



July 7, 1998

618.0101.002

Alameda County
Environmental Health Services
Environmental Protection
1131 Harbour Bay Parkway, Suite 250
Alameda, California 94502-6577

Attention: Mr. Barney Chan

98 JUL -8 AM 10:56
ENVIRONMENTAL
PROTECTION

**WORK PLAN
ADDITIONAL GROUNDWATER INVESTIGATION
PACIFIC ELECTRIC MOTOR COMPANY
1009 66TH AVENUE
OAKLAND, CALIFORNIA**

Dear Mr. Chan:

PES Environmental, Inc. (PES) has prepared this work plan on behalf of Pacific Electric Motor Company (PEM) to perform additional investigation of groundwater at the PEM facility located at 1009 66th Avenue, Oakland, California (Plate 1). This work plan ~~was~~ prepared was requested by Alameda County Environmental Health Services (ACEHS) in a letter dated May 13, 1998. A copy of the ACEHS letter is included in the Appendix. This work plan contains: (1) a brief discussion of background information and previous findings; and (2) the proposed scope of work and schedule.

1.0 BACKGROUND INFORMATION

The site is located in a residential and light industrial area in Oakland, California, and is presently used to repair large electric motors. PEM formerly operated a 2,000-gallon steel gasoline underground storage tank (UST) east of the warehouse building (Plate 2). The tank was reportedly installed in approximately 1975 (ENVIRON, 1997). In February 1995, the UST was removed by W.A. Craig (WAC). Observations at the time of removal indicated that the tank was in good condition and no holes were evident (WAC, 1995). However, free-phase gasoline product was observed on the water surface in the tank excavation. Soil samples collected from the UST excavation and associated piping trenches detected total petroleum hydrocarbons as gasoline (TPH-g) at concentrations up to 10,000 milligrams per kilogram. Approximately 1,500 cubic yards of soil were excavated and disposed offsite, and

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mainly rainwater

116,000 gallons of petroleum hydrocarbon-affected water were pumped from the excavation and disposed offsite. A dewatering sump installed by WAC during soil excavation was later converted to groundwater monitoring well WAC-1 (Plate 2). WAC summarized the results of their remediation program in a report entitled *Excavation and Sampling Report*, dated May 12, 1997.

2.0 PREVIOUS FINDINGS

ENVIRON, Inc. installed and sampled three shallow monitoring wells (MW-1, MW-2, MW-3) in June 1997 to evaluate groundwater conditions in the vicinity of the former UST. Well MW-1 was installed adjacent to the former UST, and Wells MW-2 and MW-3 were installed in the anticipated downgradient direction of groundwater flow. The well installation program and associated soil and groundwater sampling program were summarized in the ENVIRON report *Soil and Ground Water Investigation, Summary Report, Pacific Electric Motor Co., 1009-66th Avenue, Oakland, California*, dated July 17, 1997. ENVIRON concluded that the remediation performed had successfully removed the source of the petroleum hydrocarbons (i.e., the former UST and petroleum hydrocarbon-affected soil and groundwater), and that residual concentrations of petroleum hydrocarbons in soil and groundwater were present only in the immediate vicinity of the former UST.

Since June 1997, PES performed three additional quarters of groundwater monitoring of the three wells to evaluate the distribution of petroleum hydrocarbon compounds in groundwater. At the request of ACEHS, PES expanded the analytical program to include inorganic parameters to assess whether natural bioremediation of the groundwater is occurring. After completing four quarters of groundwater monitoring, PES has concluded the following: (1) groundwater flow has consistently been to the southwest to west; (2) concentrations of petroleum hydrocarbons have decreased significantly in Well MW-1 between June 1997 and March 1998; (3) no petroleum hydrocarbons have been detected in Wells MW-2 and MW-3; and (4) the results of inorganic analyses indicate that natural bioremediation appears to be occurring in MW-1.

3.0 SCOPE OF WORK

The scope of work has been divided into three tasks to further evaluate the presence of petroleum hydrocarbons in soil and groundwater in the vicinity of the former UST. These tasks are as follows: (1) grab groundwater sampling; (2) well installation, development, and sampling; and (3) data evaluation and report preparation. Prior to groundwater sampling and well installation, a site-specific health and safety plan will be prepared and the appropriate permits will be obtained. Details concerning each of these tasks are summarized below:

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Task 1 - Grab Groundwater Sampling

As requested by ACEHS, two borings for grab groundwater sampling will be drilled within the backfill of the tank excavation. The proposed sampling locations are shown on Plate 2.

The borings will be drilled to a depth of approximately 10 feet bgs using a truck-mounted drill rig equipped with hollow-stem augers. Soil samples will be collected at a minimum of every 5 feet and at any changes in lithology to document subsurface conditions. Samples will be collected by driving a modified California split-spoon sampler (lined with three, 6-inch long stainless steel liners) approximately 18 inches into undisturbed soil. The soil lithology will be logged from cuttings and from samples in accordance with the Unified Soil Classification System under the supervision of a California Registered Geologist.

The first (lead) liner of each sample will be field screened for headspace analysis of volatile organic chemicals (VOC) using a photo ionization detector (PID). The PID readings will be recorded on the boring log. One sample from depths of 5, 10, ~~15,~~ and 20 feet will be submitted for laboratory analysis. The laboratory program is described below.

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After groundwater is encountered, the drilling auger will be partially withdrawn to allow water to enter the borehole. A temporary 1-inch diameter Schedule 40 PVC casing with 5 feet of 0.020 inch machine slotted screen will be placed in the borehole. A grab groundwater sample will then be collected using a stainless steel or Teflon bailer. The sample will be transferred to the appropriate laboratory sample containers by filling slowly to minimize sample volatilization and to ensure that the sample is free of bubbles. Groundwater sample containers will be labeled, placed in a chilled thermally-insulated cooler, and transported under chain-of-custody protocol to Entech Analytical Labs of Sunnyvale, California.

Soil and groundwater samples will be analyzed on a standard turnaround time basis for total petroleum hydrocarbons quantified as gasoline (TPHg) using EPA Test Method 8015 modified, and benzene, toluene, ethyl benzene, and total xylenes (BTEX) and methyl tert-butyl ether (MTBE) using EPA Test Method 8015. After collecting the groundwater samples, the borings will be backfilled using a tremie pipe from the bottom of the borehole to the ground surface with neat cement.

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 8260*

To avoid cross contamination, drilling and sampling equipment will be decontaminated prior to use and between each sampling location. The equipment will be cleaned using a combination steam/high pressure wash system. Sampling equipment rinsate and soil cuttings will be collected in sealed containers and stored onsite until appropriate disposal arrangements are made.

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Task 2 - Well Installation, Development, and Sampling

As requested by ACEHS, one well (MW-4) will be installed downgradient of the former tank excavation. The proposed sampling location is shown on Plate 2.

The well boring will be drilled to a depth of approximately 20 feet bgs using the equipment and methodology described above. The groundwater monitoring well will be installed through the hollow stem of the augers. The well will be constructed using 2-inch diameter, flush-threaded, PVC casing and 0.020 inch machine slotted well screen. The well will be completed so that the screen extends at least 10 feet below and approximately 5 feet above the static water level. The well will be constructed with a threaded bottom cap and a clean sand pack extending from the bottom of the borehole to approximately one foot above the top of the screen. A one-foot thick bentonite pellet seal will be placed above the sand pack and a bentonite/cement grout will be placed above the bentonite pellet seal to the ground surface. The wellhead will be completed with a locking water-tight cap within a traffic-rated well vault set just above grade. A typical well construction detail is shown on Plate 3. The well top-of-casing elevation and location will be surveyed by a California-licensed land surveyor using the same benchmark system used for the existing monitoring wells.

Following monitoring well installation, the well will be developed to sort the sand pack and remove fines from the well bore. Development will be performed by surging and/or bailing followed by pumping (as necessary) until discharge is visually clear and free of sediment and at least 6 to 10 well volumes of water have been removed. Development discharge water will be monitored for pH, temperature, and electrical conductivity during development. Development equipment will be cleaned prior to use. Development water will be collected in a DOT-approved 55-gallon steel drum and stored onsite until appropriate disposal arrangements are made.

Following well development, a groundwater sample will be collected using a Teflon or stainless steel bailer. The sample will be transferred to the appropriate laboratory sample containers. The sample containers will be filled slowly to minimize sample volatilization and ensure that the sample is free of air bubbles. The sample containers will be labeled, placed in a thermally insulated cooler, and transported under chain-of-custody protocol to the project laboratory for analysis of TPHg, BTEX, and MTBE as described above. A groundwater sample will also be submitted to the project laboratory for analysis of total dissolved solids (TDS) using EPA Test Method 160.1.

Additionally, groundwater level measurements and will be collected from existing monitoring wells MW-1 through MW-3. The groundwater samples will be analyzed for the same analytical program as described above for well MW-4.

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Task 3 - Data Evaluation and Report Preparation

After receiving the analytical data for the soil and groundwater samples, the results of the investigation will be presented in a report and submitted to ACEHS. The report will include: (1) a brief summary of background information; (2) field investigation methods and procedures; (3) a discussion of the results of the investigation, including a tabular and graphical summary of the groundwater monitoring data; and (4) conclusions regarding the direction of groundwater flow and the distribution of residual petroleum hydrocarbons in soil and groundwater at the site at the new sampling locations.

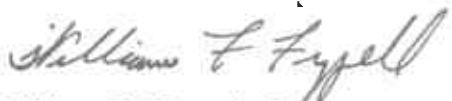
PES can commence work immediately upon approval of this work plan. We anticipate that the investigation will require approximately four weeks to complete, assuming prompt availability of subcontractors and a standard 5-day turnaround time for laboratory analyses. We trust this work plan provides you with the information required at this time and meets with your approval. If you have any questions or require additional information, please call either of the undersigned.

Yours very truly,

PES ENVIRONMENTAL, INC.



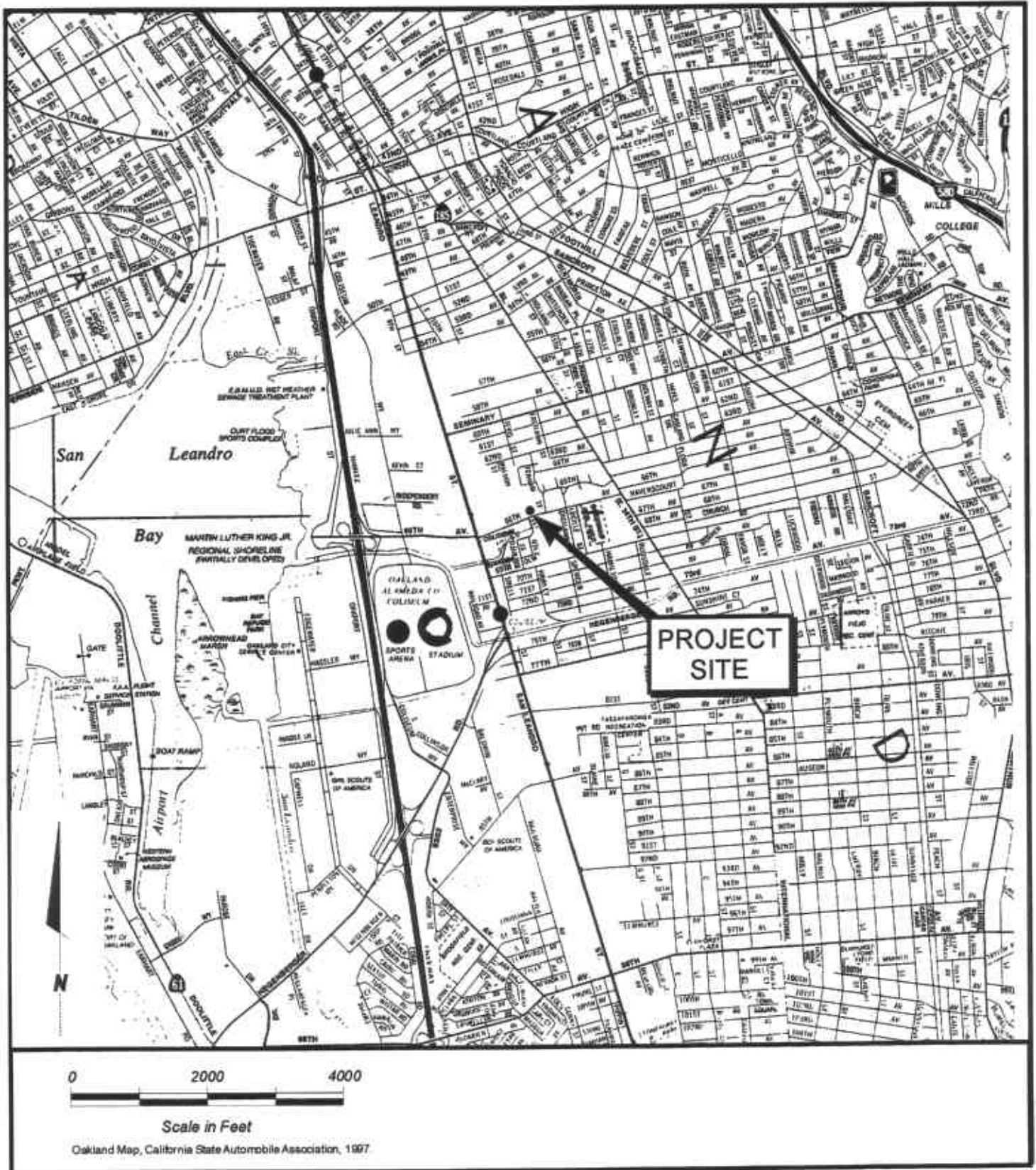
William W. Mast, R.G.
Associate Engineer



William F. Frizzell, P.E.
Principal Engineer

cc: Mr. Rand Perry - Pacific Electric Motor Company

Attachments: Plate 1 - Site Location Map
Plate 2 - Site Plan
Plate 3 - Typical Well Completion Detail
Appendix - ACEHS May 13, 1998 Letter



PES Environmental, Inc.
Engineering & Environmental Services

Site Location Map
Pacific Electric Motor Company
1009 66th Avenue
Oakland, California

PLATE

1

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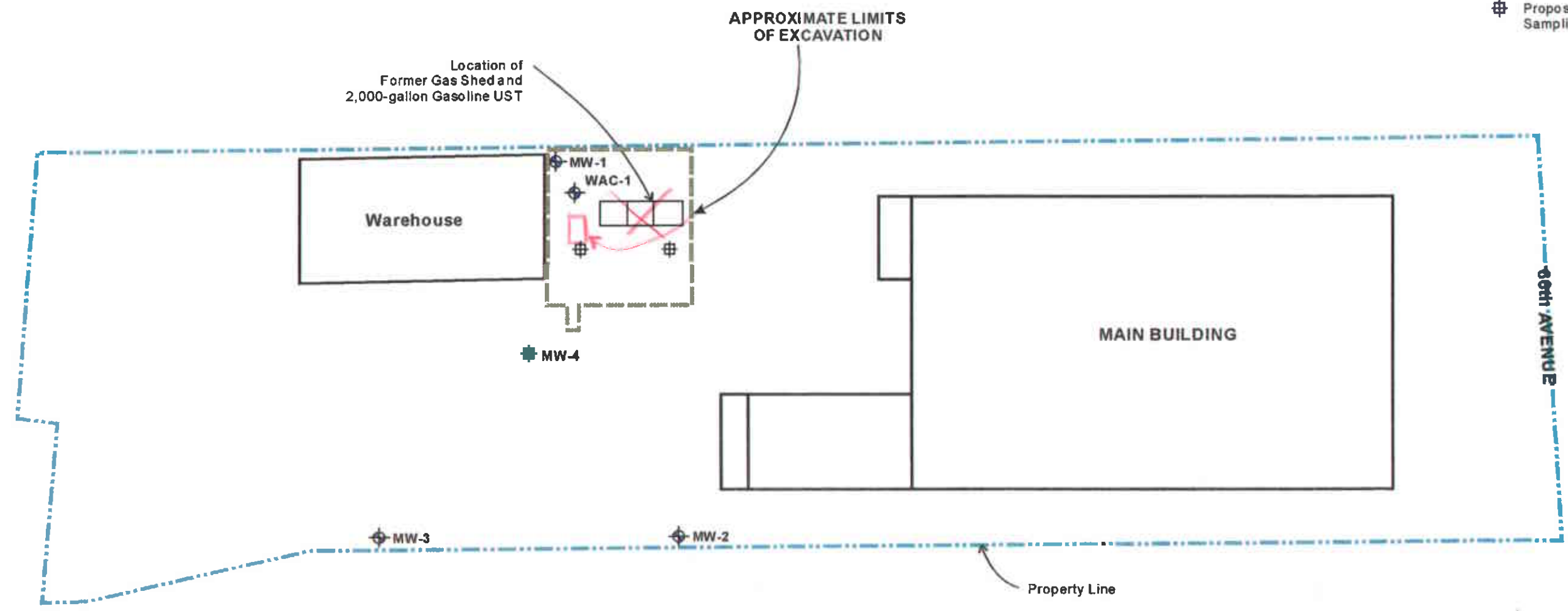
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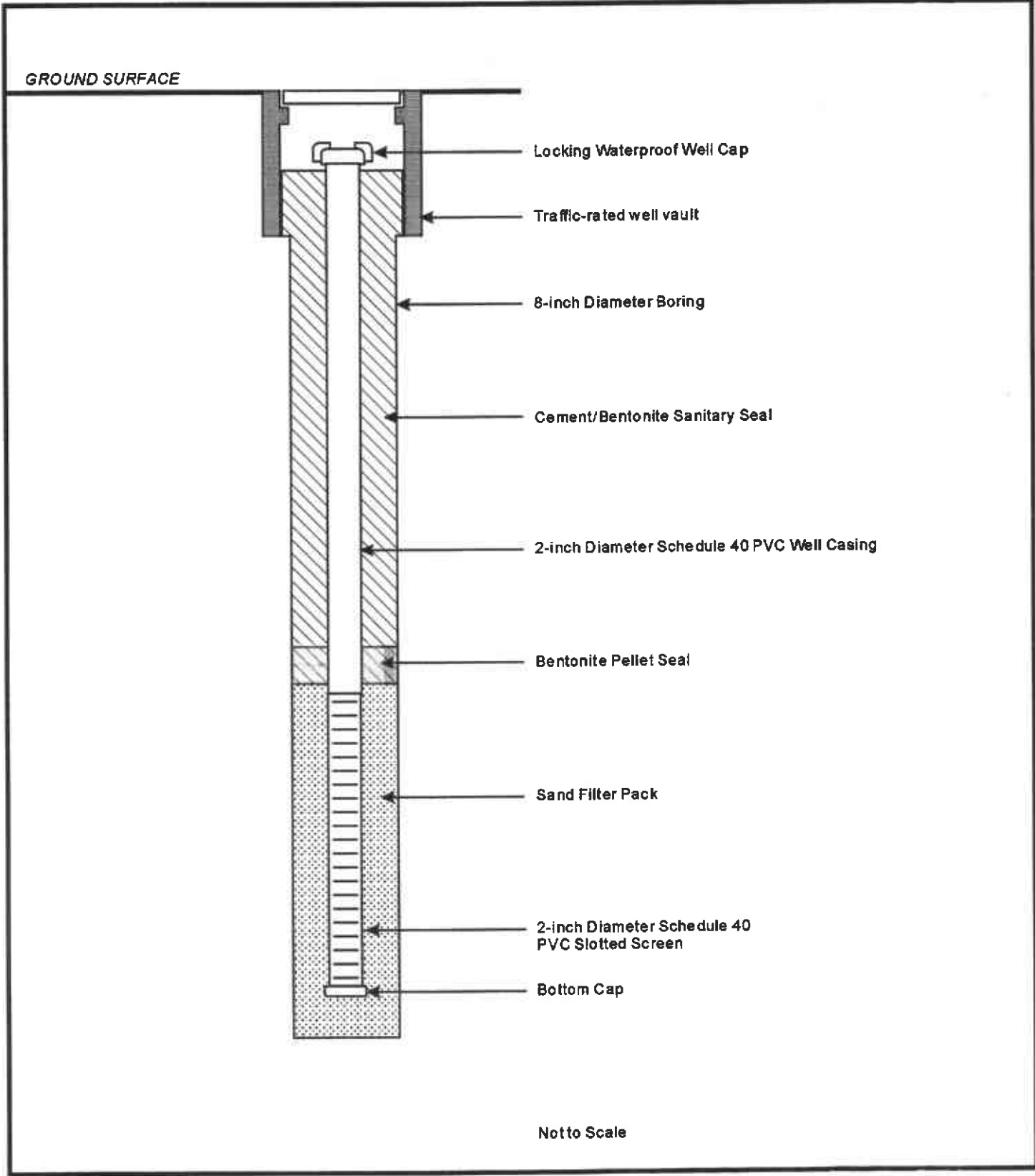
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Explanation

- ◆ Monitoring Well Location
- ◆ Proposed Monitoring Well Location
- ⊕ Proposed Grab Groundwater Sampling Location



Drawing modified from ENVIRON, 1997



Not to Scale