#### P&D ENVIRONMENTAL

A Division of Paul H. King, Inc. 55 Santa Clara Avenue, Suite 240 Oakland, CA 94610 (510) 658-6916

September 12, 2005 Report 0298.R3

Mr. Harold Turner Snow Cleaners, Inc. 2678 Coolidge Avenue Oakland, CA 94601

SUBJECT:

PREFERENTIAL PATHWAY/CONDUIT STUDY

Fuel Leak Site RO0000357

Snow Cleaners, Inc. 2678 Coolidge Avenue Oakland, California

Dear Mr. Turner:

Alameda County
SEP 2 6 2005
Environmental Health

P&D Environmental, a division of Paul H. King, Inc. (P&D), is pleased to present this preferential pathway/conduit study for the subject site. The study was completed at the request of the Alameda County Department of Environmental Health (ACDEH) in a letter dated July 11, 2005. The subject site is located on Davis Street between Coolidge Avenue and 34<sup>th</sup> Avenue in Oakland, California. The site topography in the immediate site vicinity slopes slightly to the southwest toward the San Francisco Bay along Coolidge and 34<sup>th</sup> Avenues, and slopes to the southeast toward Peralta Creek on Davis Street. Underground utilities were identified on Davis Street between Coolidge Avenue and 34<sup>th</sup> Avenue with Davis Street. A Site Location Map is attached as Figure 1, and a Site Vicinity Map is attached as Figure 2. Underground utilities adjacent to the subject site were mapped and are shown in Figure 3.

The results of the preferential pathway/conduit study suggest that a former sanitary sewer lateral located on Davis Street could have historically been a conduit for Stoddard Solvent from the former underground storage tank (UST) pit to the sanitary sewer main located in the center of Davis Street. In addition, the bottom of the trench for the sanitary sewer main appears to be approximately coincident with a perched water table identified in the vicinity of the former UST pit. In the event that the sanitary sewer lateral or the associated trench for the lateral were a conduit for Stoddard Solvent from the former UST pit, Stoddard Solvent would have been transported to the sanitary sewer main or the sanitary sewer main trench located in the center of Davis Street. This condition would be consistent with the observed distribution of Stoddard Solvent from soil and groundwater samples collected to date.

#### **DOCUMENT REVIEW**

On August 4, 2005, P&D personnel contacted Mr. Wayne Guidici of the City of Oakland Public Works Agency (COPWA) to obtain any available documentation regarding locations and depths of subsurface utilities at or near the site. Mr. Guidici stated that sanitary sewer and storm drain plans

were the only available utility information from the City of Oakland. On August 17, 2005 P&D personnel visited the COPWA offices and obtained a copy of all available sanitary sewer and storm drain plans for the site vicinity. Additionally, P&D personnel contacted utility providers East Bay Municipal Utility District (EBMUD), Pacific Gas & Electric (PG&E), and SBC Communications (SBC) to obtain any available documentation regarding locations and depths of water supply, natural gas, electrical, and telephone utilities. The utility information obtained from utility providers is described below.

#### FIELD ACTIVITIES

P&D personnel visited the study area on August 3, 2005 to identify surface features and mark the area for underground utility location by Underground Service Alert (USA). USA was contacted to identify the location of all underground utilities in the study area. Following USA notification and marking of the study area by utility service providers, P&D contracted Advanced Geological Services, Inc. (AGS) to map the location and depth of underground utilities in the site vicinity. The subsurface features identified by AGS consist of storm drain, sanitary sewer, water supply, and natural gas pipes, as well as telephone and electrical wires. The depth to the underground utilities was measured by AGS when possible. The underground utilities in the study area were mapped by AGS and are shown in Figure 3.

Based on USA markings and utility surveyor investigation; and based on documents obtained and reviewed by P&D, the subsurface features discussed below were identified. Once the features had been identified, P&D contacted the owner of each identified feature via telephone to obtain further utility and trench depth information, as described below.

#### UTILITY DESCRIPTIONS

Each type of utility identified during the investigation is described below.

#### Water Supply Pipes

Water supply pipes in the site vicinity are owned and operated by EBMUD. The depth and horizontal locations of the water supply pipes were mapped by AGS. However the survey elevations and diameters of the water supply pipes were not measured by AGS. Ms. Kathy Keller of EBMUD provided a map of the EBMUD water supply pipes in the site vicinity. The EBMUD map and an enlarged detail of the study area are attached as Appendix A.

P&D spoke with Mr. Pat Clinton of EBMUD on April 25, 2005, regarding standard trench details. Mr. Clinton stated that the depth of burial for EBMUD water supply pipes is typically 3 feet below the surface for main pipes, and 2 to 3 feet below the surface for laterals. Backfill is typically 3 inches of sand placed below the pipe, and 3 to 6 inches of sand placed above the pipe. If the pipe is located in the street, aggregate baserock is used as fill from the top of the sand to the bottom of the concrete or asphalt driving surface.

#### Sanitary Sewer Pipes

Sanitary sewer pipes in the site vicinity are owned and operated by the COPWA. Horizontal locations and depth to pipe invert for the sanitary sewer pipes were measured by AGS. A utility map obtained from the COPWA showing sanitary sewer pipe diameters and flow directions in the site vicinity is attached as Appendix B. Review of Figure 3 shows that AGS identified the depth of the sanitary sewer main in Davis Street at the intersection of Davis Street and 34<sup>th</sup> Avenue as 10.5 feet. Review of Appendix B shows that the sanitary sewer pipe is sloped towards the southeast.

#### Natural Gas Pipes

Natural gas pipes in the site vicinity are owned and operated by PG&E. The depths and horizontal locations of the natural gas pipes were mapped by AGS. However the diameters of the pipes were not measured by AGS. A utility map obtained from PG&E showing the horizontal locations of natural gas pipes in the site vicinity is attached as Appendix C.

On March 17, 2005, P&D contacted Mr. Jim Navarra of PG&E for information about depths and trench construction practices for the natural gas pipes. Mr. Navarra stated that PG&E natural gas pipes are typically buried in trenches two to three feet in total depth, and that two to four inches of sand fill is typically placed beneath the pipes. Mr. Navarra also stated that onsite backfill is used if it passes their soil testing requirements. Otherwise 12 inches of imported material is used for backfill on top of the pipes. He stated that it is impossible to know specific trench details without digging at the site.

#### Electrical Wires

Electrical wires in the site vicinity are owned and operated by PG&E. On September 2, 2005, P&D contacted Mr. Sumeet Singh of PG&E about depths and trench construction practices for the electrical wires. Mr. Sumeet stated that PG&E electrical wires are typically buried under 30 inches of sand backfill. He stated that precise backfill information for the utilities in the area of the subject site is difficult to obtain and generally unreliable, and that more reliable information (if needed) could be obtained by hand digging on site. On April 25, 2005, P&D spoke with Mr. Russell Lew of SBC. Mr. Lew stated that, as a rule, SBC telephone and PG&E electrical wires are generally buried in the same trench. According to Mr. Lew, the electrical wires are buried a minimum of 12 inches below the telephone wires. A utility map obtained from PG&E showing the horizontal locations of electrical wires in the site vicinity is attached as Appendix D.

#### Telephone Wires

Telephone wires in the site vicinity are owned and operated by SBC. On March 16, 2005, P&D spoke with Mr. Pierre Galang of SBC. Mr. Galang stated that trenches for telephone wires are typically 24 to 30 inches in total depth beneath sidewalks and private property, and 30 to 36 inches in total depth beneath streets. On April 25, 2005, P&D spoke with Mr. Russell Lew of SBC. Mr. Lew stated that

telephone wires and cables are housed in plastic schedule 40 conduit. Mr. Lew also stated that, as a rule, SBC telephone and PG&E electrical wires are generally buried in the same trench. Mr. Lew additionally stated that burial with PG&E electrical wires is promoted by PG&E, so that SBC telephone lines can help to protect PG&E electrical wires. According to Mr. Lew, the electrical wires are buried a minimum of 12 inches below the telephone wires, which would put them at a minimum of 36 inches deep. A utility map obtained from SBC showing the horizontal locations of telephone wires in the site vicinity is attached as Appendix E.

#### Storm Drain Pipes

Storm drain pipes in the site vicinity are owned and operated by the COPWA. Horizontal locations and depth to pipe invert for the storm drainpipes were measured by AGS. A utility map obtained from the COPWA showing storm drainpipe diameters and flow directions in the site vicinity is attached as Appendix B. Review of Figure 3 shows that AGS identified the depth of the stormdrain pipe in Cooldige Avenue as 1.5 feet at the intersection of Davis Street and Cooldige Avenue. Review of Appendix B shows that stormdrain pipes are not shown on the COPWA map in the vicinity of the subject site.

#### Cable Television/High Speed Internet

The cable television/high speed internet provider in the area is Comcast. No evidence of subsurface Comcast utilities was detected by AGS. Comcast could not be reached to confirm whether they have any cables in the area.

#### <u>UTILITY LOCATIONS</u>

The locations of the utilities in the site vicinity are described below.

#### Coolidge Avenue

Several utility trenches are aligned parallel with Coolidge Avenue. Coolidge Avenue is aligned approximately 35 degrees east of north. All trench alignments in this section are listed relative to their distance from the curb on the southeast side of Coolidge Avenue, in order from closest to farthest from the center of the subject site.

Review of the AGS Utility Survey Map (Figure 3) shows that a telephone wire is located 5 feet southeast of the curb. This is corroborated by the map provided by SBC (see Appendix E). A comment on the AGS map, Figure 3, suggests that the electric and telephone service may be in the same trench directly in front of the Snow Cleaners building. The map provided by PG&E electric (see Appendix D) shows electrical wires as being overhead in this location.

A storm drain pipe was located by AGS at the southeast curb and gutter of Coolidge Avenue. The structure appears to be for conveying surface flow along the curb and gutter on the southeastern edge

of Coolidge Avenue, and also for conveying surface water flow from the northeast and southwest curbs and gutters of Davis Street into the southeastern curb and gutter of Coolidge Avenue.

An unidentified utility was located by AGS 14 feet northwest of the curb. It was located in the middle of the intersection with Davis Street. The northeast and southwest extent of the utility is unknown. This feature did not correspond with any information provided by local utility companies. No further information is available about this feature.

A sanitary sewer pipe was located by AGS 18 feet northwest of the curb. This location is corroborated by a plan obtained from the COPWA (see Appendix B).

#### Davis Street

Several utility trenches are aligned parallel with Davis Street. Davis Street is aligned approximately 35 degrees south of east. All trench alignments in this section are referenced relative to their distance from the curb on the northeast side of Davis Street, unless otherwise indicated; and listed in order from closest to farthest from the center of the subject site.

According to AGS, an unknown utility is located 11 feet northeast of the curb in a trench that is two to three feet deep. This trench extends southeast from Coolidge Avenue to the property at 3320 Davis Street. This feature did not correspond with any information provided by local utility companies. No further information is available about this feature.

A water pipe was located by AGS eight feet southwest of the curb. This water pipe is located along the entire length of Davis Street between Coolidge Avenue and 34<sup>th</sup> Avenue. There are six lateral connections to individual properties on the southeastern half of the block. This location is corroborated by the EBMUD utility map (see Appendix A).

A sanitary sewer pipe is identified by AGS on their survey map 16 feet southwest of the curb. This map shows a sanitary sewer pipe that begins at a cleanout on Davis Street at the midpoint between Coolidge Avenue and 34<sup>th</sup> Avenue. A utility map obtained from the COPWA is attached as Appendix B. This map shows a pipe in the same location that continues down the centerline of Davis Street and eventually crosses Peralta Creek. According to AGS, this pipe is between 9.5 and 10.5 feet deep.

A natural gas pipe is identified by AGS on their survey map 25 feet southwest of the curb. This pipe extends the length of the block and has four lateral connections in the southeastern half of the block. According to AGS, the pipe is located 3.5 to 4 feet below the surface.

An electrical wire is identified by AGS on their map at a location 36 feet southwest of the curb, buried three feet deep. The map provided by PG&E (see Appendix D) indicates that this wire extends from a utility vault near the southernmost point of the intersection of Coolidge Avenue and Davis Street southeastward to a utility pole at the midpoint of the block.

An unknown utility was identified by AGS on their map at a location 42 feet southwest of the curb at a depth of 2.5 to 3 feet below the surface. This feature was identified for a distance of approximately 95 feet parallel to Davis Street. This feature did not correspond with any information provided by local utility companies. No further information is available about this feature.

At the southeast end of the subject site property, AGS located a sanitary sewer pipe that is connected to the rear building at the property. This pipe is oriented perpendicular to Davis Street and towards the sanitary sewer cleanout in the center of Davis Street. This pipe segment is not continuous and extends approximately six feet from a cleanout on the site to the southwest towards Davis Street. Between this pipe segment and the cleanout in the center of Davis Street is the former tank pit location. The pipe segment terminates in the vicinity of the former underground storage tank (UST) pit, which was located beneath the sidewalk adjacent to Davis Street. The USTs were used for storage of Stoddard Solvent. To date, perchloroehthylene and trichloroethylene have not been detected in any of the soil or water samples at the site. It is possible that this pipe may have extended through the former UST pit to the sewer cleanout in the center of Davis Street. It is also possible that there may be a section of pipe not found by AGS between the former UST pit and the cleanout in the center of Davis Street.

#### 34th Avenue

Several utility trenches are aligned parallel with 34<sup>th</sup> Avenue. 34<sup>th</sup> Avenue is oriented approximately 35 degrees east of north. All trench alignments in this section are referenced relative to their distance from the curb on the northwest side of 34<sup>th</sup> Avenue, in order from closest to farthest from the center of the subject site.

An unknown utility is identified by AGS on their map, three feet northwest of the curb. This feature did not correspond with any information provided by local utility companies. No further information is available about this feature. A natural gas pipe is identified on the AGS map seven feet east of the curb at a depth of 3.5 to 4 feet below the surface. This location is corroborated by the map obtained from PG&E (see Appendix C).

A water pipe is identified on the AGS map between 23 and 26 feet east of the curb. The pipe is not entirely parallel with the street. The depth indicated by AGS is four feet below the surface. This location matches the location on the EBMUD water supply map (see Appendix A).

#### **GROUNDWATER**

Review of Figure 1 shows that the site is located near the top of a northeasterly-trending interfluvial (ridge-like) structure. The topography in the area surrounding the site slopes to the east and south. Peralta Creek is located approximately 400 feet to the east and southeast of the subject site. Although the site vicinity topography slopes to the east and south, the ground surface between Coolidge Avenue (bordering the property on the west) and 34<sup>th</sup> Avenue (the first street encountered to the east of the site) is remarkably flat. Almost all of the change in elevation between the site and Peralta Creek occurs to the east of 34<sup>th</sup> Avenue. Although the groundwater

flow direction at the site is unknown, based on these observations, the anticipated groundwater flow direction at the site is toward the southeast.

In January, 1994 two groundwater monitoring wells were installed in Davis Street approximately five feet south of the former UST pit. Figure 2 shows the approximate former location of the USTs beneath the sidewalk. Well B1 (the well closest to Coolidge Avenue, and subsequently renamed as well MW1) was drilled to a total depth of 46.1 feet, and was constructed using 2-inch diameter PVC pipe. The screened interval is from 25 to 45 feet below the ground surface. Groundwater was initially encountered at a depth of 42.1 feet and subsequently stabilized at a depth of approximately 29 feet below the ground surface. The subsurface materials encountered in the borehole consisted predominantly of clay and silty clay. No evidence of petroleum hydrocarbons was detected in the borehole at the time of drilling, and no petroleum hydrocarbons were detected in soil samples from the borehole or water samples from the well.

Well B2 (subsequently re-named as well MW2) was drilled to a total depth of approximately 26.5 feet, and was constructed using 4-inch diameter PVC pipe. The screened interval is from 11 to 26 feet below the ground surface. Groundwater was initially encountered at a depth of approximately 18.5 feet, and subsequently stabilized at a depth of approximately 18.5 feet. The subsurface materials encountered in the borehole consisted predominantly of clayey sand and clayey gravel between the depths of approximately 10 and 21 feet below the ground surface. Petroleum odors were detected in materials from the borehole at the time of drilling, and in soil samples from the borehole. A layer of separate phase hydrocarbons was detected on the water in the well. The laboratory identified the petroleum hydrocarbons as Stoddard Solvent. The water in well MW2 was interpreted to be perched water.

Review of the historical water sample results from the wells shows that no petroleum hydrocarbons have been detected in well MW1, but petroleum hydrocarbons have been consistently detected in well MW2.

On January 18, 2003 P&D personnel monitored the two wells for depth to water and the presence of free product. The measured depth to water in well MW1 was 20.06 feet. No free product was present in the well, and no odors or other evidence of petroleum hydrocarbons were detected in the well. In well MW2, the measured depth to water was 11.55 feet, and 0.02 feet of free product was measured in the well.

Water levels in the two existing groundwater monitoring wells show that a perched water table is present at or near the site. Based on field observations and the laboratory results of water samples from well MW2, the perched water table has historically been impacted with separate phase Stoddard Solvent. Between the former UST pit and borehole B7 the Stoddard Solvent has moved vertically downward from the perched water table (static water level of approximately 16 feet below the ground surface) to the regional water table (static water level of approximately 23 feet below the ground surface).

On September 22, 2004 during the drilling of boreholes B3, B4, B6 and B7 at the subject site, groundwater was initially encountered between 39.5 and 45.0 feet below the ground surface. Groundwater was subsequently measured in these boreholes prior to grouting at depths between 24.8 and 39.0 feet below ground surface.

In borehole B5, groundwater was initially encountered while drilling at a depth of 25.0 feet, and was subsequently measured at a depth of 10.3 feet below the ground surface prior to grouting the borehole. This shallower depth of groundwater in borehole B5 is consistent with the measured depth to groundwater reported by others of 18.5 feet 2 hours after drilling borehole B2, and the static water level encountered in well MW2 (formerly borehole B2) of 16.18 feet on October 27, 2004. The depths at which water was initially encountered and the depths at which water appears to have stabilized in boreholes B1 through B7 indicates that the perched water table is not continuous to the east of the subject site towards the intersection of Davis Street and 34<sup>th</sup> Avenue.

The presence and extent of Stoddard Solvent in soil and groundwater at and near the site was discussed in P&D's Subsurface Investigation Report (document 0298.R2), dated February 28, 2005. Figure 2 from that report showing isoconcentration contours for Stoddard Solvent in groundwater is attached with this report as Figure 2. Soil and groundwater sample results from the subsurface investigation boreholes indicate that the Stoddard Solvent concentrations are highest in the vicinity of the former UST pit. The groundwater isoconcentration contours suggest that the Stoddard Solvent is moving in groundwater from the former tank pit area along Davis Street to the southeast.

#### DISCUSSION

Groundwater elevations in boring logs and groundwater monitoring wells, subsurface geology, and Stoddard Solvent isoconcentration contours were evaluated to identify depth to groundwater, groundwater flow direction, and the known extent of Stoddard Solvent in the vicinity of the subject site. The information suggests that Stoddard Solvent has impacted groundwater in the vicinity of the former UST pit located adjacent to Davis Street and is moving in a southeasterly direction parallel to Davis Street.

Underground utilities were identified in the site vicinity by USA and a private utility locator. In addition, utility service providers were contacted to obtain maps of buried utility locations and to identify utility burial practices, including utility burial depth. Review of Figure 3 shows that an unknown utility that is oriented parallel to Davis Street appears to be coincident with the former UST pit. However, the utility is identified as being buried at a depth of two to three feet, and is presently not considered as a potential conduit for Stoddard Solvent from the former UST pit. Similarly, a water pipe located in Davis Street in the vicinity of the former UST pit is also considered to have a burial depth of four feet that is presently not considered a potential conduit for Stoddard Solvent from the former UST pit.

None of the utilities identified in the study area are buried at a depth that would result in the bottom of a utility trench being below seasonal groundwater levels with the exception of the sanitary sewer main in Davis Street. The bottom of the sanitary sewer main trench is approximately coincident with the perched water table that is present in the vicinity of the former UST pit. In addition, a pipe that is interpreted to be a sanitary sewer lateral appears to have historically extended across the former UST pit. It is unknown when the sanitary sewer lateral use was discontinued. The likely anticipated use scenarios include discontinuation of the sanitary sewer lateral prior to installation of the UST pit, or contemporaneous use with the UST pit and discontinued use at the time of UST removal. In either of these scenarios, it is possible that releases to the UST pit could have preferentially migrated in the sanitary sewer lateral trench fill materials to the sanitary sewer main. In addition, it is possible that historic facility practices could have included discharging spent Stoddard Solvent to the sanitary sewer, potentially resulting in Stoddard Solvent releases at pipe joints.

In the event that the sanitary sewer lateral or the associated trench for the lateral were a conduit for Stoddard Solvent from the former UST pit, Stoddard Solvent would have been transported to the sanitary sewer main or the sanitary sewer main trench located in the center of Davis Street. This condition would be consistent with the observed distribution of Stoddard Solvent from soil and groundwater samples collected to date. A subsurface investigation work plan dated September 12, 2005 proposes additional investigation of the extent of Stoddard Solvent in the vicinity of the sanitary sewer trench in Davis Street with soil borings B8 through B11 (see Figure 2).

#### **DISTRIBUTION**

A copy of this report should be sent to Mr. Jerry Wickham at the ACDEH. The report should be accompanied by a transmittal letter signed by an authorized representative of Snow Cleaners, Inc.

#### **LIMITATIONS**

This report was prepared solely for the use of Snow Cleaners, Inc. The content and conclusions provided by P&D in this assessment are based on information collected during our investigation, which may include, but not be limited to, visual site inspections; interviews with the site owner, regulatory agencies and other pertinent individuals; review of available public documents; subsurface exploration and our professional judgment based on said information at the time of preparation of this document. Any subsurface sample results and observations presented herein are considered to be representative of the area of investigation; however, geological conditions may vary between borings and may not necessarily apply to the general site as a whole. If future subsurface or other conditions are revealed which vary from these findings, the newly revealed conditions must be evaluated and may invalidate the findings of this report.

This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information contained herein is brought to the attention of the appropriate regulatory agencies, where required by law. Additionally, it is the sole responsibility

of the owner to properly dispose of any hazardous materials or hazardous wastes left onsite, in accordance with existing laws and regulations.

This report has been prepared in accordance with generally accepted practices using standards of care and diligence normally practiced by recognized consulting firms performing services of a similar nature. P&D is not responsible for the accuracy or completeness of information provided by other individuals or entities that is used in this report. This report presents our professional judgment based upon data and findings identified in this report and interpretation of such data based upon our experience and background, and no warranty, either express or implied, is made. The conclusions presented are based upon the current regulatory climate and may require revision if future regulatory changes occur.

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

Sincerely,

P&D Environmental

Paul H. King

Professional Geologist # 5901

1 and W. King

Expires: 12/31/05

Attachments: Figure 1 - Site Location Map

Figure 2 – Site Vicinity Map Figure 3 – Utility Survey Map

Appendix A – EBMUD Water Supply Utility Map

Appendix B - COPWA Sanitary Sewer and Storm Drain Utility Map

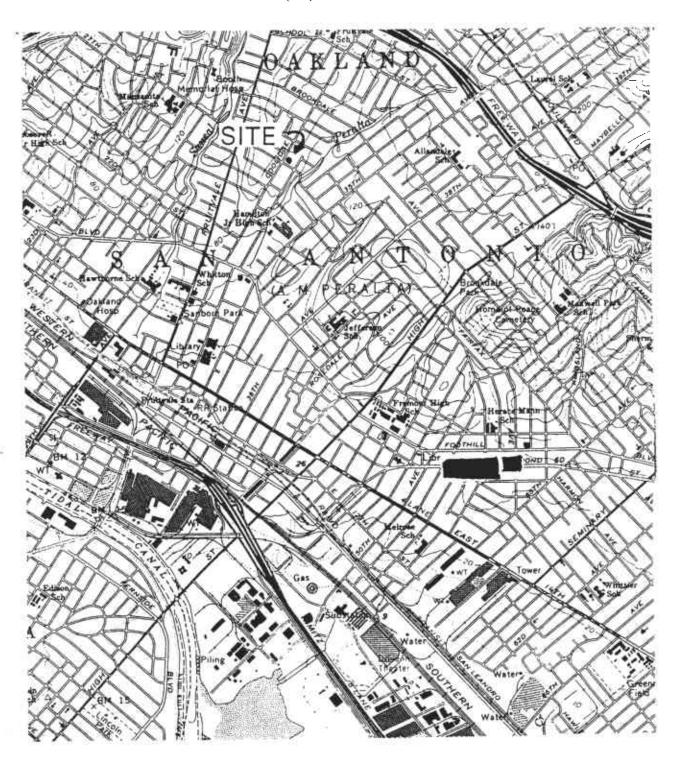
Appendix C – PG&E Natural Gas Utility Map Appendix D – PG&E Electric Utility Map

Appendix E - SBC Communications Telephone Utility Map

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Base Map From U.S. Geological Survey Oakland East, Calif. 7.5 Minute Quadrangle Photorevised 1980

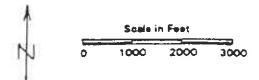
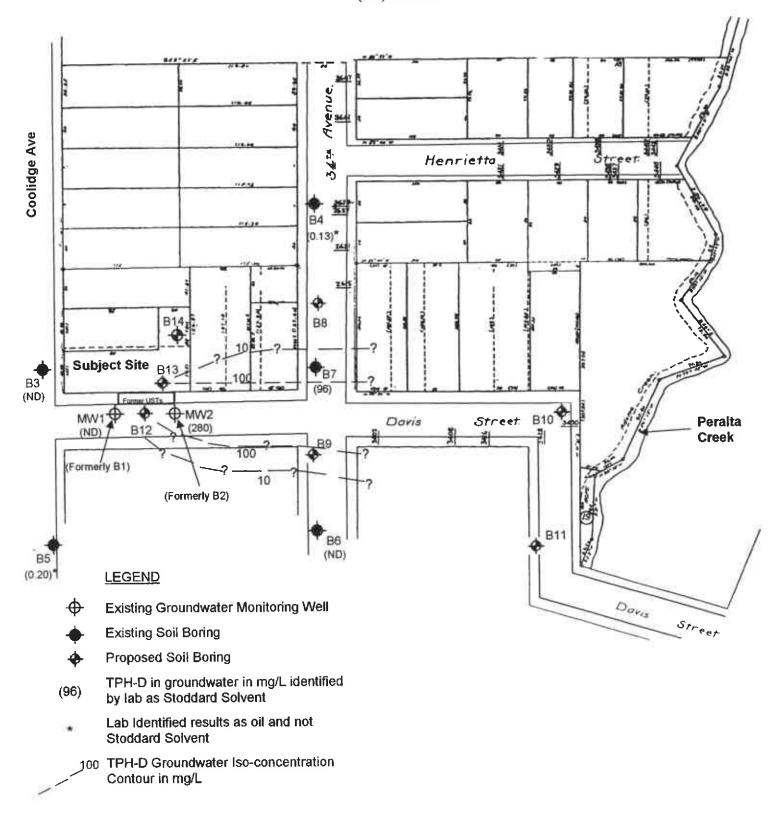


Figure 1 SITE LOCATION MAP 2678 Coolidge Ave Oakland, CA

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Base Map From Parcel Quest Assesor's Parcel Maps Alameda County Map Disc July 2001

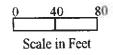
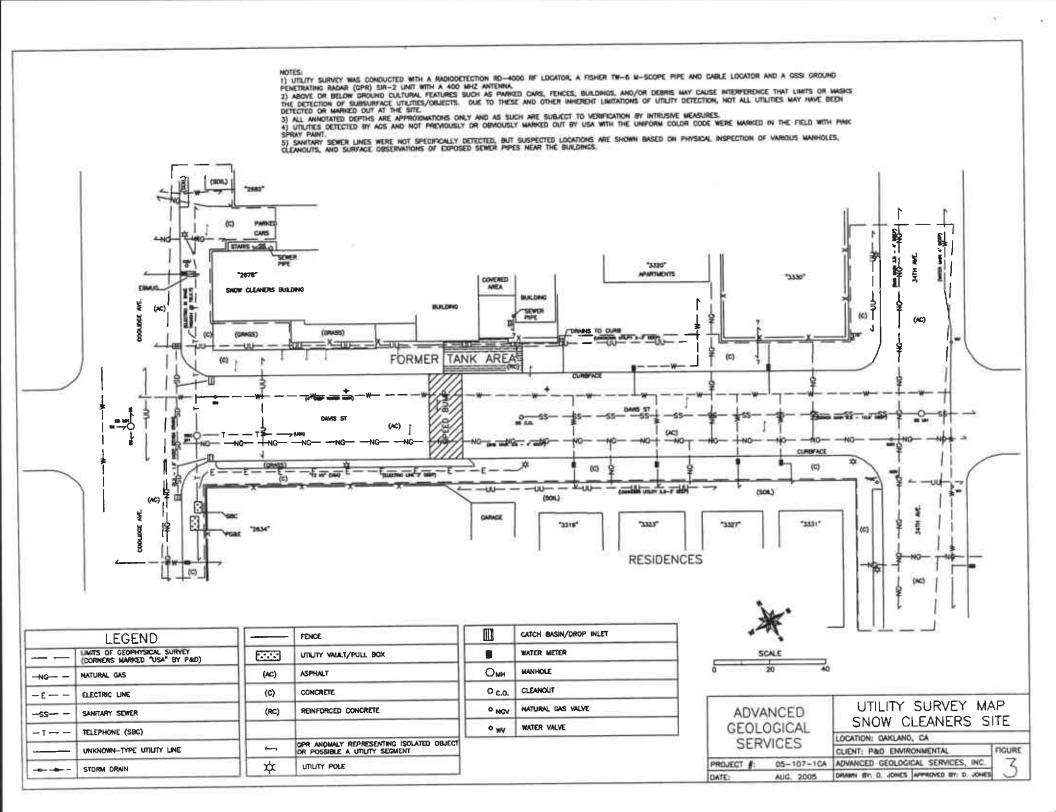




Figure 2 SITE VICINITY MAP TPH-D Concentrations 2678 Coolidge Ave Oakland, CA



### Appendix A

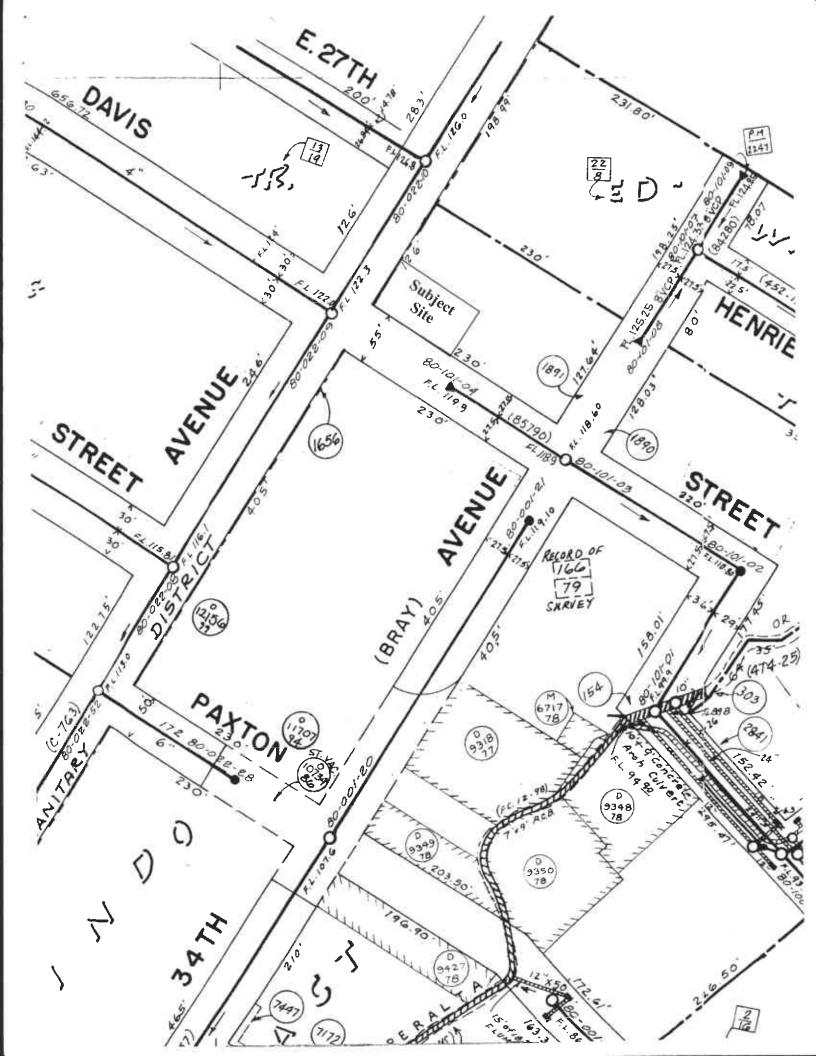
### EBMUD Water Supply Utility Map





### Appendix B

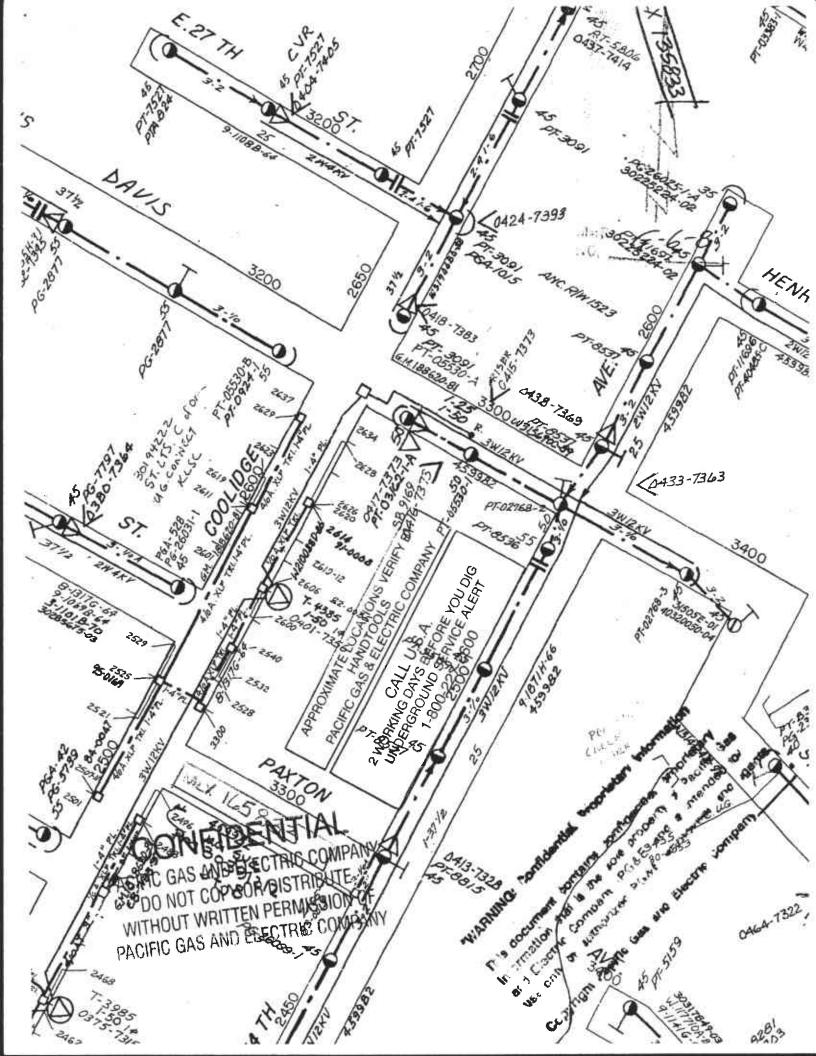
## COPWA Sanitary Sewer and Storm Drain Utility Map



# Appendix C PG&E Natural Gas Utility Map

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# Appendix D PG&E Electric Utility Map



# Appendix E SBC Communications Utility Map

