Subsurface Consultants, Inc.

CAP#

MW-14 (new well inside bldg for FP)

April 15, 1999
SCI 447.055

Ms. Susan Hugo
Senior Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Work Plan
Groundwater Monitoring and
Expanded Corrective Action Plan Preparation
Connell Automotive Dealership Facility
3093 Broadway (STID# 469)
Oakland, California

Dear Ms. Hugo:

This letter presents a work plan prepared by Subsurface Consultants, Inc. (SCI) to (1) continue free product removal and groundwater monitoring activities, and (2) prepare an expanded Corrective Action Plan (CAP) for the referenced Site in accordance with the requirements outlined in your letter dated January 25, 1999. The Site is shown on Plate 1. The work plan describes the research, investigation, monitoring, and evaluation services which will be performed.

PROJECT OVERVIEW

The Site is an active automobile dealership, with a service facility and a sales department which are open 6 and 7 days a week, respectively. The automobile dealership is larger than a typical service station as it was constructed as a "show place" in an area referred to as Oakland's Auto Row. The hydrogeology underlying the Site is relatively complex, with preferential flow occurring in permeable sand and gravel sediments within former subsurface stream channels. The channel deposits which extend below the repair and office portions of the existing facility are contaminated by former releases from a gasoline dispensing system which was removed from the Site in 1989.

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The Alameda County Health Care Services Agency (ACHCSA) approved a Corrective Action Work Plan dated November 6, 1995, which proposed using vapor extraction system (VES) technologies to remove free product. The VES had limited success in reducing the quantity of free product as a result of the complex hydrogeologic conditions. As a result, in 1998, the ACHCSA requested that efforts be undertaken to enhance VES efficiencies or identify another acceptable approach to remove free product.

STATUS OF ACTIVITIES CONDUCTED IN 1998

SCI prepared a work plan dated December 23, 1997, which outlined the following tasks to be conducted in 1998:

Task 1 - Interim free product removal using Vapor Extraction System
Task 2 - Groundwater monitoring,
Task 2A - Soil stockpile transportation and disposal,
Task 2B - Additional investigation,
Task 3 - Vapor extraction pilot test,
Task 4 - Biotreatability evaluation,
Task 5 - Tier 1 risk-based corrective action analysis,
Task 6 - Feasibility study and corrective action plan, and
Task 7 - Project management and consultation.

The plan was approved by the ACHCSA on January 26, 1998. Following meetings and discussions with the California Underground Storage Tank Cleanup Fund (Fund) and ACHCSA, SCI obtained approval to cease operating the VES unit. The system was removed from the site in March 1998.

The results of additional subsurface investigation conducted in May 1998 were consistent with previous data suggesting that free product and dissolved hydrocarbon concentrations of potential concern occurred primarily within the Site areas underlain by channel deposits, and did not appear to be widespread. These new studies further delineated the presence of a significant permeable channel deposit which SCI believes has acted as a preferential pathway for the accumulation of free product released at the Site. As water levels rise and fall, it appears that product has migrated within the channel deposit and intersected other permeable layers or "fingers" at various depths below the ground surface (bgs). In addition to varying in depth, the permeable layers vary in size and shape.

Further evaluation of the Site data suggests that fluctuation of the water table is a significant controlling factor at the site. At several locations, the permeable layers which have been encountered contain varying quantities of free floating product. As the water table fluctuates,

permeable layers collect product which then may or may not be able to migrate away from the permeable zone as the water table continues to rise and fall. Our studies suggest that these subsurface conditions do not lend themselves to timely and successful remediation using standard VES, as was originally believed. As such, SCI does not intend to conduct the proposed vapor extraction and groundwater pumping tests which were to provide data to complete the remediation feasibility studies.

Between July and October, 1998, SCI had several meetings with the regulatory agencies to establish a consistent approach to manage the Site's environmental issues in an effort to move toward Site closure. The ACHCSA (acting as the lead regulatory agency), Cal/EPA San Francisco Regional Water Quality Control Board (RWQCB), the City of Oakland, representatives of the Site owners, and SCI participated in these meetings to assure that there was a consensus for decisions made. Four meetings were held on July 13, August 18, October 1, and October 8, 1998.

The culmination of the meetings resulted in the ACHCSA and the RWQCB conditionally accepting a risk-based approach for Site management and closure. Further, it was agreed that the Site will be a "pilot site" for use in the City of Oakland's Urban Land Redevelopment (ULR) Program. The City of Oakland is in the process of finalizing risk-based criteria which can be used to establish cleanup standards at qualifying sites. A detailed discussion of the ACHCSA acceptance of this approach is outlined in the ACHCSA's January 25, 1999 letter. In general, ACHCSA indicated that a risk-based cleanup approach will be acceptable provided the site-specific issues outlined below are addressed in an expanded CAP:

- The primary source of contamination (i.e., free product found in groundwater) has been removed,
- The extent of the soil and/or groundwater contamination has been adequately characterized,
- The dissolved hydrocarbon plume appears to be stable and not migrating,
- No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted,
- The stratigraphy of the Site indicates that the City of Oakland ULR criteria is appropriate to use, and
- Residual contamination in soil and groundwater does not pose a risk to human health or the environment.

The ACHCSA January 25, 1999 letter further requires that the expanded CAP also incorporate the following necessary elements:

- Scope and schedule for free product recovery,
- Scope and schedule for the groundwater monitoring program,
- Results of geotechnical laboratory testing of selected soil samples to confirm that the soils beneath the Site satisfy the ULR criteria,
- Research, evaluation, and discussion of preferential subsurface pathways such as utility trenches along Broadway, which may allow contaminant migration offsite,
- A Risk Management Plan (RMP) to (1) manage residual contamination left at the Site and (2) establish a process for agency notification prior to any construction, redevelopment and/or change in land use, and
- Proper abandonment procedures for the existing monitoring wells to be implemented upon direction of the ACHCSA.

PROPOSED SCOPE OF WORK

This work plan has been prepared at the request of the ACHCSA to describe the steps necessary to prepare an expanded CAP for the Site. It has been prepared to meet ACHCSA's requirements as set forth in the preceding section. This scope of work includes both ongoing and new tasks. As such, this document supersedes all other work plans and proposals previously submitted by SCI. The work plan includes the following tasks:

Task 1	Free Product Removal
Task 2	Groundwater Monitoring
Task 3	Additional Site Evaluation
Task 3.1	Categorization of Soil
Task 3.2	Research of Potential Subsurface Pathways
Task 3.3	Sensitive Receptor Survey
Task 3.4	Human Health Risk Evaluation
Task 4	Risk Management Plan
Task 5	Expanded CAP
Task 6	Technical Regulatory Assistance

These tasks are further described herein.

Task 1 - Free Product Removal

SCI will continue to check all Site wells monthly for free product as required by the ACHCSA. The depth to water and the thickness of free product will be gauged using a measuring tape covered with petroleum and water sensitive pastes. If the free product thickness is measured to be greater than 1/4 inch, then efforts will be undertaken to remove the product. Monthly product and

water level measurements, and the quantity of product removed, will be reported in the quarterly groundwater monitoring reports.

During our Site studies, free product has been measured periodically in 7 of the Site wells, but has recently been present in only 3 wells. To expedite the product removal activities, SCI will install passive product removal devices in wells MW-1, MW-6 and MW-14 where product has recently been measured. The recovery units will be more effective for product removal than hand-bailing in these wells, because product will be recovered constantly rather than intermittently. Free product measured in any other wells will be removed by hand-bailing.

Significant quantities of free product have been removed from Well MW-6 on a monthly basis. SCI will install a passive skimming system in this well, to facilitate the removal of greater quantities of product in a shorter period of time. The skimming system will incorporate the use of an active buoy assembly suspended within the well.

The volume of product in monitoring wells MW-1 and MW-14 has been significantly less than the volume recovered from well MW-6. SCI proposes to install an absorbent "sock" passive recovery system in these wells. This type of system consists of a stainless steel canister equipped with a disposable absorbent inner tube. The sorbent material is a fibrous polypropylene material contained in a white fabric sock. Each tube is capable of absorbing approximately a liter of product. The system will be suspended within the well.

During the first month after installation, the passive systems will be checked weekly to make sure that they are functioning correctly, and will be repositioned as necessary. The systems will then be monitored during the monthly free product removal events. Collection canisters will be emptied and "socks" will be replaced as necessary during each event. Free product and spent sorbent materials removed from the wells will be stored onsite in labeled drums.

Task 2 - Groundwater Monitoring

SCI will continue to perform the groundwater monitoring as required by the ACHCSA. Based on our review of the monitoring data, SCI proposes that the program be revised as follows:

- Quarterly Sampling Events - Downgradient wells MW-7, MW-8 and MW-13 will be sampled and analyzed for TVH, TEH, BTEX, and DCA.[1]

[1] TVH=Total volatile hydrocarbons as measured using EPA Methods 5030/8015mod.
TEH=Total extractable hydrocarbons as measured using EPA Methods 3520/8015mod.
BTEX=Benzene, Toluene, Ethylbenzene, Xylenes as measured using EPA Methods 5030/8020
DCA=1,2 Dichloroethane as measured using EPA Methods 5030/8260

- ~~Semi-Annual~~ Events - Plume wells MW-1, MW-4, MW-6, MW-9, and either MW-14 or MW-15 will be sampled and analyzed if free product is not detected. Samples will be analyzed for TVH, TEH, BTEX, and DCA. Well MW-1 samples will also be analyzed for O&G and SVOC[2].

- Cease Monitoring - SCI recommends that monitoring be discontinued in all other wells. Well MW-10 is in close proximity to well MW-4, and has a history of similar measurements. The other wells (MW-2, MW-3, MW-5 and MW-11) have shown non-detectable concentrations of hydrocarbons for at least 4 consecutive quarters of monitoring.

During each event, the depth to groundwater and the presence of free floating product will be measured as discussed in the previous section. The groundwater gradient and flow direction will be determined and presented on a map included with each quarterly technical report.

Wells which are proposed for sampling, and which do not contain free product, will be purged of at least three well volumes of water. Purge water will be collected and stored on site in appropriate containers. After the wells recharge to within 80 percent of their initial level, they will be sampled with new disposable bailers. Purge water will stored in labeled drums.

Groundwater samples will be retained in pre-cleaned containers supplied by the analytical laboratory and will be placed in ice-filled coolers, remaining iced until delivery to the laboratory. Chain-of-custody records will accompany the samples.

The results of each event will be summarized in a written report which will be submitted on a quarterly basis. The reports will include field sampling forms, analytical test reports, chain-of-custody documents, a groundwater contour map and tabulated analytical data, water level measurements and free product removal quantities.

Waste materials including free product, spent sorbent materials and purge water which are generated during SCI Site activities will be periodically removed from the site, and properly disposed. During the first removal action 8 drums containing purge water and soil cuttings remnants following Site investigations conducted in 1998, will also be removed. SCI will coordinate waste removal activities with qualified waste management contractors.

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[2] O&G=Oil and Grease as measured using EPA Methods 5520 B&F
SVOC=Semi-volatile Organic Compounds as measured using EPA Methods 3550/8270

Documentation of removal activities conducted will be presented with project status and quarterly reports, as appropriate.

Task 3 - Additional Site Evaluation

Additional site evaluation tasks are required to provide data to complete the expanded CAP and to comply with ACHCSA's requirements. The tasks are described below.

Task 3.1 - Categorization of Soil

The City of Oakland ULR screening criteria have been formulated for three predominate soil types found in the Oakland area. The soil types include Merritt sand, sandy silts, and clayey silts. The City of Oakland has presented general soil characteristics for each of these soil types. The ACHCSA has required that an assessment be conducted to determine (1) whether it is appropriate to use the City of Oakland ULR program given the type of soils present at the Site, and (2) if it is appropriate, then which soil type should be used. To address these issues SCI will prepare cross section plans which present our graphical interpretation of the site stratigraphy. SCI will identify those prominent soil layers which appear to be horizontally continuous. SCI will then compare the data to the soil characteristics for the three ULR designated soil types, and make a determination as to which of these types typifies the soil present at the Site.

During the aforementioned agency meetings it was also agreed that for the Site to be considered for the ULR program it would be necessary to confirm the presence of soil layers which act as barriers to the upward migration of vapors within the area overlying the plume as this area represents the highest potential exposure risk. To address this issue SCI will review the cross sections and select two soil sampling locations in the area overlying the plume to evaluate the permeability of the shallow soil layers. The locations will be discussed with the ACHCSA prior to obtaining the samples. If possible SCI will select locations outside of the existing facility to minimize disturbance to current activities.

Samples will be collected from the upper 3 feet and between 3 and 10 feet bgs using a truck mounted drill rig with direct push technology. All sampling equipment that will be placed in the test borings will be cleaned prior to their initial use and prior to each subsequent use to reduce the likelihood of cross-contamination between borings and/or samples. Following sample collection, the holes will be filled with cement grout and the surface area will be patched to match existing conditions.

The soil samples will be analyzed for the following soil characteristics:

- Grain size distributions (sieve analysis, including hydrometer);
- Porosity;

- Moisture Content; and
- Specific Yield/Retention.

The data will be reviewed to evaluate the apparent effectiveness of the shallow clay layer to act as a barrier to vapor migration.

Task 3.2 - Research of Potential Subsurface Pathways

SCI will research City of Oakland Public Works documents and maps to locate known subsurface pathways including utilities and other improvements which may exist in the area immediately adjacent to the downgradient side of the Site. SCI will also review historic geologic maps available at the public library to locate historic channels and drainage's in the Site vicinity.

SCI will prepare a map which shows the location of improvements which are identified as potential migration pathways. SCI will also prepare two geologic cross sections which show the geologic units encountered in Site borings, the relationship of the plume to preferential pathways, and the historic groundwater fluctuation zone. The results of the research will be incorporated in the CAP to evaluate the potential for offsite migration of the plume via any of the suspected pathways.

Task 3.3 - Sensitive Receptor Survey

To comply with the ACHCSA required elements for the expanded CAP, SCI will also conduct a sensitive receptor survey for the Site vicinity. The survey will attempt to identify potentially "at-risk" human and environmental receptors in the vicinity of the plume and assess the exposure routes for each receptor. The survey will also include contacting public agencies to identify the presence of industrial and/or municipal water wells within a 2,000 foot radius of the Site. SCI will conduct a reconnaissance within the site vicinity to identify the presence of surface water bodies. A map will be prepared which shows the location of the potentially sensitive receptors. The results of the survey including a description of the sensitive receptors and whether they appear to be at risk from the Site groundwater plume will be included in the CAP.

Task 3.4 - Human Health Risk Evaluation

SCI will perform an assessment of whether residual soil and groundwater contamination may pose a potential health risk to Site workers. This type of assessment is a tiered decision making process. To preliminarily determine the level of effort required to complete this type of assessment, SCI compared average residual concentrations found in groundwater at the Site to non-site specific RBSLs presented in the ASTM E-1739 Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites. Because concentrations of benzene in

groundwater exceeded the ASTM Tier 1 benzene RBSL, SCI concluded that a Tier 2 evaluation is necessary using the City's ULR program guidelines. The guidelines include Oakland-specific RBSLs for various Site use, exposure pathways and media types. SCI will tabulate maximum and average soil and groundwater concentrations for the Site, and compare them to the City of Oakland RBSLs for a commercial use scenario. On the basis of this comparison, and a review of current Site uses and potentially complete exposure pathways, SCI will evaluate potential risks to human health. The results of the Tier 1 and Tier 2 risk assessments will be summarized in the CAP.

Task 4 - Risk Management Plan

To comply with the ACHCSA required elements for the expanded CAP, SCI will prepare a Risk Management Plan (RMP) for the Site. The RMP will describe the environmental condition of the Site including the types and location of contaminants of concern (COC) identified to date, and the apparent risks posed by the COCs. The RMP will describe the potentially complete exposure pathways identified in Tasks 3.2 through 3.4 above. The RMP will also describe the current use of the Site and Best Management Practices to minimize future spills and releases. In addition, the RMP will describe restricted activities that should not be performed onsite without the approval of ACHCSA, such as subsurface excavation or utility repair work that may encounter contaminated soils.

SCI understands that the City is currently preparing technical guidance describing the required contents of the RMP. The scope of the RMP presented herein may therefore, need to be revised once we have had the opportunity to review the finalized technical guidance. The RMP will be a stand alone document which will also be included as an appendix to the CAP.

Task 5 - Expanded CAP

SCI will prepare a CAP which presents our assessment of the environmental condition of the Site and the selected remedial alternative(s), as well as incorporating the rationale for the use of the City's ULR criteria and a presentation of risk management strategies, as required for sites included in the City's ULR program.

In general, the expanded CAP will include a summary of investigation activities, a description of historic and current Site uses, a detailed analysis of the hydrogeology, the results of the additional evaluation tasks proposed in this work plan, discussion of the conceptual site model used to evaluate risks, a discussion of corrective action alternatives and the selection of the most cost effective alternative. Alternatives will at a minimum include natural attenuation, enhanced insitu bioremediation, and physical removal of residual contamination. The RMP as described herein will also be presented and discussed in the CAP.

Several maps and plans will be incorporated into the CAP. The maps and plans will include at a minimum a plan showing current improvements, a plan showing points of investigation, a plan showing the location of subsurface pathways and sensitive receptors, groundwater contour maps for the most recent hydrogeologic cycle, iso-concentration maps for soil and groundwater, and cross sections which depict stratigraphy and the location of potential pathways of migration. The CAP will also include tabulated water level measurements, free product removal quantities and the analytical test results. In addition, the CAP will present a schedule for groundwater monitoring, and free product removal, and the procedures for well abandonment.

Task 6 - Regulatory Technical Assistance

SCI will prepare monthly status reports that summarize Site activities. SCI will assist the client with obtaining preapproval from the FUND for the services described herein and in preparing backup documentation for submittal with reimbursement requests. This task also includes consultation and discussions with the regulatory agencies and the FUND as necessary, regarding the anticipated 1999 activities.

SCHEDULE

SCI is prepared to implement this work plan upon your approval and pre-approval from the Fund. In accordance with ACHCSA requirements, groundwater monitoring and free product removal will continue as outlined in the January 25, 1999 ACHCSA letter until this plan is approved.

If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

Jerianne N. Alexander, PE, REA
Associate Engineer

Terence J. McManus, REA
Associate Environmental Scientist

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Attachment: Site Plan

cc: Mr. George Hill and Mr. Gordon Linden
Mr. Mark Gomez, City of Oakland
Mr. Charles Headlee, Cal/EPA San Francisco RWQCB
Mr. Jonathan Redding, Fitzgerald Abbott & Beardsley, LLP

HAWTHORNE STREET

SIDEWALK

11

1

3093 BROADWAY

14

15

6

8

SIDEWALK

9

10/CPT13

4

2

7

3

WEBSTER STREET

SIDEWALK

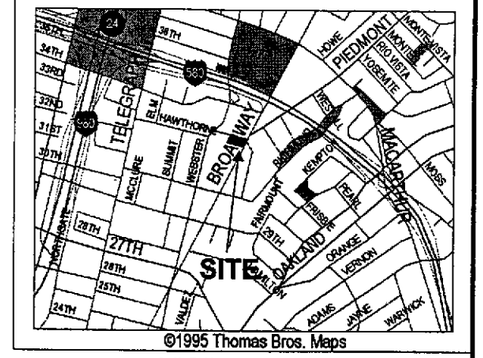
13

BROOK STREET

5

BROADWAY

SIDEWALK



VICINITY MAP

EXPLANATION

- 1 — SCI MONITORING WELL
- 8 — EXTRACTION WELL
- FENCE
- RETAINING WALL
- FORMER TANK LOCATION

APPROXIMATE SCALE (feet)

0 60 120

SITE PLAN

SCI Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

CONNELL OLDSMOBILE - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
447.055	4/15/99	

PLATE 1