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ENGEO

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LETTER OF TRANSMITTAL

DATE: April 21, 1994 ENGEO PROJECT NO.: 3174-F7

TO: Alameda County
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

ATTENTION: Ms. Eva Chu

SUBJECT: 2900 Ladd Avenue, Livermore

TRANSMITTED HEREWITH: A copy of the proposed work plan for a subsurface investigation at the subject property.

REMARKS: The school district would like to begin the investigation in mid-June, after school is out for the summer. Please give me a call if you have any questions.

ENGEO INCORPORATED

BY: Brian Flaherty BF

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ENGEO INCORPORATED

GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS

In Reply
Please Refer to:
3174-F7

April 11, 1994

Mr. Dick Alford
Livermore Valley Joint Unified School District
685 E. Jack London Boulevard
Livermore, CA. 94550

Subject: 2900 Ladd Avenue
Livermore, California

WORK PLAN FOR ADDITIONAL SUBSURFACE INVESTIGATION

References:
1. ENGEO Inc.; Report on Soil and Ground-Water Investigation, 2900 Ladd Avenue, Livermore, California, July 8, 1993.
2. Alameda County Department of Environmental Health, SWI Report for 2900 Ladd Avenue, Livermore, California, Letter dated July 30, 1993.

Dear Mr. Alford:

We are pleased to present a work plan to expand the referenced investigation of the soil and ground-water contamination associated with a leaking underground fuel storage tank at the Transportation Facility, 2900 Ladd Avenue in Livermore, California. The investigation is intended to address the soil and ground-water contamination resulting from a leaking underground unleaded gasoline storage tank at the site. The purpose of our study is to evaluate the vertical and lateral extent of the petroleum hydrocarbon contamination in the vadose zone soils, at the top of the ground-water table and in the ground water below the tank complex (Reference 2).

We are available at your convenience to discuss the findings and recommendations of our report. Please do not hesitate to contact our office if you have any questions.

Very truly yours,

ENGEO Incorporated

Brian Flaherty
CEG 1256

cc: 1 to Alameda County Department of Environmental Health

BACKGROUND

Site Description

The facility at 2900 Ladd Avenue included an operations building, a maintenance yard, fuel dispensing pumps, associated underground piping and vents, and three fiberglass underground fuel storage tanks (Figure 1). The underground tank complex consisted of 6,000-gallon regular gasoline, 6,000-gallon unleaded gasoline and 10,000-gallon diesel fuel storage tanks. The tanks were located within a common excavation and were attached to a concrete hold-down pad.

Previous Investigations

The regular gasoline tank failed a precision test in 1990. In order to prepare a preliminary assessment of possible soil contamination, a limited subsurface investigation was undertaken. Soil samples were collected adjacent to the 6,000-gallon regular gasoline tank. Laboratory testing of the soils exposed total petroleum hydrocarbons (TPH) as gasoline at concentrations of 2,300 parts per million (ppm) at 14 feet and 1,500 ppm at 17 feet. These gasoline concentrations exceeded the Regional Water Quality Control Board (RWQCB) guideline level of 100 ppm for TPH in soil. We understand that an *Underground Storage Tank Unauthorized Release Report* was prepared at that time.

ENGEO Incorporated conducted a soil and ground-water study of the area around the tank complex in December, 1990. A ground-water monitoring well placed adjacent to the underground tanks exposed soil and ground-water contamination. Laboratory testing of soil samples found significant petroleum hydrocarbon contamination from 15 to 40 feet beneath the ground surface in the area of the tanks. A ground-water sample contained concentrations of benzene at 63 parts per billion (ppb).

Ground-water sampling of the monitoring well was conducted in September 1991 and July 1992. Gasoline and BTXE were not detected in a ground-water sample obtained in September 1991. Laboratory analysis of the ground-water sample recovered in July 1992 detected 50 ppb gasoline and 17 ppb benzene. The measured ground-water surface had fallen 15.2 feet to 59.0 feet below the ground surface between the December 1990 and September 1991. The ground-water level rose 6.4 feet to a depth of 52.6 feet beneath the ground surface between September 1991 and July 1992. A schematic drawing of the tank complex with the location of the well is shown on Figure 1.

The three underground fuel storage tanks were removed from the site in August, 1992. Laboratory testing of soil samples recovered adjacent to the northern end of the 6,000-gallon leaded gasoline storage tank detected gasoline at 1200 ppm.

Decommissioning of the monitoring well was undertaken on July 9, 1992, since the well location was within the limits of the proposed tank excavation. A permit to decommission the well was obtained from Alameda County Zone 7 Flood Control District.

1993 Investigation

Review of the boring logs, PID readings and the laboratory test results for both the soil and ground-water samples found that the subject site has been impacted by petroleum hydrocarbons. It appears that the soil and ground water has been affected primarily in the area northwest of the former underground storage tanks complex. Soil samples collected from the east and southwest of the tanks were not significantly impacted by petroleum hydrocarbons.

Review of the laboratory test data found that the soil from a depth of approximately 15 feet below the ground surface down to the top of the ground-water table has been affected. From a review of the previous soil and ground-water studies on the site the ground-water level is ten to fifteen feet higher then measured in July, 1992.

It appears that the soil from depths of about 18 feet to 35 feet are the most affected. The concentrations of petroleum hydrocarbons in the soil below a dept of 35 feet are lower. It appears that the petroleum hydrocarbon contamination in the soil is dispersing toward the northwest within a sandy gravel. The gravel extends from beneath the tank excavation down to depths of at least 30 to 35 feet below the ground surface. The gravel layers may be interstratified with a clayey silt such that the stratification influences the vertical and lateral spreading of the hydrocarbons as they migrate laterally and downward.

The reported concentrations of total petroleum hydrocarbons and BTXE in the ground water were greater than the levels recorded in the previous monitoring well reports. As the ground-water level rises it appears that the water comes in contact with the impacted soil. We anticipate that the northwestward dispersion of the hydrocarbons is most likely affecting the ground water in this direction.

Based on the findings of the 1993 subsurface investigation, additional exploration of the soil and ground water was recommended by ENGEO and the Alameda County Department of Environmental Health. The following is a proposed scope of work and work plan to satisfy the county's July 30, 1993, request for additional information.

Scope of Work

The proposed scope of services includes:

1. One day of drilling and logging of exploratory test borings with the collection of soil samples and Hydropunch™ ground-water samples. An Organic Vapor Meter (PID) will be used during the drilling of the boreholes to monitor for volatile vapors.

2. Submittal of the soil samples and ground-water samples for laboratory testing. Samples will be analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline, and volatile aromatic compounds (BTXE).

3. Analyses of the soil vapor readings and the laboratory test results. The test results and exploratory test boring information will be studied in an attempt to develop an areal and vertical representation of the soil and ground-water contaminant plume.

4. Installation of two to three ground-water monitoring wells, with the collection of a ground-water sample from the wells to be analyzed for TPH as gasoline, and BTXE.

5. Preparation of a report documenting the work performed and the findings of the investigation including recommendations for further study, if necessary.

Prior to drilling, we will obtain the necessary permits from Alameda County.

A. Soil Borings

We propose to spend one day drilling exploratory test borings to the depth of the local ground-water table. The exploratory soil borings will be drilled in the approximate locations shown on Figure 1.

The exploratory borings will be advanced using a truck-mounted, hollow stem auger. The soil samples will be collected using a 3-inch-diameter split spoon barrel sampler retaining 6-inch-long stainless steel tubes. Sampling equipment will be washed with a trisodium phosphate (TSP) and water solution and rinsed with distilled water between each sampling event.

Drilling will be performed under the observation of an ENGEO Environmental Geologist who will log the borings in accordance with the Unified Soil Classification System. Soil samples will be obtained at five foot sampling intervals and from the saturated soil above the ground-water table. The depth to ground water is estimated at 30 to 40 feet below the ground surface. The samples and soil cuttings will be screened in the field using a photoionization detector (PID), a device that provides a field determination for volatile organic compounds.

These samples will be preserved for laboratory testing by sealing the sample tube with PTFE sheets, plastic end caps and tape. The soil samples would be selected for laboratory testing on the basis of the PID screening and visual observations. The samples will be placed in a cooled ice chest and transported under documented chain-of-custody to a certified analytical testing laboratory.

The drill cuttings will be stored on plastic sheeting and covered until the laboratory test results are available and a schedule for the disposition of the soil can be developed. The boreholes will be backfilled in accordance with Alameda County Zone 7 Flood Control District requirements.

B. Ground-Water Sampling

Ground-water samples will be collected from the bore holes using the Hydropunch™ sampling method. The purpose is to evaluate the possible dispersion of the contaminants in the ground water and to evaluate locations for the permanent ground-water monitoring wells.

The Hydropunch™ is a 2-inch-diameter stainless steel sampling tool used for the collection of representative ground-water samples without the installation of permanent monitoring

wells. The hollow stem drill auger will be used to provide the bore hole or 'pilot hole' for the Hydropunch™. After inserting the polypropylene screen and attaching the point, the Hydropunch™ will be fixed to the casing, lowered through the bore hole and driven to the proper depth. The tool will then be withdrawn approximately 48 inches, leaving the point in the ground and exposing the screen so that ground water can drain into the sampler.

A 1-inch-diameter O.D. bailer will be lowered through the hollow stem interior of the drive casing and the Hydropunch™ in order to collect the representative samples. The ground-water samples will be decanted into clean 40-milliliter volatile organic analysis vials (VOA). The samples will be cooled in an ice chest until delivery under a documented chain-of-custody to an analytical testing laboratory.

Sample collection, preservation, chain-of-custody procedures and equipment decontamination will be performed in accordance with ENGEO's quality assurance/quality control procedures.

C. Ground-Water Monitoring Well Installation

The proposed ground-water monitoring well locations will be determined after review and analysis of the soil and Hydropunch™ sampling test results.

The monitoring wells will be advanced using a truck-mounted, 6-inch-diameter hollow stem auger. Soil samples will be collected using a 3-inch-diameter split spoon barrel sampler retaining 6-inch-long stainless steel tubes. Sampling equipment will be washed with a trisodium phosphate (TSP) and water solution and rinsed with clean water between each sampling event.

Drilling will be performed under the direction of an ENGEO Environmental Geologist who will log the well borings in accordance with the Unified Soil Classification System. Soil samples will be obtained at five foot sampling intervals and in the saturated zone above the ground-water table. These samples will be screened in the field using a photoionization detector (PID), a device that provides a field determination of the presence of certain volatile organic compounds. The drill cuttings will be stored on plastic sheeting and covered until the laboratory test results are available and a schedule for the disposition of the soil can be developed. The boreholes will be backfilled in accordance with the Alameda County Zone 7 Flood Control District requirements.

The soil samples will be preserved for testing by sealing the sample tube with PTFE sheets, plastic end caps and tape. The samples will be placed in a cooled ice chest and transported under documented chain-of-custody to a certified analytical testing laboratory.

The monitoring wells will consist of 2-inch-diameter PVC casing with flush joints, installed down through the hollow stem auger. The wells will be constructed with about 15 feet of screened casing (0.01-inch slot width) and an appropriate length of solid PVC well casing

Water quality parameters, including temperature, pH, and dissolved solids, will be monitored. Ground-water samples will be collected for laboratory testing using a clean dedicated polyethylene bailer. The samples will be decanted into clean 40-milliliter volatile organic analysis vials (VOA) and cooled in an ice chest until delivery under a documented chain-of-custody an analytical testing laboratory. Sample collection, preservation, chain-of-custody procedures and equipment decontamination will be performed in accordance with ENGEO's standard quality assurance/quality control procedures.

Following completion of the monitoring wells, we will complete Department of Water Resources (DWR) Well Installation Forms to be submitted to the County and State.

C. Laboratory Testing

The laboratory testing will be performed in accordance with test methods specified in the Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites (August 1990).

The soil and ground-water samples selected for laboratory testing will be analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline and for benzene, toluene, xylene and ethyl benzene (BTXE) (EPA Test Method 8015/5030 and 8020).

D. Analysis of Data

We will review the data from the exploratory boring logs, the PID readings, and the laboratory test results. A determination will be made regarding the possible vertical and lateral extent of petroleum hydrocarbons. The potential extent of the ground-water contamination beneath the subject site will also be evaluated.

E. Report Preparation

Upon the completion of the subsurface investigation and laboratory testing, ENGEO will prepare a report documenting the work performed with a summary of the laboratory test results. The report will be prepared under the direct supervision of and will be signed by a certified engineering geologist. The report will include an analysis of the data collected and conclusions relative to the following items:

- The extent of petroleum hydrocarbons in soil and ground water beneath the site
- A determination of the possible extent of on or off-site ground-water contamination.

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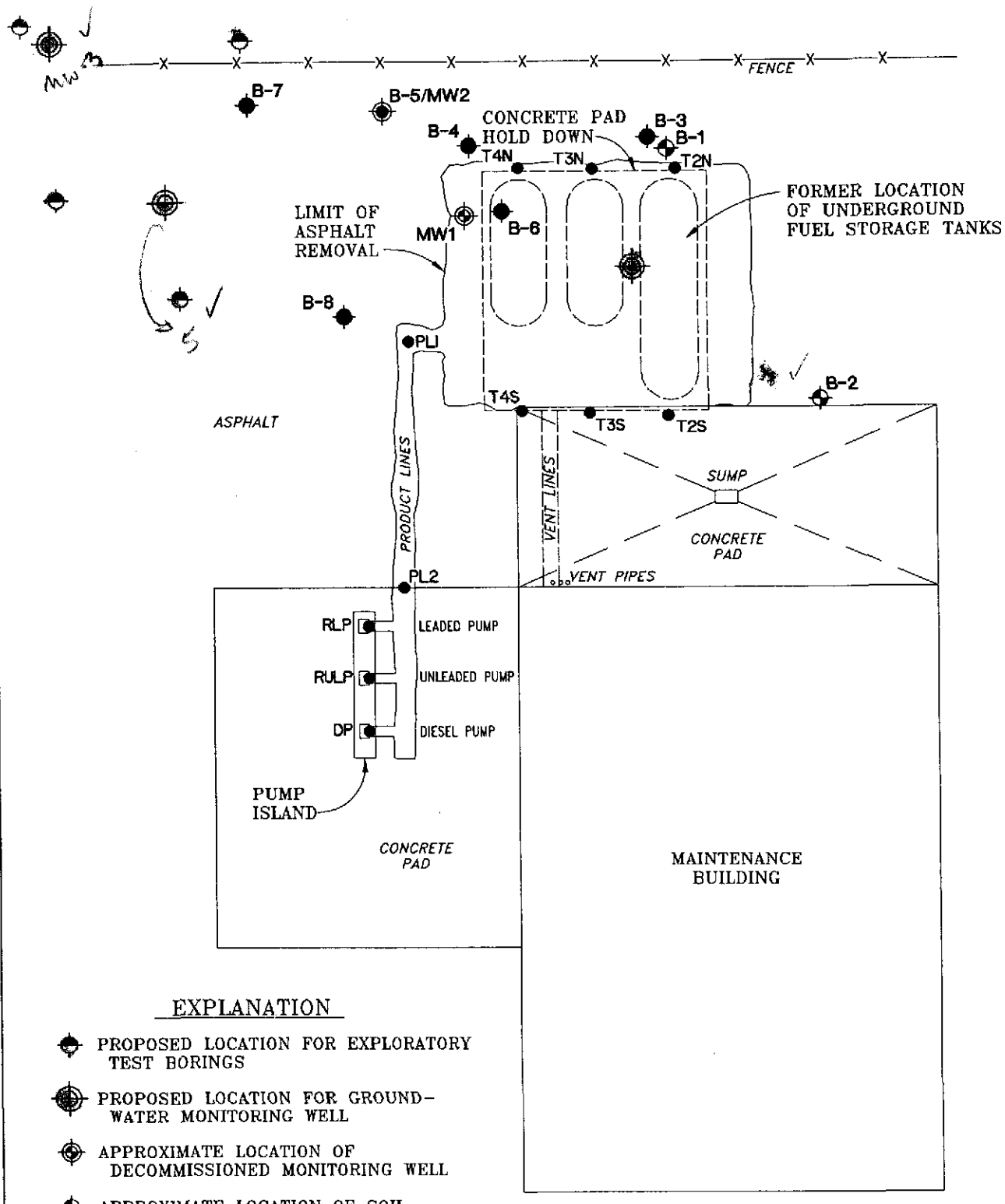

EXPLANATION

- PROPOSED LOCATION FOR EXPLORATORY TEST BORINGS
- PROPOSED LOCATION FOR GROUND-WATER MONITORING WELL
- APPROXIMATE LOCATION OF DECOMMISSIONED MONITORING WELL
- APPROXIMATE LOCATION OF SOIL BORING (ENGEO 12/13/90)
- SAMPLE LOCATION AT TIME OF TANK REMOVALS
- APPROXIMATE LOCATION OF EXPLORATORY SOIL BORINGS (ENGEO 4/9/93)
- APPROXIMATE LOCATION OF GROUND-WATER MONITORING WELL INSTALLED 4/13/93

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FEET

ENGEO INCORPORATED

PROPOSED MONITORING WELL LOCATIONS
L.V.J.U.S.D. MAINTENANCE YARD
2900 LADD AVENUE
LIVERMORE, CALIFORNIA

JOB NO.: 3174-F7
DATE: APRIL 1994
DRAWN BY: CS CHECKED BY: RF

FIGURE NO. 1