



BERKELEY FARMS, Inc.

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August 31, 1992

Juliet Shin
Department of Environmental Health
Division of Hazardous Materials
80 Swan Way, Room 200
Oakland, CA 94621

Dear Ms. Shin:

Enclosed please find the narrative indicating the procedures used to provide groundwater monitoring by the use of wells installed at our property at 23555 Saklan Road in Hayward.

If you need additional information or have any questions, please call me.

Sincerely,

Timothy W. Blaney dh
Timothy W. Blaney
Property Manager

Enclosure

dh

SECTION 2.0

PROCEDURES

Details on the following procedures were discussed in the work plan prepared by Certified Environmental Consulting, Inc. (CEC). The date of the work plan was March 26, 1990.

2.1 SUBSURFACE INVESTIGATION

To characterize the groundwater contamination and to determine the groundwater gradient, it was decided to install five monitoring wells. Four of the monitoring wells were positioned as close as practical to the four corners of the property. All four monitoring wells were also constructed inside the fenced area to provide additional protection from possible tampering. The positions of these four wells are shown as MW-1, 2, 4, and 5 in Figure 2.1.

The main purpose for the four wells was to accurately determine the groundwater gradient. Secondly, the wells were used to measure groundwater contamination both up gradient and down gradient at the site. Such information would indicate if contamination was being carried onto the property from other sources or if contamination was being carried off site to neighboring properties.

The fifth monitoring well (MW-3) was positioned within 10 feet of the tank excavation in the down gradient direction (see Figure 2.1). This fulfills the requirement of installing a monitoring well in the verified down gradient direction within the immediate vicinity of the

site as required by the County in their letter of October 13, 1989. This well has been used to determine if contamination is migrating from the tank excavation.

Soil borings were also made during phase II of this investigation. These borings were done to characterize soil contamination. The boring locations were selected to determine if potential soil contamination was the result of off-site or on-site contaminant sources.

During both the soil boring and the monitoring well installation, undisturbed soil samples were collected at least every 5 feet. These samples were collected for physical and/or chemical analysis. Additionally, field notes were kept describing field activities (see Appendix B) and soil boring logs were kept to show the different layers of material encountered during the drilling process (see Appendix C).

2.2 DRILLING PROGRAM

The drilling was done by Bay Land Drilling Company using both CME 55 and 75 drill rigs with nominal 8 and 10 inch OD hollow-stem augers. Bay Land Drilling Company is a licensed drilling contractor in the State of California.

The drilling operation was under the supervision of Richard C. Kent. Mr. Kent is a Registered Geologist in the State of California (No: 4231).

The drilling process for both the monitoring wells and soil borings was identical except the bore hole diameter for the wells was 10 inches rather than 8 inches so that the 4 inch well casing could be accommodated. Drilling began by identifying the well or bore hole location. Because concrete covered some of the property, a hole had to be cut before the drilling could be started.

Next, the hole was drilled to a depth 4 to 5 feet. Without raising the auger flight from the hole, the plug in the bottom of the auger was removed. Through the center of the auger a sampler was pushed 18 inches in front of the drill head to collect an undisturbed soil sample for physical and/or chemical analysis. The sampler was a standard penetration test split-spoon sampler, nominal 2 inch diameter, with three brass retainers.

The number of blows to drive the sampler into the soil using a 140 pound drop hammer, was recorded to determine the density of the material sampled. Following removal of the sampler the plug was reinstalled and the drilling was resumed. This drilling and sampling regime continued until the maximum depth was reached. Maximum depth was 15 feet for bore holes and 25 to 30 feet for monitoring wells. During the drilling, special attention was given to the avoidance of cross contaminating underlying aquifers. When boring in a zone of saturated permeable material, the geologist would cease drilling if 5 feet of impermeable material, such as clay, were reached. The clay layer was considered an aquiclude separating the shallow and deep aquifers and was not penetrated.

After the sampler was removed from the boring, it was opened and the three brass retainers were removed. The ends of the middle retainer were sealed with aluminum foil and plastic caps. Tape was wrapped around the caps to further seal the retainer. The retainer was marked with a unique sample identification number, sealed in a plastic bag and placed in an ice chest kept at 4° C for delivery to a State certified laboratory for chemical analysis. Chain-of-custody records were completed for each sample delivery

In general soil samples from every 5 foot interval were analyzed for chemical constituents, although some discretion by the site geologist was used.

The soil in the remaining tubes was extruded and examined on-site by the geologist for soil type and the obvious presence of contamination. The presences of obvious contamination was verified using an organic vapor meter. The soil and soil cuttings generated during drilling were classified using the Uniform Soil Classification System. All observations were recorded in the boring logs.

Before another sample was collected, the sampler and brass retainers were decontaminated by steam cleaning, or an Alconox solution wash followed by tap water and deionized water rinses.

After the cuttings were evaluated by the geologist, they were placed in drums and sealed. A label was affixed to the drum describing its contents, name of a contact person, and

telephone number. The drums were kept in a secure area to prevent tampering by unauthorized persons. Final disposition of the soil was dependant on the sample results. Abandoned sample bores were sealed with bentonite or a bentonite concrete grout mix.

All drilling equipment was steam cleaned before and after drilling of each hole. Only clean water from a municipal supply was used for cleaning the drilling equipment.

2.3 INSTALLATION OF GROUNDWATER MONITORING WELLS

Some of the exploratory borings developed into groundwater monitoring wells. The borings used for monitoring well construction were deeper and a larger diameter.

When the appropriate boring depth was reached, the plug at the bottom of the augers was removed. The on site geologist then designed the well construction. Depending on the well design, borings were back filled with bentonite pellets prior to installation of the well casing. The geologist designed and installed a 4 inch PVC well casing. The use of glue was prohibited because of its possible interference with the analytical tests. The casing was cleaned and then lowered through the center of the augers. Clean sand was added around the outside of the casing as the augers were slowly lifted from the boring. The sand was added until it reached a height of 2 feet above the screened area of the casing.

Next, 2 feet of bentonite pellets was added followed by portland cement. Finally, a water tight locking cap with cover was constructed. The locking cap prevents unauthorized access to the wells. The as-built well construction drawings are shown in Appendix D.

When the monitoring well installation was complete, the wells were developed using surging techniques. Well development generally suppresses damage to the formation by drilling operations, restores natural hydraulic properties to the adjacent soils, and improves hydraulic properties near the boring so the water flows more freely in the well.

During development, pH, specific conductance, and temperature of the return water was measured. Well development was continued until these parameters stabilized and the water was at its maximum possible clarity.

The water generated during the development process was placed in 55 gallon drums and sealed. A label was affixed to the drum stating what it contained, name of a contact person, and telephone number. The drums were kept in a secure area to prevent tampering from unauthorized persons. Final disposition of the water depended on the sampling results.

2.4 LEVELING WELLS AND MEASURING DEPTH TO GROUNDWATER

To determine the groundwater gradient, the relative depth to groundwater for each monitoring well and their location were determined. Using a surveyors level, CEC

engineers determined the height to the top of each well casing. The position on the casing where the height was calculated was marked (not all casings were cut level).

From the point where the casings were marked, the depth to groundwater was measured using an electronic water sensing device. It should be noted that the depth to groundwater measurement was not made until the wells had an opportunity to equilibrate with the aquifer. With this information CEC engineers were able to calculate the relative depth to groundwater. Knowing this and the distance between the wells it was possible to determine water gradient.

2.5 GROUNDWATER SAMPLING

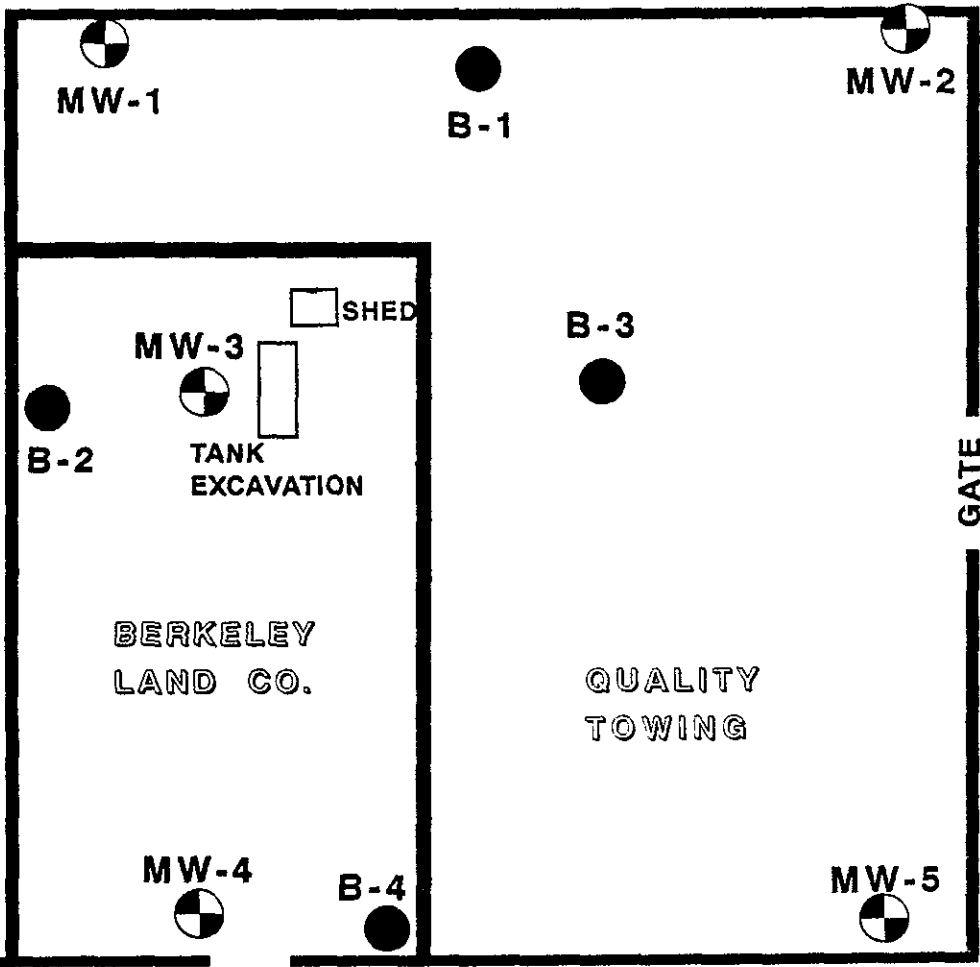
Prior to collecting samples, the wells were purged by pumping at least three well volumes of water. Once the wells had recovered 80 percent of the original water level, water samples were collected using a clean 2 inch bailer. A clean bailer was used for each well.

The water from the bailer was immediately syphoned into a clean 40 mL VOA bottle until the bottle began to overflow. A teflon lined cap was placed on the bottle and the bottle was inverted to check for air bubbles. If air bubbles were detected, the sampling was repeated.

The bottles were labeled with a unique sample number and placed in a ice chest maintained at 4° C. A chain-of-custody form was completed and accompanied the sample to the laboratory.

2.6 LABORATORY ANALYSIS

Both the soil and water samples were analyzed for total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and xylene (BTEX). Superior Analytical Laboratory, Inc. of Martinez, California performed the sample analysis. Superior is certified by the State of California to do hazardous waste analysis.



SAKLAN STREET

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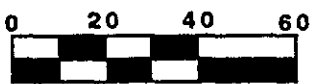
QUALITY
TOWING

GATE

MIDDLE LANE

- MONITORING WELL
- BORING

SCALE: 1" = 40'



FEET



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FIGURE 2.1
WELL AND BORING LOCATION MAP

SECTION 3.0

RESULTS

3.1 SITE GEOLOGY

The geology underlying the site was characteristic of the San Francisco Bay area.

This is shown in the drill hole cross sections (Figures 3.1 to 3.3) The drill logs are shown in Appendix C. The clay, to sand to gravel sequences in the upper 7.5' to 8.5' of holes MW-3 and B-1, and most of B-4, are good examples of transgressive/regressive sedimentary sequences. Such sequences develop along beaches as the water and land interface rises and falls over extended periods of time.

The sedimentary sequences in the three previously mentioned holes create an aquifer. Clay-rich layers act as sealants while overlying gravel-rich layers provide the porosity and permeability for groundwater storage and movement.

3.2 SITE HYDROLOGY

On June 7, 1990 engineers from CEC leveled the monitoring wells and measured the depth to groundwater. The procedures for determining the groundwater gradient were described in Section 2.0. The field data collected for this determination is presented in Appendix E.

From the field data it was determined that the groundwater gradient was towards the southwest with a slope. Figure 3.4 overlays the gradient onto the site map.

3.3 FIELD OBSERVATIONS OF CONTAMINATION

According to the boring logs in Appendix C, a moderately strong hydrocarbon odor was detected at 15 feet in drill hole B-2 and at 13 feet in drill hole MW-3. In drill hole MW-3 the hydrocarbon odor became very strong at 15 feet. Both of these drill holes are located in the down gradient direction from the tank excavation.

There was no floating product or hydrocarbon odor associated with the water in the monitoring wells. Even drill hole MW-3, in which very strong hydrocarbon odors were detected in the soil during the drilling, had no noticeable odors or floating product.

3.4 ANALYTICAL RESULTS OF THE SOIL ANALYSES

The procedures for collecting the soil samples and the methods used for analysis have already been discussed in Section 2.0. The chain-of-custody sheets and certified laboratory results are found in Appendix F. The data from the certified laboratory results has been summarized in Table 3.1.

Laboratory results indicated soil contamination at approximately 15 feet in drill holes B-2 and MW-3. As discussed in paragraph 3.3, both these drill holes were in the down gradient

direction from the excavation site. All other drill holes sampled during phase II had non-detectable levels of TPH-G, TPH-D, and BTEX.

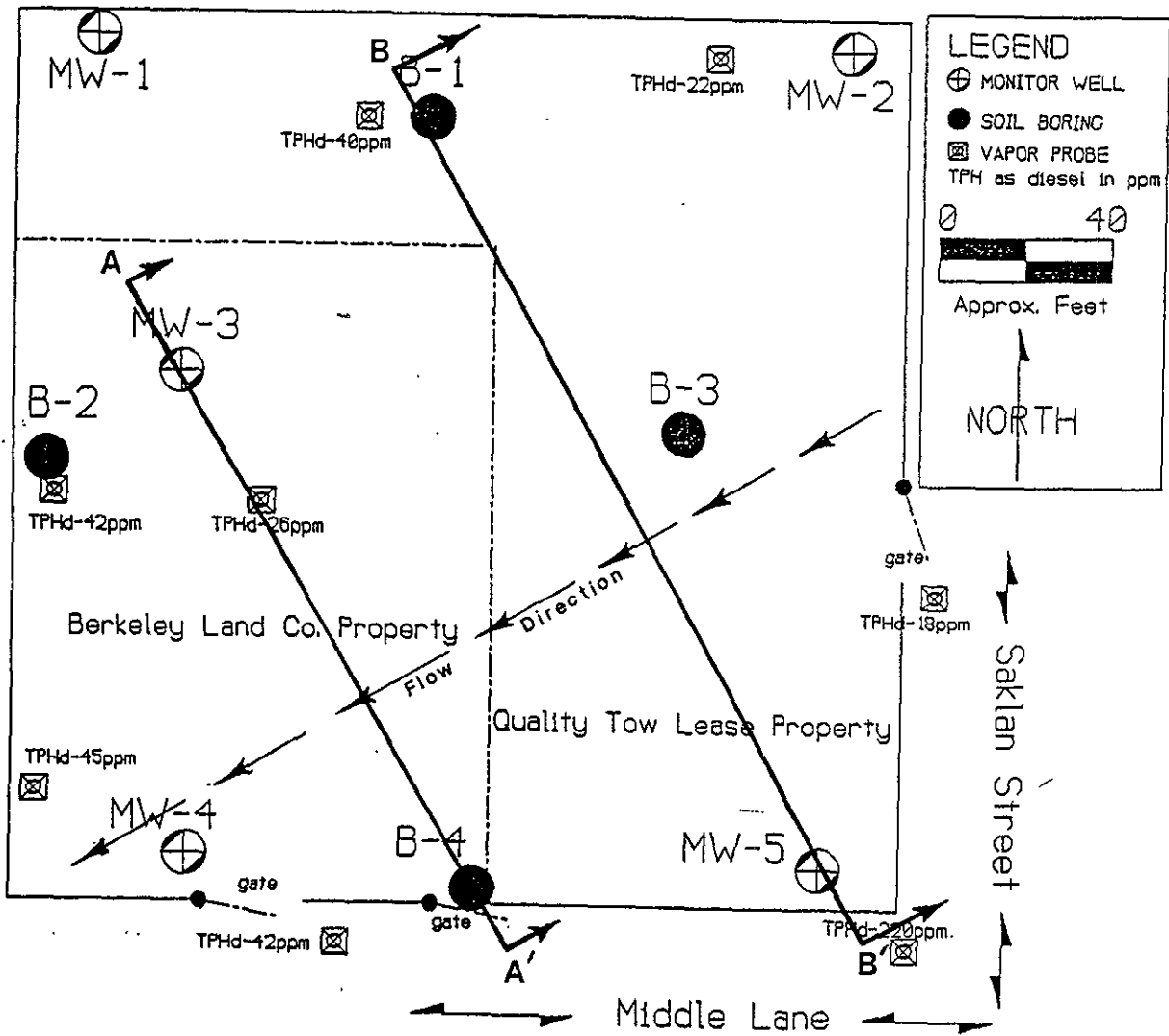
Neither sample from B-2 or MW-3 had detectable concentrations of TPH-G however both had detectable levels of some or all of the four gasoline constituents (BTEX). Drill hole MW-3's BTEX concentrations were 4, 6, 12, and 58 ppb respectively. Drill hole B-2's BTEX concentrations were ND < 3, ND < 3, 11, and 22 ppb respectively.

Both drill holes had detectable concentrations of TPH-D. The TPH-D levels of MW-3 and B-2 were 250 and 50 ppm respectively.

3.5 ANALYTICAL RESULTS OF THE WATER ANALYSES

The procedures for collecting water samples and the methods used for analysis were discussed in Section 2.0. The chain-of-custody sheets and certified laboratory results are found in Appendix F. The data from the certified laboratory results has been summarized in Table 3.2.

Only the groundwater from monitoring well MW-3 had detectable levels of contamination. The TPH-G, concentration was 0.10 ppm, however the laboratory indicated that there was no gasoline pattern present. The TPH-D, and BTEX components were not detected.

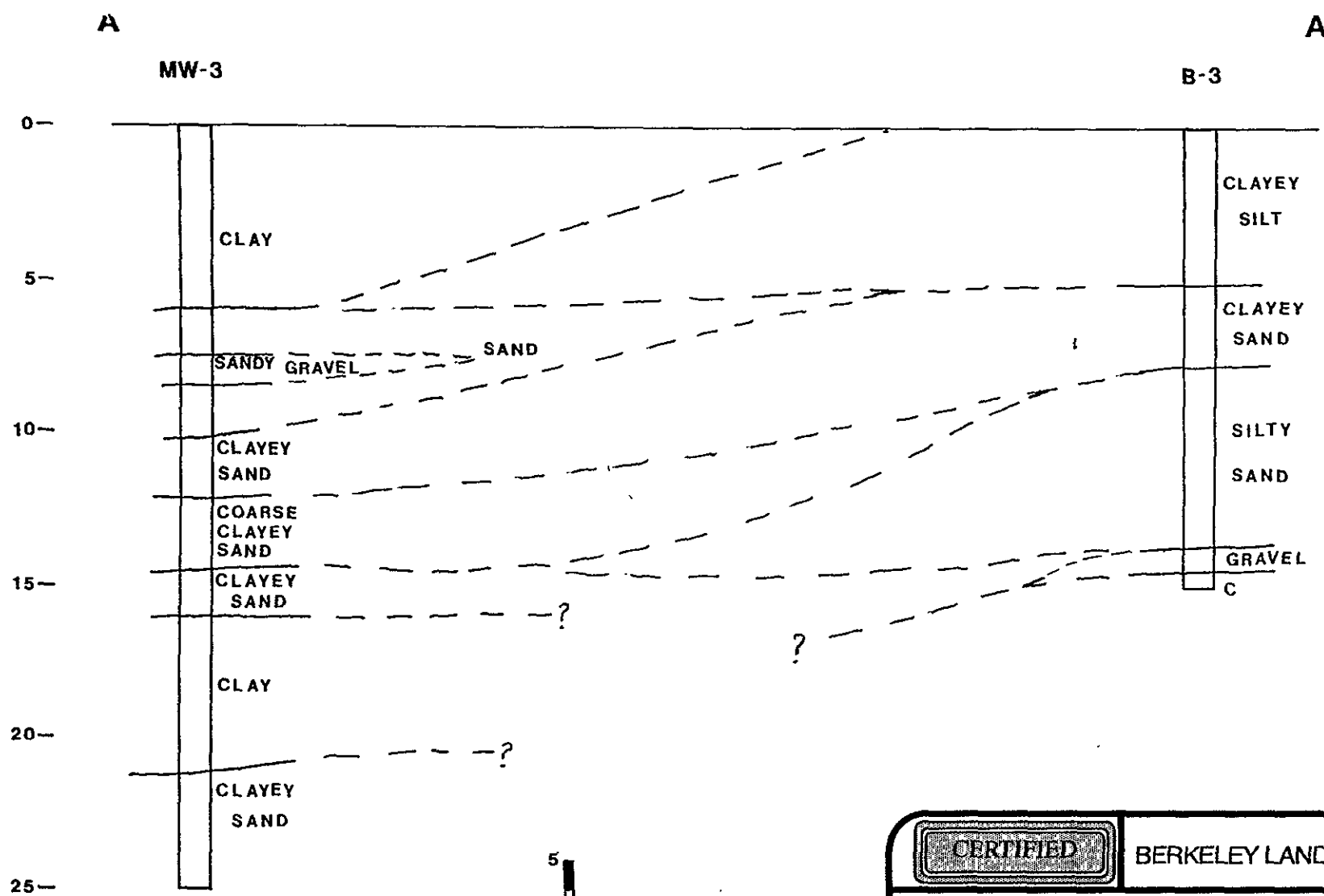


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FIGURE 3.1 - CROSS SECTION LOCATION MAP

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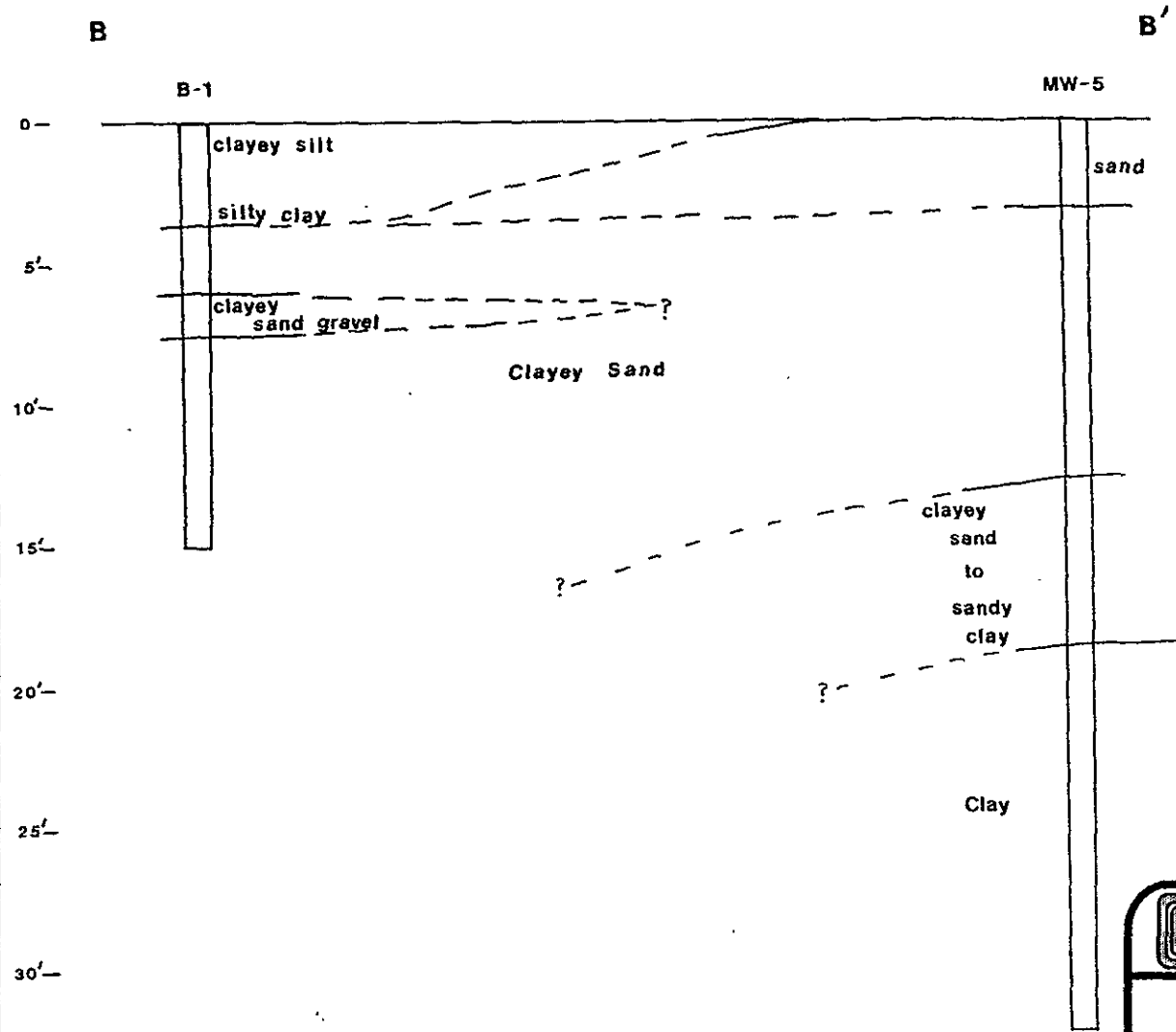
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FIGURE 3.2 - CROSS SECTION OF A TO A'

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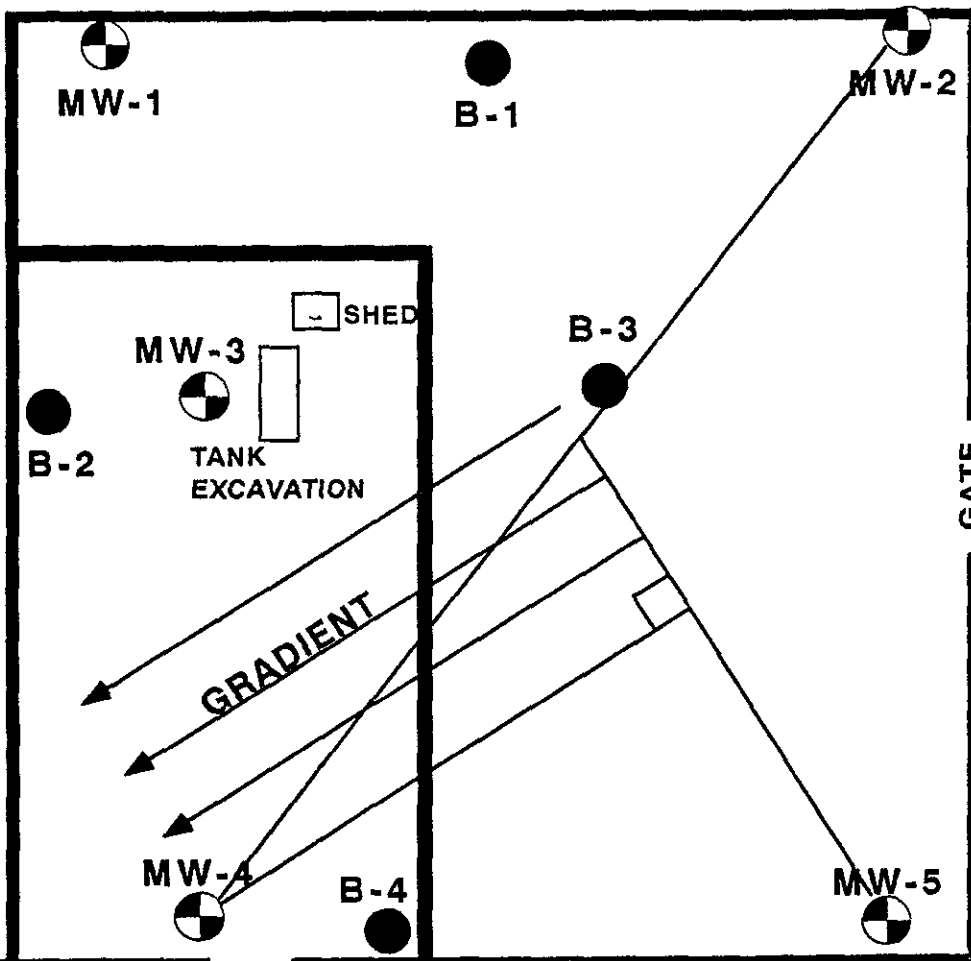
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FIGURE 3.3 - CROSS SECTION OF B TO B'



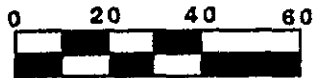
SAKLAN STREET

GATE

MIDDLE LANE

-  MONITORING WELL
-  BORING

SCALE: 1" = 40'



FEET



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FIGURE 3.4
GROUNDWATER GRADIENT

**TABLE 3.1
SUMMARY OF THE ANALYTICAL RESULTS FROM THE SOIL SAMPLING
CONDUCTED DURING PHASE II**

Drill Hole	Sample Number	Depth (ft)	TPH-G (ppm)	TPH-D (ppm)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylene (ppb)
B-1	S-1	4	N/A	N/A	N/A	N/A	N/A	N/A
B-1	S-2	6.5	N/A	N/A	N/A	N/A	N/A	N/A
B-1	S-3	10	N/A	N/A	N/A	N/A	N/A	N/A
B-1	S-4	15	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
B-2	S-1	10	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
B-2	S-2	15	ND<1	50	ND<3	ND<3	11	22
B-3	S-1	4.5	-	-	-	-	-	-
B-3	S-2	8.5	ND<1	ND<10	ND<3	ND<3	ND>3	ND>3
B-3	S-3	14.5	ND<1	ND<10	ND<3	ND<3	ND<3	ND>3
B-4	S-1	5	-	-	-	-	-	-
B-4	S-2	10	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
B-4	S-3	15	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-1	S-1	4	-	-	-	-	-	-
MW-1	S-2	10	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-1	S-3	11.5	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-1	S-4	16.5	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-1	S-5	21.5	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-2	S-1	4	-	-	-	-	-	-
MW-2	S-2	6.5	-	-	-	-	-	-
MW-2	S-3(5-8)	11.5	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-2	S-4(5-9)	16.5	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-2	S-5(5-10)	21.5	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-3	S-1	6.5	-	-	-	-	-	-
MW-3	S-2	10	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-3	S-3	15	ND<1	250	4	6	12	58
MW-3	S-4	20	-	-	-	-	-	-
MW-4	S-1	4	-	-	-	-	-	-
MW-4	S-2	6.5	-	-	-	-	-	-

See MW-2 for details

TABLE 3.1 CONTINUED

Drill Hole	Sample Number	Depth (ft)	TPH-G (ppm)	TPH-D (ppm)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylene (ppb)
MW-4	S-3	11.5	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-4	S-4	16.5	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-4	S-5	21.5	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-5	S-1	3	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-5	S-2	6.5	-	ND<10	-	-	-	-
MW-5	S-3	10	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-5	S-4	15.5	ND<1	ND<10	ND<3	ND<3	ND<3	ND<3
MW-5	S-5	20	-	ND<10	-	-	-	-

TABLE 3.2
SUMMARY OF THE ANALYTICAL RESULTS FROM THE WATER SAMPLING
CONDUCTED DURING PHASE II

Sample Number	TPH-G (ppm)	TPH-D (ppm)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylene (ppb)
MW-1	ND<1	ND<1	ND<0.3	ND<0.3	ND<0.3	ND<0.3
MW-2	ND<1	ND<1	ND<0.3	ND<0.3	ND<0.3	ND<0.3
MW-3	0.10	ND<1	ND<0.3	ND<0.3	ND<0.3	ND<0.3
MW-4	ND<0.05	ND<1	ND<0.3	ND<0.3	ND<0.3	ND<0.3
MW-5	ND<1	ND<1	ND<0.3	ND<0.3	ND<0.3	ND<0.3