EVAX TECHNOLOGIES, INC.

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September 28, 1992

Ms. Juliet Shin
Alameda County Health Care Services
Department of Environmental Health
Hazardous Materials Program
80 Swam Way, Room 200
Oakland, California 94621

SUBJECT: WORKPLAN FOR GROUNDWATER INVESTIGATION,
PLANTS UNLIMITED INC., SAN LORENZO, CA

Dear Ms. Shin:

If you will recall, we talked over the telephone recently and I indicated that our company, EVAX Technologies, Inc. (EVAX), was retained by Plants Unlimited Inc. (Plants Unlimited) to conduct a groundwater investigation. The investigation will address concerns raised by your department with regards to groundwater resources at the subject project.

Please review the attached workplan. Plants Unlimited is eager to begin the work. Thank you.

Sincerely Yours,
EVAX Technologies, Inc.

Paul A. Studemeister
Senior Geologist, RG 4635

Attachment: Workplan

WORKPLAN FOR A GROUNDWATER INVESTIGATION AT PLANTS UNLIMITED INC., 16450 KENT AVENUE, SAN LORENZO, CALIFORNIA

EVAX PROJECT A559-01

Prepared By:
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Prepared For:
PLANTS UNLIMITED INC.
16450 Kent Avenue
San Lorenzo, California 94580

September 24, 1992

EVAX TECHNOLOGIES, INC.

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WORKPLAN FOR A GROUNDWATER INVESTIGATION AT PLANTS UNLIMITED INC., 16450 KENT AVENUE, SAN LORENZO, CALIFORNIA

INTRODUCTION

EVAX Technologies, Inc. (EVAX) was retained by Mr. John Goldstein of Plants Unlimited, Inc. (Plants Unlimited) to prepare a workplan for a groundwater investigation at the Plants Unlimited Facility. The subject site is located at 16450 Kent Avenue in San Lorenzo, Alameda County, California. EVAX proposes to install and sample 3 groundwater monitoring wells to evaluate the possibility of groundwater impact by gasoline hydrocarbon products.

REGULATORY COMPLIANCE

The main purpose of the project is to comply with a request by the Alameda County Health Care Services, Department of Environmental Health (Alameda County Environmental Health) to test groundwater around an underground storage tanks (USTs) system that was recently removed from the site. This workplan follows the San Francisco Regional Water Quality Control Board (Regional Water Quality Control Board) recommendations for the installation and testing of groundwater monitoring wells at underground storage tank sites. The workplan is being submitted to the Alameda County Environmental Health for review and approval.

SITE LOCATION

Plant Unlimited is a business that specializes in the wholesale growth of acclimated interior plants. An office building and greenhouses occupy the site, except for a unpaved parking lot in front of Kent Avenue and a driveway along the south property boundary. The Assessors Parcel Numbers are 80B-300-22-1 and 80B-300-23. The site is located in a residential area of San Lorenzo and is shown on the attached Site Map, Figure 1.

UNDERGROUND STORAGE TANKS

According to Alameda County Environmental Health, 2 USTs were excavated and removed from the site in July 1990. The tanks were located in the parking lot area in front of Kent Street (Figure 1). A 280-gallon capacity steel tank was used for storage of gasoline and a 1,500-gallon capacity steel tank was used for storage of diesel or heating fuel.

Alameda County Environmental Health reported that a small hole was observed in the 280-gallon capacity gasoline tank. Soil samples were taken at the time from the tank pits and submitted to a laboratory for chemical analyses. A soil sample taken from beneath the gasoline tank reportedly analyzed 2,300 part per million (ppm) total petroleum hydrocarbons as gasoline. Because of the shallow nature of groundwater in the area, Alameda County Environmental Health requested an investigation to evaluate the possibility that groundwater was impacted by gasoline hydrocarbon products.

REGIONAL SETTING

The site is in an area of low topographic relief, approximately 2.25 miles east of the current shoreline of the San Francisco Bay. Although the regional groundwater flow direction is inferred to the generally westward like surface drainages, the San Lorenzo River may have a local influence on groundwater flow direction. The site is located approximately 0.5 mile north of the San Lorenzo River and groundwater near the river may be diverted towards the existing or old river course.

According to Regional Water Quality Control Board, the Okada Property is the nearest site to the subject site in the underground storage tank leak files. The Okada Property is at 16109 Ashland Avenue, approximately 0.5 miles northwest of the subject site. A groundwater investigation was conducted in 1989 which included the installation and sampling of 3 groundwater monitoring wells. Results of the 1989 investigation indicated depth to groundwater at the Okada Property was at 8 to 9 feet below ground surface and groundwater flow direction was towards the west.

There are no known groundwater monitoring wells in the immediate vicinity of the Plant Unlimited Site. Groundwater flow direction at the subject site is assumed to be west to south based on the Okada Property data and relative location of the San Francisco Bay and San Lorenzo River.

SCOPE OF WORKPLAN

The project consists of the following tasks: 1) Well Installation, 2) Well Development, 3) Well Survey, 4) Monthly Groundwater Monitoring Program, 5) Quarterly Groundwater Sampling Program, 6) Laboratory Analyses, and 7) Reports.

WELL INSTALLATION

Well Permit

EVAX will secure a well permit from Zone 7 Alameda County Flood Control and Water Conservation District prior to installation of the groundwater monitoring wells. Furthermore, EVAX will contact Underground Services Alert to locate and mark underground public utility lines. EVAX will prepare a Site Safety Plan which describes the basic health and safety issues for the proposed work.

Well Drillers

EVAX will subcontract Exploration Geoservices, Inc. (Exploration Geoservices: C57 484288) of San Jose, California to construct the groundwater monitoring wells. The wells will be drilled and constructed with a truck mounted drill rig equipped with continuous flight, hollow stem augers of 6-inch inside diameter. Augers and other drill equipment will be steam cleaned and washed between uses to minimize the possibility of cross contamination. The drilling and construction of the wells will be supervised by a California Registered Geologist for EVAX. A hand operated auger will be used at each well location to test for underground utility lines prior to starting drilling operations.

Well Location

The groundwater monitoring wells will be designated MW-1 through MW-3. EVAX anticipates installing MW-1 in an area generally west of the former USTs system, MW-2 within approximately 10 feet of the former pit of the 250-gallon gasoline UST, and MW-3 in an area southwest of the former USTs system. The location of the wells was selected to have at least one well located in an area assumed to be downgradient to the former USTs. The wells will be used to (1) establish a site specific groundwater flow direction and gradient, and (2) sample and test groundwater for possible presence of gasoline hydrocarbon constituents.

Soil Sampling

The boring for each well will be advanced to first groundwater and then continued to a depth of approximate 10 feet below groundwater level. Each boring will be oriented vertically and EVAX anticipates the borings will each be advanced to a maximum depth of 25 feet below ground surface. This is based on the assumption that the first groundwater level at the site is at a depth approximately 15 feet below ground surface. Soil borings and well construction will be modified in the field based on actual site conditions.

Soil samples will be taken at approximately 3 to 5 feet depth intervals, significant lithological transitions, and/or soil-groundwater interface. Samples will be taken using a California modified, split-spoon sampler loaded with 3 pre-cleaned brass sleeves each of 2-inch diameter and 6-inch length. Sampling will involve advancing the boring to a point just above the sampling depth, sliding the sampler with brass sleeves through the hollow stem of augers, and then driving the sampler 18 inches into the soils with a standard 140 pound hammer dropped repeatedly 30 inches. This sampling procedures affords sampling of relatively undisturbed soils below the base of the boring.

Soil samples will be described following the Unified Soil Classification System and field screened with a portable gas analyzer, such as a flame-ionization detector (FID). Portable gas analyzers measure, on a qualitative basis, total volatile hydrocarbon/organic (TVH) content in soils.

The geologist will select at least one soil-packed sleeve from each boring, probably taken at or immediately above the groundwater level, for laboratory analyses. The selected sleeve samples will each be sealed with aluminum foil, plastic end caps, and tape; and then labeled and placed in iced storage. A chain of custody record will be initiated at the field and follow the samples to the laboratory.

Well Construction

Exploration Geoservices will construct a groundwater monitoring well in each borehole. Well construction is illustrated in the attached Typical Groundwater Monitoring Well, Figure 2. Flush thread jointed, Schedule 40 polyvinyl chloride (PVC) casing of 2-inch diameter will be placed down the hollow stem of the augers to the base of the boring. EVAX anticipates the lower 15 feet of the well casing will be of the screened casing type. The remaining casing (top 10 feet section) will be made of solid casing. A threaded plug will be attached to the bottom of the well casing and a locking cap will be placed at the top.

The annular space between the well casing and borehole wall will be filled as follows. Graded sand will be placed in the annular space between the base of the boring and approximately 2 feet above the screened well casing. A seal of bentonite pellets, approximately 1 to 2 feet thick, will be placed above the sand pack. The remaining annulus, between ground surface and the bentonite seal, will be filled with a neat cement slurry.

A traffic rated utility box will be placed around the wellhead and set in the cement slurry even with ground surface. A special tool will be required to open the utility box and a key is needed to open the wellhead cap so that the risk of unauthorized access to the monitoring wells will be discouraged.

WELL DEVELOPMENT

At least 48 hours after completion, the groundwater monitoring wells will be developed. Well development will be performed using a well development rig equipped with a swabber, bailer, and/or water pump. Well development will entail repeatedly swabbing and purging groundwater out of the wells. The main purpose is to remove sediment accumulation in the well casing and prepare the wells for sampling. Water parameters such as turbidity will be monitored during well development.

WELL SURVEY

A licensed well surveyor will be subcontracted by EVAX to survey the elevation of the top of the well casing of each well relative to a bench mark. Well casing elevations will be measured to the nearest 0.01 foot. An EVAX representative will be at the site to assure the well surveyor has access to and correctly identifies the wells.

EVAX will also contact the Alameda County Flood Control and Water Conservation District to conduct a water well survey of the an area within a 1/2 mile radius of the subject site. The purpose of the water well survey is to identify the uses of groundwater in the immediate vicinity of the subject site.

MONTHLY GROUNDWATER MONITORING PROGRAM

EVAX will conduct a groundwater monitoring program of the site for a period of a year. Groundwater monitoring program will consist of measurement of depth to water and subjective evaluation of each groundwater monitoring well on a monthly schedule. At each monthly monitoring event, depth to water will be measured using a Solinst electronic water level sounder to the nearest 0.01 feet and relative to the top of the well casing. Subjective evaluation will consist of gently lowering a pre-cleaned Teflon bailer approximately half its length past the air-water interface. The bailer will be retrieved from the well and water will be examined for the possible presence of floating product, sheen, or product odor. If floating product is present, the thickness of the floating product will be measured with a water-product interface probe.

QUARTERLY GROUNDWATER SAMPLING PROGRAM

EVAX will sample groundwater from the wells on a monthly schedule during the initial 3 months following well development. After the initial 3 months, the wells will be sampled on a quarterly schedule for the remainder of the year. At each sampling event, EVAX will first measure depth to water and conduct subjective evaluation as outlined in Monthly Groundwater Monitoring Program. Starting with the cleanest well and ending with the dirtiest well, EVAX will then purge each well of at least 5 well volumes to prepare the well for sampling. The wells will be purged using a hand operated Teflon bailer or submersible water pump. During purging, purged water will be monitored for temperature, pH, and conductivity. After purging at least 5 well volumes and when water parameters stabilize, water level in the wells will be allowed to recover to at least 80% of the static level. At this point a water sample will be taken from the well.

Water sampling will involve gently lowering a pre-cleaned Teflon bailer approximately half its length past the air-water interface. The bailer will be retrieved from the well and water will be promptly transferred into standard 40-ml volatile organic analyses (VOA) glass vials. The vials will contain hydrochloric acid preservative. The vials will be promptly sealed with Teflon lined caps, labeled according to well identification and sampling date, and placed in iced storage for prompt transport to a state-certified laboratory. A chain of custody record with the usual chain of custody protocol will be initiated and follow the samples to the laboratory.

LABORATORY ANALYSES

Soil and water samples will be submitted to Anametrix Inc. (Anametrix: California State Department of Health Services Certified Laboratory, Certificate 1234) of San Jose, California. The samples will be analyzed for total petroleum hydrocarbons as gasoline (TPHg) by Environmental Protection Agency 5030/8015, and for benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8020/602. If elevated concentrations of TPHg are found, at least 1 sample will also be analyzed for total lead and organic lead by LUFT Field Manual recommended methods.

REPORTS

A site investigation report, which documents the procedures and results of the project, will be prepared by EVAX. The report will also discuss recommendations for additional work if results warrant further site characterization and remediation. In addition, EVAX anticipates preparing summary reports on a quarterly schedule which present the results of quarterly groundwater sampling events. EVAX will submit copies of reports to Alameda County Environmental Health and Regional Water Quality Control Board.

SOIL CUTTINGS AND WATER

Soil cuttings generated from the drilling of soil borings will be placed in an enclosure is visqueen and stored on site. Water generated from well installation, development, and sampling activities, and water resulting from clean up procedures, will be placed in 55-gallon capacity steel drums. The drums will be sealed, labeled as to contents, and stored temporarily at the site.

WORKPLAN SCHEDULE

Upon workplan review by the Alameda County Environmental Health, EVAX will implement the workplan. The installation and development of the groundwater monitoring wells will occur within 2 weeks of regulatory review. During this time, the well survey will be completed. The first groundwater monitoring and sampling event will occur within a week of completion of well development. For the remainder of the one-year project, EVAX will conduct monthly groundwater monitoring and quarterly groundwater sampling of the wells as explained above. EVAX will issue reports of investigation procedures and results in a timely fashion.

LIMITATIONS

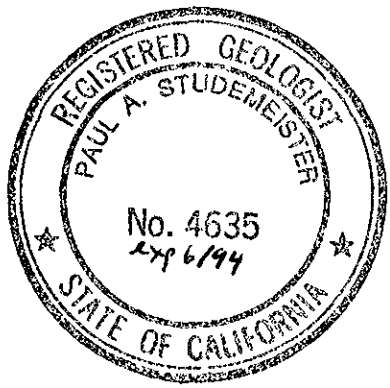
This workplan was prepared on the basis of information provided by Plants Unlimited and gathered by EVAX from discussions with regulatory officials and examination of files at Regional Water Quality Control Board. EVAX reserves the right to amend or make changes in the proposed workplan before or during the course of the investigation. Unexpected conditions or changes in the scope of work may result in changes or implementation delays in the workplan.

Please call if you have questions.

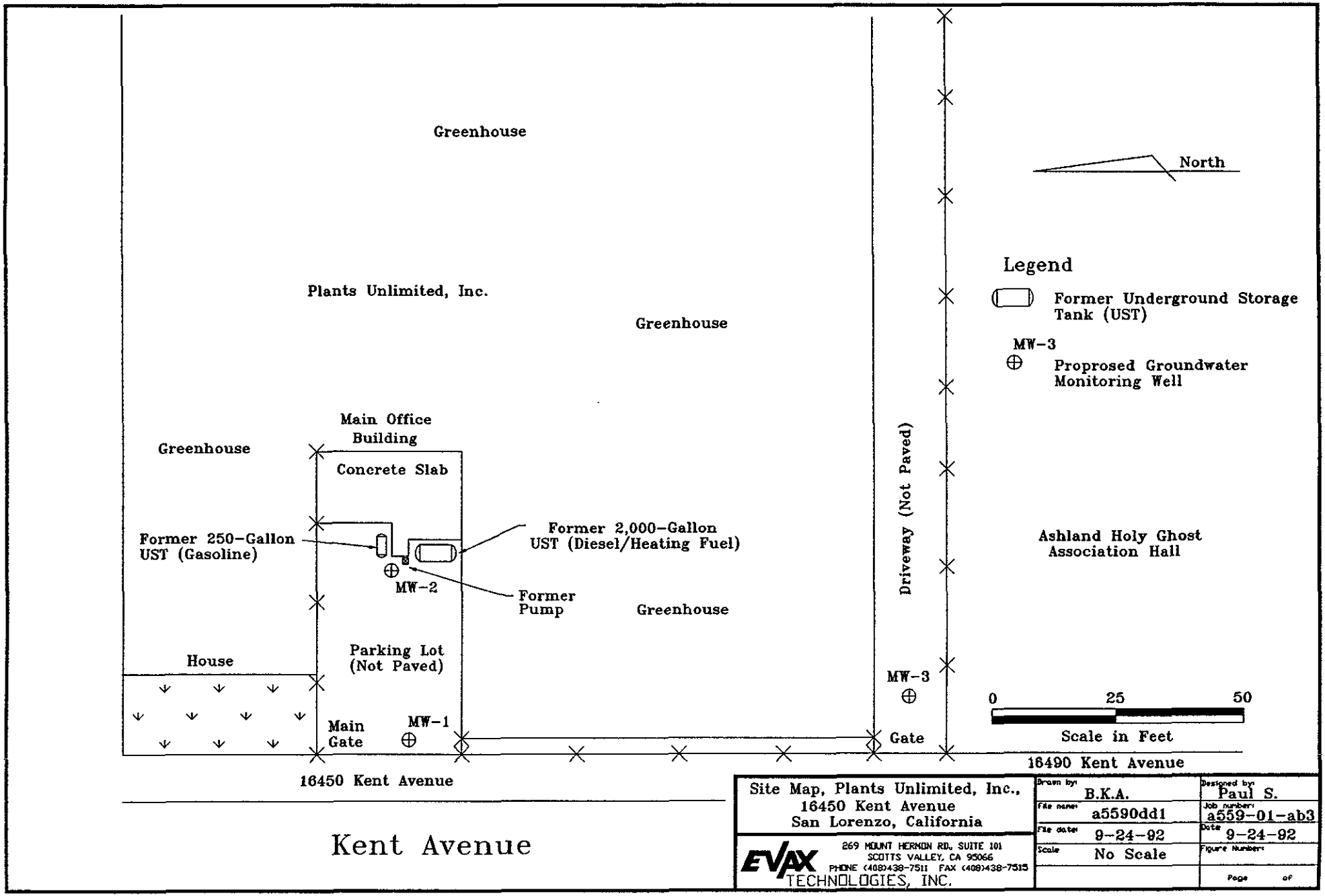
Sincerely,
EVAX Technologies, Inc.

Paul A Studt

Paul A. Studemeister
Senior Geologist, RG 4635



Attachments: Site Map, Figure 1
Typical Groundwater Monitoring Well, Figure 2



Site Map, Plants Unlimited, Inc.,
16450 Kent Avenue
San Lorenzo, California

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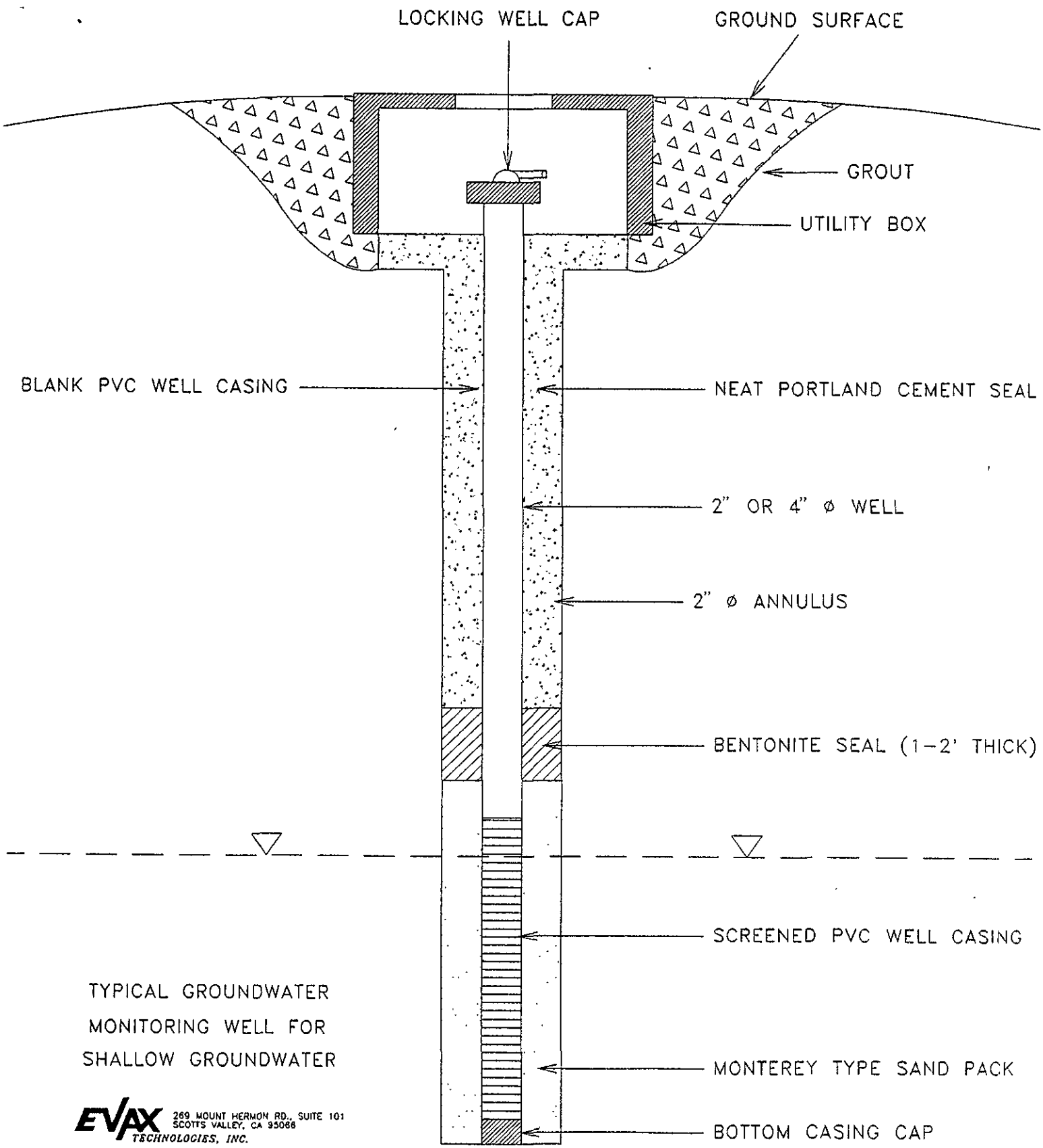

TYPICAL GROUNDWATER MONITORING WELL FOR SHALLOW GROUNDWATER

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