


FUGRO WEST, INC.

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November 1, 2005
Project No. 1121.009

Alameda County Health Care Services Agency
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Attention: Mr. Jerry Wickham

Subject: Soil-Gas Work Plan
Arrow Rentals Property
187 North "L" Street
Livermore, California 94550

Alameda County
NOV - 7 2005

Dear Mr. Wickham:

Fugro West, Inc., (Fugro) presents this Work Plan to complete a soil-gas study at the Arrow Rentals property in Livermore, California (Plates 1 and 2). Fugro prepared this Work Plan to evaluate soil-gas concentrations near the former fuel dispenser island and USTs as requested by Alameda County Environmental Health Services (County) during our meeting on October 17, 2005. The purpose of this study is to address County concerns regarding residual soil-gas concentrations near former gasoline source areas and evaluate whether residual soil-gas concentrations present a potential risk to future residential site users via indoor inhalation pathways. Accordingly, Fugro will compare soil-gas concentrations with shallow soil-gas screening levels established by the San Francisco Bay Regional Water Quality Control Board (RWQCB)¹. Results of this investigation will be used to assist the Livermore Redevelopment Agency (Agency) with upcoming redevelopment plans for residential development on the site.

BACKGROUND

Based on our review of available reports, a Mobile service station operated at the site between 1951 and 1968. Arrow Rentals purchased the property in 1972. In 1972, three 1,500-gallon USTs were removed from the site after they failed integrity tests. In 1984, the two remaining USTs were removed and one 1,000-gallon gasoline UST with vapor well was installed in the southeastern portion of the site. We understand that the 1,000-gallon UST has also been removed from the site. In June 1985, approximately 600 gallons of gasoline were accidentally dispensed into the vapor well. In January 1992, fuel pipelines and valve boxes located between the USTs and dispenser islands were removed by Mobile's contractor².

¹ Interim Final Report dated February 2005. Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater

² Additional Soil Exploration Report by Woodward-Clyde Consultants dated April 17, 1992



Based on reports provided, several soil and groundwater investigations were conducted between 1988 and the present, including soil and groundwater investigations, a dual-phase extraction pilot test, and regular groundwater monitoring from several onsite and offsite shallow monitoring wells. Investigation reports suggest that the extent of groundwater impact from the UST operations were limited to within 60 feet bgs and up to 100 feet offsite. Groundwater monitoring reports indicate that no free-phase hydrocarbons have been observed since November 2001 when 0.14 feet of hydrocarbons were measured in Well W-1s, located approximately 40 feet downgradient of the vapor well. Results of those investigations were presented to the County, which has been providing regulatory oversight for this property, presumably dating back to 1984 or earlier.

Aquifer Sciences Inc. (ASI) used the results of chemical testing on soil and groundwater samples to complete the Revised Human Health Risk Assessment report dated April 30, 2001. Based on evaluation of the site history, site characterization, and chemical findings, the chemicals of concern listed in that report included benzene, ethylbenzene, toluene, xylenes (BTEX), methyl tert butyl ether (MTBE), and naphthalene. The calculated onsite human health risks exceeded residential criteria primarily due to elevated benzene in both the indoor inhalation and groundwater ingestion pathways used in the risk model. The calculated offsite human health risks for residential and commercial scenarios were within acceptable limits. However, results of the soil-vapor sampling, conducted by Gribi Associates in 1998³, indicated that detected BTEX concentrations were lower the values calculated by ASI. Gribi's findings also indicated BTEX concentrations in soil vapor samples that were much lower than Risk-Based Screening Levels established by the RWQCB indicating no significant human health risk at the site due to indoor vapor exposure. In their report dated August 8, 2005, ASI requested Case Closure from the County and recommended using a deed restriction to prevent use of groundwater from the site as well as consideration of engineering controls to mitigate potential vapor intrusion depending on future land use.

In the letter dated August 15, 2005, the County indicated a number of concerns about the site. Technical Comment No. 2 described a concern that previous soil-gas sampling may not have been collected directly within the areas of fuel discharges to soil and therefore may not represent the highest soil gas concentrations that may be encountered at the Site. In our meeting on October 17, 2005, the County requested soil-gas sampling at four locations, including the former fuel dispenser island, and the three former UST areas.

SCOPE OF WORK

Fugro has prepared this Work Plan on behalf of the City of Livermore Redevelopment Agency and Arrow Rentals to assist with potential redevelopment plans for the site. This Work Plan focuses on the soil-gas concerns identified by the County in their August 15, 2005 letter.

³ Report of Soil Vapor Sampling by Gribi Associates dated November 4, 1998



Fugro will conduct this investigation to evaluate soil-gas conditions at the former fuel dispenser island (SG-1) and the three former UST locations (SG-2 through SG-4) as requested by the County. Soil-gas sampling protocols and quality control (QC) measures will be completed in general conformance with the *Advisory for Active Soil Gas Investigations* dated January 28, 2003, prepared by the Department of Toxic Substances Control (DTSC) and the Los Angeles Regional Water Quality Control Board, which is commonly used as a guidance document for such studies.

Before beginning fieldwork, Fugro will obtain drilling permits from the County, and will clear all boring locations by contacting Underground Service Alert and contracting with a private utility locator.

Using direct-push methodology provided by Vironex, a State-licensed drilling contractor, four soil-gas probes will be installed at the locations illustrated on Plate 2. The probes will extend 5 feet bgs. Fugro will collect soil-gas samples at discrete depths using an expendable point, an expendable point holder, a PRT adapter and tubing. The expendable point is placed in the expendable point holder, which in turn is attached to the drive rod, and driven to 5 feet bgs. The drive rod and expendable point holder are retracted approximately 6 to 12 inches, separating the expendable point from the point holder, and creating the desired void in the soil. A PRT adapter and tubing are advanced down the inner rods and secured to the expendable point holder. The tubing at the surface is attached to the Vacuum/Volume System on the Geoprobe rig to purge the line.

Probes will be allowed to stabilize undisturbed for approximately 30 minutes prior to purging and sampling. Each probe will be fitted a flow regulator and particulate filter placed in-line to maintain a 100-200 cc (ml) per min flow rate and prevent influx of soil particles into samples containers while purging or collecting soil gas samples.

Sample tubing will also comprise stainless steel airtight fittings, disposable sample tubing, and the Summa canister to collect the actual soil-gas sample. Prior to sampling, Fugro will conduct a pressurized leak test, which will consist of charging sampling tubing with a negative pressure and maintaining that pressure for about 10 minutes. If no pressure change is observed, then soil-gas sampling will be conducted. If a pressure loss is observed, the tubing and fittings will be tightened, replaced, etc., until the negative pressure can be maintained for at least 10 minutes.

Prior to sampling, Fugro will also calculate the dead space volume that includes the volume of tubing and the annular space around the probe tip. At least three dead space volumes will be purged before collecting the soil-gas sample. Once the line has been purged, we will collect the soil-gas sample using a laboratory-provided Summa canister. The sample string will be fitted with a flow meter and regulator to monitor and ensure a steady flow rate during sample collection. The soil-gas sample will be collected at a flow rate of approximately 200 cc/minute or lower to limit stripping of volatiles and short-circuiting to the atmosphere during sampling. We anticipate that sampling will be conducted over a 15- to 20-minute period. During



sampling, clean gauze will be saturated and placed in a sealed headspace create around the stainless steel fittings as a field QC leak check measure.

Fugro will collect the air sample on the intake side of the vacuum pump or collect the sample using the negative vacuum provided by the Summa canister, and record the initial and final vacuum readings at the time of collection. At the completion of sampling, each Summa canister will maintain a negative pressure to confirm no leakage during transport. We will endeavor to not collect the soil gas samples within 24-hours of a significant rain event.

After each sample collection, we will decontaminate the drive rods and other sampling components before the next reuse. We will wash the equipment with a non-phosphate detergent, rinse with tap water, and finally rinse with distilled water. The polyethylene tubing will be discarded after each sampling. Each probe will then be backfilled with neat cement grout and topped with concrete to match the existing grade.

Soil-gas samples will be transported to Air Toxics LTD., a State-certified analytical laboratory for analysis under the appropriate chain of custody documentation. Samples will not be refrigerated and will be shielded from exposure to sunlight prior to analyses. Analytical testing will be conducted on a standard turnaround basis. The testing program will consist of the following:

- TPH as Gasoline by Method TO-3;
- Benzene, toluene, ethylbenzene, and xylenes, MTBE, naphthalene, and isopropanol (leak check compound) by Method TO-15; and
- Oxygen, carbon dioxide, and methane, by Method ASTM 1946

In addition to the standard laboratory QC protocols for method blanks and matrix spikes, field QC samples will include one duplicate QC sample and one trip blank for the soil-gas investigation.

Fugro will prepare a brief letter report describing this investigation and findings. The report will include a site plan, showing sample locations and previous dispenser island and UST locations; a summary table of the soil-gas data collected, including that from the previous studies; laboratory reports with chain-of-custody documentation; and a discussion of our findings. Results of analyses will be tabulated and compared to the Soil-Gas Screening criteria listed in Tables E2a and 2b of the Environmental Screening Levels (ESL) established by the RWQCB. The report will also contain our recommendations regarding the need for mitigation measures prior to or as a part of site redevelopment.

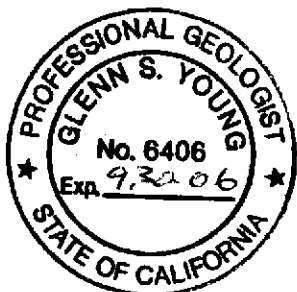
CLOSING STATEMENT

With County approval of this Work Plan, Fugro will obtain the permits and coordinate the sampling with Arrow Rentals, Vironex, and the County. We will notify the County at least 72 hours prior to the actual sampling. Depending on the drillers availability Fugro is prepared begin work on this upon receipt of County approval of this work plan. We have tentatively



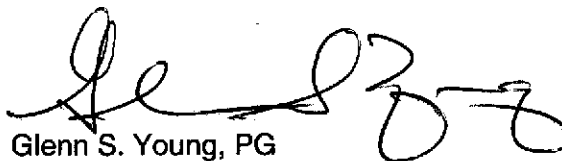
scheduled soil-gas sampling for November 16, 2005. Fugro estimates that the field work can be completed during one business day and the follow up analyses and reporting will be completed by the end of November.

If you have any questions or comments regarding this Work Plan, please call either one of the undersigned at (510) 268-0461.



Yours truly,

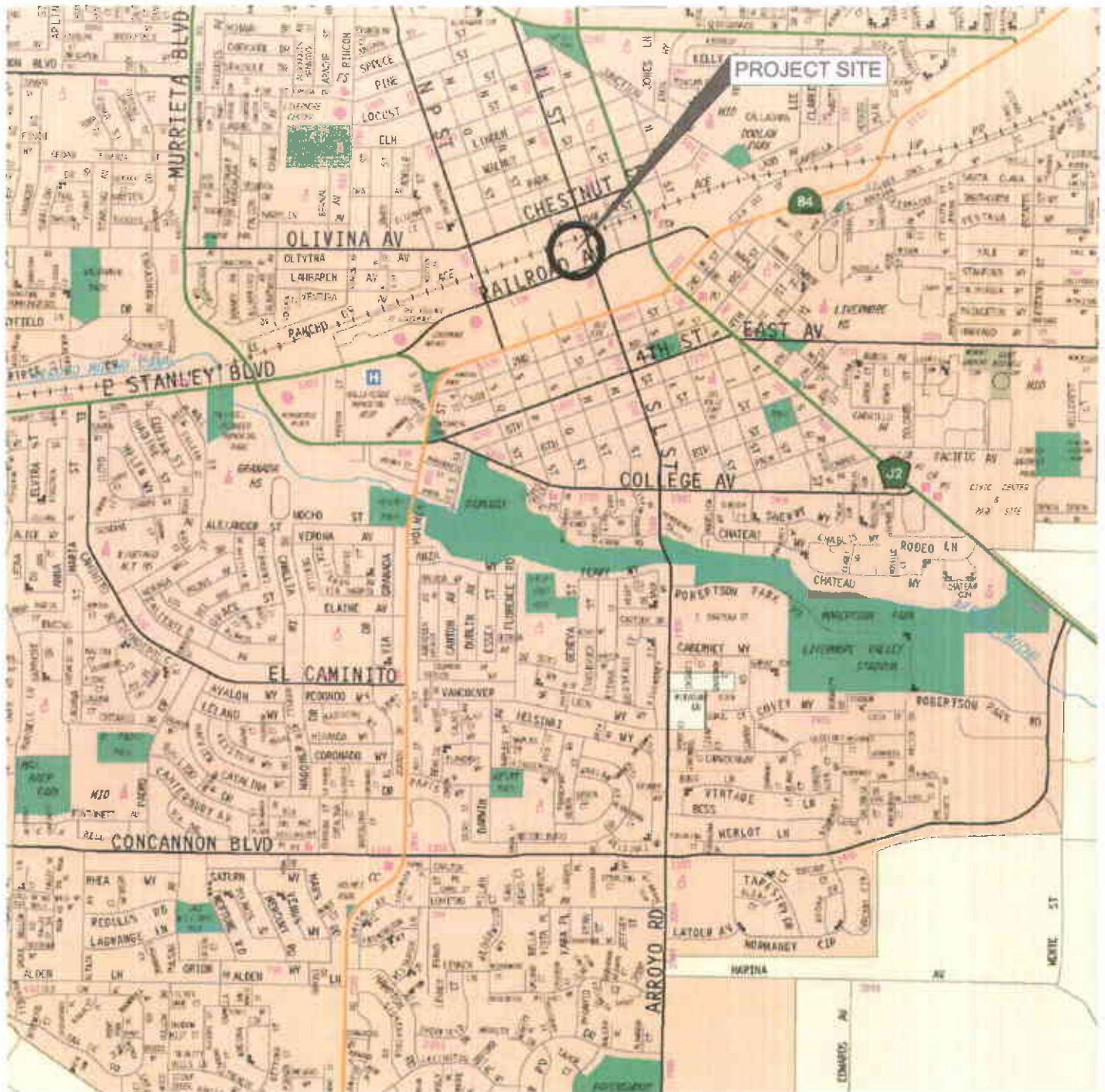
FUGRO WEST INC.


Glenn S. Young, PG
Principal Geologist

GSY:tm

Attachments: Plate 1 – Vicinity Map
Plate 2 – Soil-Gas Sampling Plan

Copies Submitted: (1) Addressee
Ms. Rita Sullins (1)
Ms. Chris Davidson (Livermore Redevelopment Agency – 1)



SOURCE: This Site Vicinity Map is based on The Thomas Guide Digital Edition 2003, Bay Area Metro, Alameda, Contra Costa, Marin, San Francisco, San Mateo, and Santa Clara Counties.



VICINITY MAP
Arrow Rentals Property
187 N. "L" Street
Livermore, California

PLATE 1



SOURCE: This Site Plan was based on aerial photo, May 2001, provided by City of Livermore.

NOTE: Former dispenser and UST locations based on site map from Aquifer Sciences Inc. dated August 8, 2005.

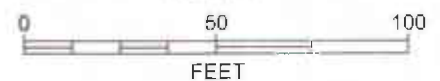
LEGEND



Proposed Soil-Gas Probe



Property Boundary



SOIL-GAS SAMPLING PLAN

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Livermore, California