File No. 10-91-483-MW

ADDITIONAL SUBSURFACE INVESTIGATION AT FORMER UNDERGROUND GASOLINE TANK AREA LOCATED AT 1801 HIBBARD STREET ALAMEDA, CALIFORNIA

MAY 18, 1992

PREPARED FOR:
WEYERHAUSER PAPER COMPANY
1801 HIBBARD STREET
P.O. BOX DRAWER X
ALAMEDA, CALIFORNIA 94501

BY:
SOIL TECH ENGINEERING, INC.
298 BROKAW ROAD
SANTA CLARA, CALIFORNIA 95050

SOIL TECH ENGINEERING, INC.

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SOIL TECH ENGINEERING
Soil, Foundation and Geological Engineers
298 BROKAW ROAD, SANTA CLARA, CA 95050 ■ (408) 496-0265 OR (408) 496-0266

May 18, 1992

File No. 10-91-483-MW

Weyerhauser Paper Company
1801 Hibbard Street
P.O. Box Drawer X
Alameda, California 94501

ATTENTION: MR. ERNESTO JACINTO

SUBJECT: ADDITIONAL SUBSURFACE INVESTIGATION AT FORMER UNDERGROUND GASOLINE TANK AREA Located at 1801 Hibbard Street, in Alameda, California

Dear Mr. Jacinto:

Enclosed is the results of the additional subsurface investigation at Weyerhauser Paper Company located at 1801 Hibbard Street, in Alameda, California.

Per your request and authorization, additional investigation was conducted in the vicinity of the former gasoline tank area. The purpose of this investigation was to comply with the Alameda County Environmental Health Department (ACEHD) and California Regional Water Quality Control Board (CRWQCB) Fuel Leak Guidelines to evaluate and define the extent of dissolved hydrocarbons plume.

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The investigation conducted near the former gasoline tank area showed that the groundwater has been impacted. Per Alameda County Environmental Health Department (ACEHD) and California Regional Water Quality Control Board (CRWQCB) Fuel Leak Guidelines, we recommend a quarterly monitoring of the six wells for at least one year.

If you have any questions or require additional information, please feel free to contact our office at your convenience.

Sincerely,

SOIL TECH ENGINEERING, INC.

NOORODDIN AMELI
PROJECT ENGINEER

LAWRENCE KOO, P. E.
C. E. #34928

FRANK HAMEDI-FARD
GENERAL MANAGER

File No. 10-91-483-MW

ADDITIONAL SUBSURFACE ASSESSMENT FOR FORMER UNDERGROUND TANK AREA AT WEYERHAUSER PAPER COMPANY LOCATED AT 1801 HIBBARD STREET ALAMEDA, CALIFORNIA MAY 1, 1992

EXECUTIVE SUMMARY:

An additional subsurface assessment was conducted by Soil Tech Engineering, Inc. (STE), at Weyerhauser Paper Company located at 1801 Hibbard Street, in Alameda, California during April 1992. Preliminary assessments conducted by STE in 1991 detected elevated concentrations of petroleum hydrocarbons in the soil and shallow groundwater at this site. The purpose of this assessment was to further delineate the extent of petroleum hydrocarbons in soil and groundwater. To accomplish these objectives, the scope of work was organized into following tasks:

- Evaluate existing data.
- Install and develop three additional groundwater monitoring wells.
- Sample three existing on-site wells and the newly installed wells.
- Analyze selected soil samples and groundwater samples for petroleum hydrocarbons.
- Evaluate field and laboratory data and prepare a report of the assessment.

STE drilled three soil borings to a depth of 20 feet below ground surface (bgs). All borings were converted to groundwater monitoring wells. Soil and groundwater samples were collected for laboratory analysis. The subsurface soil material consists of irregularly layered sequence of clay and silt and sandy clay.

The measured static water level in the monitoring wells ranged from approximately 5.4 to 7.7 feet below ground surface. The groundwater flow was northwesterly direction.

Selected soil and six groundwater samples were analyzed using EPA Method 8015 for Total Petroleum Hydrocarbons (TPH) and EPA Method 8020 for Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX) compounds, and Total Oil and Grease (TOG). Laboratory analytical reports for soil reported TPH, BTEX and TOG are below detection limit.

No free phase hydrocarbon was observed in any on-site well. The groundwater samples from well STMW-1 to STMW-4 reported to contain low levels TPH and BTEX compounds. No TOG were detected in groundwater samples from all six on-site wells.

INTRODUCTION:

This report presents the results of a supplemental subsurface assessment conducted by Soil Tech Engineering, Inc. (STE), in April 1992, in the vicinity of the former underground storage tanks area located at the Weyerhauser Paper Company in Alameda, California (Figure 1). Weyerhauser requested that STE perform this work to further evaluate the extent of subsurface hydrocarbons encountered during preliminary assessment in December 1991. The additional assessment was initiated in order to comply with the requirements of the Alameda County Environmental Health Department (ACEHD) and Cali-fornia Regional Water Quality Control Board--San Francisco Bay Region (CRWQCB--SFBR) for underground fuel tank.

PURPOSE:

The purpose of the subsurface assessment described in this report was to characterize and further delineate the extent of petroleum hydrocarbons in soil and shallow groundwater around the former underground storage tanks area.

SCOPE:

The scope of the work completed is intended to provide data to satisfy the objectives stated above. The basic tasks included in this assessment are summarized below:

- Evaluate existing data.

- Install and develop the three additional groundwater monitoring wells (STMW-4 to STMW-6).

- Sample the existing three on-site wells (STMW-1 to STMW-3) and the three new wells (STMW-4 to STMW-6).

- Analyze selected soil and groundwater samples for petroleum hydrocarbons.

- Evaluate field and laboratory data and prepare a report of the assessment.

SITE DESCRIPTION:

The project site is located south of Highway 880 and approximately one (1) mile northeast of San Francisco Bay on relatively flat ground that is currently occupied by buildings and paved parking areas. The immediate surrounding are consist of light and heavy industrial complex.

PREVIOUS WORK:

On February 7, 1991, four underground tanks (one 10,000 gallon diesel and three 1,000 gallon gasoline) were removed from the property by Minter and Fahy Construction (MFC). The tanks were located near the warehouse building and shed (Figure 2). Following the tank removal, MFC collected soil samples. Initial soil

analytical results showed high levels of Total Petroleum Hydrocarbons as gasoline (TPHg ranging from 220 to 3,000 milligrams per kilogram (mg/Kg). Low to moderate levels of Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX) were also detected.

A water sample, taken by MFC from the diesel tank excavation on February 28, 1991, detected TPH as diesel (TPHd) showing concentration of 3.6 mg/L.

Due to presence of elevated TPH as gasoline detected at the former gasoline tanks area, additional excavation was conducted by MFC on February 27 and 28, 1991. Soil sampling of the sidewalls showed TPHg ranging from 43 to 2,600 mg/Kg. BTEX levels ranged from 0.006 to 25 mg/Kg. In addition, moderate levels of Total Oil and Grease (TOG) and some metals were also detected. The grab water sample that was also taken from the excavation showed moderate levels of TPHg (22 mg/L) and TPHd (0.19 mg/L).

MFC excavated additional three feet of soil from the excavation on April 13, 1991 due to the presence of elevated TPH as gasoline. Additional soil and water samples were collected. Soil analytical results showed low levels of all dissolved hydrocarbons constituents analyzed. Water samples collected from the excavation continued to show elevated levels of TPHg and Benzene.

what is meant by here

In October 1991, STE was retained to perform a preliminary subsurface investigation in the vicinity of the former underground tank complex.

Soil Tech Engineering, Inc. (STE), conducted the field work on December 3 and 4, 1991, by installing three monitoring wells in the vicinity of the former underground tank area. The approximate location of the wells (STMW-1 to STMW-3) and the former tanks area are shown in Figure 2.

Two of the three monitoring wells did detect low to moderate levels of hydrocarbons in the water sample. Due to presence of hydrocarbons, STE recommended additional investigation to define the extent of dissolved hydrocarbons plume per ACEHD and CRWQCB requirements. Detail of STE's preliminary subsurface investigation is described in a report, dated January 20, 1992.

SUPPLEMENTAL SUBSURFACE ASSESSMENT:

This section describes the methods and procedures used in drilling exploratory soil boring, soil sampling, monitoring wells installation, wells development and sampling.

SOIL BORING AND SAMPLING:

STE drilled three exploratory borings at the site on April 10, 1992. The location of these borings are shown on Figure 3? ² These borings were drilled to 20 feet below ground surface using eight-inch hollow stem auger equipment. All boring equipments were steam cleaned prior use, to minimize the potential of cross-contamination.

The drilling and exploratory borings, well installation, soil sampling, well development and water sampling were conducted in accordance with the STE's Standard Operation Procedures (SOP) included in the Appendix "B" of this report. STE's SOP contains well construction procedures in accordance with state and local requirements.

A detailed lithologic log of each boring was prepared by STE's staff project engineer. Boring logs are included in Appendix "C" of this report.

Discrete soil samples were collected at five-foot depth intervals using a California modified sampler with brass liners. The deepest tube from each driven sample was immediately sealed with aluminum foil and plastic caps, then labeled and stored in a cold ice chest. A portion of the remaining soil from each sample was screened for volatile hydrocarbon compounds in the field using an photoionization detector (PID). Strict chain-of-custody procedures were followed throughout sample acquisition, storage and transport. Copies of chain-of-custody records are included in Appendix "E" of this report.

Soil cuttings from drilling operations were placed on drum and temporarily stored on-site pending the results of laboratory analyses. Arrangements are in progress for appropriate off-site disposal of this material.

MONITORING WELL INSTALLATION:

Three groundwater monitoring wells were installed in the soil borings following the completion of each boring. Monitoring well permits were obtained from Alameda County Flood Control and Water Conservation District (ACFCWCD) prior to beginning field operations. Copies of these permits are included in Appendix "D" of this report. The locations of these wells are shown on Figure 3.

The installation of wells, development and sampling were conducted in accordance with state and local agencies guidelines.

The groundwater surface and top-of-casing elevations of all three new wells and the existing three on-site wells were surveyed relative to a fixed datum. This data was used to calculate the local groundwater flow direction.

WELL DEVELOPMENT AND SAMPLING:

STE developed the three new wells (STMW-4 to STMW-6) on April 22, 1992. Prior to development, all wells were sounded to determine the depth-to-water and potential presence of free phase hydrocarbon. No indication of free phase hydrocarbon was observed. Measured water levels in each well were several feet shallower than the depth at which water was first encountered during drilling.

Monitoring wells were developed by mechanical surging and bailing until the water was reasonably free of sediment. The development equipment was steam cleaned prior to use in each well to reduce the potential of cross-contamination. The purged water was temporarily stored on-site in labeled drums pending the results of laboratory analyses. Arrangements are in progress for appropriate off-site disposal of this material.

STE collected groundwater samples from wells STMW-1 through STMW-6 on April 27, 1992. Approximately four well volumes of water were removed from each well using a bailer before the sample was collected. Temperature, pH and conductivity were allowed to stabilize before collection of each sample. A clean stainless steel bailer was used for sample collection. Water sampling equipment was decontaminated before and after each well using non-phosphate soap and water wash, followed by double rinsing in potable and deionized water.

Groundwater samples were contained in laboratory-cleaned 40 milliliter glass vials with Teflon-lined septa. After labeling, they were immediately stored in a cold ice chest. Strict chain-of-custody procedures were maintained during sample acquisition, storage and transport. A copy of the chain-of-custody report is included in Appendix "E" of this report.

SITE GEOLOGY AND HYDROGEOLOGY:

Site-specific geology and hydrogeology are discussed in this section. This information has been developed from soil borings and monitoring wells completed at the site by STE.

SITE GEOLOGY:

The subsurface geology shown in the boring logs (Appendix "C") is relatively non-uniform and can be characterized by three distinct soil units from the surface downward; man-placed fill; alluvial floodplain deposits of clay and silt; generally cohesive clayey and sand, sandy clay alluvial deposits.

GROUNDWATER ELEVATION AND FLOW DIRECTION;

The groundwater depth encountered in all on-site monitoring wells ranged from 5.40 to 7.68 feet below the ground surface. The lateral groundwater gradient direction at this site is relatively flat and is toward northwest direction as of April 27, 1992, measurement.

The water elevations in wells STMW-1 to STMW-3 did increase by at least a foot in April 1992 as compared with December 1991 measurements. Water level elevations area shown in Table 1.

RESULTS OF LABORATORY ANALYSES:

This section presents the results of laboratory analyses for soil and groundwater samples collected during this assessment. Copies of laboratory reports and chain-of-custody records are included in Appendix "E" of this report.

RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES:

Six soil samples from the three borings were submitted to GeoChem Labs in Milpitas, California. These samples were analyzed using EPA Methods 5030/3550 for Total Petroleum Hydrocarbons in diesel and gasoline (TPHd and TPHg) range, Total Oil and Grease (TOG), and EPA Method 8020 for differentiation of Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX). Copies of laboratory reports and the chain-of-custody record for these samples are included in Appendix "E" of this report.

The results of laboratory analysis of soil samples are presented in Table 2. The results show that no petroleum hydrocarbon compounds and Total Oil and Grease (TOG) analyzed were detected in the shallow soil beneath this site.

RESULTS OF LABORATORY ANALYSIS OF GROUNDWATER SAMPLES:

Groundwater samples from wells (STMW-1 through STMW-6) were submitted to GeoChem Labs on April 27, 1992. Samples were analyzed

per EPA Method 8015 for TPH in diesel and gasoline range, EPA Method 8020 for BTEX differentiation and TOG. Copies of laboratory reports and the chain-of-custody record of these samples are included in Appendix "E" of this report.

The results of laboratory analysis of groundwater are summarized in Table 3. These results show presence of petroleum hydrocarbon compound in only four of the six groundwater samples analyzed (STMW-1 to STMW-4). No TOG was detected in any of the well. Only one of the three newly installed wells showed presence of low concentration of TPHg and BTEX only.

Comparison of recent analyses of the three existing wells (STMW-1 to STMW-3) to December 1991 showed a decrease in concentration of TPHg and BTEX in wells STMW-2 and STMW-3. Well STMW-3 showed a slight increase in TPHd from 1.7 to 2.0 mg/L. Well STMW-1 also showed a presence of low levels of TPHg and BTEX.

No petroleum product sheen nor odor were noted in any of the wells during monitoring.

CONCLUSIONS:

Based on field and laboratory data generated during this supplemental subsurface assessment, it is concluded:

- The soil beneath the site consist of alluvial flood plain deposits of clay, silt and sandy clay.

- Groundwater levels in monitoring wells ranged from 5.4 feet to 7.68 feet below ground surface. The static water levels measured in monitoring wells STMW-1 to STMW-3 increased by a foot. The groundwater flow direction was measured on April 27, 1992.

- Oily product was observed in the well casings of well STMW-2 and STMW-3 which appears to be inadvertent spillage and or poor housekeeping of steam cleaning area.

- No TPH, BTEX and TOG were reported in the soil samples from the three newly installed wells.

- No floating product was detected in any of the wells during monitoring.

- Water analytical results reported no TOG in any of the on-site wells. Low concentrations of TPH as gasoline and BTEX compounds were detected in wells STMW-1 to STMW-4 only. None of the compounds were detected in the down-gradient wells STMW-5 and STMW-6.

- The presence of low concentrations of TPHg an BTEX compounds in the well STMW-1 appears to be from leaching of residual dissolved hydrocarbons in the soil due to a foot rise in the water elevation or fluctuation of groundwater.

- The dissolved hydrocarbons detected in the groundwater appears to be localized in the vicinity of the former underground tank areas. It is possible that the lateral migration of dissolved hydrocarbons may be restricted due to fine textured soil beneath the site.

RECOMMENDATIONS:

As indicated earlier, the dissolved hydrocarbons plume appears to be localized in the vicinity of the former underground tank areas. Therefore, STE feels no further subsurface investigation is necessary at this time. STE recommends the following:

- Conduct a quarterly monitoring and sampling of the 6 wells for at least one year. The quarterly data gathered will be used to assess a need for further investigation or designing a cost-effective groundwater cleaning method, if necessary.

- The surface areas in the vicinity of steam cleaning area and the wells should be kept clean.

- Submit this report to ACEHD and RWQCB.

LIMITATIONS AND UNIFORMITY OF CONDITIONS:

The monitoring well installation services or soil and water sampling for pollution on this project was a direct request by Soil

Tech Engineering, Inc.'s client. These installations were performed to meet the existing requirements for near-surface groundwater monitoring.

This service does not make Soil Tech Engineering, Inc., liable for future maintenance, repairs, damages, injury to a third party or any other elements causing future problems.

The locations or these monitoring wells are approximate and should not be used for any reference point, surveying, or any other uses except studying groundwater.

Any recommendations that were made in this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings.

This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are called to the attention of the Local Environmental Agency.

The findings of this report are based on the results of an independent laboratory and are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or the works of man, on this property or adjacent properties.

TABLE 1
MONITORING WELL OBSERVATION
AND GROUNDWATER ELEVATIONS
IN FEET

Date	Well No.	Casing Elevation	Water Level	Groundwater Elevation	Floating Product	Odor
12/23/91	STMW-1	99.96	6.77	93.19	No	No
12/23/91	STMW-2	99.65	6.60	93.05	No	No
12/23/91	STMW-3	100.35	7.38	92.97	No	No
4/27/92	STMW-1	98.46	5.72	92.74	No	No
4/27/92	STMW-2	98.08	5.52	92.56	No	No
4/27/92	STMW-3	99.83	6.20	93.63	No	No
4/27/92	STMW-4	97.84	5.66	92.18	No	No
4/27/92	STMW-5	98.98	6.84	92.14	No	No
4/27/92	STMW-6	99.30	7.84	91.46	No	No

TABLE 2
SOIL ANALYTICAL RESULTS
IN
MILLIGRAMS PER KILOGRAM (mg/Kg)

Date	Sample #	Depth feet	TPHd	TPHg	B	T	E	X	TOG
12/3/91	STMW-1-3	3	ND	ND	ND	ND	ND	ND	ND
12/3/91	STMW-1-7	7	ND	ND	ND	ND	ND	ND	ND
12/3/91	STMW-2-3	3	ND	ND	ND	ND	ND	ND	ND
12/3/91	STMW-2-7	7	ND	370	0.56	1.0	1.5	6.7	ND
12/4/91	STMW-3-3	3	ND	74	0.16	0.006	0.24	0.79	1,000
12/4/91	STMW-3-7	7	ND	550	0.44	1.0	1.3	8.5	ND
4/10/92	STMW-4-5*	5	ND	ND	ND	ND	ND	ND	ND
4/10/92	STMW-5-5*	5	ND	ND	ND	ND	ND	ND	ND
4/10/92	STMW-6-5*	5	ND	ND	ND	ND	ND	ND	ND

At water table

TPHd - Total Petroleum Hydrocarbons as diesel
TPHg - Total Petroleum Hydrocarbons as gasoline
BTEX - Benzene, Toluene, Ethylbenzene, Total Xylenes
ND - Not Detected (Below Laboratory Detection Limit)
* - Newly Installed Wells - Soil Samples

TABLE 3
GROUNDWATER ANALYTICAL RESULTS
IN
MILLIGRAMS PER LITER (mg/L)

Date	Well #	TPHd	TPHg	B	T	E	X	TOG
12/23/91	STMW-1	ND	ND	ND	ND	ND	ND	NA
12/23/91	STMW-2	0.08	2.3	0.72	0.066	0.0015	0.24	NA
12/23/91	STMW-3	1.7*	14	3.0	0.54	0.37	1.2	NA
4/27/92	STMW-1	ND	0.15	0.0015	0.0012	0.0018	0.002	ND
4/27/92	STMW-2	ND	1.1	0.0094	0.0053	0.002	0.024	ND
4/27/92	STMW-3	2.0	9.4	0.057	0.05	0.0046	0.22	ND
4/27/92	STMW-4	ND	0.79	0.0077	0.0026	0.002	0.011	ND
4/27/92	STMW-5	ND	ND	ND	ND	ND	ND	ND
4/27/92	STMW-6	ND	ND	ND	ND	ND	ND	ND

TPHd - Total Petroleum Hydrocarbons as diesel
TPHg - Total Petroleum Hydrocarbons as gasoline
BTEX - Benzene, Toluene, Ethylbenzene, Total Xylenes
NA - Not Analyzed
ND - Not Detected (Below Laboratory Detection Limit)

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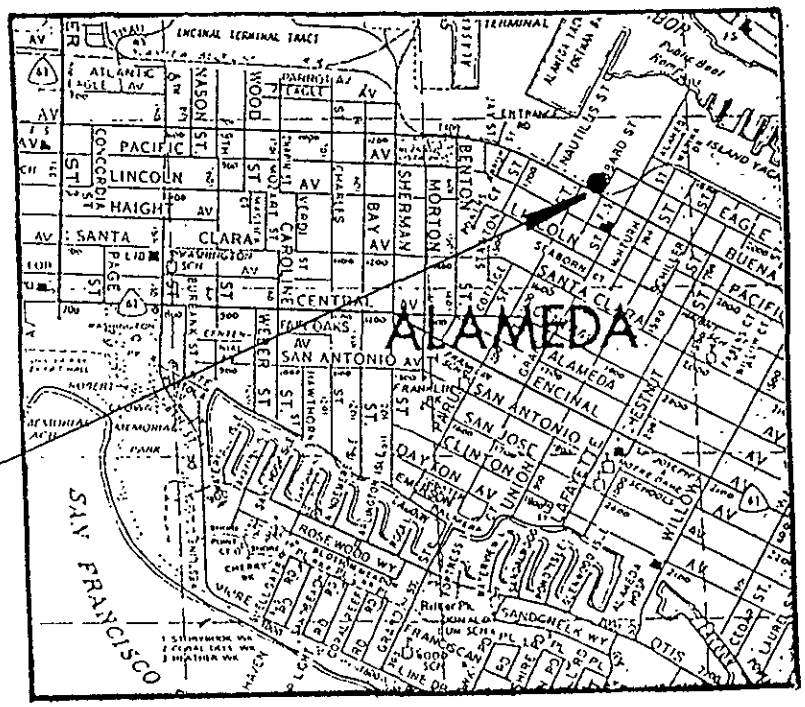
A P P E N D I X "A"

SOIL TECH ENGINEERING, INC.



Thomas Brothers Map 1982 Edition
Alameda - Contra Costa Counties

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Figure 1

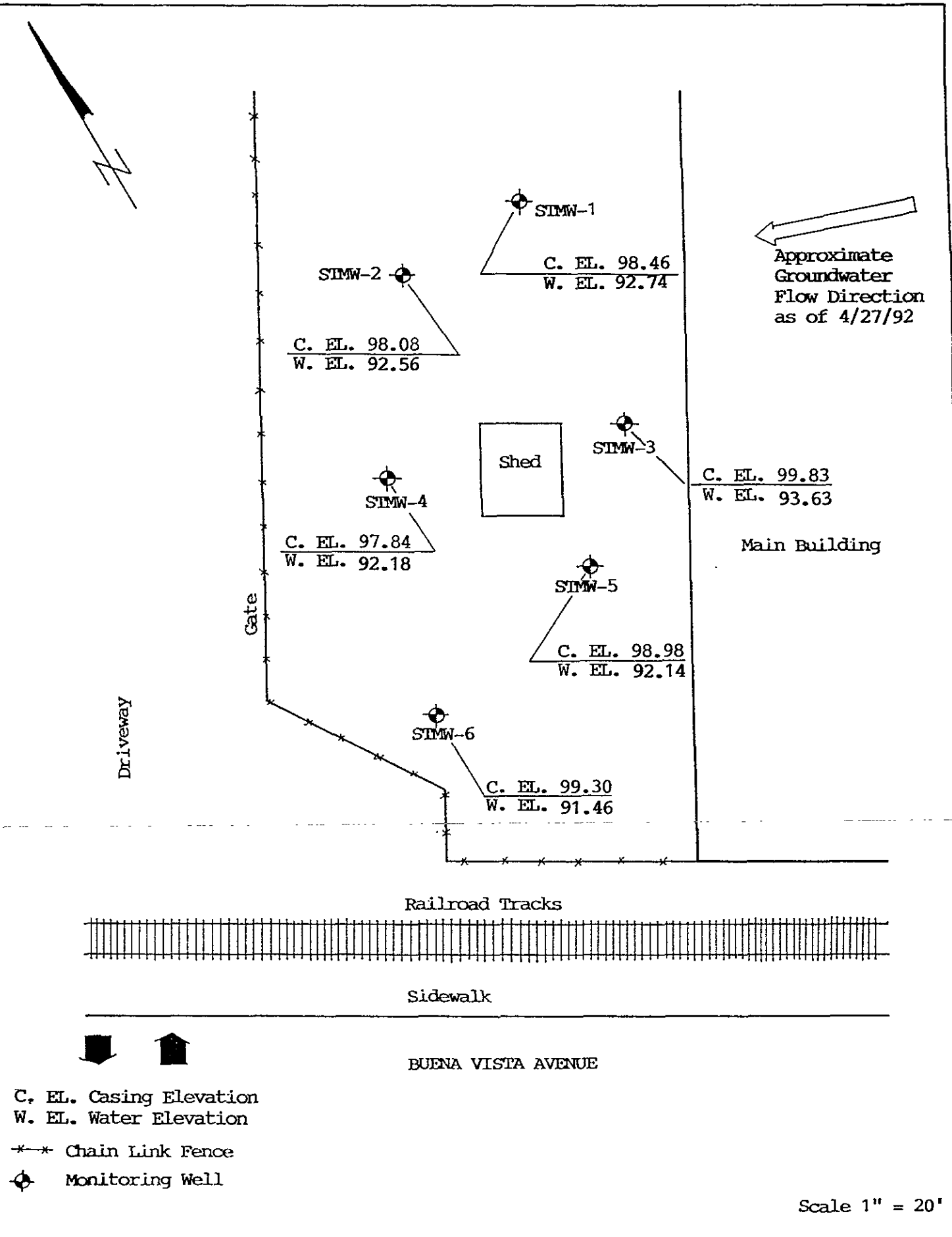
N
SIMW-1
C. EL. 98.46
W. EL. 92.74
SIMW-2
C. EL. 98.08
W. EL. 92.56
Approximate
Groundwater
Flow Direction
as of 4/27/92
Shed
SIMW-3
C. EL. 99.83
W. EL. 93.63
SIMW-4
C. EL. 97.84
W. EL. 92.18
Main Building
SIMW-5
C. EL. 98.98
W. EL. 92.14
Gate
Driveway
SIMW-6
C. EL. 99.30
W. EL. 91.46
Railroad Tracks
Sidewalk
BUENA VISTA AVENUE
C. EL. Casing Elevation
W. EL. Water Elevation
Chain Link Fence
Monitoring Well
Scale 1" = 20'

Figure 2

File No. 10-91-483-MW

A P P E N D I X "B"

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DRILLING AND SOIL SAMPLING PROCEDURE

A truck-mounted drill rig, using a continuous, solid-flight, hollow stem auger was used in drilling the soil borings to the desired depths.

Prior to drilling, all drilling equipment (auger, pin, drilling head) were thoroughly steam-cleaned to minimize the possibility of cross-contamination and/or vertical migration of possible contaminants.

In addition, prior to obtaining each individual soil sample, all sampling tools, including the split-spoon sampler and brass liners were thoroughly washed in a Trisodium Phosphate (TSP) solution followed by a rinse in distilled water.

During the drilling operation, relatively undisturbed soil samples were taken from the required depth by forcing a 2-inch I.D. split-spoon sampler insert with a brass liner into the ground at various depths by means of a 140-lb. hammer falling 30-inches or by hydraulic forces.

The samplers were contained relatively undisturbed soil. In general, the first section of soil from the sampler (shoe) was used in the field for lithologic inspection and evidence of contamination. The selected brass liner was immediately trimmed, the ends of the brass liner were covered tightly with aluminum foil and

plastic caps, sealed with tape, labelled, placed in a plastic bag and stored in a cold ice chest in order to minimize the escape of any volatiles present in the samples. Soil samples for analysis were then sent to a state-certified hazardous waste laboratory accompanied by a chain-of-custody record.

Soil samples collected at each sampling interval were inspected for possible contamination (odor or peculiar colors). Soil vapor concentrations was measured in the field by using a Photoionization Detector (PID), PhotoVac Tip Air Analyzer. The soil sample was sealed in a Zip-Loc plastic bag and placed in the sun to enhance volatilization of the hydrocarbons from the sample. The purpose of this field analysis is to qualitatively determine the presence or absence of hydrocarbons and to establish which soil samples will be analyzed at the laboratory. The data was recorded on the drilling log at the depth corresponding to the sampling point.

Other soil samples may be collected to document the stratigraphy and estimate relative permeability of the subsurface materials.

Soil tailings that are obtained during drilling are stored at the site, pending the analytical test results to determine proper disposal.

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MONITORING WELL INSTALLATION

The boreholes for the monitoring wells were hand augered with a diameter of at least two inches larger than the casing outside diameter (O.D.).

The monitoring wells were cased with threaded, factory-perforated and blank, schedule 40 P.V.C. The perforated interval consisted of slotted casing, generally 0.010 to 0.040 inch wide by 1.5 inch long slot size, with 42 slots per foot (slots which match formation grain size as determined by field grain-size distribution analysis). A P.V.C. cap was fastened to the bottom of the casing (no solvents, adhesive, or cements were used), the well casing was thoroughly washed and steam-cleaned.

After setting the casing inside the borehole, kiln-dried sand or gravel-filter material was poured into the annular space to fill from the bottom of the boring to two feet above the perforated interval. A one to two feet thick bentonite plug was placed above this filter material to prevent grout from infiltrating down into the filter material. Approximately one to two gallons of distilled water were added to hydrate the bentonite pellets. Then the well was sealed from the top of the bentonite seal to the surface with concrete or neat cement containing about 5% bentonite (see Well Construction Detail).

To protect the well from vandalism and surface water contamination, Christy boxes with a special type of Allen screw were installed around the well head, (for wells in parking lots, driveways and building areas). Steel stove pipes with padlocks were usually set over well-heads in landscaped areas.

In general, groundwater monitoring wells extend to the base of the upper aquifer, as defined by the consistent (less than 5 feet thick) clay layer below the upper aquifer, or at least 10 to 15 feet below the top of the upper aquifer, whichever is shallower. The wells do not extend through the laterally extensive clay layer below the upper aquifer. The wells are terminated one to two feet into such a clay layer.

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WELL DEVELOPMENT

For all newly installed groundwater monitoring wells, the well casing, filter pack and adjacent formations were cleared of disturbed sediment and water.

Well development techniques included pumping, bailing, surging, swabbing, jetting, flushing or air lifting by using a stainless steel or Teflon bailer, a submersible stainless steel pump, or air lift pump. The well development continued until the discharged water appeared to be relatively free of all turbidity.

All water and sediment generated by well development were collected in 55-gallon steel drums (Department of Transportation approved), closed-head (17-H) for temporarily storage, and were then disposed of properly, depending on analytical results.

To assure that cross-contamination did not occur between wells, all well development tools were steam-cleaned or thoroughly washed in a Trisodium Phosphate (TSP) solution followed by a rinse in distilled water before each well development.

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GROUNDWATER SAMPLING

Prior to collection of groundwater samples, all of the sampling equipment (i.e. bailer, cables, bladder pump, discharge lines and etc...) were cleaned by pumping TSP water solution followed by distilled water.

Prior to purging, the well "Water Sampling Field Survey Forms" was filled out (depth to water and total depth of water column were measured and recorded). The well was then bailed or pumped to remove four to ten well volumes or until the discharged water temperature, conductivity and pH stabilized. "Stabilized" is defined as three consecutive readings within 15% of one another.

The groundwater sample was collected when the water level in the well recovered to 80% of its static level.

Forty milliliter (ml.), glass volatile organic analysis (VOA) vials with Teflon septa were used as sample containers. The groundwater sample was decanted into each VOA vial in such a manner that there was a meniscus at the top. The cap was quickly placed over the top of the vial and securely tightened. The VOA vial was then inverted and tapped to see if air bubbles were present. If none were present, the sample was labeled and refrigerated for delivery under chain-of-custody to the laboratory. The label information would include a sample identification number, job identification number, date, time, type of analysis requested, and the sampler's name.

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A P P E N D I X "C"

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Logged By. Noori Ameli	Exploratory Boring Log	Boring No. STMW-4
Date Drilled. 4/10/92	Approx. Elevation	Boring Diameter 8-inch
Drilling Method: Mobile drill rig B-40L		Sampling Method

Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft	Unified Soil Classification	DESCRIPTION
1					4-inch asphalt, 4-inch very dark grey baserock. Munsell Color: HUE 10YR 3/1
2					Black silty clay, damp, stiff, mild petroleum odor. Munsell Color: HUE 5Y 2.5/1
3					
4					Very dark grey silty fine sandy clay, damp. Munsell Color: HUE 5Y 3/1
5	STMW-4-5			CL	Dark olive-grey silty fine sandy clay, damp, stiff. Munsell Color: HUE 5Y 4/2
6					
7					
8					
9					
10					Color changes to light olive-brown silty fine sandy clay, moist. Munsell Color: HUE 2.5Y 5/6
11					▽ First groundwater encountered at 11 feet.
12					
13					
14					
15					
16					

Remarks

File No. 10-91-483-MW

Logged By: Noori Ameli	Exploratory Boring Log	Boring No. STMW-4
Date Drilled. 4/10/92	Approx. Elevation	Boring Diameter 8-inch

Drilling Method: Mobile drill rig B-40L

Sampling Method:

Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft.	Unified Soil Classification	DESCRIPTION
17					Color changes to light olive-brown silty fine sandy clay, moist. Munsell Color: HUE 2.5Y 5/6
18					
19					
20					Boring terminated at 20 feet.
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

Remarks

File No. 10-92-483-MW

Logged By. Noori Ameli	Exploratory Boring Log	Boring No. STMW-5
Date Drilled. 4/10/92	Approx. Elevation	Boring Diameter 8-inch
Drilling Method: Mobile drill rig B-40L		Sampling Method

Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft	Unified Soil Classification	DESCRIPTION
1					4-inch asphalt, 4-inch very dark grey baserock. Munsell Color: HUE 10YR 3/1
2					Black silty clay, damp, stiff. Munsell Color: HUE 5Y 2.5/1
3					Color changes to dark brown silty fine sandy clay, damp. Munsell Color: HUE 10YR 3/3
4					
5	STMW-5-5			CL	Dark brown silty fine sandy clay, damp, stiff. Munsell Color: HUE 10YR 3/3
6					
7					Color is getting lighter to brown silty fine sandy clay, damp. Munsell Color: HUE 10YR 4/3
8					
9					
10					
11					▽ First groundwater encountered at 11 feet. Color is getting lighter to dark yellowish-brown silty fine sandy clay, damp. Munsell Color: HUE 10YR 4/4
12					
13					
14					
15					
16					

Remarks

File No. 10-91-483-MW

Logged By: Noori Ameli	Exploratory Boring Log	Boring No. STMW-5
Date Drilled: 4/10/92	Approx. Elevation	Boring Diameter 8-inch
Drilling Method: Mobile drill rig B-40L		Sampling Method

Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft	Unified Soil Classification	DESCRIPTION
17					Color is getting lighter to dark yellowish-brown silty fine sandy clay, damp. Munsell Color: HUE 10YR 4/4
18					
19					
20					Boring terminated at 20 feet.
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

Remarks

File No 10-91-483-MW

Logged By: Noori Ameli	Exploratory Boring Log	Boring No. STMW-6	
Date Drilled: 4/10/92	Approx. Elevation	Boring Diameter 8-inch	
Drilling Method: Mobile drill rig B-40L		Sampling Method	

Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft	Unified Soil Classification	DESCRIPTION
1					4-inch asphalt, 4-inch very dark grey baserock. Munsell Color: HUE 10YR 3/1
2					Black silty clay, damp, stiff. Munsell Color: HUE 5Y 2.5/1
3					Color changes to dark brown silty fine sandy clay, moist, stiff. Munsell Color: HUE 10YR 3/3
4					
5	STMW-6-5			CL	Dark brown silty fine sandy clay, moist, stiff. Munsell Color: HUE 10YR 3/3
6					
7					
8					Color is getting lighter to dark yellowish-brown silty fine sand, moist. Munsell Color: HUE 10YR 4/4
9					
10					
11					▽ First groundwater encountered at 11 feet.
12					
13					
14					
15					
16					

Remarks

File No. 10-91-483-MW

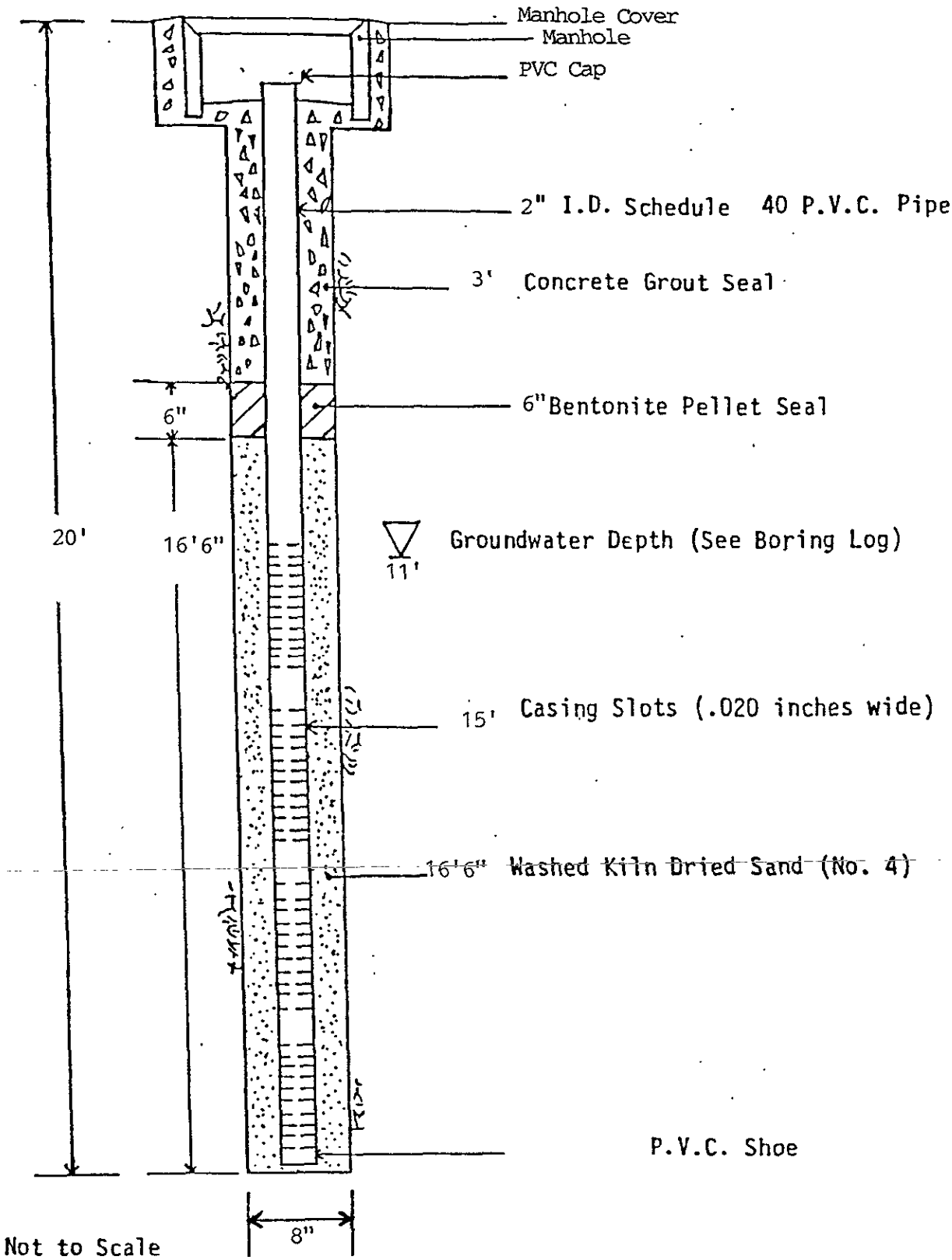
Logged By: Noori Ameli	Exploratory Boring Log	Boring No. STMW-6
Date Drilled. 4/10/92	Approx. Elevation	Boring Diameter 8-inch

Drilling Method: Mobile drill rig B-40L

Sampling Method:

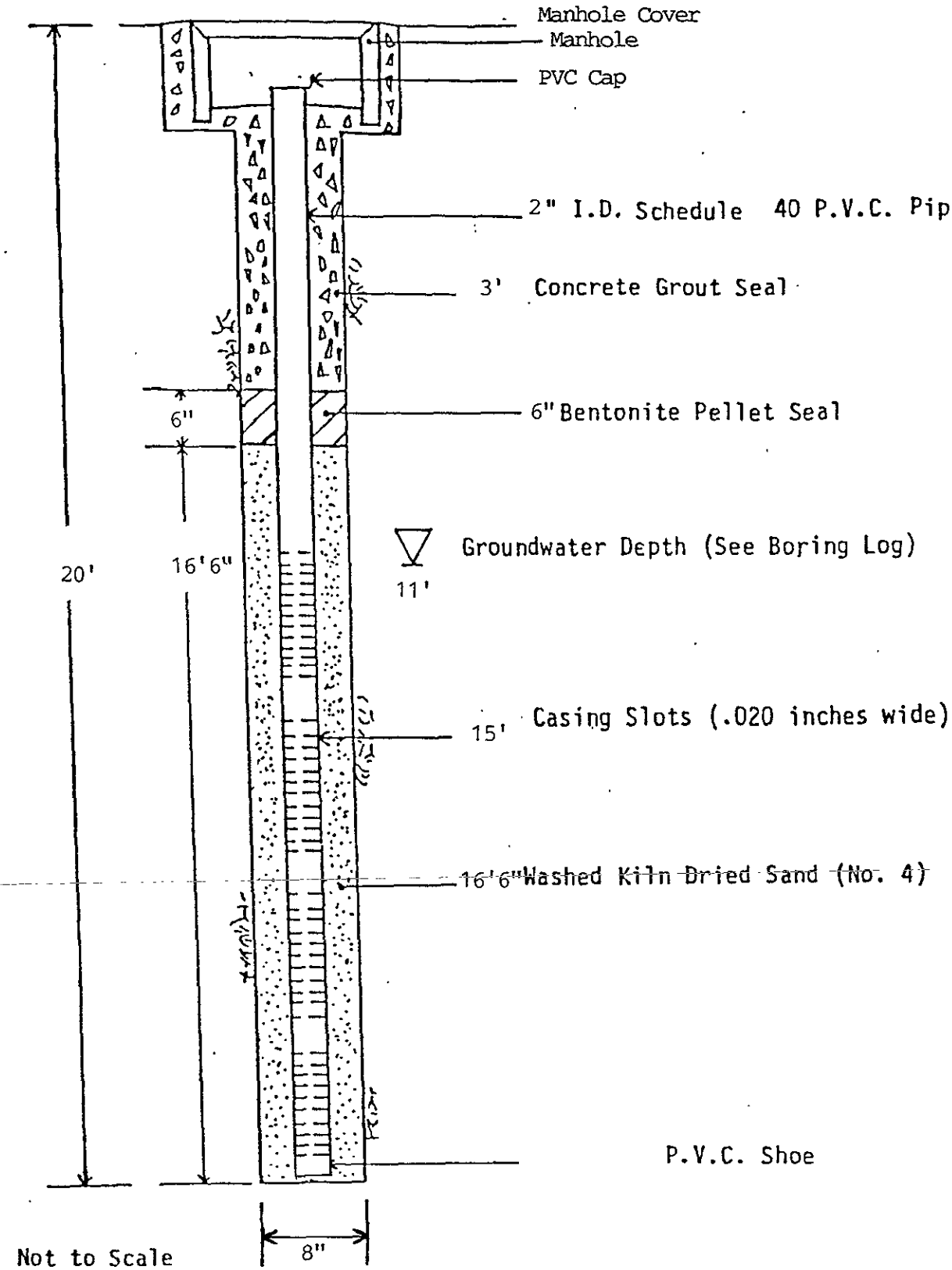
Depth, Ft.	Sample No.	Field Test for Total Ionization	Penetration Resistance Blows/Ft.	Unified Soil Classification	DESCRIPTION
17					Color is getting lighter to dark yellowish-brown silty fine sand, moist. Munsell Color: HUE 10YR 4/4
18					
19					
20					Boring terminated at 20 feet.
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					

Remarks



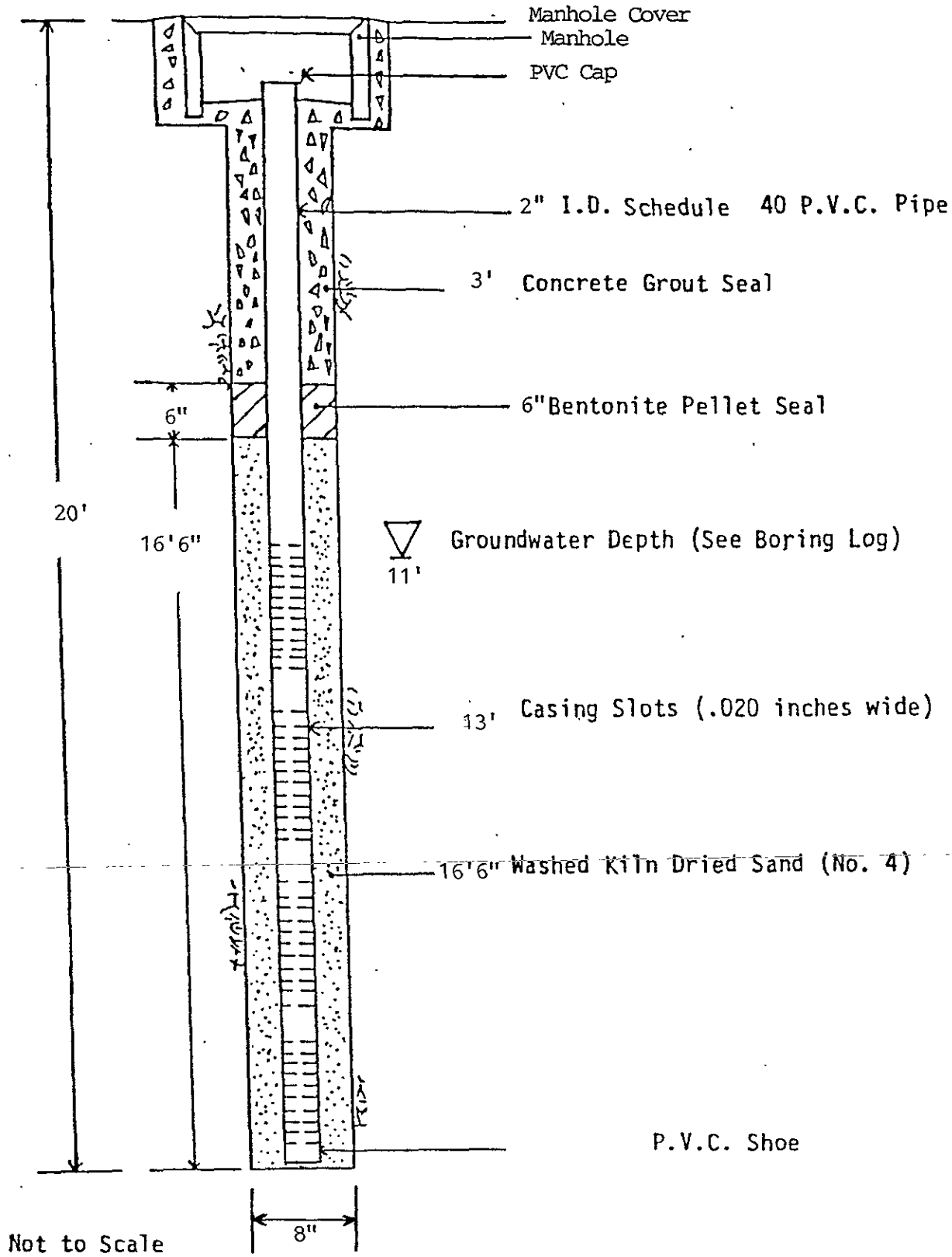
STMW-4

Piezometer Schematic



SIMW-5

Piezometer Schematic



SIMW-6

Piezometer Schematic

File No. 10-91-483-MW

A P P E N D I X "D"

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94588 • (510) 484-2600

7 April 1992

Alpha Geo Sciences
298 Brokaw Road
Santa Clara, CA 95050

Gentlemen:

Enclosed is drilling permit 92153 for a monitoring well construction project at 1801 Hibbard Street in Alameda for Weyerhaeuser Paper Company.

Please note that permit condition A-2 requires that a well construction report be submitted after completion of the work. The report should include drilling and completion logs, location sketch, and permit number.

If you have any questions, please contact Wyman Hong or me at 484-2600.

Very truly yours,

Craig A. Mayfield

Craig A. Mayfield
Water Resources Engineer

WH:mm
Enc.

RECEIVED APR 0 8 1992

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE ♦ PLEASANTON, CALIFORNIA 94588 ♦ (510) 484-2600

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 1801 Hibbard Street
Alameda, CA 94501

CLIENT
Name Weyerhaeuser Paper Company
Address 1801 Hibbard Street Phone 510-523-6121
City Alameda, CA Zip 94501

APPLICANT
Name Alpha Geo Services
Address 298 Brokaw Road Phone 408-988-1032
City Santa Clara, CA Zip 95050

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	___	General	___
Water Supply	___	Contamination	___
Monitoring	X	Well Destruction	___

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. C57 507520

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth ___ ft.
Surface Seal Depth ___ ft. Number 3

GEOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ in. Depth ___ ft.

ESTIMATED STARTING DATE 4/7/92
ESTIMATED COMPLETION DATE 4/7/92

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] Date 3/30/92

FOR OFFICE USE

PERMIT NUMBER 92153
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 3 Apr 92
Wyman Hong

51991

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

File No. 10-91-483-MW

A P P E N D I X "E"

GEOCHEM LABS

Precision Environmental Analytical Laboratory

GCL # 0492028

Date: Apr. 16, 1992

SOIL TECH ENGINEERING
Attn: Noori Ameli
Re: Three soil samples for Gasoline/BTEX, Diesel, and Oil & Grease analyses.

Project name: 1801 Hibbard St.- Alameda
Project number: 10-91-483-MW

Date sampled:Apr. 10, 1992 Date submitted:Apr. 15, 1992
Date extracted:Apr. 15-16, 1992 Date analyzed:Apr. 15-16, 1992

RESULTS:

SAMPLE I.D.	Gasoline (mg/Kg)	Diesel (mg/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)	Oil & Grease (mg/Kg)
STMW-4-5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
STMW-5-5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
STMW-6-5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Blank	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spiked Recovery	98.2%	95.4%	105.0%	82.3%	93.4%	83.3%	----
Duplicate spiked Recovery	100.4%	97.2%	89.4%	95.4%	92.5%	87.1%	----
Detection limit	1.0	1.0	5.0	5.0	5.0	5.0	50
Method of Analysis	5030 / 8015	3550 / 8015	8020	8020	8020	8020	5520 D & F

David Duong
Laboratory Director

1764 Houret Court Milpitas, CA. 95035 Tel: 408-946-9636 Fax: 408-946-9663

GEO CHEM

CHAIN OF CUSTODY RECORD

PROJ. NO.	NAME
10-91-483-MW	1801 Hibbard St. Alameda

SAMPLERS: (Signature)

GCL # 0492028

INV # 201052

NO.	DATE	TIME	SOIL	WATER	LOCATION	CONTAINER	Analyses Requested (2) TPHG/BTE&X	TPHD	T O & G
1	4/10/92	11^{45}	✓		STMW-4-5	1	✓	✓	✓
2	4/10/92	14^{20}	✓		STMW-5-5	1	✓	✓	✓
3	4/10/92	15^{40}	✓		STMW-6-5	1	✓	✓	✓

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Receive by: (Signature)
	4/15/92 12^{15}	GEOCHEM			
Relinquished by: (Signature)	Date / Time	Received by: (Signature) 4/15/92 VICTOR DUONG	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) 12^{15}	Date / Time	Remarks	

SOIL TECH ENGINEERING
Soil, Foundation and Geological Engineers
[redacted] BROKAW ROAD, SANTA CLARA, CA 95050 [redacted] (408) [redacted] 0265 [redacted] (40[redacted] 96-[redacted]

GEO CHEM

CHAIN OF CUSTODY RECORD

PROJ. NO.	NAME
10-91-483-MW	1801 Hibbard St. Alameda

SAMPLERS: (Signature)

NO.	DATE	TIME	SOIL	WATER	LOCATION	CONTAINER	ANALYSES REQUESTED (2) TPHG/BTE&X	TPHD	T O & G				REMARKS
1	4/10/92	11:45	✓		STMW-4-5	1	✓	✓	✓				
2	4/10/92	14:20	✓		STMW-5-5	1	✓	✓	✓				
3	4/10/92	15:40	✓		STMW-6-5	1	✓	✓	✓				

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Receive by: (Signature)
	4/15/92 12:15	GEOCHEM			
Relinquished by: (Signature)	Date / Time	Received by: (Signature) 4/15/92 VICTOR DUONG	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) 12:15	Date / Time	Remarks	

SOIL TECH ENGINEERING
Soil, Foundation and Geological Engineers
[redacted] SANTA CLARA, CA 95050 [redacted] (408) 496-[redacted]

GEOCHEM LABS

Precision Environmental Analytical Laboratory

GCL # 0492055

Date: Apr. 30, 1992

SOIL TECH ENGINEERING

Attn: Noori Ameli
Re: Six water samples for Gasoline/BTEX , Diesel, and Oil & Grease analyses.

Project name: 1801 Hibbard St. -Alameda
Project number: 10-91-483-MW

Date sampled: Apr. 27, 1992 Date submitted: Apr. 28, 1992
Date extracted: Apr. 28-30,1992 Date analyzed: Apr. 28-30,1992

RESULTS:

SAMPLE I.D.	Gasoline (ug/L)	Diesel (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)	Oil & Grease (mg/L)
STMW-1	150	N.D.	1.5	1.2	1.8	2.7	N.D.
STMW-2	1100	N.D.	9.4	5.3	2.0	24	N.D.
STMW-3	9400	2000	57	50	46	220	N.D.
STMW-4	790	N.D.	7.7	2.6	2.3	11	N.D.
STMW-5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
STMW-6	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Blank	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spiked Recovery	98.6%	88.5%	89.3%	87.2%	91.5%	103.2%	---
Duplicate Spiked Recovery	98.1%	104.2%	96.0%	87.5%	109.1%	101.7%	---
Detection limit	50	50	0.5	0.5	0.5	0.5	0.5
Method of Analysis	5030 / 8015	3510 / 8015	602	602	602	602	5520 C & F

David Duong
Laboratory Director

1764 Houret Court Milpitas, CA. 95035 Tel: 408-946-9636 Fax: 408-946-9663

GEO CHEM

CHAIN OF CUSTODY RECORD

PROJ. NO.	NAME
10-91-483-MW	1801 Hibbard St. Alameda

SAMPLERS: *(Signature)* N. Andrade

NO.	DATE	TIME	SOIL	WATER	LOCATION	CONTAINER	TPH G/BTE&X	TPHD	TO&G				REMARKS
							ANALYSES REQUESTED (2)						
1	4/27/92	12:05		✓	STMW-1	4	✓	✓	✓				
2	4/27/92	12:25		✓	STMW-2	4	✓	✓	✓				
3	4/27/92	13:30		✓	STMW-3	4	✓	✓	✓				
4	4/27/92	11:05		✓	STMW-4	4	✓	✓	✓				
5	4/27/92	11:20		✓	STMW-5	4	✓	✓	✓				
6	4/27/92	11:45		✓	STMW-6	4	✓	✓	✓				

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Receive by: *(Signature)*
N. Andrade	4/28/92 9:45	VICTOR DUONG			
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
		V. Duong			
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	
		GEO CHEM	4/28/92 9:45		

SOIL TECH ENGINEERING
Soil, Foundation and Geological Engineers
[redacted] SANTA CLARA, CA 95[redacted] ([redacted]) 4[redacted]265 [redacted] (408) [redacted]96-[redacted]

CHAIN OF CUSTODY RECORD

GEO CHEM

PROJ. NO.	NAME
10-91-483-MW	1801 Hibbard St. Alameda

SAMPLERS: (Signature) N. Andali

GCL # 0492055

INV # 22775

NO.	DATE	TIME	SOIL	WATER	LOCATION	CONTAINER	ANALYSES REQUESTED (2) TPH G/BTE&X	TPHD	TO&G
1	4/27/92	12:35		✓	STMW-1	4	✓	✓	✓
2	4/27/92	12:25		✓	STMW-2	4	✓	✓	✓
3	4/27/92	13:20		✓	STMW-3	4	✓	✓	✓
4	4/27/92	11:05		✓	STMW-4	4	✓	✓	✓
5	4/27/92	11:20		✓	STMW-5	4	✓	✓	✓
6	4/27/92	11:45		✓	STMW-6	4	✓	✓	✓

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Receive by: (Signature)
N. Andali	4/28/92 9:45	VICTOR DUONG			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) GEO CHEM	Date / Time 4/28/92 9:45	Remarks	

SOIL TECH ENGINEERING
Soil, Foundation and Geological Engineers
[redacted] (408) 496-0265 [redacted] (408) 496-0266