25 August 2003

RESPONSE TO TECHNICAL COMMENTS

Fidelity Roof Company
1075 40th Street
Oakland, California

8/25/03

Project No. 4436

Prepared For

Fidelity Roof Company
1075 40th Street
Oakland, CA 94608

Prepared By

AEI Consultants
2500 Camino Diablo, Ste. 200
Walnut Creek, CA 94597
(925) 283-6000

AEI

The proposed cleanup levels and rationale for those levels are described in detail in Appendix B.

SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

AEI Consultants has prepared this response for the site located at 1075 40th Street in the City of Oakland, California. If you have any questions regarding this plan, please do not hesitate to contact us at 925.283.6000.

Sincerely,

L. M. Sawyer #4450

Lorraine M. Sawyer, RG

APPENDIX A – Proposed Drilling and Pilot Test Activities
APPENDIX B – Proposed Cleanup Levels
APPENDIX C – Boring Logs

DISTRIBUTION

Mr. Monte Upshaw
Fidelity Roof Company
1075 40th St.
Oakland, CA 94608

Mr. Barney M. Chan
Alameda County Health Care Services
1311 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Ms. S. Knieriem
SWRCB
1001 I Street; 17th Floor
Sacramento, CA 95814-2828

AEI CONSULTANTS
ENVIRONMENTAL & CIVIL ENGINEERING

2500 Camino Diablo, Suite 200, Walnut Creek, CA 94597
Phone: (925) 283-6000 Fax: (925) 944-2895

25 August 2003

Mr. Barney M. Chan
Alameda County Health Care Services Agency
1311 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Fidelity Roof Company - 1075 40th Street, Oakland, CA; Fuel Leak Case RO0000186; Underground Storage Tank Cleanup Fund Claim #13833

Dear Mr. Chan:

This letter and appendix is in response to Alameda County Health Care Services Agency (ACHCSA) technical comments dated 15 May 2003.

RESPONSE TO TECHNICAL COMMENTS

The ACHCSA indicated that: "the remediation should concentrate on groundwater, as it is the main source of contamination. Indications are that the soil type (silts and clays), which is typically fairly impermeable and not amenable to groundwater or vapor extraction."

Response to Technical Comment #1

The ACHCSA requested that a more detailed description of the air sparge (AS)/vapor extraction system (VES) test.

The proposed pilot testing will consist of three elements (i.e., VES testing, AS testing and combined VES/AS testing) that are described in detail in Appendix A.

The ACHCSA also indicated that the vapor extraction would be enhanced in the excavated and backfilled areas, however that no AS wells are proposed within this area.

Proposed AS-2 will be placed in the excavated area as shown on Figure A-1 in Appendix A.

The ACHCSA also indicated that the pilot test should show the viability and effectiveness of this type of remediation. The ACHCSA also indicates that beyond the former excavation, the effectiveness of vapor extraction is expected to be less and that the pilot test should extend to outside the excavation to confirm the radius of influence (ROI) in this area.

The pilot testing will address the most contaminated area around MW-3. Figure A-1 in Appendix A shows the proposed VES and AS wells as well as drive points that will used for monitoring during the pilot test.

One objective of the pilot test will be to determine the ROI for VES wells and the bubble radius for the AS wells. For lithologies similar to the predominant types on the site (sandy clays and silts), effective VES well spacing typically ranges between 10-25 feet. In the disturbed material within the excavation, the ROI associated with the VES may be greater. Without pilot testing, the ROI for VES or for AS also is not precisely known. Based on the estimated well spacing range - 2 VES wells, 2 AS wells and 6 drive points for monitoring are proposed for use during the pilot test. MW-1 through MW-4 will also be used for monitoring purposes during pilot testing. Requirements for well spacing may change in different directions based on changes in the lithology. Additional wells may be required during the actual remediation efforts. This pilot test will be used to determine effective well spacing.

Drive points are placed at varying distances from VES-1, which is located outside the excavated area. VES–1 will be used for the first (if any others tests are required) based on the expected lower permeability of the undisturbed area. If well response is not observed in a sufficient number of wells or within the excavation, a second VES test using VES-2 will be conducted. The AS test will be conducted at AS-1 or AS-2 depending on which VES well was used successfully (or most successfully).

Table A-1 in Appendix A indicates the rationale for selection of the wells and drive points.

Response to Technical Comment #2

The ACHCSA indicated that the location of the proposed monitoring well (MW5) is too far down-gradient to determine the effectiveness of the remediation and that no groundwater contamination was identified in the prior grab groundwater sample from this area.

The previously proposed MW-5 will be used for groundwater monitoring as the down gradient point of compliance but will not be used as part of the remediation system/pilot testing and monitoring effort. The proposed location will remain at the same location that was previously indicated in the "Corrective Action Plan; 1075 40th Street; Oakland, California" dated 31 July 2003 on Figure 1.1.2 of that plan.

Response to Technical Comment #3

A letter dated 11 December 2001 from the ACHCSA requested that the proposed clean-up levels reflect the protection of human health and the environment. The ACHCSA requested that the City of Oakland Urban Land Redevelopment (ULR) guideline and the San Francisco Bay Regional Water Quality Control Board (SFRWQCB) risk based screening level (RBSL) guideline be used. They also requested that all analytes detected must be evaluated including total petroleum hydrocarbons as gas (TPH-g) as diesel (TPH-d), benzene, toluene, ethyl benzene and xylenes (BTEX) and methyl tertiary butyl ether (MTBE). Additionally, the agency requested that both cleanup levels (risk-based) and clean-up goals, those, which are long term objectives that take into, account potential use as drinking water unless shown to be otherwise.

PROPOSED DRILLING AND PILOT TESTING ACTIVITIES

This appendix describes the proposed drilling, biofeasibility sampling and soil vapor extraction (SVE) / air sparging (AS) pilot testing for the Fidelity Roof Company Fuel Leak Case RO0000186 and Cleanup Fund Claim #13833. The site is located at 1075 40th Street in Oakland, California. The site is regulated under the Alameda County Health Care Services Agency (ACHCSA).

Remediation well drilling, biofeasibility, and pilot testing will precede the final remediation design. The results of the drilling, biofeasibility work and pilot tests will be incorporated into the site documentation.

Proposed Remediation Wells and MW-5

AEI proposes to advance 2 SVE wells, 2 AS and 6 drive points which will be used to monitor conditions during the pilot test. The locations are shown on Figure A-1. The final locations of these wells are contingent upon approval by the ACHCSA. In addition, MW-5, which, was previously proposed will be advanced as a downgradient point of compliance well. It is not planned for remediation use or use during the pilot testing. The proposed location for MW-5 will remain at the same location that was previously indicated in the "Corrective Action Plan; 1075 40th Street; Oakland, California" dated 31 July 2003 on Figure 1.1.2 of that plan. The borings will be drilled and completed to the depths indicated in Table A-1. The rationale for well locations is also indicated on that table.

Four existing groundwater monitor wells (MW-1, MW-2, MW-3 and MW-4) will also be used (for purposes of monitoring vapor, ROI and vacuum) during the pilot testing as appropriate.

For the 2 SVE and 2 AS wells, a hollow stem auger drill rig, with 10" outside diameter hollow stem augers will be used to advance the borings that will be converted to SVE or AS wells. For proposed MW-5, the boring will be advanced with a minimum 8" auger. Soil samples will be collected every five feet for lithological analysis and will be screened in the field using a photo-ionization detector. Two soil samples for each of the VES wells and a maximum of two soil samples and one groundwater sample for each the AS wells will be analyzed for contaminants of concern. Two soil samples and one ground water sample will also be analyzed from the previously proposed MW-5. These samples will be analyzed for gasoline and diesel by EPA Method 8015M, for volatile organic compounds (VOC) by EPA Method 8260. The VOC analysis will include Methyl Tertiary Butyl Ether (MTBE). See Table A-2.

The two SVE and two AS wells remediation wells will be constructed of 4-inch flush threaded Schedule 40 poly vinyl chloride (PVC) casing. MW-5 will be constructed of 2-inch flush threaded Schedule 40 PVC casing. These wells will be screened with .01-inch or .02-inch factory-slotted well screen. Well casing and screen will be inserted through the augers to a point a few inches above the borehole terminus where it will be suspended until the well is secured within the sand pack. Sand (#2 or #3) will be poured through the augers in one to two-foot lifts so that the top of the sand pack is 2 feet above the screen. Bentonite chips will be poured through the augers so that the bentonite seal is approximately one to three feet thick. The chips will be activated with tap water. Cement grout will be placed above the bentonite seal to surface. A locking top cap and a traffic rated well box will be installed.

Drive Point Installation

The field efforts will also consist of advancing six drive points which, are in the most contaminated areas of soil and/or ground water contamination as shown on Figure 1. The drive points are intended to target the lower vadose zone/ capillary and the shallow groundwater contamination. The points will be used for periodic pressure monitoring during the short-term VES/AS pilot testing and later for use in the remediation system or for measuring the effectiveness of the remediation system.

The presence of underground obstructions as well as utilities may require the drive point locations to change slightly. The drive points will be advanced to the extent practical with a Geoprobe™ or other direct push "rig" to total depths of approximately 37' feet bgs at each location. Final depths in each location will be based on field conditions. Soil samples will not be collected.

?

These drive points will be completed with ¾ " to 1" stainless steel or carbon steel combination blank/slotted pipe. The slots will be .01-inch or .02-inch factory-slotted screen. The drive points, which, will be completed in both the vadose zone and in groundwater, will be developed to the extent practical extent. The points will be screened between approximately seven feet bgs to 37 feet bgs. The exact depth will be determined based on field conditions. A locking top cap and a flush-mounted watertight well cover will be installed.

Surveying

Each well and drive point will be surveyed relative to each other, mean sea level, and a known datum by a California licensed land surveyor. Survey data will be obtained utilizing GPS equipment, and will be in a format acceptable for submission to the California GeoTracker database, as required by Assembly Bill (AB) 2886.

Waste Disposal

Generated wastes including equipment rinse water and well purge water will be stored in 55-gallon drums. The waste materials will be transported from the site under appropriate manifest to an approved disposal or recycling facility.

Biofeasibility Bench Testing

A biofeasibility bench test is also planned for the Fidelity Roof site. The planned bench test activities include evaluation of subsurface microbiological conditions/data and the potential for microbiological degradation under various scenarios. The first objective will be to evaluate the potential for aerobic biodegradation by enhancing the intrinsic population. These are processes which might occur to some level during the SVE/AS operation and maintenance (O&M) and be enhanced (e.g., with additions of nutrients, minerals, etc.) if suitably bioengineered. Additional samples will be collected for microbiological evaluation to determine if site conditions may require additions of CL-Solutions' Petrox™ to accelerate the remediation efforts or Regenesis' Oxygen Release Compound (ORC™) to remediate the residual contamination at the site after the SVE/AS system comes off line.

The rationale for selection of samples during fieldwork and for the biofeasibility study is indicated on Table A-2. Two soil samples from each VES well and two soil samples and one groundwater sample from each AS well (after completion) will be analyzed for the phospholipid fatty acids (PLFA), plate counts, specific biodegraders - "listed as bioparameters" on Table A-2. One groundwater sample from 3 of the 4 existing ground water monitoring wells and DP-2 will also be analyzed for the phospholipid fatty acids (PLFA), plate counts, specific biodegraders – the "bioparameters" indicated on Table A-2. [Note: The analysis of PLFA is an effective tool for monitoring microbial responses since PLFA are essential components of all bacterial membranes and are a reliable measure of total viable microbial biomass. PLFA profiles can be used as a "fingerprint" of a microbial community, sensitive to environmental changes. The physiological status (toxic exposure, starvation) of a microbial community are detected by the presence of adaptations in the PLFA profile.]

The soil samples will be collected within possible areas of vadose contamination or within the capillary fringe. The soil samples collected will overly the 1) hot spot or area of highest groundwater contamination; 2) the area of average groundwater contamination; and 3) the soil overlying the plume edge. One groundwater sample from each of three existing groundwater wells will also be collected at the time the groundwater samples are collected from the AS and DP wells. The collection of groundwater samples from the existing wells and planned remediation wells is expected to provide a similar type of distribution for groundwater (i.e., hot spot, or area of highest contamination; 2) the area of average contamination; and 3) the groundwater plume edge).

During the testing of the indigenous population an end-point assay will be performed first. This analysis will indicate if any of the indigenous microbial populations will degrade the contaminant of concern. Once the degraders have been identified, a kinetics study will be performed to know how the addition of nutrients, additives, etc. will affect growth/degradation. A third test that will be performed is called the Comparative Population Assay. This will provide information on the order of magnitude of the site degrader populations and will determine the highest sample dilution at which growth is detected. This data could be used to determine areas where biodegradation on the site is likely without additions of additives, nutrients, etc. or areas where conditions need to be enhanced in order for biodegradation to occur. The analytical chemistry data for the samples will then be integrated into this data. The project length or the time it would take to reach specified clean-up goals under ideal conditions would be estimated for the combined data.

In addition to the bioparameters and contaminants of concern previously described, groundwater samples from three of the four existing groundwater wells, the two proposed AS wells and DP-2, will also be analyzed for California Metals by EPA Method 6010 or equivalent. The optimum pH for bacterial growth is approximately seven (7) and the acceptable range for pH in the vadose zone and in the aquifer is between six (6) and eight (8). Additional soil testing and groundwater testing for pH is also planned. Temperature, specific conductivity, and dissolved oxygen (typical groundwater monitoring parameters) and general water chemistry parameters such as, chloride, calcium, magnesium, sodium, potassium, phosphate, nitrate, nitrite, sulfite and sulfate, total iron, BOD, COD, CO2 and TOC will be analyzed in the borings/ wells where the samples will be collected for bioparameters.

Pilot Testing

Pilot testing is proposed and will include the following components:

1. A vapor extraction vent test for SVE portion of system;
2. An AS test with SVE turned off; and
3. A combined sparge/vent test with SVE and AS operating concurrently.

The objectives of the pilot testing will be:

1. Determine the SVE zone of influence (to determine if any additional wells are required? and the placement of those SVE wells);
2. Estimate the areal influence of the AS system (to determine if any additional wells are required and the placement of those sparging wells);
3. Define the vacuum and pressure requirements for effective treatment and capture of volatilized contamination; and
4. Determine if additional controls will be necessary to contain vapor migration associated with the sparging.

The results of these tests will be documented in the Remedial Design Plan.

SVE Vent Testing

SVE vent testing is planned because the radius of influence (ROI) is not known. A typical effective ROI of SVE wells is on the order of 10-25 feet based on field experience for silty and clayey soils encountered in the subsurface. The current well spacing for proposed VES wells is on the conservative side of this range because of the planned AS component and the presence of buildings where gases could accumulate if an adequate vacuum was not applied. Additional wells may be required and will be identified during the proposed VES vent testing.

The testing will be conducted approximately as follows. The system will be mobilized and the distance between the well used for extraction (VES-1) and the wells (DP-1 through DP-6 and

MW-1 through MW-4) used for monitoring vacuum will be measured. To the extent practically possible, contaminant concentrations and background O2 will be measured prior to the test.

The pilot test will be performed long enough to evacuate a minimum of 1.5 - 2 pore volumes of air in order to gather sufficient and representative data. An eight to 12-hour test is planned. The test will be conducted for long enough for the measured vacuums and extracted TPH and associated VOCs concentrations to reach equilibrium conditions.

The vacuum will then be stepped-up (i.e., more than one vacuum rate will be applied at the test well). Sufficient steps will be performed in order to adequately establish the relationship between vacuum, airflow rates and the VOC mass removal rate. The highest vacuum step applied will be at the maximum capabilities of the air pump or blower used (without submerging the screened interval). Lower vacuum step tests will also be performed, because results from operating at the vacuum extremes helps to determine the vacuum required to obtain optimum mass removal rates.

At two extraction/vacuum rates, vapor samples will be taken for laboratory analysis. Three to five samples will be taken at each of these selected extraction rates in several intervals. These samples will be taken during the test at the extraction well head or upstream of any air dilution valves. Rate of extraction and time of collection will be recorded. Changes in barometric pressure will be monitored at the beginning and end of each vacuum step in order to determine baseline shifts in apparent vacuum. The test will be conducted for long enough for the measured vacuums and extracted hydrocarbon concentrations to reach equilibrium conditions (based on field instrumentation) to the extent practical.

Initial extracted TPH and VOCs concentrations observed are not expected to be indicative of equilibrium conditions and would tend to be higher than during system operation. The first representative sample of the extracted vapors will be collected only after air near the extraction well(s), monitoring wells or probes has been purged. Extraction well vacuum will be held constant at each step until vacuum measurements in all monitoring points have stabilized and reached equilibrium. Vacuum monitoring readings will be taken at wells and/or probes at nominal 15-minute intervals through each vacuum step. Airflow rates will be measured at the extraction well frequently throughout each vacuum step in order to document any increase or decrease in flow. The temperature of the extracted air will be measured concurrently with flow rate measurements during testing. Vacuum levels in each of the surrounding wells will be recorded periodically throughout the testing.

If a vacuum can't be read in wells within the former excavation area, the majority of drive points or in MW-1, MW-2, MW-3, the vapor extraction testing will be conducted using VES-2. Vapor extraction well, VES-2, is within the former excavation area and therefore is expected to have a greater ROI.

Blowers/vacuum pumps used for the SVE vent testing will have explosion proof motors, starters, and electrical systems.

AS Testing

AS testing will follow the selected SVE vent well(s) if more than one test is conducted. AS testing is recommended to determine the effective AS ROI or bubble radius. AS-1 will be used as the injection well if the VES-1 testing was successful. If the VES-1 testing was not successful, but a test using VES-2 is successful, AS-2 will be used for the air injection.

Assuming AS-1 is used for the AS testing, AS-2 and DP-1 through DP-6 as well as MW-1 through MW-4 to the extent practical will be used to determine the ROI. Tracer gases will also be measured in these wells and in VES-1 and VES-2.

Prior to the conducting the AS test, water levels in the AS wells, drive points and groundwater-monitoring wells will be measured. Mounding can be used to determine a ROI of a sparging well because the rise in the water table is localized. Two main stages lead to a steady-state flow pattern. During the first stage, air injected into the saturated zone exceeds the airflow out of the saturated zone. This can be compared to the inflation of a balloon. Once air breaks through the vadose zone, the balloon begins to shrink. During the second stage, pathways of higher air permeability to the vadose zone can be compared to a leak in the balloon of air. The air pocket shrinks until the amount of air injected equals the amount of air that leaks out, and mounding decreases. The maximum mounding will occur at the sparging well and it dissipates radially, spreading wavelike.

Air (with an inert tracer gas such as helium) will be slowly injected below groundwater into the bottom of one of the AS wells at the Fidelity Roof site. At least two different injection pressures will be applied during the AS testing, holding pressure constant for a minimum of two hours at each step. Although the injection pressure will overcome the hydraulic pressure, frictional losses in system, and capillary resistance it will not exceed 3 times the static hydraulic pressure calculated at the top of the injection well screened interval. (Note: It is believed that turbulent flow occurs at higher pressures, potentially producing increased contaminant dissolution and plume migration.) In addition, the injection pressure will not exceed 80% of the total pressure exerted by the weight of the soil and water above the top of the screen. (Note: It is believed that higher pressures may produce fracturing in the sparging well annular seal or along weak joints in the soil, resulting in a loss of system efficiency.) Typical airflow rates range from two SCFM to 25 SCFM but will be based on available rental equipment and field conditions. Pressure readings (in vadose zone) and flow rate readings (at the injection point) will be taken several times at each injection rate.

Changes in dissolved oxygen (DO) and to the extent possible/practical, VOCs will be measured with field instrumentation during testing. Tracer gas concentrations will also be monitored over time in the AS wells, the drive point wells, the groundwater monitoring wells and the VES wells. The distance from each well used for testing and the air injection well will be recorded.

Groundwater mounding will be measured periodically at the injection point and in multiple monitoring wells over time, and distance. The VES wells will also be monitored for the presence of fluid, if any, or evidence in change in fluid levels, if any. This data will be used to determine the ROI -bubble radius and if additional AS wells are required.

Combined SVE Vent Testing and AS Testing

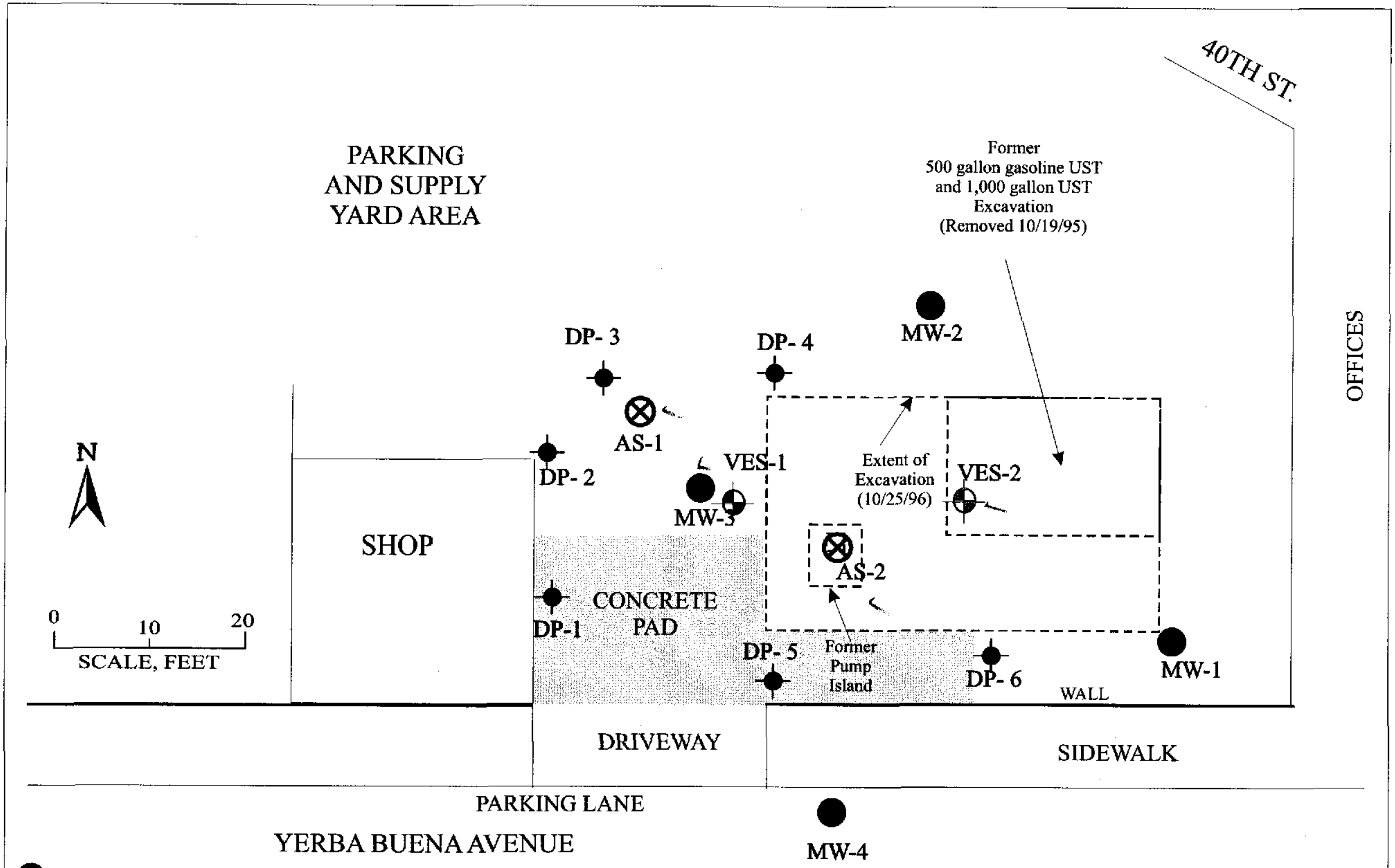
During this portion of the test at the Fidelity Roof site the SVE wells and AS injection wells will be operated concurrently for a period of at least 12 hours. However, some parameters will be monitored for 24 hours. Drive points and MW-1 through MW-4 in addition to the remediation wells will be monitored. The SVE system extraction rate will exceed the AS injection rate to ensure that a net negative pressure is maintained in the subsurface and vapor migration is prevented.

During the testing, vacuum, flow rates and sparging pressure will be monitored periodically. Pressure in the vadose zone will be monitored. To the extent practical groundwater mounding will be measured periodically at the injection point and in multiple monitoring wells. Subsurface gas phase contaminant concentration changes in vadose zone wells/probes and water table wells will be measured.

Changes in the DO of groundwater will be evaluated. DO will be measured over a 24-hour period at the following intervals: 2, 4, 8, 12, and 24 hours following start-up. Oxidation-reduction potential, pH, and conductivity and temperature will be measured and recorded.

Reporting

Following receipt of all chemical, microbiological and survey data as well as analysis of the pilot test data, a technical report will be prepared. The report will include figures, data tables and logs of borings. Recommendations will be made if further well installation appears necessary.



● **Existing Groundwater Monitoring Well**

⊕ **Proposed VES Well**

✛ **Proposed Drive Point**

⊗ **Proposed AS Well**

AEI CONSULTANTS
2500 CAMINO DIABLO, SUITE 200, WALNUT CREEK, CA

PROPOSED WELL LOCATION MAP

1075 40TH STREET
OAKLAND, CALIFORNIA

FIGURE A-1
PROJECT NO. 4436

TABLE A-1
RATIONALE FOR WELL OR DRIVE POINT SELECTION

Proposed Well or Drive Point	Proposed Locations/ Area	Proposed Well Total Depth and Diameter	Proposed Screen Interval	Rationale for Proposed Well and Location
VES-1	Outside the Former Excavation near MW-3	VES-1 = 10' – 12'; 4" ID SCH 40; PVC	7' – 12'	Vapor Extraction; Near the most contaminated groundwater area – near MW-3
VES-2	Inside the Former Excavation	VES-2 = 10' - 12'; 4" ID; SCH 40; PVC	7' – 12'	Vapor Extraction and Vapor Monitoring during testing of VES-1; Within degraded area (soil placed back in the excavation) and in optimum area for vapor extraction due to higher permeability of excavated area
AS-1	Outside the Former Excavation; "Center" of a "5-spot" of varying distances and VES-1	AS-1 = ~37' (25 feet minimum below the greatest depth to water of 12 feet); 4" ID; SCH 40 PVC	17' – 37' 5-15' generally	AS near the most contaminated groundwater area – near MW-3
AS-2	Inside the Former Excavation; "Center" of a "6-spot" plus VES-1 and VES-2	AS-1 = ~37' (25 feet below the greatest depth to water of 12 feet); 4" ID; SCH 40 PVC	17' – 37'	AS within excavation and in optimum area for enhancing vapor extraction due to higher permeability of excavated area; Monitoring AS during testing of AS-1
MW-5	West of MW-3; Western Parking and Supply Yard	MW-5 = 32' 2" ID; SCH 40; PVC	7' – 32'	Point of Down Gradient Compliance
DP-1	Outside the Former Excavation; Western Concrete Pad Area;	DP-1 = ~37'; ¾' to 1" OD; SS	7' – 37'	Monitoring point for VES-1, AS-1

DP-2	Outside the Former Excavation; NE Corner of Shop; SW of AS-1	DP-2 = ~37'; ¾' to 1" OD; SS	7' – 37'	Monitoring point for VES-1, AS-1
DP-3	Outside the Former Excavation; NW of AS-1 in Parking and Supply Yard Area	DP-3 = ~37'; ¾' to 1" OD; SS	7' – 37'	Monitoring point for VES-1, AS-1
DP-4	Outside the Former Excavation; NE of AS-1 in Parking and Supply Yard Area	DP-4 = ~37'; ¾' to 1" OD; SS	7' – 37'	Monitoring point for VES-1 and AS-1; Monitoring Point for VES-2 and AS-2
DP-5	Outside the Former Excavation; Eastern Concrete Pad Area	DP-5 = ~37'; ¾' to 1" OD; SS	7' – 37'	Monitoring point for VES-1; Monitoring Point for VES-2 and AS-2
DP-6	Outside the Former Excavation; East of Concrete Pad Area	DP-6 = ~37'; ¾' to 1" OD; SS	7' – 37'	Possible Monitoring point for VES-1; Monitoring Point for VES-2 and AS-2

TABLE A-2
PROPOSED SAMPLING & RATIONALE FOR SELECTION

Proposed or Existing Well Number	Soil Sample Collection Interval [in fbgs]	Samples Analyses/ # of Samples	Rationale for Sample Selection
VES-1	5, 10/TD	EPA 8015M (TPH-g & TPH-d); EPA 8260 (BTEX & MTBE) 2 – Soil; Bioparameters/1 – Soil	S – Possible Vadose Zone Soil Contamination/ Soil Contamination in the Capillary Fringe; Baseline Microbiological Conditions; Grain Size Analysis
VES-2	5, 10/TD	EPA 8015M (TPH-g & TPH-d); EPA 8260 (BTEX & MTBE) /2 – Soil; Bioparameters/1 - Soil	S –Soil Contamination in Excavated Area / Soil Contamination in the Capillary Fringe; Baseline Microbiological Conditions; Grain Size Analysis
AS-1	5, 10, 15, 20, 25, 30, 35/TD	EPA 8015M (TPH-g & TPH-d); EPA 8260 (BTEX & MTBE) / 2 – Soil; Bioparameters/2 – Soil EPA 8015M (TPH-g & TPH-d); EPA 8260 (BTEX & MTBE); General Chemistry and Bioparameters/1 – GW	S – Possible Vadose Zone Soil Contamination/ Soil Contamination in the Capillary Fringe; Grain Size Analysis GW – Projected GW Hot Spot Area
AS-2	5, 10, 15, 20, 25, 30, 35/TD	EPA 8015M (TPH-g & TPH-d); EPA 8260 (BTEX & MTBE) / 2- Soil; Bioparameters/2 – Soil EPA 8015M (TPH-g & TPH-d); EPA 8260 (BTEX & MTBE); General Chemistry and Bioparameters/1 – GW	S – Soil Contamination in Excavated Area / Soil Contamination in the Capillary Fringe; Grain Size Analysis GW – Projected Mid Plume Area
DP - 1	No Soil Sampling	Field Parameters Only/ 1 - GW	NA
DP - 2	No Soil Sampling	EPA 8015M (TPH-g & TPH-d); EPA 8260 (BTEX & MTBE) General	GW - Ground water monitoring data; Microbiological conditions and general chemistry down gradient of

		Chemistry and Bioparameters/1 – GW	MW-3 and AS-1
DP - 3	No Soil Sampling	Field Parameters Only/ 1 - GW	NA
DP - 4	No Soil Sampling	Field Parameters Only/ 1 - GW	NA
DP - 5	No Soil Sampling	Field Parameters Only/ 1 - GW	NA
DP - 6	No Soil Sampling	Field Parameters Only/ 1 - GW	NA
MW-1	NA	General Chemistry and Bioparameters/1 – GW	GW – Ground water monitoring data; Microbiological conditions and general chemistry at the Plume Boundary
MW-2	NA	General Chemistry and Bioparameters/1 – GW	GW – Ground water monitoring data; Microbiological conditions and general chemistry in the Mid Plume Area
MW-3	NA	EPA 8015M (TPH-g & TPH-d); EPA 8260 (BTEX & MTBE); General Chemistry and Bioparameters/1 – GW	GW –Ground water monitoring data; Microbiological conditions and general chemistry in the Hot Spot Area
MW-4	NA	EPA 8015M (TPH-g & TPH-d); EPA 8260 (BTEX & MTBE) / 1 - GW	GW- Ground water monitoring data
MW-5	5, 10, 15, 20, 25, 30/ TD	EPA 8015M (TPH-g & TPH-d); EPA 8260 (BTEX & MTBE) / 2- Soil and 1 – GW	GW- Ground water monitoring data

PROPOSED CLEANUP LEVELS

Appendix B describes the proposed cleanup levels for the Fidelity Roof Company Fuel Leak Case RO0000186 and Cleanup Fund Claim #13833. The site is located at 1075 40th Street in Oakland, California. The site is regulated under the Alameda County Health Care Services Agency (ACHCSA).

The cleanup levels were proposed based on the:

1. San Francisco Regional Water Quality Control Board (SFRWQCB) Interim Final "Application of Risk-Based Screening Levels and Decision making to Sites with Impacted Soil and Groundwater"; Volume 1: Summary Tier 1 Lookup Tables; dated December 2001; - 2003 July interim final -
2. City of Oakland Public Works Agency "Oakland Urban Land Redevelopment Program Guidance Document"; dated 1 January 2000; and
3. United States Environmental Protection Agency and California Department of Health Services Maximum Contaminant Levels for Drinking Water.

The rationale for selection of clean-up levels is incorporated into this appendix.

Factors Considered in the Selection of the SFRWQCB Risk-Based Screening Levels (RBSL) and in the Selection of the Oakland Urban Land Redevelopment (ULR) Guidelines for the Fidelity Roof Company Site

To select the appropriate ULR guideline and RBSL tables, the following factors were considered for the Fidelity Roof Company site:

- Contaminant levels for TPH-g, TPH-d, BTEX and MTBE from the latest groundwater-monitoring episode conducted on 16 May 2003, which are indicated on Tables B-1. TPH-g concentrations ranged from ND at method detection limits in MW-4 to 59,000 micrograms per liter (ug/L) in MW-3. TPH-d concentrations ranged from 60 ug/L in MW-4 to 17,000 ug/L in MW-3. Benzene ranged from ND at method detection limits in MW-4 to 6200 ug/L in MW-3. MTBE was detected in MW-2 at 6000 ug/L and in MW-4 at 23 ug/L but was not detected in MW-1 and MW-3 at method detection limits (Table B-1);
- Free product is not present;
- The underground storage tanks (USTs), dispensers and associated product piping at the site have been removed completely. The UST system has not been replaced and there is not a primary source for the chemicals of concern;
- The UST area was excavated in stages. The original tank-hold material had low levels of contamination and was used as backfill (after obtaining regulatory permission). The excavation was later reopened, extended and approximately 235 tons of contaminated soil

were transported to BFI Vasco Road Sanitary Landfill in Livermore for disposal. The most impacted soil near the former dispensers was removed and transported offsite;

- Soil contaminants remained at the edge of the excavation (on the west sidewall of the excavation in SWW) and outside the excavated area in SB-4 (near MW-3) based on the 12 September 1996 field activities. In these locations, TPH-g concentrations were 100 milligrams per kilogram (mg/kg) in SB-4 and 150 mg/kg in SWW (9'). TPH-d concentrations were 41 mg/kg in SB-4 and 300 mg/kg in SWW (9'). **MTBE and benzene were present in significant concentrations (13 mg/kg and 16 mg/kg, respectively) in** SWW (9). Other VOCs were also present in these areas. TPH-g, TPH-d, MTBE and benzene contamination was also present at elevated concentrations in SWS-2 (9'), which is between MW-1 and MW-4 and SB-3, which, is closest to MW-1;
- Based on a review of the available boring logs, the type of lithologies present appear to be sandy clay or sandy gravelly clays (MW-1 through MW-3) and clay, sandy silts and silty and clayey sand mixtures (MW-4). This combination of lithologies is probably closest to the clayey silts from the Oakland soil types. **Sieve analyses are planned to confirm the classification;**
- Depth to groundwater ranged from 6.81 feet below top of casing elevation in MW-4 to 11.47 feet below top of casing elevation during the 16 May 2003 groundwater monitoring event;
- The RWQCB classification, which is indicated on the 2000 Water Quality Control Plan for the San Francisco Bay (Basin Plan), Table 2-9 "Existing and Potential Beneficial Uses of Groundwater in Identified Basins or Portions Thereof". On this table, the Oakland Sub-Area of the East Bay Groundwater Basin is classified as existing beneficial use for municipal and domestic water supply, industrial process water supply, industrial service water supply and agricultural water supply. Based on the footnote 8 "the dedesignation of the municipal beneficial use in these areas only applies to the shallow aquifers and not the deeper aquifers. The shallow aquifers are defined as those water-bearing zones above the Yerba Buena Mud (generally less than 100 feet below ground surface). Within these areas, there is no historical, existing or planned use of groundwater as a source of drinking water either in the shallow or deeper aquifers. However, deep aquifers in these areas will continue to be designated as municipal. Therefore pollution in the shallow zones will still be required to be remediated to levels to protect the deeper aquifers or other more stringent levels as required to protect remaining beneficial uses (i.e., aquatic receptors in the shoreline bands);
- Although groundwater protection is thought to be major concern based on the RWQCB Basin Plan classification, the groundwater has been monitored since 3/19/97 and contamination in each of the wells has remained fairly consistent;
- The site is in a mixed residential and commercial area of Oakland. Because of the residential use, more conservative residential risk levels were selected in the SF RWQCB RBSL and Oakland ULR evaluations;
- The facility contains a shop, parking and supply yard area, and is bordered by or contains offices, sidewalk and streets. The site is predominantly paved over with asphalt or concrete or occupied by buildings. Direct exposure to soil and soil gas and impacts to

human health through these media are thought to be limited because of the paving. There is not a known preferential vapor pathway near the source area;

- Urban area ecotoxicity is also thought to be limited. Existing or potential exposure pathways to nearby ecological receptors, such as endangered species, wildlife refuge areas, wetlands, surface water bodies or other protected areas have not been identified. For example, surface runoff that might come in contact with contaminated substances is thought to be limited (i.e., due to paving); and
- Impacts on indoor air quality are unknown but thought to be limited based on the:
    - ☐ Facility use (i.e., industrial, office Vs residential) and open shop area;
    - ☐ Previous removal of near surface soil (hot spot contamination) from the dispenser area and distribution of the degraded soil remaining after the phased excavation;
    - ☐ Immediate re-development efforts for sensitive receptors in this area have not been identified; and
    - ☐ Immediate and acute health risks to humans have not been identified.

<u>Selection of SFRWQCB RBSL, Oakland ULRs and Other Contaminant Levels</u>

Based on the information summarized in the section on "Factors Considered in the Selection of Risk-Based Screening Levels (RBSL) and in the Selection of the Urban Land Redevelopment (ULR) Guidelines for the Fidelity Roof Company Site" of this appendix, SFRWQCB Table A-1 was selected for developing appropriate site clean-up levels. This table addresses RBSL components for surface soil (≤ 3m bgs), which could impact groundwater that is a current or potential drinking water resource. Table A-1 considers the residential risk category. With depth to groundwater ranging from 6.81 feet below top of casing elevation in MW-4 to 11.47 feet below top of casing elevation, the table addressing surface soils less than 0-3 meters below surface seemed to be the best fit.

The Oakland Tier 2 SSTLs for Clayey Silts was also tentatively selected for developing site cleanup levels. The selection of this table was made based on the best fit for lithologies described on boring logs, the apparent low permeability of soils and stability of the groundwater plume at the site, and the shallow depths to groundwater. (Note: One basis for selection of a lithology from the available tables is a sieve analysis for grain size. However, no sieve analyses have been performed to date. During the planned remediation drilling activities these analyses will be performed.) The residential category for subsurface soils was selected from the Oakland Tier 2 SSTLs. The exposure pathway for soil by ingestion of groundwater impacted by leachate was selected because it was conservative. The exposure pathway for groundwater of residential ingestion of groundwater was selected for the same reason.

A third category was also considered for groundwater - the Maximum Contaminant Levels (MCLs) for drinking water from both the United States Environmental Protection Agency (US EPA) and the California Department of Health Services (CA DOHS). In determining total Vs soluble concentrations of contaminants (including organic contaminants) of soils the US EPA Toxicity Characteristic Leaching Procedure (TCLP) and the California Waste Extraction Test (WET) which are an extraction methods are often used in combination with EPA Methods to determine soluble concentrations. The US EPA MCLs (converted to directly to mg/Kg) X 20 and the CA DOHS MCLs (converted directly to mg/Kg) X 10 were used to develop potential soil cleanup levels for organic contaminants at the site. The laboratory method dilution procedure for performing the US EPA TCLP analysis and the California WET were the basis of the multipliers. Contaminant levels below the MCL X the multiplier represent soil contaminant levels below which if the contaminant were 100% soluble it would theoretically not exceed the MCL. OK

Proposed Site Cleanup Levels

Proposed site cleanup levels are indicated on Tables B-2 and B-3. Based on the boring logs, ground water monitoring conducted over several years and the groundwater plume stability, the highest concentrations allowed by SFRWQCB RBSLs, City of Oakland Tier 2 SSTLs or the MCLs were selected as clean-up levels. SFRWQCB RBSLs and City of Oakland Tier 2 SSTLs levels were based on residential sites.

Soil cleanup levels for TPH were taken from the SFRWQCB RBSLs because they were not set by the City of Oakland. Soil cleanup levels for benzene and toluene were also taken from the SFRWQCB RBSLs. Soil cleanup levels for ethyl benzene and xylene were taken from the Oakland ULRs. A soil cleanup level for MTBE was taken from a modification of the CA Wet Test, which, takes into consideration the leaching potential, and the CA DOHS MCL.

Groundwater cleanup levels for TPH were taken from the SFRWQCB RBSLs because they were not set by the City of Oakland. GW cleanup levels for benzene, toluene, ethyl benzene, xylenes and MTBE were taken from the Oakland ULRs.

TABLE B-1
GROUNDWATER SAMPLE ANALYTICAL DATA

Well ID	Date	Consultant/Lab	TPHg (ug/L)	TPHd (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Xylenes (ug/L)	MTBE (ug/L)
MW - 1	03/19/97	AEI/MAI	ND<50		ND<0.5	ND<0.5	ND<0.5	ND<0.5	23
	06/23/97	AEI/MAI	1,300	420	150	2.1	12	19	14
	10/08/97	AEI/MAI	56	66	2.8	ND<0.5	ND<0.5	ND<0.5	5.8
	01/16/98	AEI/MAI	1,500	910	95	0.72	69	8.4	ND<33
	08/05/99	AEI/MAI	160	63	1.6	ND<0.5	0.56	1.1	ND<15
	11/18/99	AEI/MAI	79	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0
	02/24/00	AEI/MAI	300	160	14	0.82	3.5	1.6	ND<5.0
	05/24/00	AEI/MAI	1,300	480	93	ND<0.5	17	1.6	ND<10
	08/29/00	AEI/MAI	120	ND<0.5	0.93	ND<0.5	ND<0.5	ND<0.5	ND<5.0
	01/12/01	AEI/MAI	360	170	16	ND<0.5	9.3	0.69	ND<5.0
	04/18/01	AEI/MAI	1,100	410	63	ND<0.5	34	0.73	2,800
	07/27/01	AEI/MAI	130	66	1.6	ND<0.5	ND<0.5	ND<0.5	ND<5.0
	11/06/01	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0
	02/13/02	AEI/MAI	430	270	17	0.51	11	0.64	ND<5.0
	05/14/02	AEI/MAI	340	170	21	ND<0.5	5.3	0.67	ND<5.0
	08/15/02	AEI/MAI	96	53	0.66	ND<0.5	ND<0.5	ND<0.5	ND<5.0
	11/14/02	AEI/MAI	66,000	23,000	8,300	860	3,000	11,000	ND<1,200
	02/12/03	AEI/MAI	710	120	28	4.3	32	130	ND<5.0
	05/16/03	**AEI/MAI**	**1,100**	**340**	**54**	**4.1**	**40**	**100**	**ND<15**
MW - 2	03/19/97	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	65
	06/23/97	AEI/MAI	ND<50	ND<50	3.4	ND<0.5	ND<0.5	ND<0.5	70
	10/08/97	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	90
	01/16/98	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	65
	08/05/99	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	600
	11/18/99	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	370
	02/24/00	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	880
	05/24/00	AEI/MAI	ND<250	62	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2,200
	08/29/00	AEI/MAI	ND<200	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1,900
	01/12/01	AEI/MAI	470	70	8.7	3.1	16	73	2,000
	04/18/01	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2,800
	07/27/01	AEI/MAI	ND<100	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3,300
	11/06/01	AEI/MAI	ND<100	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3,000
	02/13/02	AEI/MAI	54	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3,200
	05/14/02	AEI/MAI	ND<150	ND<50	4.8	ND<1.0	ND<1.0	ND<1.0	3,800
	08/15/02	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2,900
	11/14/02	AEI/MAI	ND<120	ND<50	ND<1.0	ND<1.0	ND<1.0	ND<1.0	3,800
	02/12/03	AEI/MAI	1,100	120	57	7	55	210	3,200
	05/16/03	**AEI/MAI**	**530**	**85**	**35**	**3.6**	**22**	**79**	**6,000**

TABLE B-1
GROUNDWATER SAMPLE ANALYTICAL DATA

MW -3	03/19/97	AEI/MAI	26,000	5,000	3,000	530	340	2,300	230
	06/23/97	AEI/MAI	25,000	7,000	4,400	120	540	1,500	270
	10/08/97	AEI/MAI	17,000	5,100	4,400	47	280	410	ND<280
	01/16/98	AEI/MAI	29,000	7,300	5,600	740	950	3,500	ND<360
	08/05/99	AEI/MAI	31,000	5,100	5,400	150	1100	2,300	ND<200
	11/18/99	AEI/MAI	74,000	490,000	8,100	5,000	2,100	8,100	ND<1,000
	02/24/00	AEI/MAI	110,000	6,300	12,000	1,400	2,900	14,000	ND<200
	05/24/00	AEI/MAI	87,000	26,000	13,000	1,900	2,900	14,000	ND<200
	08/29/00	AEI/MAI	49,000	9,400	7,400	800	1,800	7,400	ND<200
	01/12/01	AEI/MAI	69,000	21,000	8,600	980	2,600	11,000	ND<300
	04/18/01	AEI/MAI	75,000	13,000	9,200	1,200	2,500	12,000	ND<500
	07/27/01	AEI/MAI	75,000	85,000	8,700	1,100	2,600	12,000	ND<650
	11/06/01	AEI/MAI	89,000	86,000	7,900	910	2,800	12,000	ND<200
	02/13/02	AEI/MAI	85,000	13,000	8,500	830	2,600	11,000	ND<2000
	05/14/02	AEI/MAI	94,000	35,000	9,700	1,100	3,400	15,000	ND<1000
	08/15/02	AEI/MAI	37,000	9,700	5,200	430	1,800	5,900	ND<1200
	11/14/02	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0
	02/12/03	AEI/MAI	61,000	8,400	6,800	500	2,400	9,800	ND<500
	05/16/03	**AEI/MAI**	**59,000**	**17,000**	**6,200**	**320**	**2,000**	**6,500**	**ND<500**
MW-4	08/05/99	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	37
	11/18/99	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	20
	02/24/00	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	20
	05/24/00	AEI/MAI	120	140	1.3	ND<0.5	ND<0.5	ND<0.5	31
	08/29/00	AEI/MAI	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	22
	01/12/01	AEI/MAI	ND<50	81	ND<0.5	ND<0.5	ND<0.5	ND<0.5	25
	04/18/01	AEI/MAI	30	170	2.4	1.1	0.66	4.2	35
	07/27/01	AEI/MAI	87	110	1.8	ND<0.5	2	10	26
	11/06/01	AEI/MAI	200	59	4.5	1	5.2	24	21
	02/13/02	AEI/MAI	ND<50	91	ND<0.5	ND<0.5	ND<0.5	ND<0.5	15
	05/14/02	AEI/MAI	260	140	12	2.7	11	49	26
	08/15/02	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	12
	11/14/02	AEI/MAI	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	11
	02/12/03	AEI/MAI	170	130	3.1	0.66	6.4	27	16
	05/16/03	**AEI/MAI**	**ND<50**	**60**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**23**

Notes:

ug/L= micrograms per liter

MTBE= Methyl Tertiary Butyl Ether

TPHg= Total Petroleum Hydrocarbons as gasoline

TPHd= Total Petroleum Hydrocarbons as diesel

AEI = AEI Consultants

MAI = McCampbell Analytical Inc., Pacheco, California

Please refer to Appendix B: Laboratory Analysis for more detailed information including method detection limits and dilution factors

TABLE B-2
PROPOSED SOIL CLEANUP LEVELS

Chemical Parameter	SB RWQCB		Oakland ULRs				Fidelity Roof Soils Site Soils					Summary of Regulatory Levels			USEPA MCLs X 20 (mg/Kg)	CA DOHS MCLs X 10 (mg/Kg)	Proposed Site Soil Cleanup Levels (mg/Kg)
	Table A-1 - Surface Soils RBSLs - Residential		Tier 2 SSTLs for Clayey Silts (Residential)														
	Residential Land Use Permitted (mg/kg)	Commercial/ Industrial Land Use Only (mg/kg)	Surficial Soils (Ingestion/Dermal/ Inhalation) (mg/Kg)		Subsurface Soils (Ingestion of Groundwater impacted by leachate) (mg/Kg)		Highest Levels Remaining after Excavation (mg/Kg)		Number of Samples that Exceed RBSLs Levels	Samples/ Concentrations that Exceed RBSLs (mg/Kg)		Soil Cleanup Levels based on RWQCB RBSLs (mg/Kg)	Soil Cleanup Levels based on Oakland ULRs Ingestion of Groundwater Impacted by Leachate (mg/Kg)				
			Carcinogenic	Hazard	Carcinogenic	Hazard							Carcinogenic	Hazard			
TPH (gasolines)	100	100	None Set	None Set	None Set	None Set	150	SWW	2 of 7	150 120	SWW SWS-2	100	NA	NA	NA	NA	100
TPH (middle distillates)	100	100	None Set	None Set	None Set	None Set	300	SWW	1 of 7	300	SWW	100	NA	NA	NA	NA	100
TPH (residual fuels)	500	1000	None Set	None Set	None Set	None Set	NA	NA	NA			500	NA	NA	NA	NA	500
Benzene	0.045	0.045	19	63	0.0045	0.0045	16	SWW	5 or Possibly 6 of 7	16 2.7 0.54 0.37 0.33 ND <0.5	SWW SB-3 SWS-2 SB-4 SB-2 SWS-1	0.045	0.0045	0.0045	0.1	0.01	0.045
Toluene	2.6	2.6	-	7,100	1.8	1.8	83	SWW	2 of 7	83 2.9	SWW SB-3	2.6	1.8	1.8	20	1.5	2.6
Ethylbenzene	2.5	2.5	-	3,900	16	16	28	SWW	2 of 7	28 2.7	SWW SB-3	2.5	16	16	14	6.8	16
Xylenes	1	1	- -	53,000	27	27	140	SWW	3 of 7	140 11 6.9	SWW SB-3 SB-4	1	27	27	200	17.5	27
Methyl Tert Butyl Ether	0.028	0.028		200	0.021	0.021	13	SWW	3 or Possibly 6 of 7	13 1.1 0.24 ND <0.3 ND <0.05 ND <0.05	SWW SB-3 SB-4 SWS SB-2 SWS-2	0.028	0.021	0.021	NA	0.13	0.13

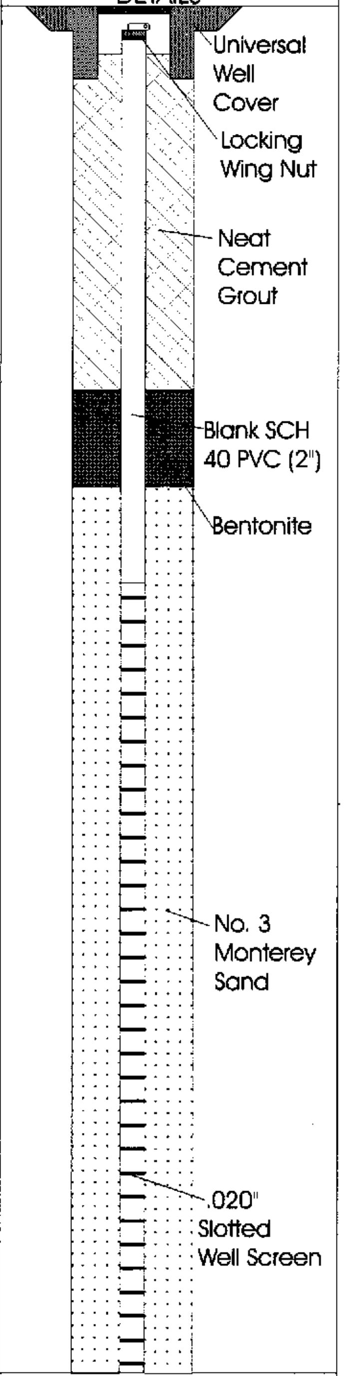
TABLE B-3
PROPOSED GROUNDWATER CLEANUP LEVELS

Chemical Parameter	SBRWQCB		Oakland ULRs		Fidelity Roof Groundwater							Summary of Regulatory Levels				Proposed Site Cleanup Levels
	Groundwater RBSLs		Tier 2 - Clayey Silts		Site Conditions											
	Drinking Water Resource Threatened (ug/L)	Elevated Threat to Surface Water (ug/L)	Ingestion of Groundwater (ug/L)		Highest Historic Levels Reported (ug/L)		Highest Levels In 16 May 2003 GWM Episode (ug/L)		Number of Samples that Exceed RBSLs Levels In 15 May 2003 GWM Episode	Samples/ Concentrations that Exceed RBSLs (ug/L)		Required GW Cleanup Levels based on RWQCB RBSLs (ug/L)	Required GW Cleanup Levels based on Oakland ULRs (ug/L)	USEPA MCLs (ug/L)	CA DOHS MCLs (ug/L)	(ug/L)
			Carcinogenic	Hazard												
TPH (gasolines)	100	-	None Set	None Set	110,000	MW-3	59,000	MW-3	3 of 4	59,000 1,100 530	MW-3 MW-1 MW-2	100	NA	NA	NA	100
TPH (middle distillates)	100	-	None Set	None Set	490,000	MW-3	17,000	MW-3	2 of 4	17,000 340	MW-3 MW-1	100	NA	NA	NA	100
TPH (residual fuels)	100	-	None Set	None Set	NA	NA	NA	NA	NA	NA	NA	100	NA	NA	NA	
Benzene	1	-	1	1	13,000	MW-3	6,200	MW-3	3 of 4	6,200 54 35	MW-3 MW-1 MW-2	1	1	5	1	1
Toluene	40	-	150	150	5,000	MW-3	320	MW-3	1 of 4	320	MW-3	40	150	1,000	150	150
Ethylbenzene	30	-	700 -	700	3,400	MW-3	2,000	MW-3	2 of 4	2,000 40	MW-3 MW-1	30	700	700	680	700
Xylenes	13	-	1800 -	1800	15,000	MW-3	6,500	MW-3	3 of 4	MW-3 MW-1 MW-2	6,500 100 79	13	1,800	10,000	1,750	1,800
Methyl Tert Butyl Ether	5	-	13 -	13	6,000	MW-2	6,000	MW-2	2 or Possibly 4 of 4	6,000 23 ND<500 ND<15	MW-2 MW-4 MW-3 MW-1	5	13	NA	13	13

PROJECT: Fidelity Roof Co. # 1540		**LOG OF WELL NUMBER:** MW-1	
BORING LOC.: REFER TO SITE PLAN		ELEVATION, TOC: 45.41'	
DRILLING CONTRACTOR: GREGG DRILLING		START DATE: 3/6/97	END DATE: 3/6/97
DRILLING METHOD: HOLLOW STEM AUGER		TOTAL DEPTH: 21'	SCREEN INT: 6'-21'
DRILLING EQUIPMENT: MOBILE B-53		DEPTH TO WATER: 9'	CASING: 2" PVC
SAMPLING METHOD: 2" DRIVE SAMPLER		LOGGED BY: BC	
HAMMER WEIGHT and FALL: 140 lb, 30"		RESPONSIBLE PROFESSIONAL: JPD	

DEPTH (feet)	SOIL SYMBOLS	DESCRIPTION	SAMPLES		
			SAMPLE NO.	INTERVAL	BLOW COUNTS
	AB	0.0 - 0.6; Asphalt, 3" Aggregate Base.			
1					
2					
3					
4				☒	6 12 18
5	CL	0.6 - 21.0: Sandy Gravelly Clay; dark greenish gray with low plasticity; gravel up to 1/8"; slight hydrocarbon odor; 30 ppm.	5'		
6					
7					
8					
9		▼		☒	7 14 14
10	CL	0.6 - 21.0: Sandy Clay (cont.): moderate yellowish brown with high plasticity; grayish olive mottling; strong hydrocarbon odor; 700 ppm.	10'		
11					
12					
13					
14				☒	5

WELL CONSTRUCTION DETAILS

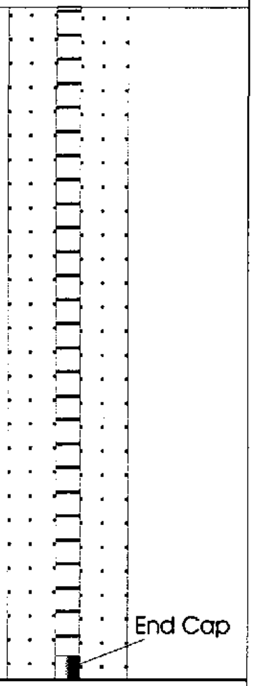


PROJECT: Fidelity Roof Co. #1540

LOG OF BOREHOLE: MW-1

DEPTH (feet)	SOIL SYMBOLS	DESCRIPTION	SAMPLES: SAMPLE NO.	SAMPLES: INTERVAL	SAMPLES: BLOW COUNTS
15	CL	0.6 - 21.0: Sandy Clay (cont.): moderate yellowish brown with low plasticity; grayish olive mottling; slight hydrocarbon odor; 30 ppm.	15'		7 8
16					
17					
18					
19					20 25
20	CL	0.6 - 21.0: Sandy Gravelly Clay (cont.): moderate yellowish brown with high plasticity; grayish olive mottling; slight hydrocarbon odor; 0 ppm.	20'		40
21		Terminated at 21.0'			
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

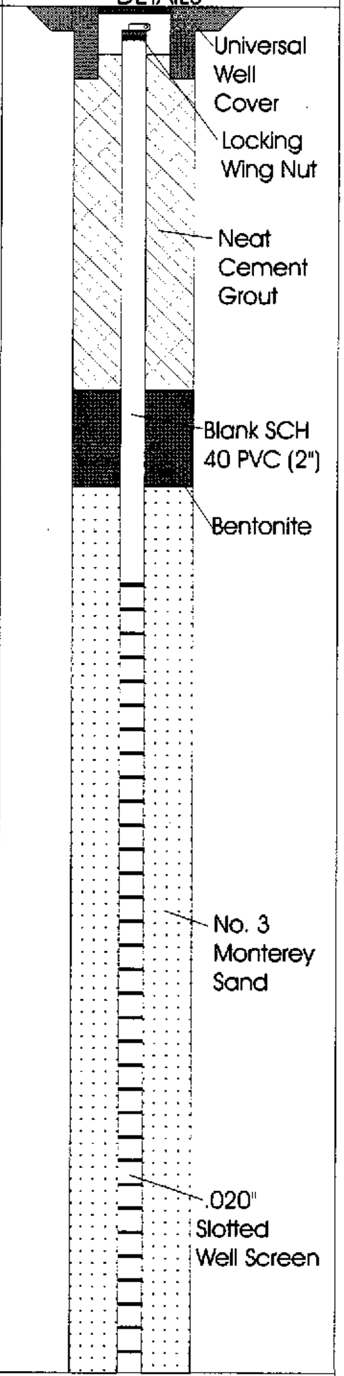
WELL CONSTRUCTION DETAILS



PROJECT: Fidelity Roof Co. # 1540
LOG OF WELL NUMBER: MW-2
BORING LOC.: REFER TO SITE PLAN
ELEVATION, TOC: 44.94'
DRILLING CONTRACTOR: GREGG DRILLING
START DATE: 3/6/97
END DATE: 3/6/97
DRILLING METHOD: HOLLOW STEM AUGER
TOTAL DEPTH: 21'
SCREEN INT: 6'-21'
DRILLING EQUIPMENT: MOBILE B-53
DEPTH TO WATER: 9'
CASING: 2" PVC
SAMPLING METHOD: 2" DRIVE SAMPLER
LOGGED BY: BC
HAMMER WEIGHT and FALL: 140 lb, 30"
RESPONSIBLE PROFESSIONAL: JPD

DEPTH (feet)	SOIL SYMBOLS	DESCRIPTION	SAMPLES SAMPLE NO.	SAMPLES BLOW COUNTS
0	AB	0.0 - 0.6; Asphalt, 3" Aggregate Base.		
4				6
				8
5	CL	0.6 - 21.0: Sandy Gravelly Clay; dark greenish gray with low plasticity; gravel up to 1/8"; slight hydrocarbon odor; 30 ppm.	5'	18
9		▼		6
				10
10	CL	0.6 - 21.0: Sandy Clay (cont.): moderate yellowish brown with low plasticity; grayish olive mottling; slight hydrocarbon odor; 40 ppm.	10'	14
14				6

WELL CONSTRUCTION DETAILS



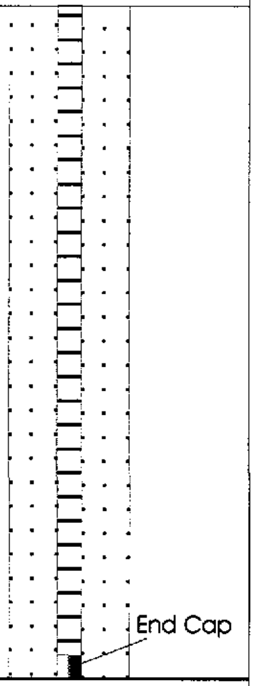
ALL ENVIRONMENTAL, INC.

PROJECT: Fidelity Roof Co. #1540

LOG OF BOREHOLE: MW-2

DEPTH (feet)	SOIL SYMBOLS	DESCRIPTION	SAMPLES SAMPLE NO.	SAMPLES INTERVAL	SAMPLES BLOW COUNTS
15	CL	0.6 - 21.0: Sandy Clay (cont.): moderate yellowish brown with low plasticity; grayish olive mottling; slight hydrocarbon odor; 40 ppm.	15'		12 15
16					
17					
18					
19					10 18
20	CL	0.6 - 21.0: Sandy Gravelly Clay (cont.): moderate yellowish brown with low plasticity; grayish olive mottling; slight hydrocarbon odor; 20 ppm.	20'		25
21		Terminated at 21.0'			
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

WELL CONSTRUCTION DETAILS



PROJECT: Fidelity Roof Co. # 1540

LOG OF WELL NUMBER: MW-3

BORING LOC.: REFER TO SITE PLAN

ELEVATION, TOC: 44.32'

DRILLING CONTRACTOR: GREGG DRILLING

START DATE: 3/6/97

END DATE: 3/6/97

DRILLING METHOD: HOLLOW STEM AUGER

TOTAL DEPTH: 21'

SCREEN INT: 6'-21'

DRILLING EQUIPMENT: MOBILE B-53

DEPTH TO WATER: 9'

CASING: 2" PVC

SAMPLING METHOD: 2" DRIVE SAMPLER

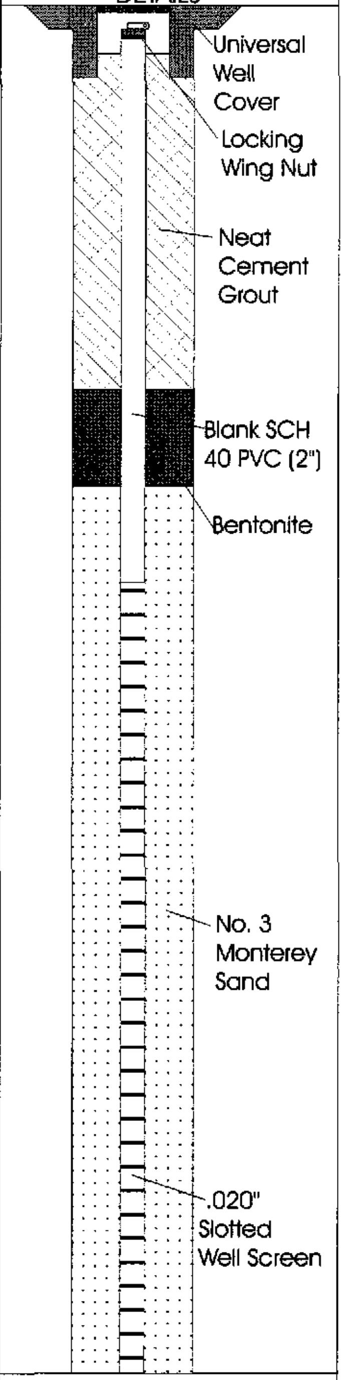
LOGGED BY: BC

HAMMER WEIGHT and FALL: 140 lb, 30"

RESPONSIBLE PROFESSIONAL: JPD

DEPTH (feet)	SOIL SYMBOLS	DESCRIPTION	SAMPLE NO.	INTERVAL	BLOW COUNTS
0	AB	0.0 - 0.6; Asphalt, 3" Aggregate Base.			
1					
2					
3					
					6
4					12
5	CL	0.6 - 21.0: Gravelly Clay; grayish brown with low plasticity; gravel up to 1/8"; slight hydrocarbon odor; 10 ppm.	5'		20
6					
7					
8					
9		▼			8
					16
10	CL	0.6 - 21.0: Sandy Gravelly Clay (cont.): grayish brown with low plasticity; grayish olive mottling; strong hydrocarbon odor; >1,000 ppm.	10'		16
11					
12					
13					
14					6

WELL CONSTRUCTION DETAILS



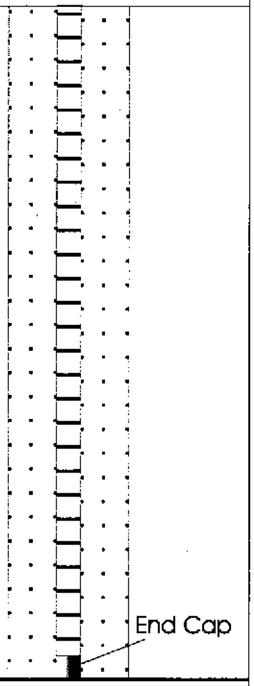
ALL ENVIRONMENTAL, INC.

PROJECT: Fidelity Roof Co. #1540

LOG OF BOREHOLE: MW-3

DEPTH (feet)	SOIL SYMBOLS	DESCRIPTION	SAMPLE NO.	INTERVAL	BLOW COUNTS
15	CL	0.6 - 21.0: Sandy Clay (cont.): moderate yellowish brown with low plasticity; grayish olive mottling; slight hydrocarbon odor; 84 ppm.	15'		8 10
16					
17					
18					
19					
20	CL	0.6 - 21.0: Sandy Gravelly Clay (cont.): moderate yellowish brown with low plasticity; grayish olive mottling; slight hydrocarbon odor; 8 ppm.	20'		8 15 20
21		Terminated at 21.0'			
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					

WELL CONSTRUCTION DETAILS



ALL ENVIRONMENTAL, INC.

Project No: 3119

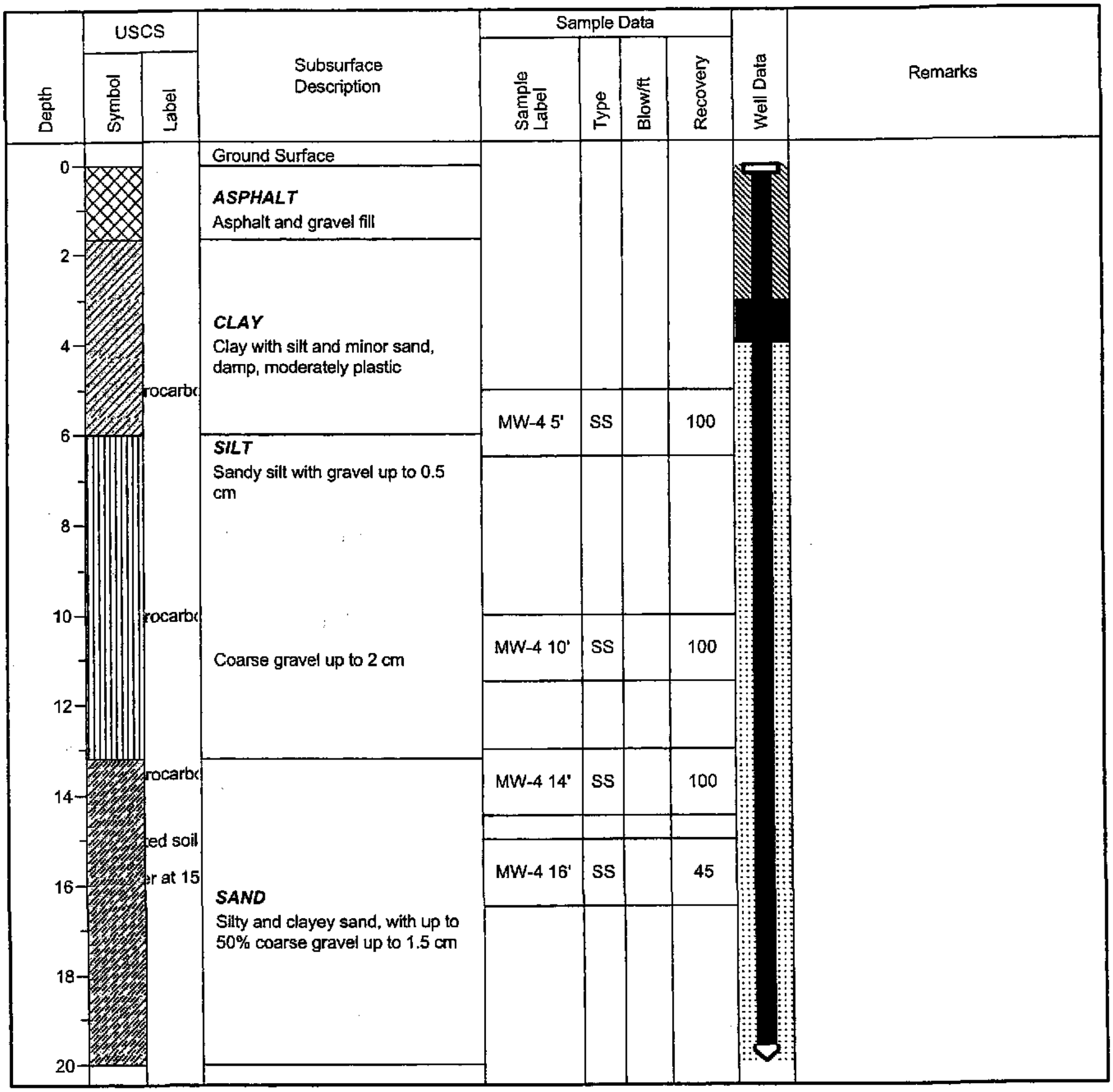
Project Name: FIDELITY

Client: M. UPSHAW

Location: YERBA BUENA AVE.

Sheet: 1 of 1

Log of Borehole: MW-4



Depth	Subsurface Description	Sample Label	Type	Blow/ft	Recovery
0	Ground Surface				
0–1.6	***ASPHALT*** Asphalt and gravel fill				
1.6–6	***CLAY*** Clay with silt and minor sand, damp, moderately plastic	MW-4 5'	SS		100
6–13.2	***SILT*** Sandy silt with gravel up to 0.5 cm				
	Coarse gravel up to 2 cm	MW-4 10'	SS		100
13.2–20	***SAND*** Silty and clayey sand, with up to 50% coarse gravel up to 1.5 cm	MW-4 14'	SS		100
		MW-4 16'	SS		45

Drill Date 7/15/99

Drill Method: HOLLOW AUGER

Total Depth: 20 ft.

Depth to Water: 15 ft.

Reviewed by: JPD

Logged by: PJM

AEI Consultants
3210 Old Tunnel Road, Suite B
Lafayette, CA 94549
(925) 283-6000