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WORKPLAN TO CONDUCT OFF-SITE SOIL AND GROUNDWATER INVESTIGATION TEXACO SERVICE STATION 15101 FREEDOM AVENUE SAN LEANDRO, CALIFORNIA

July 22, 2003

Project 2550

Prepared for

Mr. Mohammed Pazdel
15101 Freedom Avenue
San Leandro, California 94530

Prepared by

SOMA Environmental Engineering, Inc.
2680 Bishop Drive, Suite 203
San Ramon, California 94583

CERTIFICATION

This workplan has been prepared by SOMA Environmental Engineering, Inc. on behalf of Mr. Mohammed Pazdel, the property owner of 15101 Freedom Avenue, San Leandro, California to comply with a request from the Alameda County Health Care Services, dated May 16, 2003.

Mansour Sepehr, Ph.D., P.E.
Principal Hydrogeologist

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

This workplan has been prepared by SOMA Environmental Engineering, Inc., (SOMA) on behalf of Mr. Mohammed Pazdel, the property owner of 15101 Freedom Avenue, San Leandro, California (the Site), as illustrated in Figure 1. This workplan has been prepared based on the Alameda County Health Care Services (ACHCS) request letter dated May 16, 2003. The scope of this workplan is to define the lateral extent of the groundwater chemical plume in the off-site areas.

Since the 1960's, the Site has been used as a gasoline service station. In 1985, Mr. Mohammad Pazdel purchased the business and in 1992 he purchased the property from Mr. Mohammad Mashhoon. From 1985 until 1997 when Mr. Pazdel sold the business, the Site operated as the "Freedom ARCO Station". To comply with the underground storage tank (UST) upgrade regulation in 1999, three 10,000-gallon single-walled USTs were removed and replaced by new double-walled fuel tanks. During the UST upgrade, petroleum hydrocarbon contaminants were detected in subsurface soils beneath the old USTs.

2.0 PREVIOUS ACTIVITIES

On May 20, 1999, Geo-Logic oversaw the removal of three 10,000-gallon USTs, approximately 250 feet of product piping, and six dispensers at the Site. Paradiso Mechanical, Inc. removed and over-excavated the old USTs. The on-site overseeing agency was the ACHCS.

After the excavation and removal, the three USTs and product piping were transported to the ECI facility in Richmond, California for proper disposal. Soil samples were collected from beneath the USTs, product piping, and dispensers by Geo-Logic on May 20 and May 21, 1999. On May 20, 1999, seven soil samples (T1W, T2W, T3W, T1E, T2E, T3E, and an additional soil sample at

T1W) were collected from the west and east sides of the tank excavation pit ranging in depth from 12 to 14 feet below ground surface (bgs). In addition, six soil samples (P1, P2, P4, P5, P6, and P7) were collected from beneath the dispensers ranging in depth from 2.5 to 3 feet bgs. One soil sample (P3) was collected from beneath the product lines at 2.5 feet bgs. On May 21, 1999, eight additional soil samples (P8, P9, P10, P11, P12, P13, P14, and P15) were collected from beneath the product piping and in the area of the dispensers at depths ranging from 3 to 3.5 feet bgs. Stockpile soil samples were also collected on May 21, 1999.

On June 2, 1999, additional soil samples were collected during over-excavation of the product piping and from the bottom of tank excavation pit. An additional soil sample (P12) was collected beneath the product piping at a depth of 5 feet bgs. Three additional soil samples were collected in the western portion of the tank cavity and ranged in depth from 16.5 to 24.5 feet bgs, to better define the vertical extent of the hydrocarbon contamination.

The soil samples collected during the removal and over-excavation activities were submitted to Calcoast Analytical in Emeryville, California. The samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-g) using EPA Method 8015, benzene, toluene, ethylbenzene and xylene (BTEX) and Methyl tertiary Butyl Ether (MtBE) using EPA Method 8020 with MtBE confirmation using EPA Method 8260B, and total lead using EPA Method 6010A. The TPH-g concentration in the soil samples ranged from 0.76 mg/Kg (P3-2.5 ft bgs) to 4,000 mg/Kg (T1W-24.5 ft bgs). Benzene concentrations ranged from 28 mg/Kg (T1W-13.5 ft bgs) to non-detectable levels (P2 through P6, and P14) at depths ranging from 2.5 to 3 feet bgs.

On July 7, 1999, Paradiso Mechanical, Inc. installed a 20,000-gallon gasoline UST, an 8,000-gallon gasoline UST, and a 6,000-gallon diesel tank inside the tank cavity.

In July 2001, CSS Environmental Services of San Rafael, California (CSS), at the request of the ACHCS, conducted an additional site investigation to further investigate potential petroleum hydrocarbon contamination discovered during the removal and upgrade of USTs at the Site. During that investigation, CSS drilled five temporary well boreholees (SB-1 through SB-5) using the direct-push technology. The boreholes were advanced to the maximum depth of 31 feet. It appeared that the groundwater beneath the Site was semi-confined, after drilling, the groundwater stabilized at depths of 17 to 20 feet bgs. The results of that investigation indicated that petroleum-impacted soils are generally encountered below 19 feet, and they occur mostly within the capillary fringe, just above the saturated zone. The maximum concentrations of TPH-g and BTEX in soil samples collected between 19 and 25.5 feet bgs were 470, 2.6, 16, 12, and 73 mg/Kg, respectively. MtBE was not detected in any of the soil samples at the analytical method reporting limit of 0.005 mg/Kg. The maximum concentrations of TPH-g and BTEX in groundwater samples collected from the soil borings were 83, 19, 1.8, 1.5, and 73 mg/L, respectively. MtBE was detected in the groundwater at each of the borings except SB-4. The maximum reported concentration was 87 mg/L at SB-2.

In response to an ACHCS letter request for a workplan, dated August 23, 2001, SOMA installed five on-site groundwater monitoring wells and delineated the extent of petroleum hydrocarbons at the subject property. Figure 2 illustrates the locations of the existing groundwater monitoring wells. Based on the elevated levels of groundwater contamination near the southern property boundary, SOMA concluded that there is a high probability of contamination migrating off-site and that the full areal extent and depth of the petroleum hydrocarbon contamination had not been delineated. Recommendations included conducting an off-site soil and groundwater investigation to delineate the off-site plume in the adjacent residential area. In a letter dated May 16, 2003, the ACHCS concurred

with SOMA's recommendation for an off-site investigation and requested that SOMA submit a workplan to perform this additional work.

3.0 SITE GEOLOGY AND HYDROGEOLOGY

Based on borehole logs from SOMA's monitoring well installation, underlying sediments generally consist of stiff to hard silty clay and clayey silt with intervening layers of medium dense to very dense sand/gravel sediments. In boreholes MW-1 and MW-2, on the west side of the Site, silt/clayey sediments predominate with an occasional discontinuous layer of sand/gravel sediments. In these boreholes and borehole MW-4, below approximately 20 to 25 feet bgs, slight to moderate petroleum hydrocarbon odors were encountered that decreased substantially with depth in the underlying silty clay aquitard.

In boreholes MW-3, MW-4, MW-5, on the east side of the Site, a two- to nine-foot thick sand/gravel layer was encountered below approximate depths of 13 to 16 feet bgs. Below approximately 20 feet bgs, strong petroleum hydrocarbon vapors were encountered in boreholes MW-3 and MW-5 that also decreased substantially in the subjacent clay aquitard.

Groundwater was first encountered at approximately 25 to 29 feet bgs. Groundwater levels later stabilized to approximately 21 to 23 feet bgs, indicating the presence of confined/semi-confined water-bearing zones. Subsequent quarterly monitoring documented a consistent southwest- to south-ward groundwater flow towards the neighboring residential properties.

4.0 SCOPE OF WORK

The ACHCS, in their letter dated May 16, 2003, requested water well and preferential path surveys, along with the additional investigation, to more fully characterize the groundwater plume. Based on the ACHCS's request, the scope

of work will include conducting the well and preferential path surveys, drilling temporary well boreholes, and collecting soil and grab groundwater samples. SOMA will perform these investigative activities to evaluate the extent of groundwater contamination migrating from the Site. To comply with the ACHCS's request, SOMA will perform the following tasks:

Task 1: **Permitting, Utility Clearance and Preparation of a Site Health and Safety Plan**

Task 2: **Water Well and Preferential Flow Path Surveys**

Task 3: **Drilling/Installing Temporary Well Boreholes and Collecting Soil and Grab Groundwater Samples**

Task 4: **Laboratory Analysis**

Task 5: **Drilling/Installing Monitoring Wells**

Task 6: **Report Preparation**

The following is a brief description of each of the above tasks.

4.1 Permitting, Utility Clearance and Preparation of a Site Health and Safety Plan

Upon approval of this workplan and prior to the initiation of field activities, necessary permits will be obtained from the Alameda County Public Works Department. Drilling locations will then be marked and underground utilities will be cleared by Underground Service Alert (USA) and a private underground utility locator.

Prior to the commencement of field activities, SOMA will prepare a site-specific health and safety plan (HASP). The HASP will be designed to address safety provisions during field activities, and provide procedures to protect the field crew from physical and chemical hazards resulting from drilling, and soil and groundwater sampling. The safety plan will establish personnel responsibilities,

general safe work practices, field procedures, personal protective equipment standards, decontamination procedures, and emergency action plans.

4.2 Water Well and Preferential Flow Path Surveys

SOMA will contact the Department of Water Resources (DWR) and obtain the location of water wells in the Site vicinity. The well location information will be plotted on a site vicinity map with the DWR documents attached as an appendix. Because the Site is located in an unincorporated portion of Alameda County, SOMA will visit the Alameda County Map and File Division and obtain maps of sewer and water utilities adjacent to the Site. SOMA will plot the underground utility alignments on a site vicinity map and determine a preferential flow path, if the flow path can be identified.

4.3 Drilling/InstallingTemporary Well Boreholes

As shown in Figure 3, SOMA proposes drilling five off-site temporary well boreholes in order to delineate the lateral extent of the groundwater contamination plume.

4.3.1 Lithologic Sampling

SOMA will use direct push technology (DPT) drilling to advance the temporary well boreholes to a total depth of 30 feet bgs. DPT drilling does not generate soil cuttings that require disposal. Prior to drilling each borehole, all of the drilling equipment that is advanced into the subsurface will be thoroughly cleaned to minimize the possibility of cross-contamination between boreholes. During the drilling, SOMA's geologist will log the boreholes and collect continuous soil cores for lithologic logging. During drilling, a photo ionization detector (PID) will be used for soil head-space analysis and for safety purposes.

4.3.2 Groundwater Sampling

After advancing the temporary well boreholes to the desired depths, the drilling crew will install a temporary 1-inch diameter PVC casing into the borehole. A ¾-inch diameter disposable bailer will be used to collect a grab groundwater sample from each borehole. The sample will be decanted into four 40-mL VOA vials. The samples will be stored in a cooler with ice pending delivery to Curtis & Tompkins, Ltd., Analytical Laboratories. After sampling, all boreholes will be tremie grouted with neat cement grout.

4.4 Laboratory Analysis

The grab groundwater samples will be analyzed for TPH-g, BTEX, MtBE, and gasoline oxygenates. The lab will use EPA Method 8015 to analyze for TPH-g and EPA Method 8260B to analyze for BTEX, MtBE and gasoline oxygenates.

4.5 Installing Off-Site Groundwater Monitoring Wells

After reviewing the groundwater analytical data, SOMA will install off-site groundwater monitoring wells at three of the off-site borehole locations based on contaminant levels. Two of the monitoring wells will be installed at borehole locations with the highest and lowest contamination levels and the third well will be installed at a borehole with a mid-range contamination level. One of these wells will be installed at the most downgradient location from the Site.

A truck mounted hollow stem auger drilling rig will be used to install the off-site monitoring wells. Based on borehole lithology, SOMA will determine the actual depth and perforated interval of each well. The monitoring wells will be installed with two-inch diameter PVC casings flush-threaded to PVC screens with 0.010 inch factory-slotted perforations due to the substantial clay content in the shallow water-bearing zone. A sand pack filter of 2/12 sand will be emplaced around the screen to at least one foot above the top of the screen. The sand pack filter will be sealed with at least one foot of bentonite followed by a grout seal of neat

cement mixed with approximately 3-5% bentonite. The grout seal will be emplaced to near-surface grade where a flush-mount traffic-rated well vault will be installed with a concrete foundation.

During the next quarterly monitoring event, on-site and off-site monitoring wells will be sampled and analyzed for TPH-g, BTEX, MtBE, and gasoline oxygenates.

4.6 Report Preparation

A technical report will be prepared to document soil and groundwater conditions and the extent of the off-site petroleum chemical contamination. The technical report will include figures, tables, lithologic logs of the soil boreholes along with geologic cross sections as specified by ACHCS. The report will also provide a detailed description of the Site's geologic and hydrogeologic conditions, field investigation procedures, the results of the soil and groundwater evaluation, as well as our recommendations for an additional site characterization, if warranted. The report will include a site map containing location and use of neighboring properties and the outcomes of a sensitive receptor survey. The report will also present a detailed description and interpretation of field measurements of bioremediation parameters and recommendations for an artificial enhancement, if warranted.

5.0 REFERENCES

Alameda County Health Care Services, May 16, 2003. Letter to Mohammed Pazdel Requesting Off-Site Soil and Groundwater Investigation.

Alameda County Health Care Services, August 23, 2001. Letter to Mohammed Pazdel Requesting Soil and Groundwater Investigation.

CSS Environmental Services, Inc., August 15, 2001. "Preliminary Site Assessment for the Property Located at 15101 Freedom Avenue, San Leandro, California".

Geo-logic , Geotechnical and Environmental Consulting Services, June 11, 1999. "Report of Soil Sampling During Tank Removal and Station Upgrade".

SOMA Environmental Engineering, Inc., October 5, 2000. "Workplan to Conduct Monitoring Well Installation at Texaco Service Station Located at 15101 Freedom Avenue, San Leandro, California".

SOMA Environmental Engineering, Inc., June 5, 2002. "Monitoring Well Installation Report, Texaco Service Station, 15101 Freedom Avenue, San Leandro, California".

FIGURES

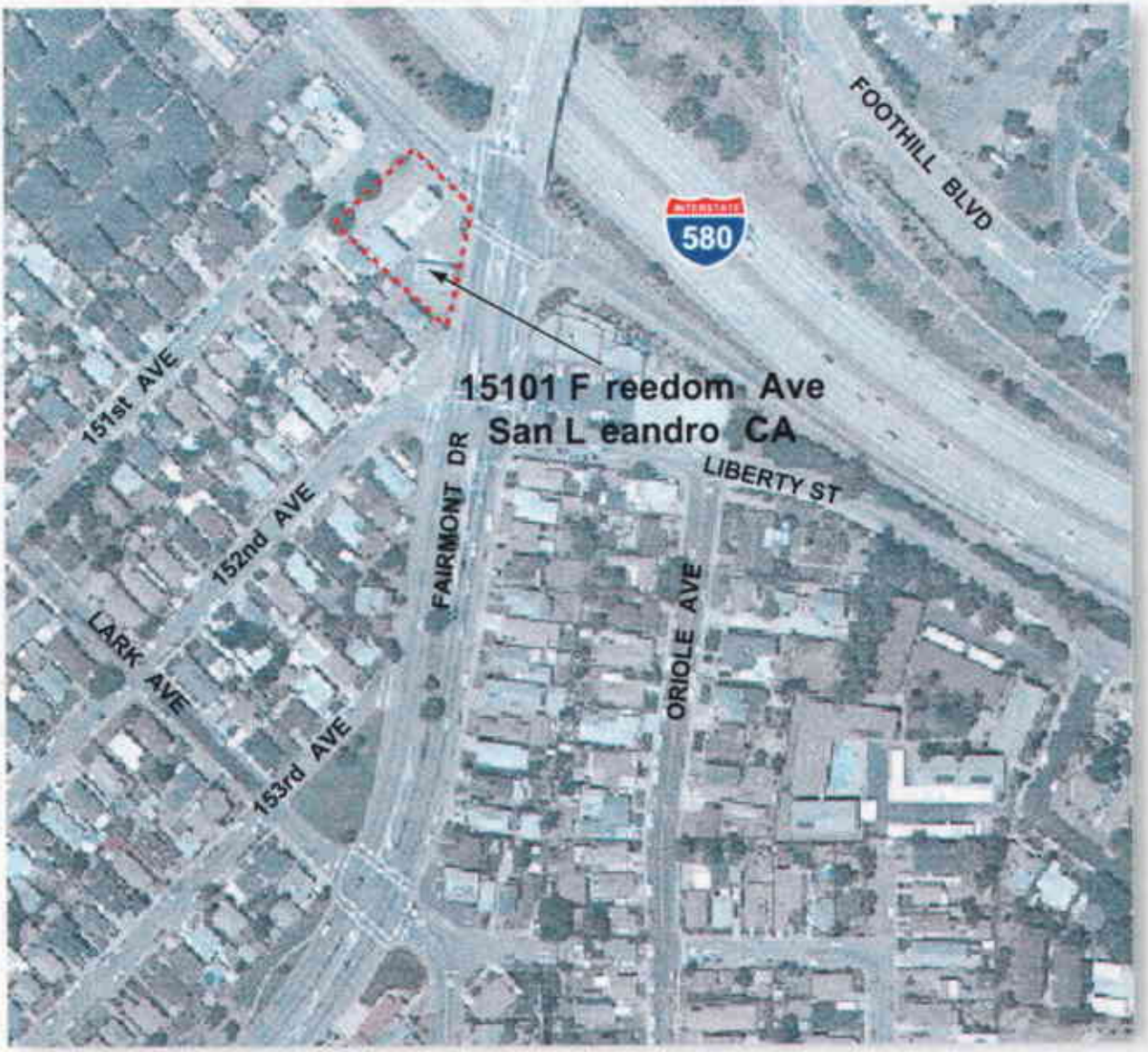

Figure 1: Site vicinity map.

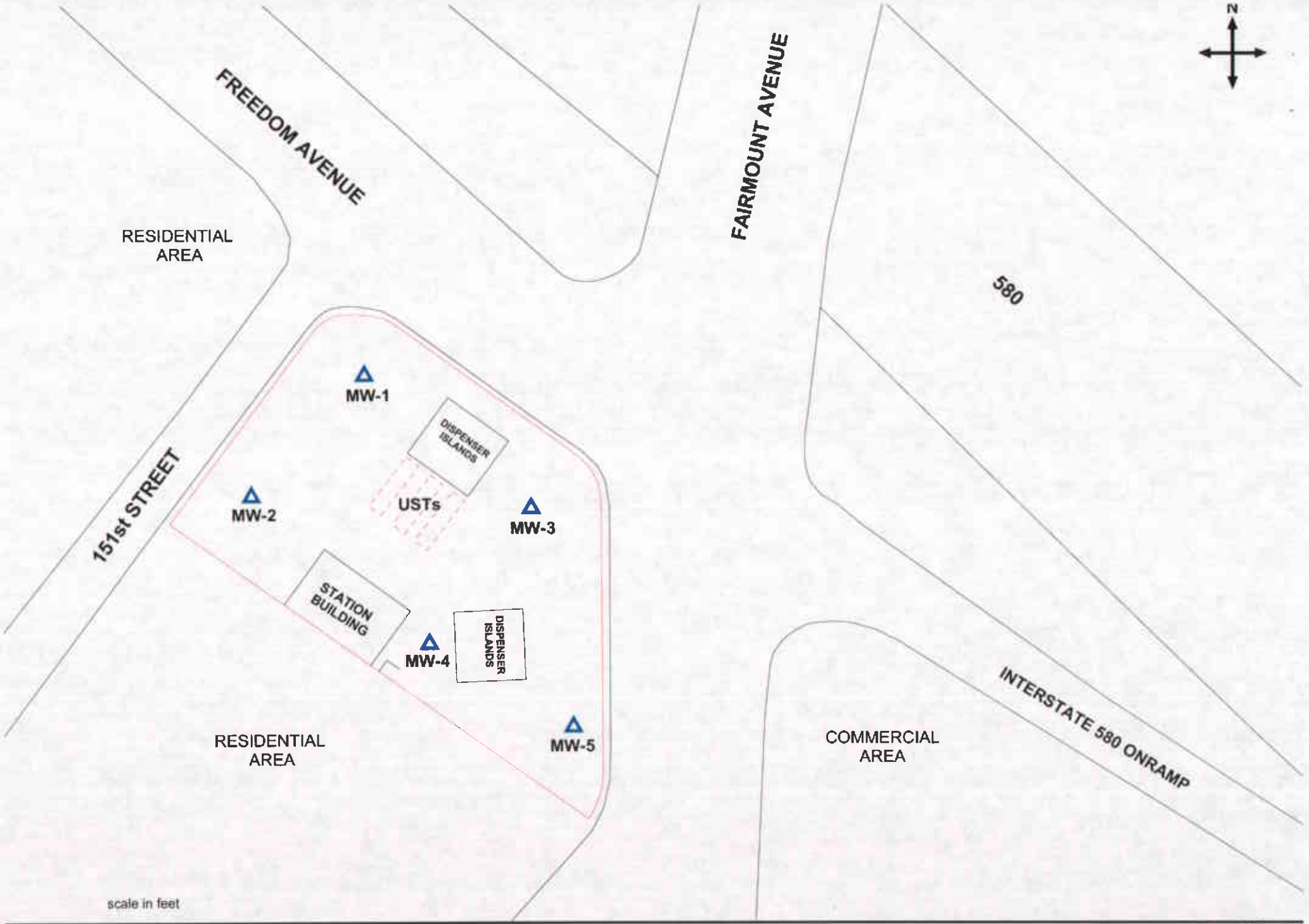

Figure 2: Site map showing locations of groundwater monitoring wells.

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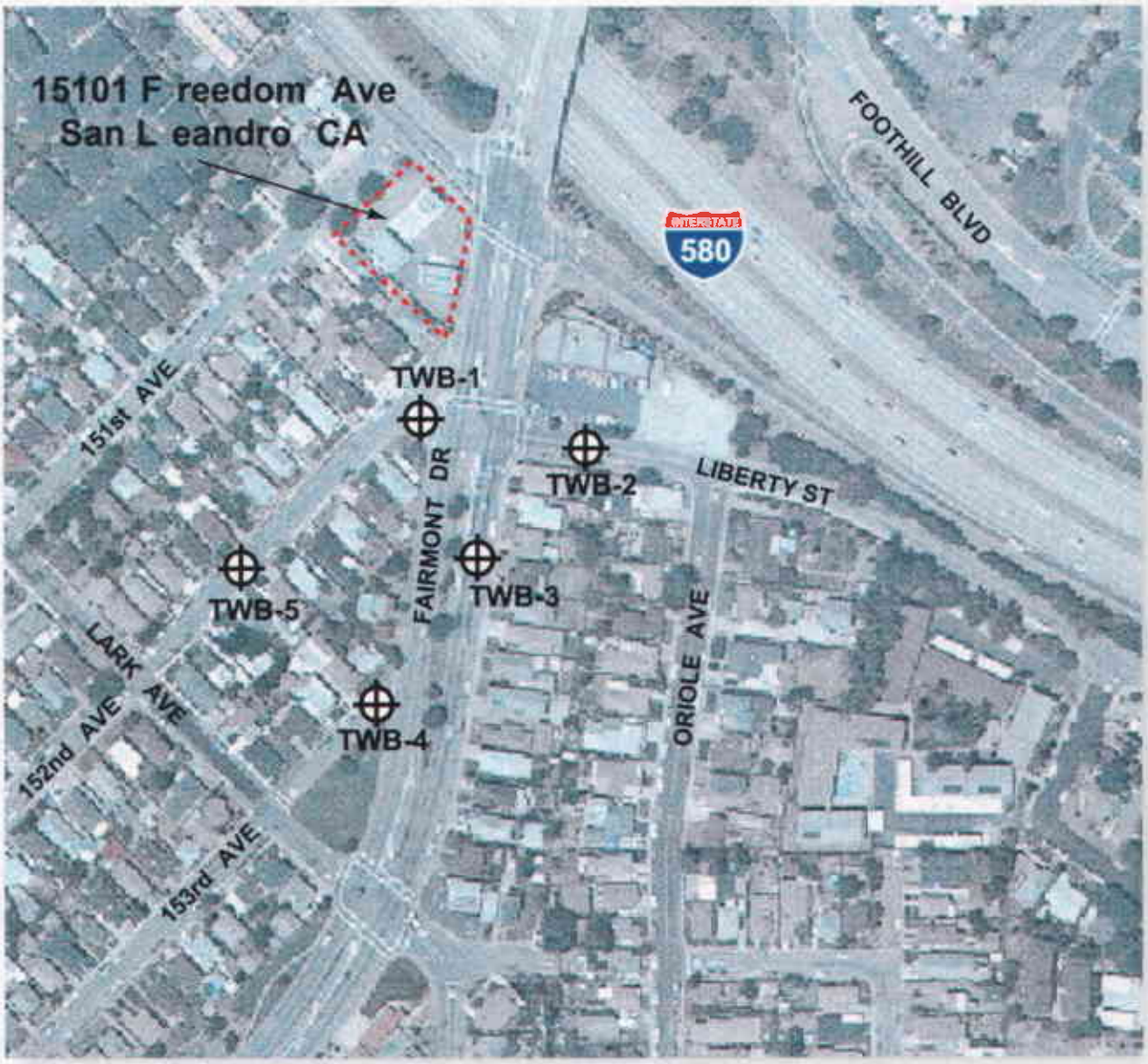

Figure 2: Site vicinity map showing proposed locations of offsite temporary well boreholes.

Appendix A

Letter from ACHCS dated May 16, 2003

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

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1131 Harbor Bay Parkway, Suite 250
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RO0000473

May 16, 2003

Mr. Mohammed Pazdel
35840 Alcazar Court 1770 Pistacia Ct
Fremont, CA 94536 Fairfield CA 94533

RE: **Former Freedom ARCO Station, 15101 Freedom Ave, San Leandro, CA**

Dear Mr. Pazdel:

I have completed review of the case file for the above referenced site. Fuel release from the former underground storage tanks has impacted groundwater beneath the site. Data collected from onsite groundwater monitoring wells suggest that the plume has migrated offsite.

At this time, additional investigations are required to delineate the extent of the contaminant plume. You should have a water well survey and preferential pathway survey prepared for the site. Information from the survey should be incorporated into a report with geologic cross-sections and work plan for offsite investigation that will delineate the vertical and horizontal extent of the contaminant plume. The geologic cross-sections should include, at a minimum, groundwater monitoring wells and screen intervals, sewer trenches, soil contamination concentration, and groundwater elevation.

The well and conduit survey should be completed within 45 days of the date of this letter and a work plan for an offsite investigation completed by **August 4, 2003.**

If you have any questions, I can be reached at (510) 567-6762 or by email at echu@co.alameda.ca.us

eva chu
Hazardous Materials Specialist

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