.0059
<b>OS-22</b>										
22-1	4.5	SM	0.90	0.88	nd	0.76	0.52	1.4	nd	0.14
22-2	6.0	SM/SP	0.26	nd	nd	0.16	0.22	0.13	nd	nd
22-3	7.5	CL/ML	4.4	4.3	0.25	3.6	1.4	6.4	21	6.0
22-4	9.5	ML/CL	nd	0.96	nd	0.18	0.14	nd	nd	nd
22-5	11	ML/CL	6.1	6.3	nd	5.1	<b>2.3</b>	7.7	29	7.2
22-6	12.5	SC	nd	nd	nd	nd	nd	nd	0.0051	nd
MDLs			0.0007	0.0006	0.00091	0.0007	0.0008	0.0008	0.0007	0.0008
FPD LUFT ILs			26	26	26	77	1.7	26	33	21

Results presented in mg/kg (parts per million).  
See Footnotes at end of Table 2 for explanation of abbreviations.

**TABLE 3B (Continued)**  
**SOIL ANALYTICAL RESULTS**  
**(Recalcitrant Hydrocarbons)**

Sample Number/ ID	Depth (feet below grade)	Soil Type (USCS)	EPA Test Method 8260B							
			n-Butyl benzene	sec-Butyl benzene	tert-Butyl benzene	Isopropyl benzene	Naph thalene	n-Propyl benzene	1,2,4- Trimethyl benzene	1,3,5- Trimethyl benzene
<b>OS-23</b>										
23-1	6.5	SP	nd	<b>30</b>	1.7	14	<b>17</b>	1.5	nd	nd
23-2	8.0	SM/SP	0.37	0.48	0.18	0.042	0.51	nd	nd	nd
23-3	9.5	ML/CL	nd	0.015	nd	0.0048	0.022	nd	nd	nd
23-4	11	CL/ML	nd	nd	nd	nd	nd	nd	nd	nd
<b>OS-25</b>										
25-1	6.0	SC/SM	nd	nd	nd	nd	<b>2.6</b>	nd	nd	nd
25-2	7.5	SC/SM	4.5	4.3	nd	1.6	<b>7.1</b>	nd	nd	nd
25-3	9.5	ML	2.2	2.1	nd	nd	<b>5.2</b>	nd	nd	nd
25-4	11	ML/CL	nd	nd	nd	nd	0.22	nd	nd	nd
25-5	12.5	ML/CL	nd	nd	nd	nd	nd	nd	nd	nd
<b>OS-26</b>										
26-1	6.0	SM	0.0067	0.011	0.0062	0.0053	0.036	0.016	nd	nd
26-2	7.5	SM	nd	19	1.4	12	<b>16</b>	1.7	nd	nd
26-3	9.5	ML/CL	nd	3.4	nd	nd	<b>7.9</b>	nd	nd	nd
26-4	11	ML/CL	nd	nd	0.0076	nd	0.009	nd	nd	nd
<b>VE-5</b>										
5-1	2.0	SC/SM	0.15	0.21	nd	0.14	0.24	0.21	nd	nd
5-2	7.0	SM	20	<b>29</b>	1.9	9.2	<b>25</b>	8.5	nd	nd
<b>VE-7</b>										
7-1	<b>3.5</b>	SC/SM	10	10	1.4	13	<b>2.7</b>	15	<b>110</b>	<b>46</b>
7-2	6.0	SM/SP	19	20	2.0	21	<b>10</b>	<b>34</b>	<b>300</b>	<b>91</b>
<b>MW-13</b>										
13-1	7.0	SM	nd	18	1.3	4.8	<b>12</b>	0.30	nd	nd
<b>MW-14</b>										
14-1	7.0	SM/SP	nd	1.7	0.76	nd	0.58	nd	nd	nd
14-2	9.5	CL/ML	0.58	0.66	0.12	0.16	0.28	0.34	nd	nd
14-3	11	ML/CL	0.0037	0.0072	0.0046	0.0034	0.0049	0.0049	0.0029	0.0013
<b>MW-15</b>										
15-1	<b>4.0</b>	SM	3.0	2.3	nd	1.5	<b>2.7</b>	3.3	13	3.9
MDLs			0.0007	0.0006	0.00091	0.0007	0.0008	0.0008	0.0007	0.0008
FPD LUFT ILs			26	26	26	77	1.7	26	33	21

Results presented in mg/kg (parts per million).  
See Footnotes at end of Table 2 for explanation of abbreviations.



HAYDEN ENVIRONMENTAL INCORPORATED

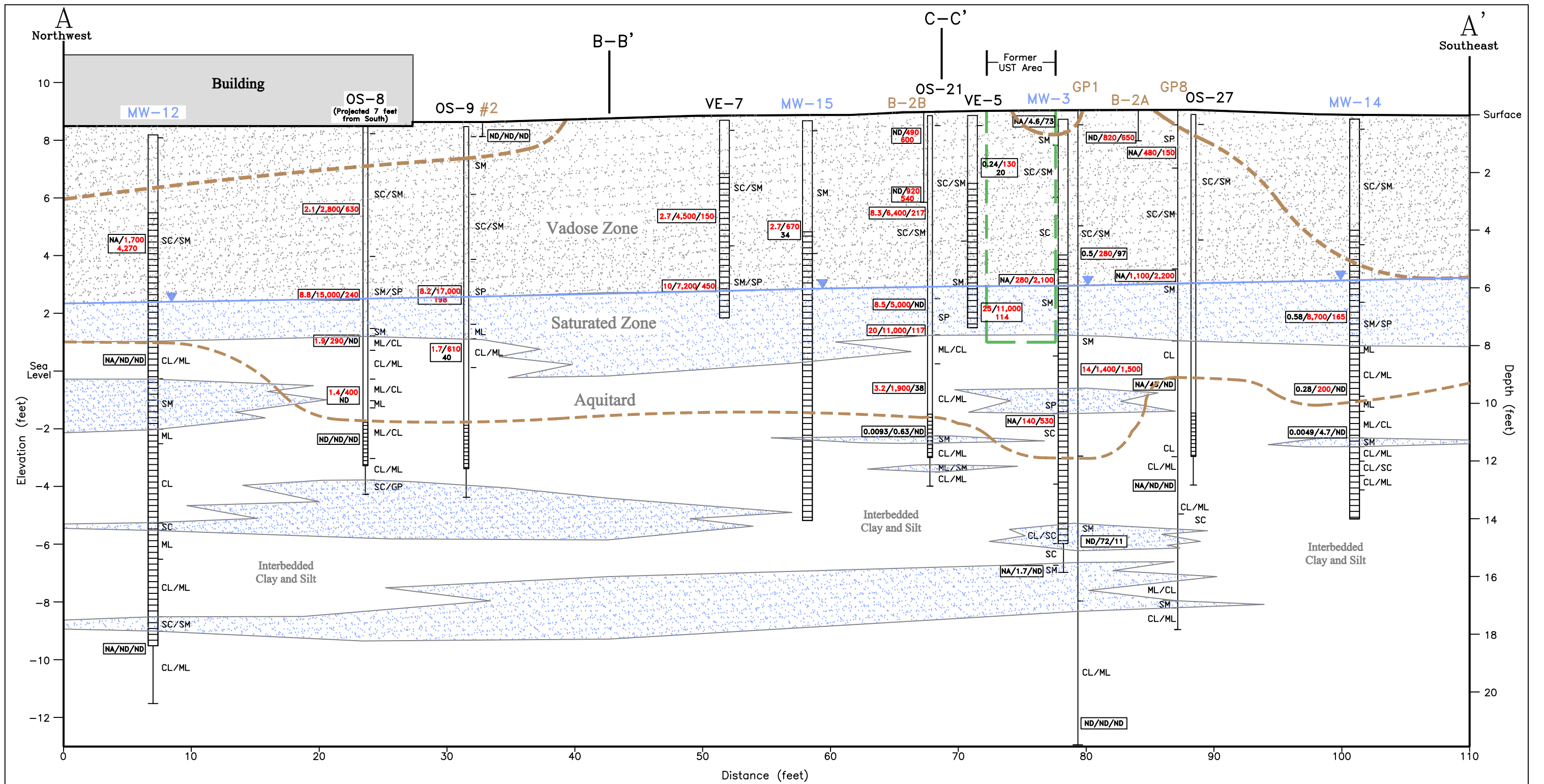
**LEGEND**

- △ ⊗ ⊕ Exploratory Soil Borings
- ⊕ Groundwater Monitoring Well
- ⊙ Ozone Sparge Well
- ⊞ Vapor Extraction Well
- ⊞ Former UST Area
- ⊞ Property Line
- ⊞ Inferred Extent of Vadose Zone Plume
- ⊞ Inferred Extent of Capillary Fringe/Saturated Zone Plume
- ⊞ Inferred Extent of Plume within Aquitard (Saturated Zone)
- ⊞ Cross-Section Line

**ADSORBED-PHASE PLUME MAP**

FORMER PETRE INDUSTRIES  
 428 East Haley Street  
 Santa Barbara, California  
 PROJECT NO. 0110-01

**FIGURE 7**



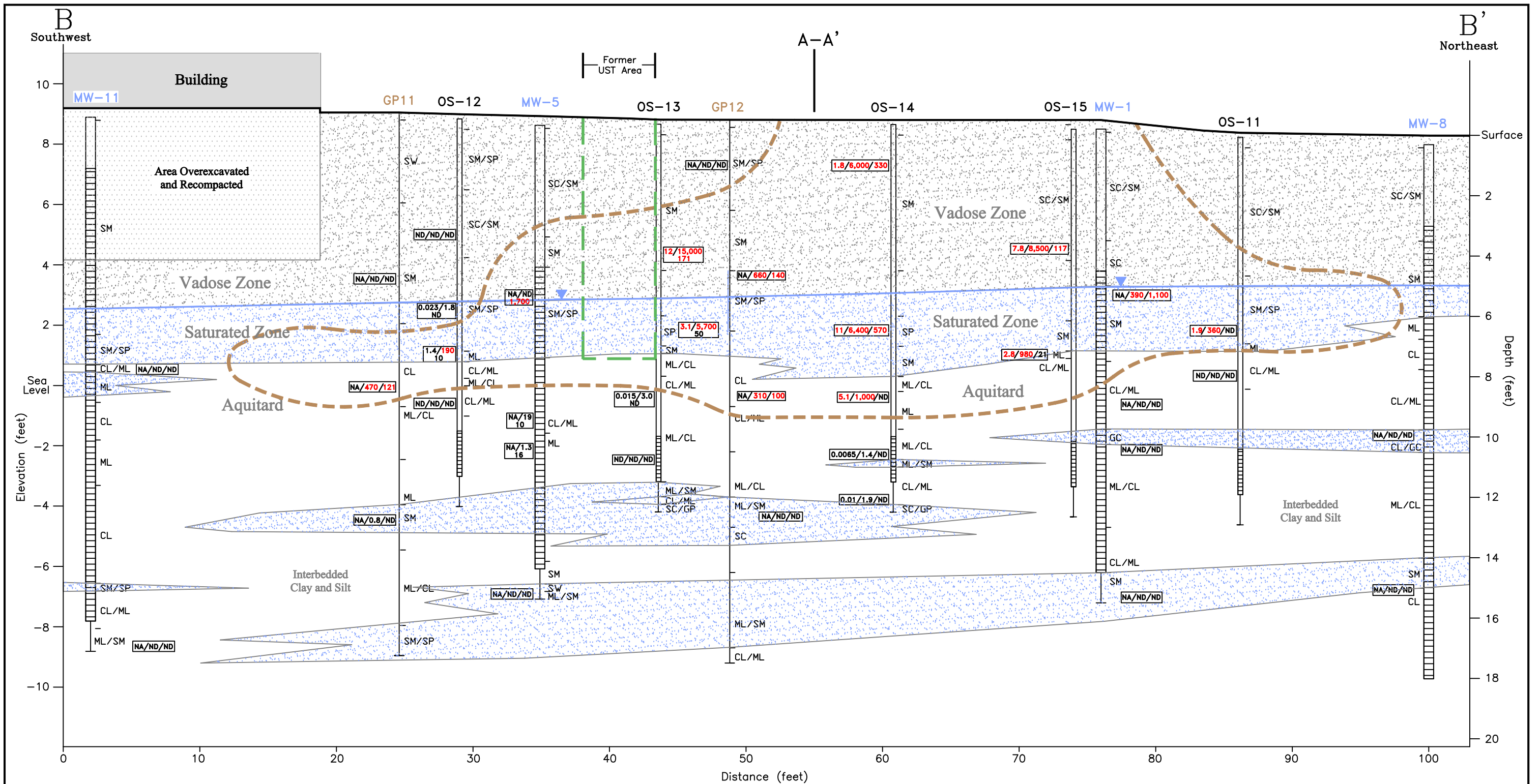
FORMER PETRE INDUSTRIES  
 428 East Haley Street  
 Santa Barbara, California  
 FPD LUFT File #90089  
 Project No. 0110-01  
**Hayden Environmental, Inc.**  
 Environmental Consulting Services  
 Santa Barbara, California

**FIGURE 8**  
**GEOLOGIC CROSS SECTION**  
 Section A-A'

LEGEND	
CL	CLAY/Sandy CLAY
ML	SILT/Clayey SILT
SC	Clayey SAND
SM	Silty SAND
SP	Poorly-Graded SAND
	CLAY/SILT
	Clayey, Silty SAND
	Saturated SAND (SM/SP)
	Static Water Level (May, 2012)
	Borehole
	Monitoring Well/ Sparge Well/ Screen Section

**25/1,650**  
**560** Naphthalene/TPH(C4-C12) Concentrations in Soil (ppm)  
 TPH(C13-C40) Concentrations in Soil (ppm)  
 ND Not Detected above Detection Limits  
 NA Not Analyzed  
 Concentrations in Red exceeds County FPD LUFT Investigation Levels  
 - - - - - Inferred Extent of Adsorbed-Phase Plume (Naphthalene>1.7 ppm/TPH>100 ppm)





FORMER PETRE INDUSTRIES  
 428 East Haley Street  
 Santa Barbara, California  
 FPD LUFT File #90089  
 Project No. 0110-01  
 Hayden Environmental, Inc.  
 Environmental Consulting Services  
 Santa Barbara, California

**FIGURE 9**  
**GEOLOGIC CROSS SECTION**  
**Section B-B'**

- LEGEND**
- CL CLAY/Sandy CLAY
  - GC Gravelly CLAY
  - ML SILT/Clayey SILT
  - SC Clayey SAND
  - SM Silty SAND
  - SP Poorly-Graded SAND
  - CLAY/SILT
  - Clayey, Silty SAND
  - Saturated SAND (SM/SP)
  - Static Water Level (May, 2012)
  - Borehole
  - Monitoring Well/ Sparge Well Screen Section

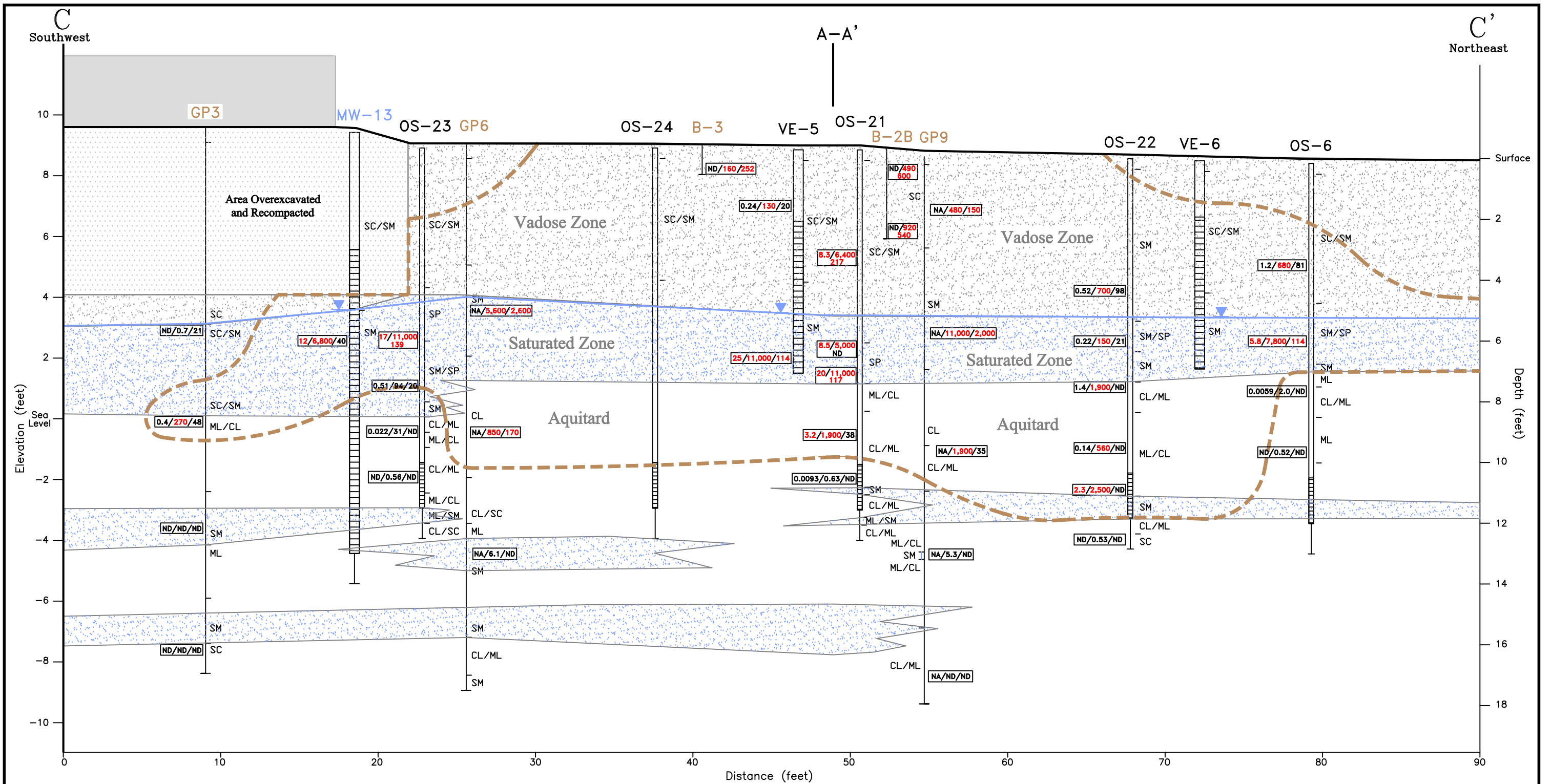
25/1,650  
560

Naphthalene/TPH(C4-C12) Concentrations in Soil (ppm)  
 TPH(C13-C40) Concentrations in Soil (ppm)

ND Not Detected above Detection Limits  
 NA Not Analyzed

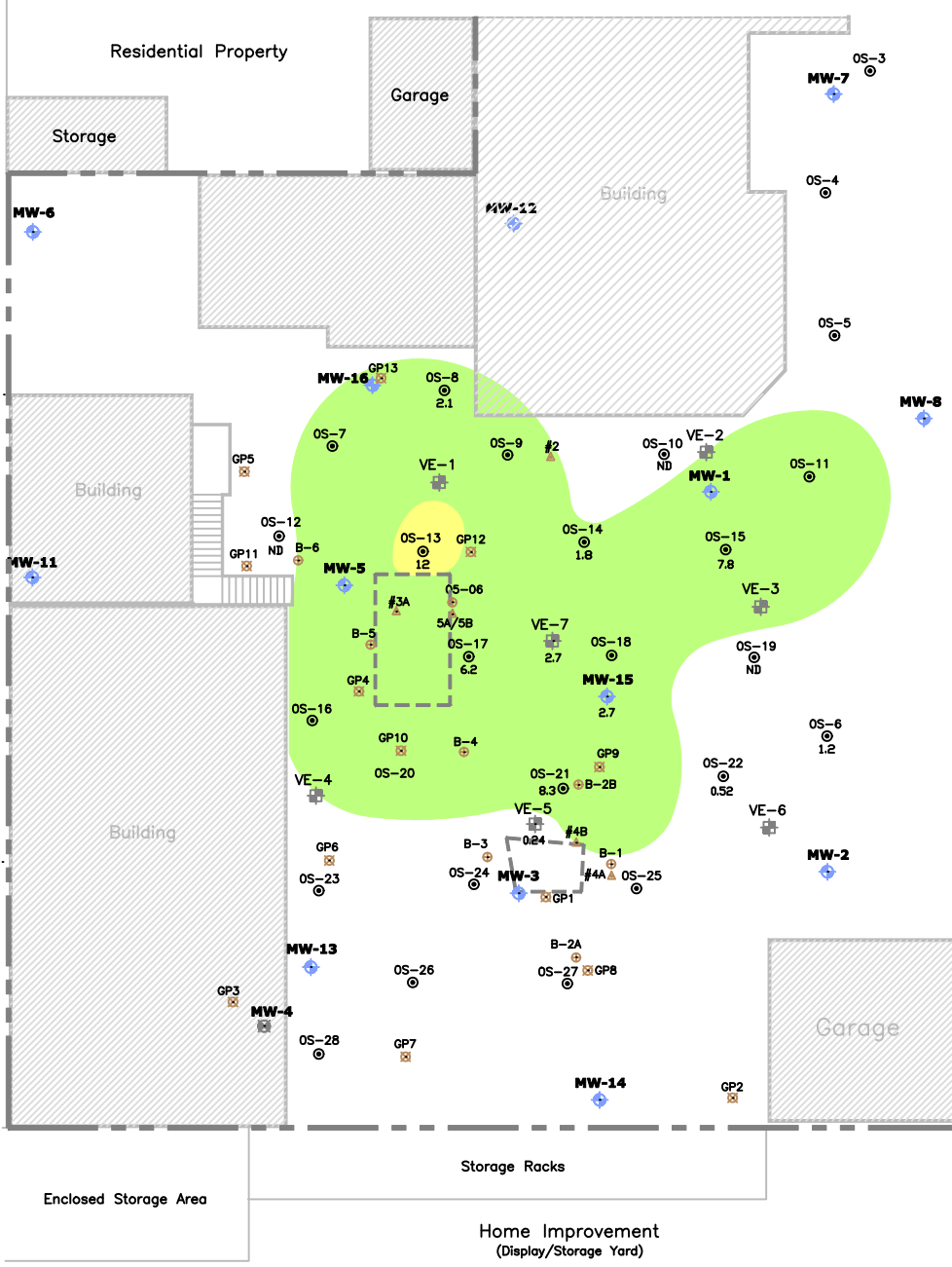
Concentrations in Red exceeds County  
 FPD LUFT Investigation Levels

----- Inferred Extent of Adsorbed-Phase Plume  
 (Naphthalene>1.7 ppm/TPH>100 ppm)

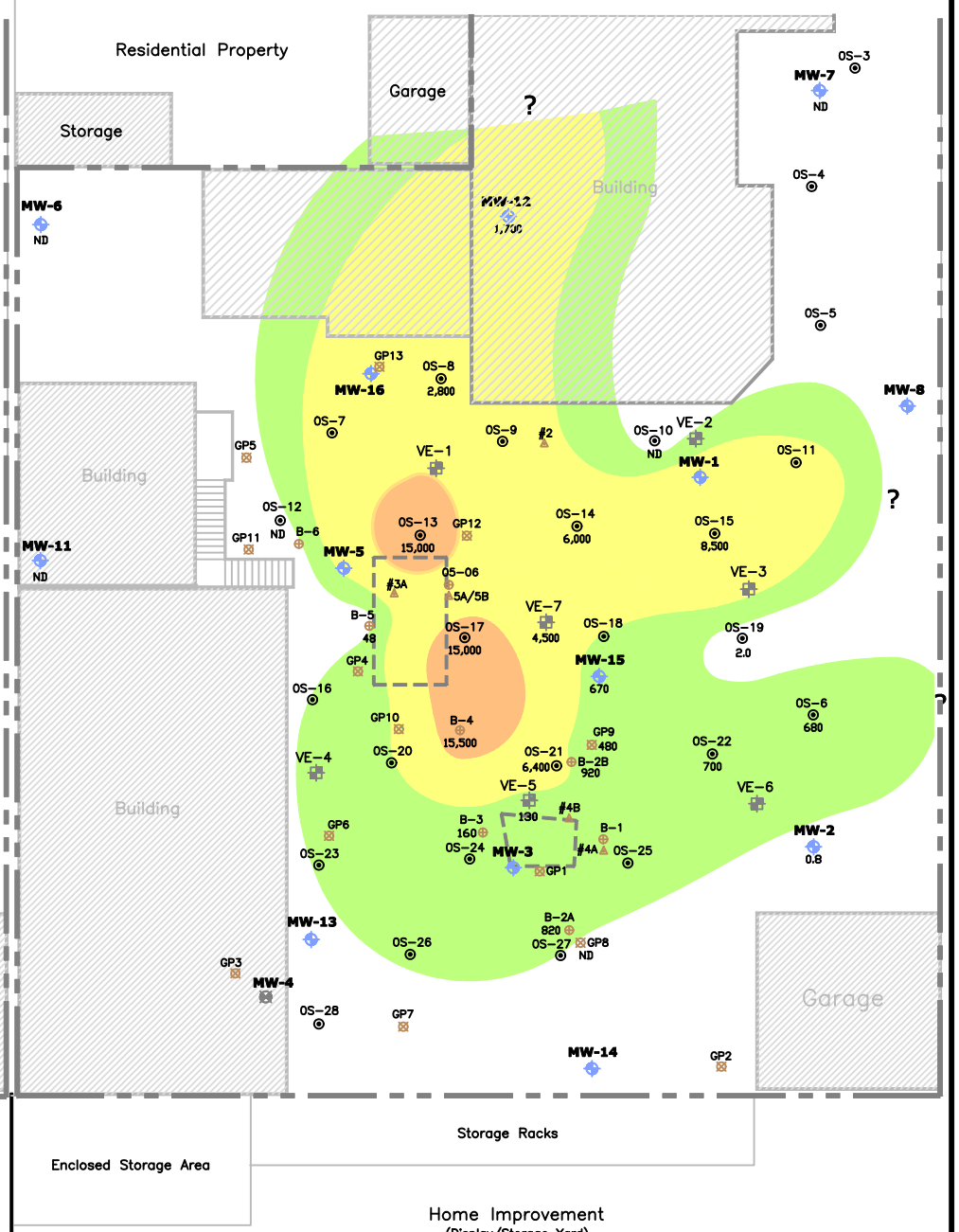


<p>FORMER PETRE INDUSTRIES 428 East Haley Street Santa Barbara, California FPD LUFT File #90089 Project No. 0110-01</p>	<p><b>FIGURE 10</b></p> <p><b>GEOLOGIC CROSS SECTION</b></p> <p><b>Section C-C'</b></p>	<p>CL CLAY/Sandy CLAY ML SILT/Clayey SILT SC Clayey SAND SM Silty SAND SP Poorly-Graded SAND</p>	<p><b>LEGEND</b></p> <p>CLAY/SILT Clayey, Silty SAND Saturated SAND (SM/SP) Static Water Level (May, 2012) Borehole Monitoring Well/ Sparge Well Screen Section</p>	<p>25/1,650 560</p> <p>Naphthalene/TPH(C4-C12) Concentrations in Soil (ppm) TPH(C13-C40) Concentrations in Soil (ppm)</p> <p>ND Not Detected above Detection Limits NA Not Analyzed</p> <p>Concentrations in Red exceeds County FPD LUFT Investigation Levels</p> <p>--- Inferred Extent of Adsorbed-Phase Plume (Naphthalene&gt;1.7 ppm/TPH&gt;100 ppm)</p>
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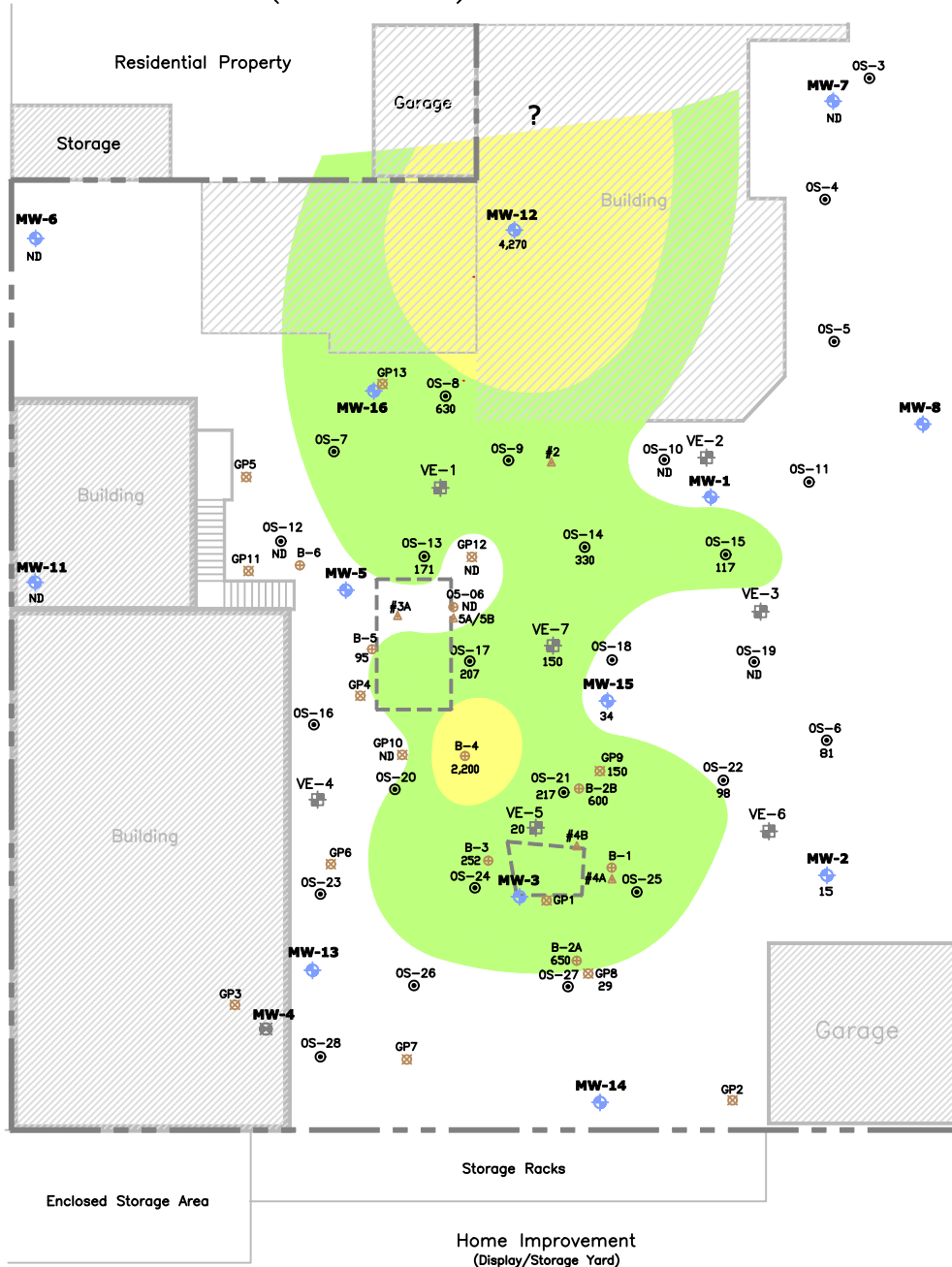
## Naphthalene Plume



## Volatile TPH(C4-C12) Plume



## Semi-Volatile TPH(C13-C40) Plume



**LEGEND**

- Exploratory Soil Borings
- Groundwater Monitoring Well
- Ozone Sparge Well
- Vapor Extraction Well
- 63 Analyte Concentration (ppm)
- ND Not Detected

**Regulatory Target Level:**

Naphthalene=1.7 ppm

- 1.7 to 10 ppm Contour
- 10 to 100 ppm Contour

TPH=100 ppm

- 100 to 1,000 ppm Contour
- 1,000 to 10,000 ppm Contour
- 10,000 to 100,000 ppm Contour

- Former UST Area
- Property Line

**Graphic Scale**  
0 20 40  
(In Feet)  
1 Inch = 20 Feet

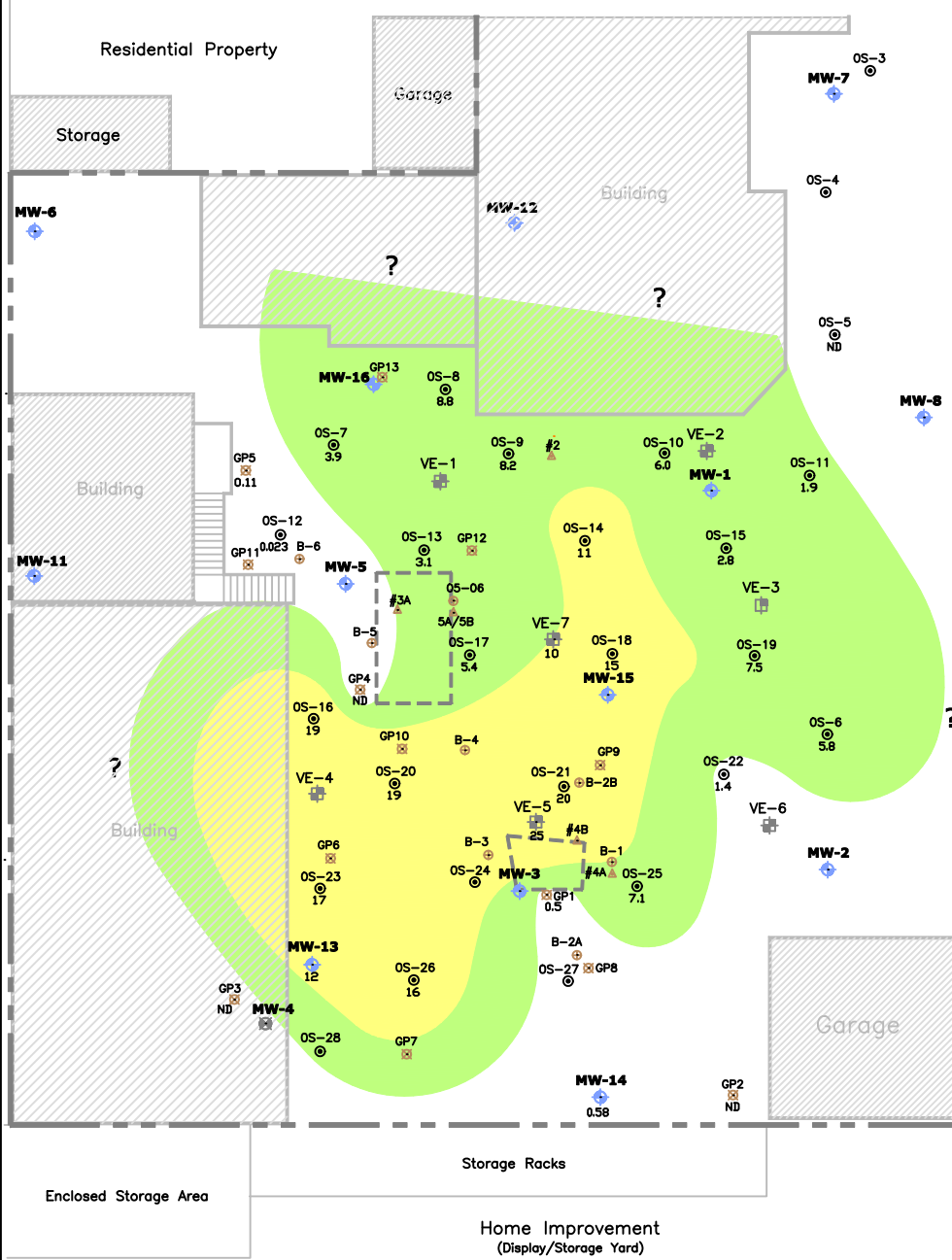
# ADSORBED-PHASE PLUME PLOTS VADOSE ZONE

FORMER PETRE INDUSTRIES  
428 East Haley Street  
Santa Barbara, California  
PROJECT NO. 0110-01

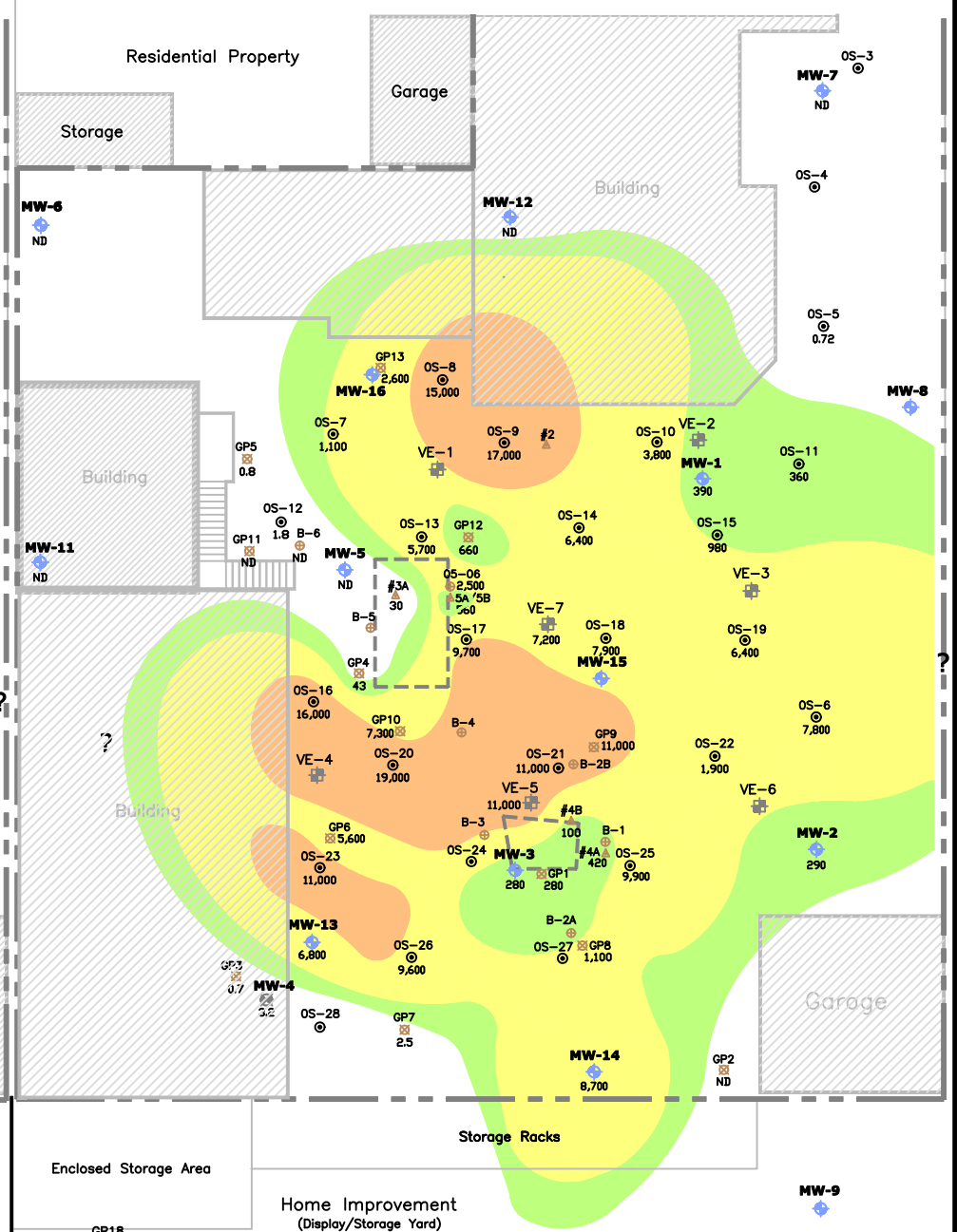
**FIGURE 11**



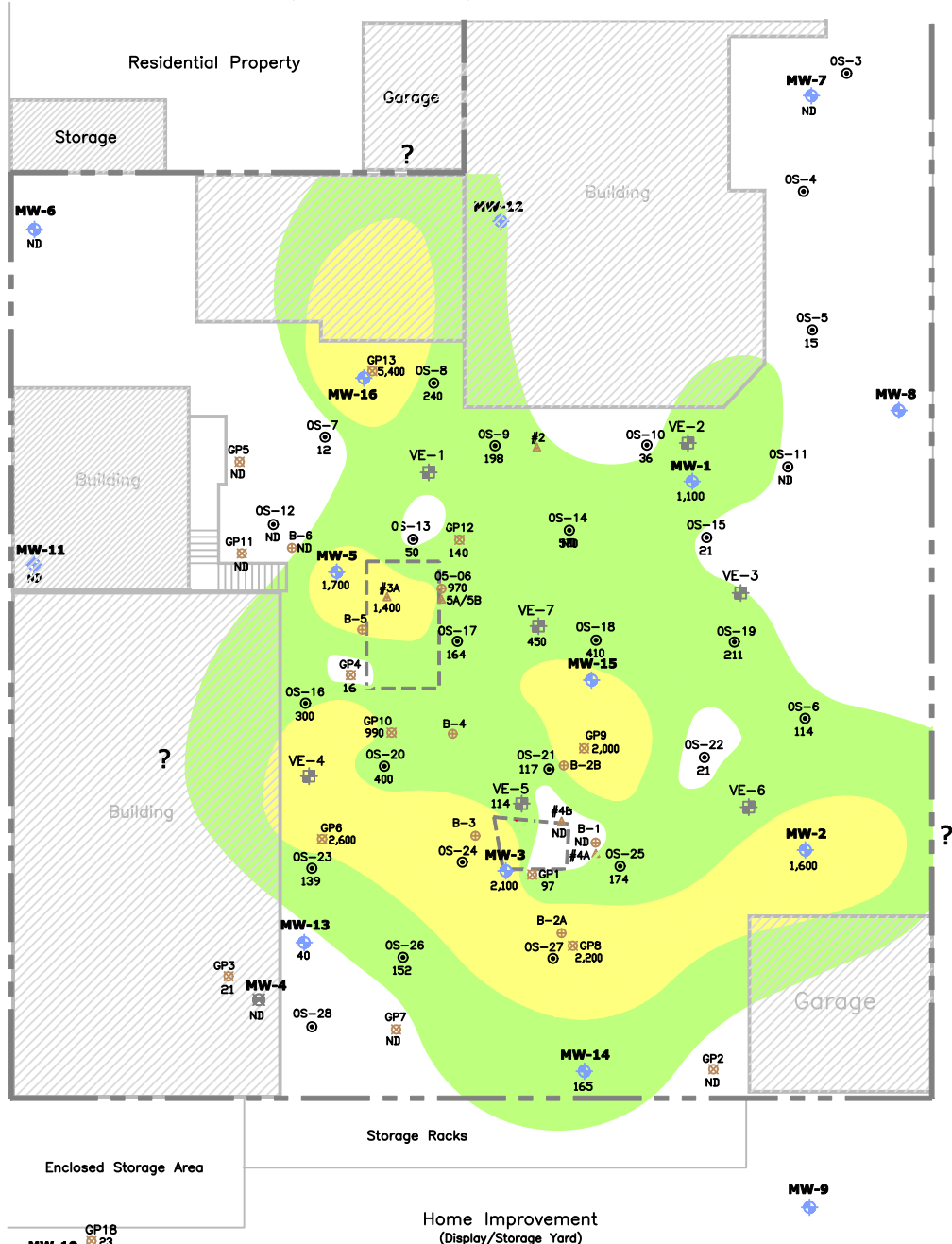
## Naphthalene Plume



## Volatile TPH(C4-C12) Plume

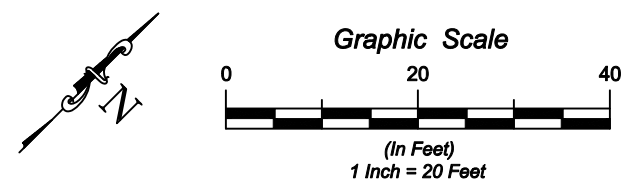


## Semi-Volatile TPH(C13-C40) Plume



### LEGEND

- Exploratory Soil Borings
- Groundwater Monitoring Well
- Ozone Sparge Well
- Vapor Extraction Well
- 540 Analyte Concentration (ppm)
- ND Not Detected
- Regulatory Target Level:**
- Naphthalene=1.7 ppm
- 1.7 to 10 ppm Contour
- 10 to 100 ppm Contour
- TPH=100 ppm
- 100 to 1,000 ppm Contour
- 1,000 to 10,000 ppm Contour
- 10,000 to 100,000 ppm Contour
- Former UST Area
- Property Line



## ADSORBED-PHASE PLUME PLOTS Capillary Fringe/ Saturated Zone

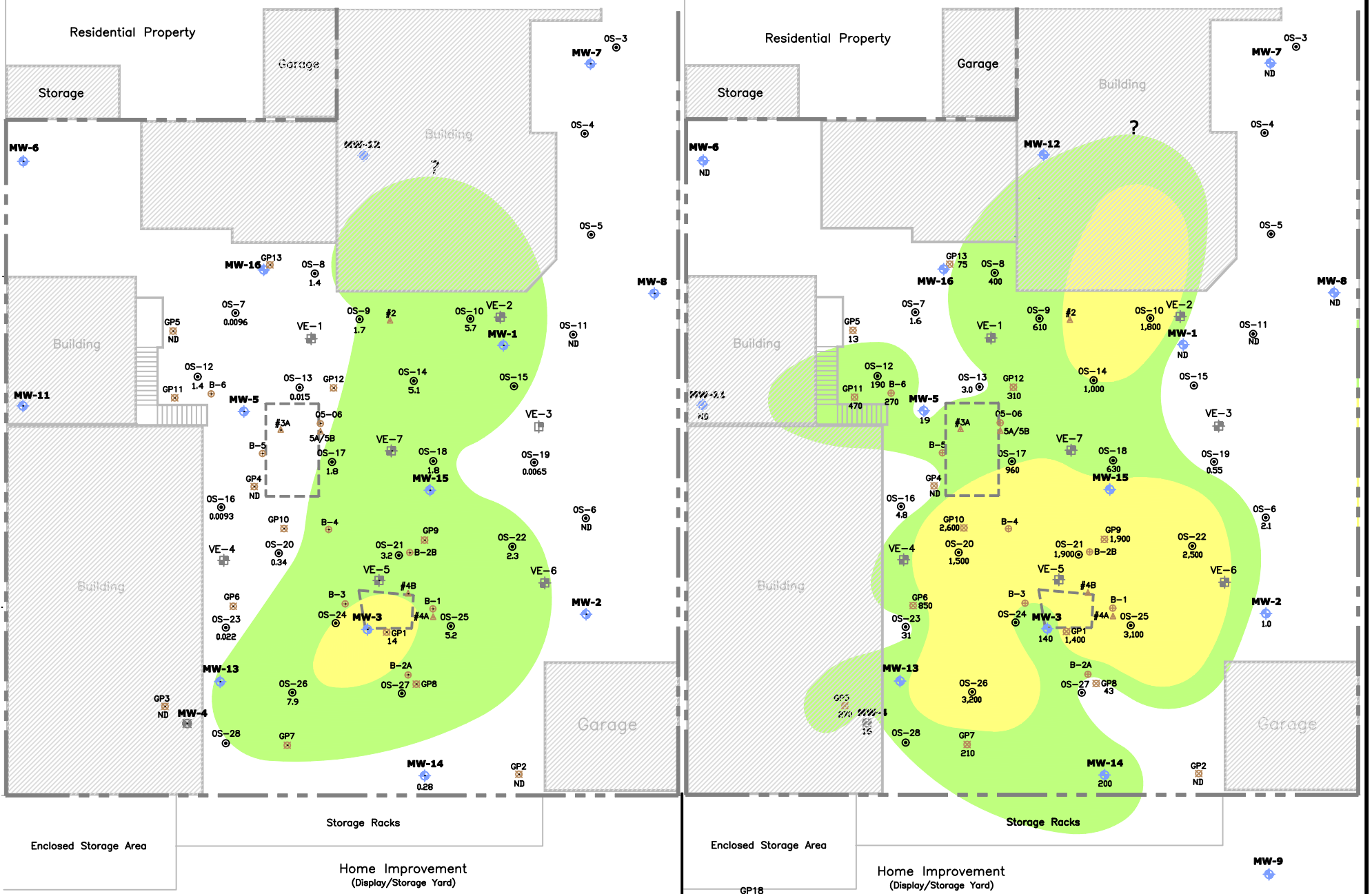
FORMER PETRE INDUSTRIES  
428 East Haley Street  
Santa Barbara, California  
PROJECT NO. 0110-01

FIGURE 12

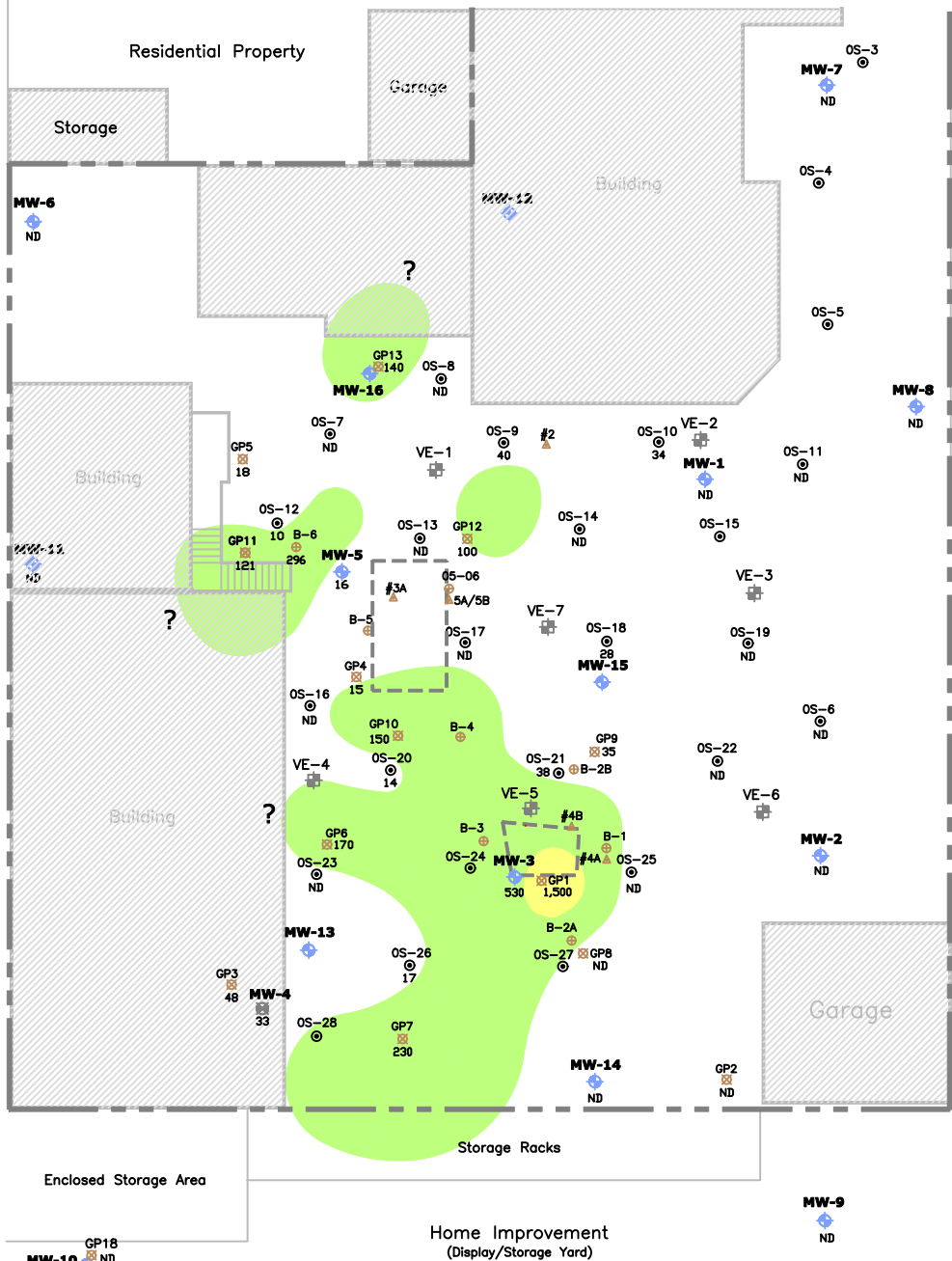
HAYDEN  
ENVIRONMENTAL  
INCORPORATED

# Naphthalene Plume

# Volatile TPH(C4-C12) Plume



# Semi-Volatile TPH(C13-C40) Plume



**LEGEND**

- △ ⊠ ⊕ Exploratory Soil Borings
- ⊕ Groundwater Monitoring Well
- ⊙ Ozone Sparge Well
- ⊞ Vapor Extraction Well

540 Analyte Concentration (ppm)  
ND Not Detected

Regulatory Target Level:  
Naphthalene=1.7 ppm

- Light Green 1.7 to 10 ppm Contour
- Yellow 10 to 100 ppm Contour

TPH=100 ppm

- Light Green 100 to 1,000 ppm Contour
- Yellow 1,000 to 10,000 ppm Contour
- Orange 10,000 to 100,000 ppm Contour

- ⊞ Former UST Area
- Property Line

**Graphic Scale**  
0 20 40  
(In Feet)  
1 Inch = 20 Feet

## ADSORBED-PHASE PLUME PLOTS Aquitard (Saturated Zone)

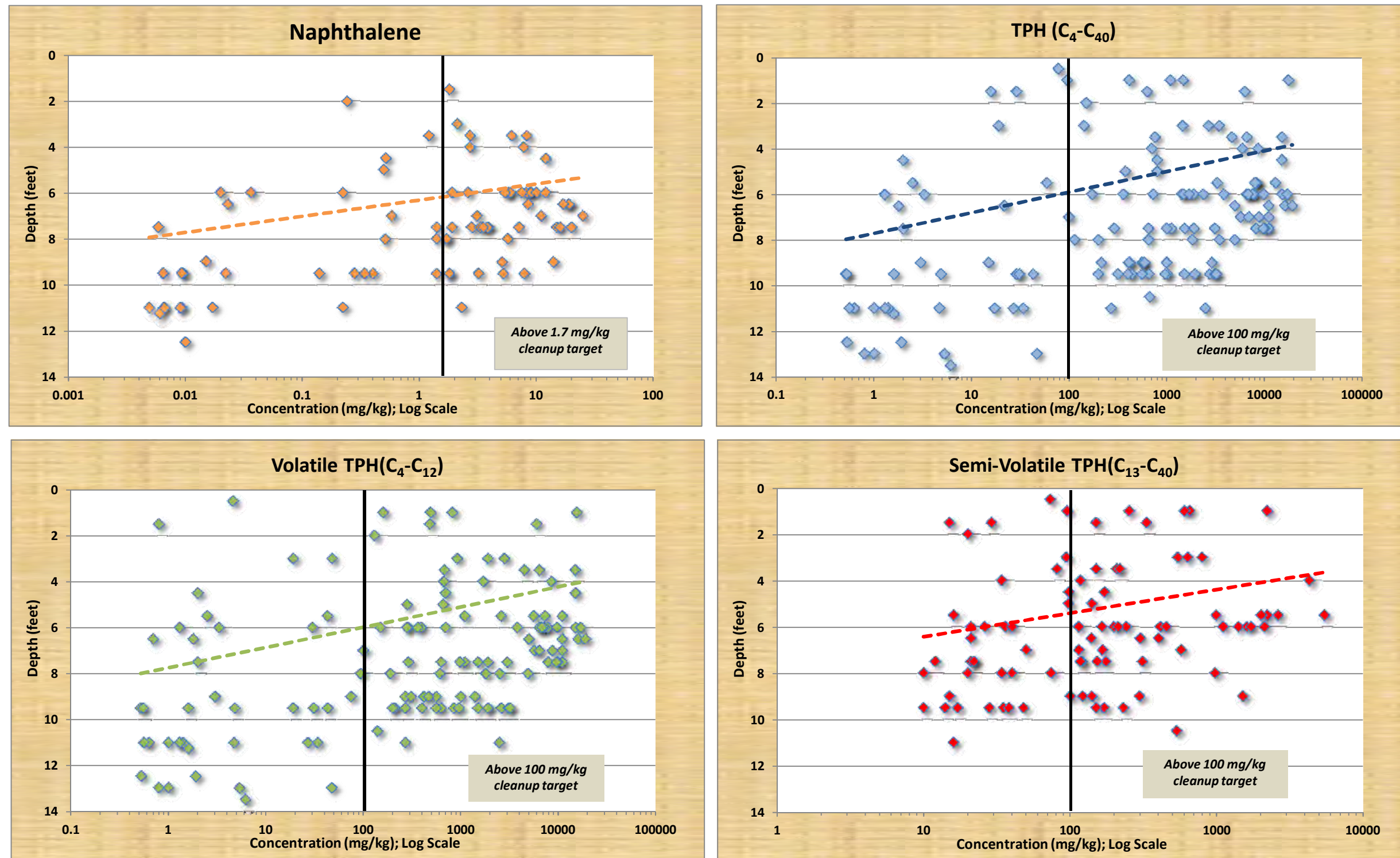
FORMER PETRE INDUSTRIES  
428 East Haley Street  
Santa Barbara, California  
PROJECT NO. 0110-01

**FIGURE 13**

HAYDEN ENVIRONMENTAL INCORPORATED



### ANALYTE CONCENTRATION VERSUS DEPTH PLOTS



**Notes:**  
Dashed lines are best-fit regressions through the data  
Graphs omit non-detects

## **ATTACHMENT 4**

**TABLE 7**  
**SOIL VAPOR ANALYTICAL RESULTS**

EPA Test Method TO-15 modified	Sample I.D.				OEHHA/ LTCP
	VE-2	VE-5	VE-7	MW-16	
Compounds					
Acetone	2,880 (J)	2,400 (J)	1,100 (J)	1,900	NL
Benzene	210	150	<b>380 (J)</b>	180 (J)	280 <sup>(1)</sup>
Carbon disulfide	nd (110)	nd (100)	250 (J)	nd (100)	NL
Chloroethane	nd (220)	nd (220)	840	nd (220)	NL
Cyclohexane	3,400	5,600	18,000	3,500	NL
1,1-Dichloroethane	nd (280)	nd (270)	330 (J)	nd (270)	NL
cis-1,2-Dichloroethene	nd (270)	nd (270)	720	nd (270)	44,000
Ethanol	1,300 (J)	1,000 (J)	1,400	1,100 (J)	NL
Ethylbenzene	600 (J)	580 (J)	610 (J)	570 (J)	3,600 <sup>(1)</sup>
4-Ethyltoluene	nd (170)	nd (170)	990	nd (170)	NL
Heptane	nd (140)	nd (140)	2,200	nd (140)	NL
Hexane	nd (240)	nd (240)	4,600	nd (240)	NL
Naphthalene	<b>2,800 (J)</b>	<b>2,600 (J)</b>	<b>2,600 (J)</b>	<b>2,600 (J)</b>	310 <sup>(1)</sup>
Propylene	170 (J)	nd (140)	1,100	nd (140)	NL
Tetrahydrofuran	230 (J)	200 (J)	910	nd (60)	NL
Toluene	540 (J)	470 (J)	580	410 (J)	380,000
Trichloroethene (TCE)	nd (180)	nd (180)	220 (J)	nd (180)	1,880
1,2,4-Trimethylbenzene	990 (J)	940	1,200	nd (170)	NL
1,3,5-Trimethylbenzene	nd (170)	nd (170)	1,000	nd (170)	NL
Vinyl Chloride	<b>170 (J)</b>	nd (170)	<b>4,100</b>	nd (170)	45
Xylenes (total)	2,000	1,800	2,100	1,900	880,000
TPHg (C <sub>4</sub> -C <sub>12</sub> )	1,100,000	820,000	2,700,000	990,000	380,000 – 810,000 <sup>(2)</sup>

See Footnotes on next page for explanation of table notations.

**Footnotes to Table 7:**

Samples collected on January 30, 2014.

Results presented in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). Results in **Bold** exceed the OEHHA levels.

OEHHA – Office of Environmental Health Hazard Assessment Soil Gas Screening Levels (2010).

Scenario represents a Commercial/Industrial property beneath buildings with no engineered fill.

(1) Value represents screening level established in the Low-Threat Closure Policy (LTCP) adopted by the State Water Resources Control Board.

(2) Value represents risk-based screening level for commercial/industrial subslab soil vapor for gasoline ( $\text{C}_5\text{-C}_8$ ) and middle distillates ( $\text{C}_9\text{-C}_{12}$ ).

(J) – Detected, but below the RL/PQL; therefore, result is an estimated concentration.

nd – not detected at or above the Method Detection Limit (MDL).

(170) – Value represents MDL.

NL – Not Listed.

## **ATTACHMENT 5**

**TABLE 6**  
**ADSORBED-PHASE PLUME DATA SUMMARY**

Analyte	Vadose Zone	Capillary Fringe/ Upper Saturated Zone	Aquitard (Saturated Zone)	FPD ILs (ppm)
<b>Average Concentration (ppm)</b>				
Naphthalene	5.45	910	4.53	1.7
Volatile TPH(C <sub>4</sub> -C <sub>12</sub> )	4,334	5,538	1,102	100
Semi-Volatile TPH(C <sub>13</sub> -C <sub>40</sub> )	752	885	360	100
Full TPH(C <sub>4</sub> -C <sub>40</sub> )	4,700	5,648	1,190	100
<b>Area (ft<sup>2</sup>)</b>				
Naphthalene	2,220	>5,500	2,925	
Volatile TPH(C <sub>4</sub> -C <sub>12</sub> )	>5,125	>7,490	4,500	
Semi-Volatile TPH(C <sub>13</sub> -C <sub>40</sub> )	>4,240	>5,300	1,575	
Full TPH(C <sub>4</sub> -C <sub>40</sub> )	>5,400	>8,000	4,630	
<b>Mass (lbs)</b>				<b>Total Mass (lbs)</b>
Naphthalene	4.24	10.82	2.52	17.57
Volatile TPH(C <sub>4</sub> -C <sub>12</sub> )	8,195	9,304	1,078	18,577
Semi-Volatile TPH(C <sub>13</sub> -C <sub>40</sub> )	1,102	1,291	122	2,514
Full TPH(C <sub>4</sub> -C <sub>40</sub> )	9,296	10,657	1,227	21,180

Footnotes:

FPD ILs –Santa Barbara County Fire Prevention Department LUFT Investigation Levels.

ppm –parts per million.

ft<sup>2</sup> – square feet.

lbs – pounds.

NA – Not Applicable.

> - Greater than.