May 11, 2000
Project Number 9910100
Via US Mail

McMorgan & Company
One Bush Street, Suite 800
San Francisco, CA 94104

ATTN: Mr. Patrick G. Murray
SUBJECT: **RISK BASED CORRECTIVE ACTION EVALUATION**
444 Hegenberger Road
Oakland, California

Dear Mr. Murray:

E_2C, Inc. is pleased to present herein the results of our Risk-Based Corrective Action (RBCA) evaluation for the above subject site (Site).

These studies were performed as part of a continuing subsurface investigation as mandated by the Alameda County Health Care Services Agency and in compliance with their requirements.

The groundwater investigative data along with quarterly monitoring data from the wells on the Site were used for a RBCA evaluation.

Based on the RBCA evaluation, it has been estimated that the fuel hydrocarbon impact at the Site does pose a significant health risk to the workers at the Site.

Should you have any questions or require supplemental information, please do not hesitate to contact us.

Sincerely,

William A. Lawson
Project Geologist

Daniel J. Hidalgo, CHG
Senior Hydrogeologist

cc: Mr. Barney Chan
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Walter H. Kim/E_2C

CERTIFIED HYDROGEOLOGIST
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1.0 INTRODUCTION

1.1 SITE BACKGROUND

The subject site is located in northwest Alameda County near the Interstate 880 and Hegenberger Road interchange at 444 Hegenberger Road (Site), about one mile east of Oakland International Airport. Figure 1 depicts the Site's location. The Site is rectangular shaped and occupies the parcel of property immediately southeast of the intersection of Hegenberger Road and Hegenberger Loop.

Former Underground Storage Tanks (USTs) and a clarifier were previously removed from the Site. The latest removals were a waste-oil UST and the clarifier in 1996 (NWEI, 1997a, document included as Appendix A). Soil samples collected beneath these two removed structures indicated that soils beneath them had been impacted by fuel hydrocarbons. Based on these results, additional investigation was mandated by the Alameda County Health Care Services Agency (ACHCSA).

The western portion of the Site was previously occupied by a gasoline service station. Currently, the Site consists of open area that is being used as a staging area for construction materials for the development of the property adjacent to the east. The adjacent property's development contractor also has their superintendent's trailer temporarily sitting on the Site during the construction activities. Concrete pad remnants are visible on the ground surface. The excavation for the former waste-oil UST is open, but fenced in for safety purposes. Figure 2 depicts the Site's configuration, the locations of the concrete pads, the former pump islands, and the former waste-oil UST.

1.2 REGIONAL GEOLOGY

The Site is situated within the Franciscan Complex Geomorphic Province of California (Blake and others, 1974). The geomorphic character of the Franciscan Complex is comprised of coastal foothills and mountains that extend from the Tehachapi Mountains in southern California to the Klamath Mountains in northern California. The western and eastern boundaries of the province include the Pacific Ocean and the Great Valley Province, respectively. The Franciscan Province has four major components, the Northern Coast Range, the Franciscan Block, the Diablo Range, and the Naciomento Block. The Site is situated within the Franciscan Block along the eastern edge of the of the San Francisco Bay. The Bay lies in the northern portion of an extension of the Santa Clara Valley, a northwest-trending structural basin. The basin is bound on the southwest by the San Andreas Fault Zone and the Santa Cruz Coastal Mountains and on the northeast by the Calaveras Fault, Hayward Fault, and the Diablo Range.

During the Cenozoic Era (the last 65 million years), the region has been subject to complex tectonic evolution as the ancestral California margin underwent transition from a convergent to a transform plate margin (Atwater and others, 1977). During this period, the earth's crust was divided into smaller sinking blocks that formed basins and embayments which are interspersed with areas of uplift that formed highlands.

Sediments that were supplied from slopewash, landslides, and gullies from upland areas were carried by shifting alluvial stream channels to the marshlands and the Bay, in time, infilling the basin with alluvial material. Other sediments occupying the basin originated

from the marine environment that covered a portion of the basin. The basin generally consists of about 1,000 to 2,000 feet of these deposits that unconformably overlie bedrock formations.

The alluvial material in the basin is characterized by weakly consolidated, irregularly-bedded gravels, sands, silts, and clays that grade progressively from coarse-grained stream deposits on abandoned terraces and at the heads of alluvial fans into fine-grained alluvial fan and fresh water marsh deposits, which lay closer to the Bay. These bedded deposits vary from being moderately or highly permeable (sands and gravels) to relatively low permeable (clays) that may exist as aquitards (Helley & Lajoie, 1979). Overlying these deposits in the area of the Site is a thick sequence of Bay Mud, consisting of fine-grained deposits deposited in a marine environment.

1.3 SITE GEOLOGY AND HYDROGEOLOGY

The Site is situated within the Xeropsamments-Urban land-Baywood (XUB) association. The character of the XUB consists of nearly level to moderately sloping coastal plains (slopes from 0 to 9 percent). The soils in this association consist generally of excessively drained sands and loamy sands that formed in sandy Eolian deposits on mounds and ridges that derived from beach deposits and in sandy material dredged from beaches (USDA, 1981)

The subsurface at the Site generally consists of clay, gravelly clay, silty clay, and gravelly sand. The boring log for monitoring well MW-2, which is located in the approximate center of the Site is included as Appendix B.

Groundwater is encountered at approximately 16 to 17 feet below ground surface (bgs). At Well MW-2, the first groundwater-bearing zone was encountered at 17 feet bgs. At Well MW-6, the most recent well, the first groundwater-bearing zone was encountered at 16 feet bgs.

After penetration, the groundwater exhibits confining conditions. In March 2000, the groundwater level in Well MW-2 was at ~~14.13~~ 5.44 feet below the top of the casing (BTOC) and the groundwater level in Well MW-6 was at ~~12.9~~ 5.49 feet BTOC.

Groundwater flow at the Site has two directional components, northerly and westerly depending on position. Figure 3 depicts groundwater flow conditions in the fourth quarter of 1999. These conditions are generally prevalent at the other times of the year as seen in Figure 4, a groundwater contour plot for March 2000. Well MW-1 is not included as part of that plot as it was destroyed in December 1999 (E_2C, 2000). The groundwater elevation at Well MW-6, which was installed in March 2000, is included in this March 2000 plot.

Between wells MW-2 and MW-4, the flow trend appears to be northerly with a gradient higher than that between wells MW-2 and MW-3, which has a westerly flow trend. This difference may be the result of different permeability of materials in the two areas. Lower permeable materials will exhibit a steeper gradient, as flow through them is restricted, whereas higher permeable materials will exhibit a flatter gradient, as flow is not restricted. This phenomena was discussed in the fourth quarter monitoring report for the Site (E_2C, 2000).

In general, groundwater elevations at the Site are relatively similar and exhibit similar rise and fall characteristics. That is, their rise and fall differences mimic each other. There is one exception. In July 1999, groundwater levels at all wells decreased with the level at Well MW-4 decreasing significantly more than the rest. The level at Well MW-4 has remained significantly lower since that time (see Figure 5). Figure 5 presents a comparison of groundwater elevations at the monitoring wells on the Site. The cause of this difference may be attributed to the difference in permeability of materials (discussed above) and/or extraction of groundwater from an area near Well MW-4. There has been no groundwater extraction at the Site, so the possibility of extraction from somewhere nearby and to the north of Well MW-4 cannot be precluded.

The boring logs for the wells were reviewed. The logs for wells MW-3 and MW-4 indicate that the first groundwater-bearing zone was encountered at 10 feet bgs. The logs for wells MW-1, MW-2, MW-5, and MW-6 indicate that the first groundwater-bearing materials are encountered at 15 to 17 feet bgs. It is possible that Well MW-4 monitors a groundwater-bearing lens that has only a slight hydraulic connection with the groundwater-bearing zone monitored by the other wells. If this is the case, then Well MW-3 may monitor both zones. The only way to determine if this is the case would be to install a groundwater extraction well and perform a pumping test. This action is beyond the scope of this work.

1.4 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

In June 1996, the waste-oil UST and clarifier were removed (NWEI, 1997). A soil sample collected from under the waste-oil UST was found to contain the following:

- Total Petroleum Hydrocarbons as gasoline (TPHg) was detected at 560 milligrams per kilogram (mg/Kg), which is equivalent to parts per million (ppm);
- Benzene at a concentration of 6.7 mg/Kg;
- Toluene at a concentration of 0.68 mg/Kg;
- Ethylbenzene at a concentration of 8.1 mg/Kg;
- Xylenes (total) at a concentration of 360 mg/Kg;
- Total oil and grease (TOG) at a concentration of 360 mg/Kg;
- Total Petroleum Hydrocarbons as diesel (TPHd) was not detected at or above the method detection limit (non-detect);
- Semi-volatile organic compounds (SVOCs) were non-detect, except for Naphthalene at a concentration of 1.7 mg/Kg; and
- Lead, chromium, nickel, and zinc were detected at concentrations indicative of background levels.

In addition, a soil sample was collected from 5 feet below the clarifier. This sample was found to contain:

- TPHg at a concentration of 65 mg/Kg;
- Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX) at concentrations of 1.0, 0.24, 0.17, and 0.68 mg/Kg, respectively;
- TOG at a concentration of 1,800 mg/Kg;

- TPHd was non-detect;
- Halogenated volatile organic compounds (HVOCs) were non-detect;
- Several polynuclear aromatic compounds (PNAs) were detected at concentrations less than 2 mg/Kg; and
- Lead and zinc were detected at higher concentrations than in the waste-oil UST soil sample (NWEI, 1997).

1.4.1 Additional Investigation

Based on the results of the sampling during the UST and clarifier removal operations, soil borings were advanced with the collection of soil and grab groundwater samples in April 1997 NWEI, 1998).

Four borings (SB-1 through SB-4) were advanced in April 1997 (NWEI, 1998) and 12 borings (SB-5 through SB-16) were advanced later in 1997 (NWEI, 1997b). Appendix C contains a plot depicting the boring locations. The data from these investigations were reported in NWEI, 1998 and NWEI, 1997b, respectively. Table 1 summarizes the analytical data on soil samples collected from these borings. Table 2 summarizes analytical data on grab groundwater samples collected from these borings.

On October 8, 1997, trenching was performed to explore for underground structures. Trenching areas are depicted on the plot in Appendix D.

In general, low levels of fuel hydrocarbon compounds were detected in soils and significant levels of fuel hydrocarbon compounds were detected in the grab groundwater samples from borings SB-5 through SB-14.

Based on these results, monitoring wells were installed at the Site.

1.4.2 Monitoring Well Installation

Well installation permits were applied for and approved by the Alameda County Public Works Agency (ACPWA). In August 1998, borings were advanced and five monitoring wells (MW-1 through MW-5) were installed. The wells were installed in accordance with ACPWA guidelines. Appendix E contains copies of the boring logs and well details.

In December 1999, Well MW-1 was destroyed. In March 2000, Well MW-6 was installed downgradient of the former waste oil UST.

1.4.3 Quarterly Groundwater Monitoring

Quarterly groundwater monitoring commenced with the first sampling in December 1998. Quarterly monitoring has continued to the current date. The next sampling round is scheduled for June 2000. Table 3 summarizes quarterly groundwater chemical analytical results.

2.0 EXTENT OF SOIL AND GROUNDWATER IMPACT

2.1 EXTENT OF SOIL IMPACT

The extent of impacted soils is depicted on the plots in Appendix F. The plots are from NWEI, 2000b.

2.2 EXTENT OF GROUNDWATER IMPACT

The groundwater plume is depicted on Figure 6. The plume appears to be migrating toward the direction of Well MW-3. Based on past groundwater monitoring episodes, it appeared that the leading edge of the plume lay somewhere near Well MW-3. Based on the most recent monitoring episode (E_2C, 2000b), it appears that the plume edge may have migrated further past Well MW-3. As such, the leading edge of the plume has yet to be identified.

3.0 RISK-BASED CORRECTIVE ACTION EVALUATION

A Tier I Risk-Based Corrective Action (RBCA) Evaluation was performed to evaluate the potential impact to the health of on-site workers resulting from the fuel constituents in groundwater beneath the Site. The evaluation was performed in accordance with the following documents:

- *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* [American Society of Testing Materials (ASTM), E1739-95, November 1995].
- *Standard Provisional Guide for Risk-Based Corrective Action* (ASTM, PS104-98, July 1998).

3.1 CHEMICALS OF CONCERN

Contaminants of concern (COCs) detected in the Site's groundwater include the following:

- Benzene
- Toluene
- Ethylbenzene
- Xylenes

As discussed above, the above petroleum-related contaminants are associated with the release of gasoline from the former USTs.

3.2 ASSUMPTIONS

The groundwater plume at the Site occurs under an outside area and does not intrude beneath any buildings. It is anticipated that this logistical setup will change in the future, as the Site may be used for commercial purposes. As such, the following assumptions were made in the performance of the Tier I RBCA Evaluation:

- The groundwater plume occupies an area of approximately 1,400 feet wide by 150 feet long (see Figure 6) at an approximate depth of 10 to 20 feet bgs in silty sandy gravels.

- The groundwater gradient beneath the Site is relatively flat due to its elevation and relative location to the Bay.
- Since groundwater exhibits confining conditions, the mixing zone of groundwater with the vadose zone is thin. Thus, a conservative mixing zone of 9.5 feet bgs has been used in the calculations.
- The averages of BTEX concentrations detected in groundwater during the grab groundwater sampling and quarterly monitoring events were evaluated.
- The averages of BTEX concentrations detected in soil samples were evaluated.
- A target risk of 1:1,000,000 (10^{-6}) and commercial exposure values were used for the evaluation of all Class A & Class B carcinogens in outdoor air exposure pathways. Class A is defined as a human carcinogen while Class B is defined as a probable human carcinogen.
- A target risk of 1:100,000 (10^{-5}) and commercial exposure values were used for the evaluation of all Class C carcinogens in outdoor air exposure pathways. Class C is defined as a possible human carcinogen.
- A hazard quotient of 1 and commercial exposure values were used for the evaluation of all non-carcinogens in outdoor air exposure pathways. A hazard quotient is defined, as the ratio of the level of exposure of a COC over a specified period to a reference dose for that COC derived for a similar exposure period.
- As a conservative estimate, 10 hours per day, for 5 days per week for commercial workers was used in the evaluation.
- Construction work at the Site will be performed with oversight by a Site Environmental Manager. If soils are exposed that expose construction workers to the chemicals of concern, construction work will be halted pending rectification. As such, the construction worker pathway is considered incomplete. False.

3.3 EXPOSURE PATHWAYS

Exposure through ingestion and dermal contact of soils is also considered to be incomplete pathways for residential and commercial worker exposures as the portions of the Site that are not occupied by buildings will be paved or covered with imported landscaping materials. False, Could be true

The Site groundwater is most likely not used as a potable source based on its relative position with respect to the Bay. However, as a conservative measure, the groundwater exposure pathway is considered as complete.

Two other human exposure pathways based on inter-medium (soil, water, and air) transport mechanisms, and current and future use of the Site were also identified:

- volatilization to outdoor air from groundwater; and + Vol to outdoor air from Soil
- Volatilization to indoor air from groundwater. + Vol to indoor air

3.4 TIER I RBCA EVALUATION

A Tier I RBCA evaluation is a comparison of Site soil and groundwater data to conservative, non-site-specific, Risk-Based Screening Levels (RBSLs) for human health. RBSLs were calculated for the COCs discussed in Subsection 3.1.

As required by the California Department of Health Services, the carcinogenic slope factor of 0.1 for Benzene was input into the evaluation. Thus, the RBSLs for Benzene in groundwater were multiplied by a correction factor of 0.1.

3.5 RESULTS OF TIER 1 RBCA EVALUATION

The Tier I RBCA Evaluation Report is presented in Appendix G. Table 8 in Appendix G presents a summary of the COCs in soil and groundwater. The COCs exceeded the applicable RBSLs for three of the identified human exposure pathways:

- groundwater volatilization to outdoor air;
- groundwater volatilization to indoor air; and
- groundwater ingestion.

3.6 CONCLUSIONS OF RBCA EVALUATION

- Three human exposure pathways based on inter-medium (soil, water, and air) transport mechanisms, and current and future use of the Site were identified as volatilization to outdoor air from groundwater, volatilization to indoor air from groundwater, and groundwater ingestion. Groundwater ingestion may not be a factor due to its location in relation to the Bay.
- Concentrations of identified COCs exceeded Tier I Commercial RBSLs for the identified human exposure pathways at the Site.

Based on the available Site soil and groundwater data, the existing Site contaminant levels are not protective of human health for commercial occupancy. It may be that evaluating the Site under a Tier 2 RBCA may be beneficial. For the Tier 2 RBCA, additional data regarding soils and groundwater at the Site is required. This would require the drilling of soil borings with the collection of soil samples for specific parameters required by the RBCA Tier 2 process.

4.0 APPLICABLE SITE CLEANUP LEVELS

As discussed in the previous Section, based on the available data, Site soil and groundwater contaminant levels are not protective of human health for residential occupancy.

According to the State Water Resources Control Board (SWRCB) Resolution No. 88-63, Sources of Drinking Water Policy, all waters are considered suitable for municipal or domestic water supply use except:

1) Where Total Dissolved Solids (TDS) exceed 3,000 mg/L; or
2) Contamination exists that cannot be reasonably treated; or
3) The source does not sufficiently supply an average sustained yield of 200 gallons per day.

Based on the relative location to the bay, groundwater beneath the site should have a TDS above 3,000 mg/L. In order to assess if the impacted groundwater can be treated at the Site, additional studies would have to be performed. Groundwater parameters such as

hydraulic conductivity, transmissivity, and velocity would have to be tested for and calculated. Soil parameters, such as porosity and seepage velocity would also have to be tested for and calculated. In order to determine the yield that the aquifer at the Site may give up, other test, such as pumping tests, would have to be performed.

As such, it is not known if groundwater beneath the Site would meet any of the above requirements.

4.1 LOW RISK SOILS AND GROUNDWATER CASE

Based on the available Site data and results of the RBCA evaluation and in accordance with the January 1996 RWQCB guidance regarding releases from USTs, the Site does not qualify as a low risk soils and groundwater case based on the following:

- The extent of groundwater impact related to the 1998 gasoline release at the Site has not been adequately characterized. The groundwater plume may have migrated past Well MW-3 and off the Site based on the latest groundwater sampling event.
- The petroleum hydrocarbon plume does not appear to be stable as indicated by the elevated level of Benzene found at Well MW-3 in March 2000.
- It is not known if water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted.
- Contamination at the Site may present a significant risk to human health, as presented in the RBCA evaluation (Section 3.0), which is based on available data.

5.0 CONCLUSIONS

E_2C, Inc. has completed a Groundwater Investigation and RBCA Evaluation for the 444 Hegenberger Road Site in Oakland, California. Based on the research performed during this investigation, E_2C, Inc. makes the following conclusions:

- Soil impact related to the former USTs appears to have been adequately defined.
- The groundwater plume appears to be unstable and have moved off the Site.
- Based on the available Site data, the ASTM RBCA Evaluation indicates that current levels of contaminants present in groundwater beneath the Site do present a risk to the health of the staff at the facility.
- The Site does not qualify as a low risk soil and groundwater case with respect to the petroleum hydrocarbon impact.

6.0 RECOMMENDATIONS

E_2C, Inc. recommends the following:

- That an off-site well be installed in the downgradient direction from Well MW-3.
- That a well survey of the surrounding area be performed to identify potential receptors and/or extractors.
- That soil borings be placed to collect data necessary to perform a Tier 2 RBCA.
- Perform a Tier 2 RBCA.

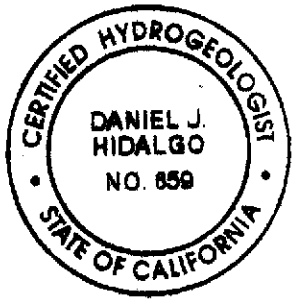
7.0 PROFESSIONAL CERTIFICATION AND LIMITATIONS

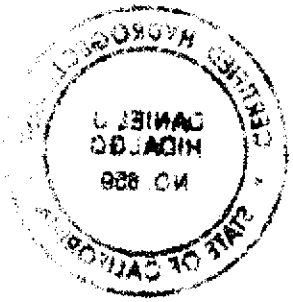
This report has been prepared by E_2C, Inc., under the professional supervision of the registered professional whose seal and signature appears herein.

The conclusions of this report are based solely on the Scope of Services outlined and the sources of information referenced in this report. Any additional information that becomes available concerning this site should be submitted to E_2C, Inc. so that our conclusions may be reviewed and modified, if necessary. This report was prepared for McMorgan & Company and/or its agents.

William A. Lawson
Project Geologist

Daniel J. Hidalgo, CHG
Senior Hydrogeologist




CERTIFIED HYDROGEOLOGIST
DANIEL J
HIDALGO
NO. 859
STATE OF CALIFORNIA

8.0 REFERENCES

American Society of Testing Materials, November 1995, Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites (ASTM, E1739-95) (ASTM, 1995)

American Society of Testing Materials, July 1998, Standard Provisional Guide for Risk-Based Corrective Action (ASTM, PS104-98) (ASTM, 1998)

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Blake, M.C., Bartow, V.A., Jr., Schlocker, J., Sorg, D., Wentworth, C.M., and Wright, R.H., 1974, Preliminary Geologic Map of Marin, and San Francisco Counties and Parts of Alameda, Contra Costa, and Sonoma Counties, California, U.S.G.S. Map MF-574 (Blake and others, 1974)

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Northwest Envirocon, Inc., December 18, 1998, Soil and Groundwater Assessment, 444 Hegenberger Road, Oakland, California (NWEI, 1997b)

Northwest Envirocon, Inc., December 18, 1998, Supplemental Soil and Groundwater Assessment, 444 Hegenberger Road, Oakland, California (NWEI, 1998)

United States Department of Agricultural Soil Conservation Service, 1981, General Soil Map from the Alameda County Soil Survey (USDA, 1981)

FIGURES

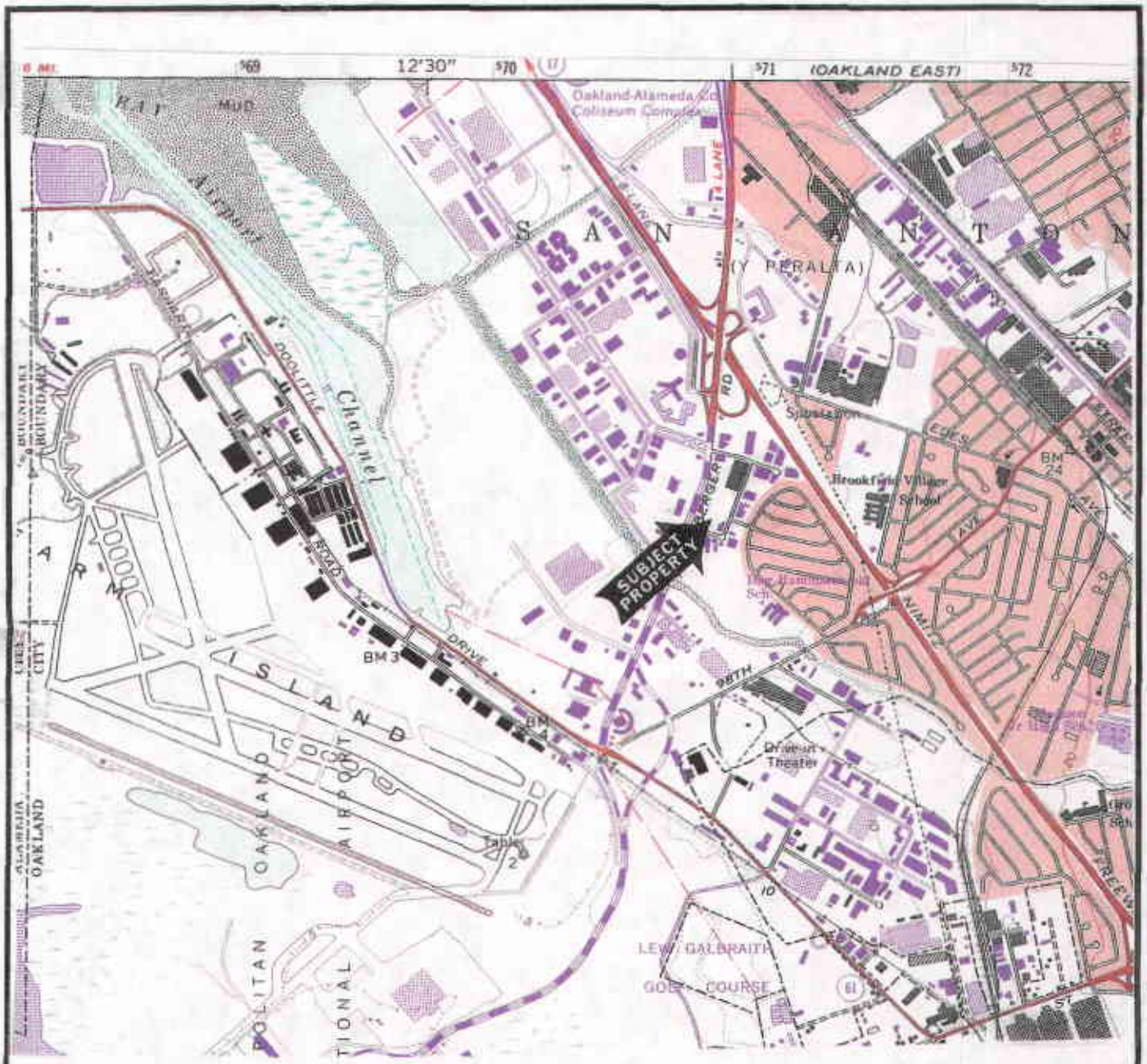


FIGURE 1 - SITE LOCATION MAP

444 Hegenberger Road	Client Name: McMorgan & Company
City, State: Oakland, California	E_2C Project Number: 1124SC01

E_2C INC.
Environmental/Engineering Consultants
382 Martin Avenue . Santa Clara, CA 95050

Source:
USGS Topo Map, San Leandro Quadrangle, California 7.5 Minute Series Topographic Map 1959, photorevised in 1980 1961 Photorevised 1980

HEGENBERGER ROAD

HEGENBERGER LOOP

GATE

MW-3

MW-4

FORMER PUMP ISLANDS

MW-2

MW-6

CONCRETE SLAB

MW-5

CONCRETE SLAB

FORMER WASTE OIL TANK

MW-1
(DESTROYED 12.27.99)

SCALE IN FEET
0' 10' 20' 30'

EXPLANATION

MW-5 GROUNDWATER MONITORING WELL LOCATION

Figure 2 - SITE PLAN

Environmental/Engineering Consultants
382 Martin Avenue
Santa Clara, California 95050-3112
Tel: 408.327.5700 Fax: 408.327.5707

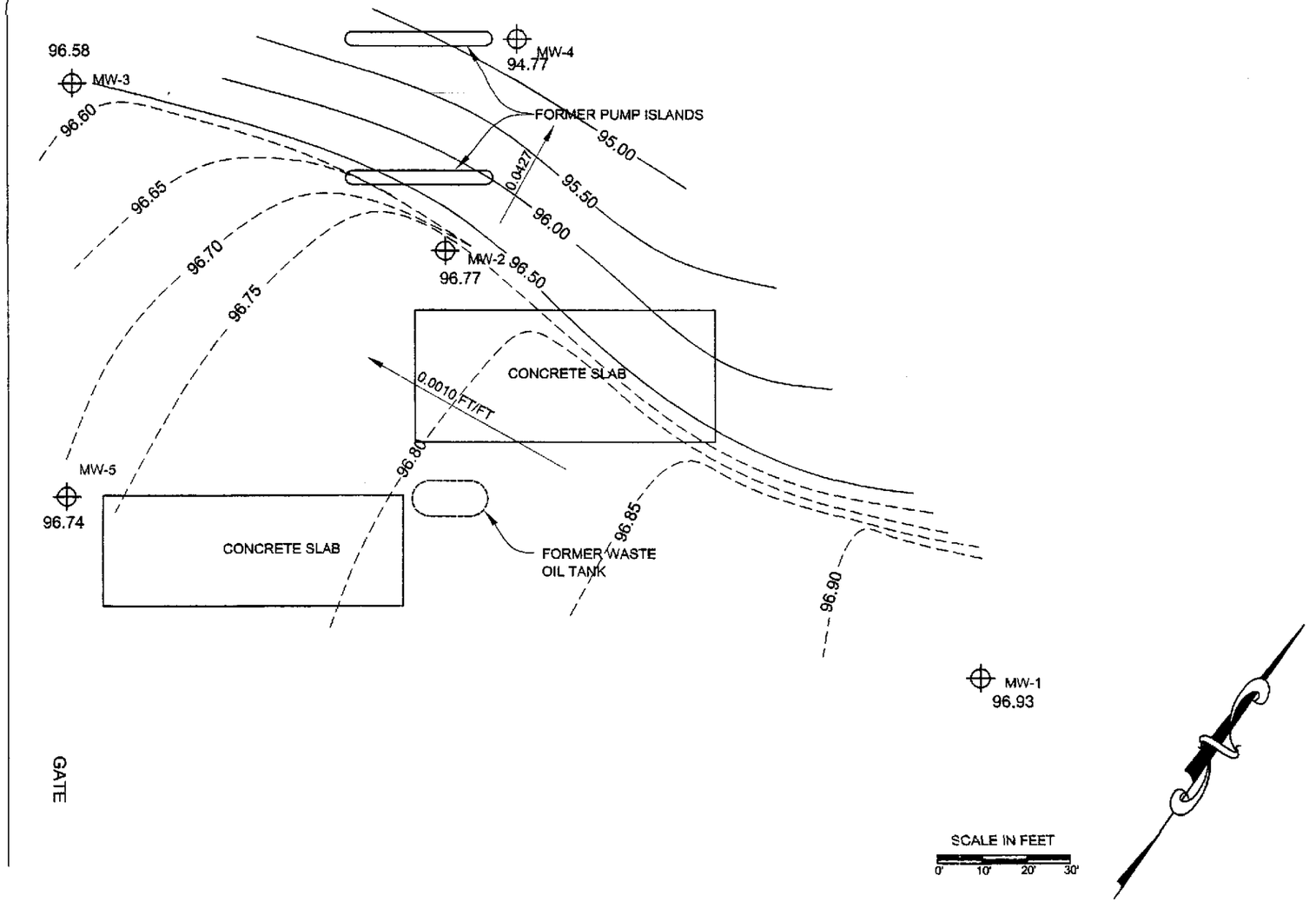
444 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

FILENAME: 1124SC01
DATE: MAY 2000
REVISION:
DRAWN: JUSTUS

Job Number:
1124SC01

HEGENBERGER ROAD

HEGENBERGER LOOP



GATE

EXPLANATION

- MW-5 — GROUNDWATER MONITORING WELL LOCATION
- (96.93) — GROUNDWATER ELEVATION (FEET BASED ON ASSUMED DATUM)
- – – – GROUNDWATER CONTOUR (DASHED WHERE APPROXIMATE) (CONTOUR INTERVAL 0.05' AND 0.50')
- ——→ 0.0427 AND 0.0010 - GROUNDWATER FLOW DIRECTION & GRADIENT

Figure 3 - GROUNDWATER GRADIENT (4TH QUARTER 1999)

Environmental/Engineering Consultants
382 Martin Avenue
Santa Clara, California 95050-3112
Tel: 408.327.5700 Fax: 408.327.5707

444 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

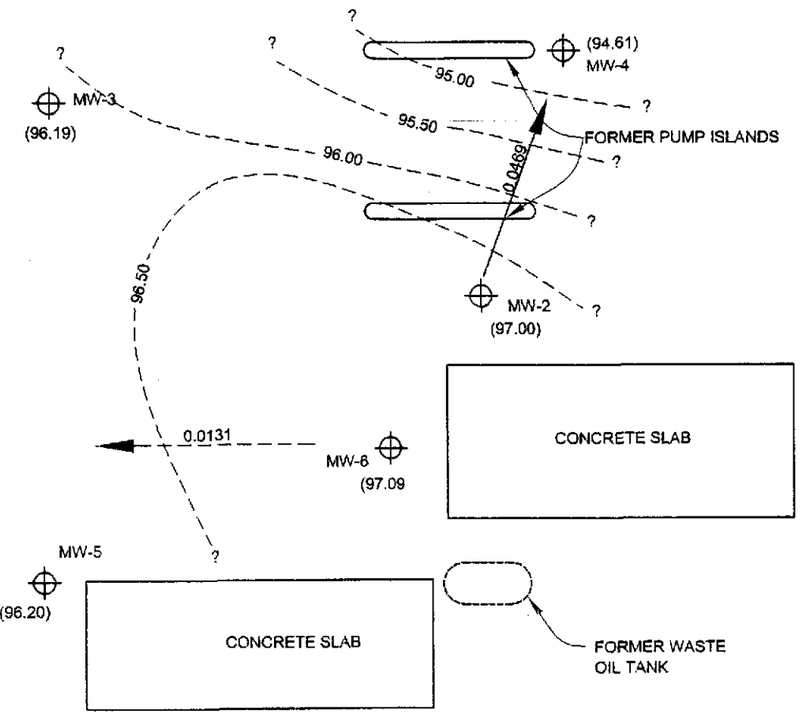
FILENAME: 1124SC01
DATE: MAY 2000
REVISION:
DRAWN: JUSTUS

Job Number:
1124SC01

HEGENBERGER ROAD

HEGENBERGER LOOP

GATE



MW-1
(DESTROYED 12.27.99)

SCALE IN FEET
0' 10' 20' 30'

EXPLANATION

MW-5 GROUNDWATER MONITORING WELL LOCATION

— 96.5 — GROUNDWATER CONTOUR, CONTOUR INTERVAL = 0.5 FOOT; DASHED WHERE INFERRED, QUERIED WHERE UNKNOWN)

(96.20) GROUNDWATER ELEVATION (BASED ON ARBITRARY DATUM)

0.0131 GROUNDWATER FLOW DIRECTION INDICATING GRADIENT (ft/ft) AND DIRECTION

Figure 4 - GROUNDWATER GRADIENT PLOT (MARCH 2000)

Environmental/Engineering Consultants
382 Martin Avenue
Santa Clara, California 95050-3112
Tel: 408.327.5700 Fax: 408.327.5707

444 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

FILENAME: 1124SC01
DATE: APRIL 2000
REVISION:
DRAWN: JCL

Job Number:
1124SC01

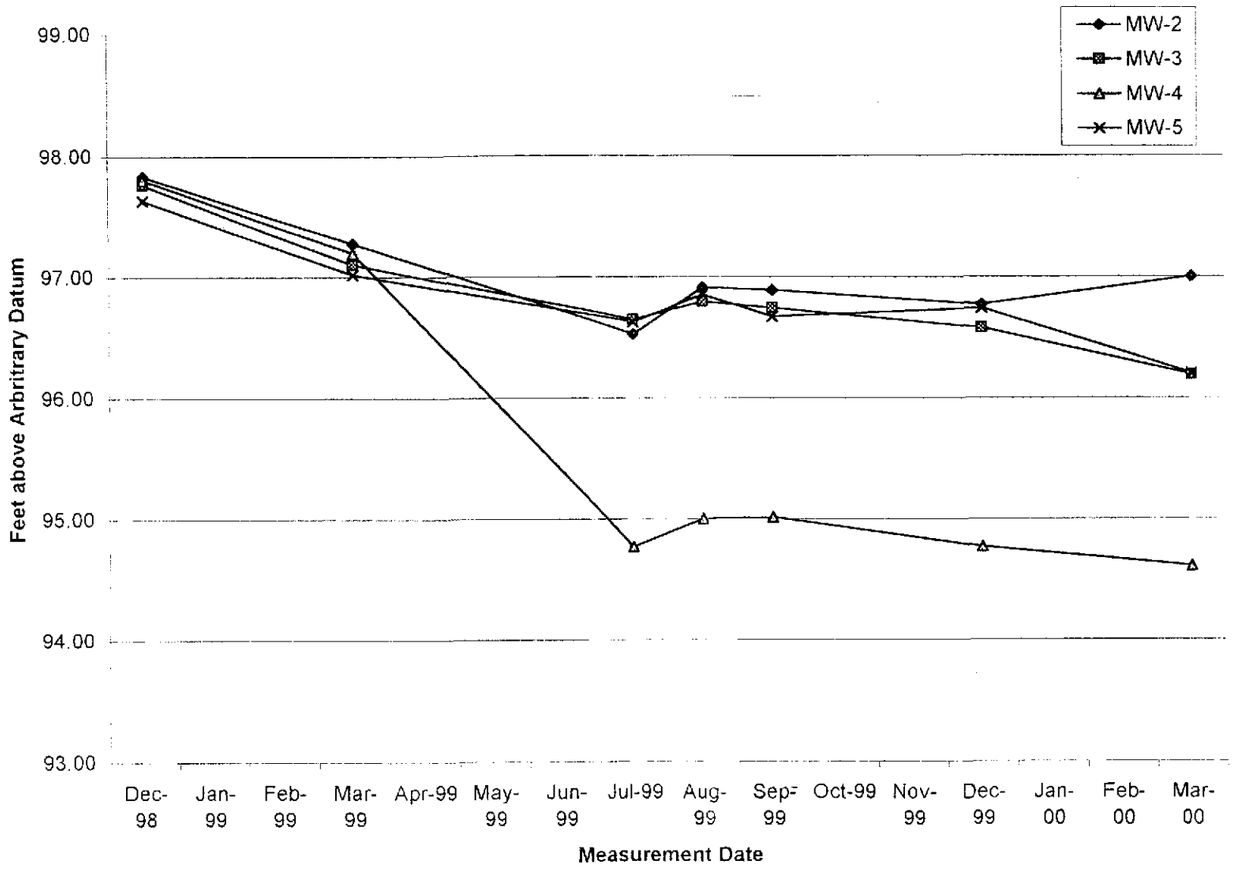


Figure 5 - COMPARISON OF GROUNDWATER LEVELS

Environmental/Engineering Consultants
382 Martin Avenue
Santa Clara, California 95050-3112
Tel: 408.327.5700 Fax: 408.327.5707

444 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

FILENAME: 1124SC01
DATE: MAY 2000
REVISION:
DRAWN: JUSTUS

Job Number:
1124SC01

TABLES

HEGENBERGER ROAD

HEGENBERGER LOOP

GATE

MW-3
B = 4,100
TPhg = 8,400

MW-4
B = 240
TPhg = 430

FORMER PUMP ISLANDS

MW-2
B = 110
TPhg = 1,900

CONCRETE SLAB

MW-6
B = 430
TPhg = 2,400

B = 560
TPhg = 2,500
MW-5

CONCRETE SLAB

FORMER WASTE
OIL TANK

MW-1
(DESTROYED 12.27.99)

SCALE IN FEET
0' 10' 20' 30'

EXPLANATION

- MW-5 — GROUNDWATER MONITORING WELL LOCATION
- ? – – – GROUNDWATER PLUME; DASHED WHERE APPROXIMATE, QUERIED WHERE UNKNOWN
- B — BENZENE CONCENTRATION IN µg/L
- TPhg — TOTAL PETROLEUM HYDROCARBONS AS GASOLINE CONCENTRATION IN µg/L

Figure 6 - GROUNDWATER PLUME PLOT (MARCH 2000)

Environmental/Engineering Consultants
382 Martin Avenue
Santa Clara, California 95050-3112
Tel: 408.327.5700 Fax: 408.327.5707

444 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

FILENAME: 1124SC01
DATE: MAY 2000
REVISION:
DRAWN:L.JUSTUS

Job Number:
1124SC01

TABLE 1 - SUMMARY OF SOIL ANALYTICAL RESULTS FOR BORINGS SB-5 - SB-16

BORING ID	SAMPLE ID	DEPTH	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	TPHg	TPHd	TOG
SB-5	SB05-3	3	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<1.0	<2.0	<10
SB-6	SB06-3	3	<0.50	0.055	0.053	0.11	0.11	59	<25	61
SB-7	SB07-3	3	<0.050	0.015	0.011	<0.0050	<0.0050	1.3	<25	130
SB-8	SB08-3	3	<2.5	1.1	<0.25	2.2	7.6	160	<30	20
SB-9	SB09-3	3	<0.050	0.017	<0.0050	<0.0050	0.015	1.1	<20	120
SB-10	SB10-3	3	<0.50	4.7	<0.50	2.8	2.5	750	<100	25
SB-11	SB11-3	3	<0.50	2.3	0.73	6.1	11	260	<15	37
SB-12	SB12-3	3	<0.050	0.036	0.007	<0.0050	0.025	1.2	<10	42
SB-13	SB13-3	3	<0.50	13	0.85	5.8	4.2	930	<150	780
SB-14	SB14-3	3	<0.50	0.81	0.36	0.087	0.38	62	<10	61
SB-15	SB15-3	3	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<1.0	<1.0	<10
	SB15-6	6	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<1.0	<1.0	<10
SB-16	SB16-3	3	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<1.0	<1.0	<10
	SB16-3	6	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<1.0	<2.0	13

< = Not detected at method detection limit, indicated by the number

Results in milligrams per kilogram (mg/Kg)

Shaded cell represents concentration detected at or above the method detection limit

TOG = Total oil and grease

TPHd = Total petroleum hydrocarbons as diesel

TPHg = Total petroleum hydrocarbons as gasoline

TABLE 2 - SUMMARY OF GRAB GROUNDWATER ANALYTICAL RESULTS FOR BORINGS SB-5 - SB-16

BORING ID	SAMPLE ID	[illegible]	Benzene	Toluene	Ethylbenzene	Xylenes	TPHg	TPHd	TOG	VOCs
SB-5	SB05-W	[illegible]0	4.5	1.1	<5.0	1.4	190	<50	<100	nd
SB-6	SB06-W	[illegible]0	620	<50	800	<50	15,000	180	130	nd
SB-7	SB07-W	[illegible]0	45	<5.0	210	<5.0	3,900	<100	<100	na
SB-8	SB08-W	[illegible]0	12,000	540	6,000	7,400	52,000	<200	360	nd
SB-9	SB09-W	[illegible]0	55	3.5	40	4.5	1,600	<100	130	nd
SB-10	SB10-W	[illegible]0	280	15	400	120	5,400	<100	110	na
SB-11	SB11-W	[illegible]0	2,100	1,800	1,300	4,800	16,000	<50	<100	na
SB-12	SB12-W	[illegible]0	460	42	2,100	230	13,000	<700	890	na
SB-13	SB13-W	[illegible]0	3,200	67	180	100	11,000	<350	440	na
SB-14	SB14-W	[illegible].0	95	3.0	120	8.9	2,700	<100	110	na
SB-15	SB15-W	[illegible].0	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	na
SB-16	SB16-W	[illegible].0	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	na

< = Not detected at method detection limit, indicated by the number

na = Not analyzed for these compounds

nd = Not detected at or above the respective method detection limit for each VOC

Results in micrograms per liter (ug/L)

Shaded cell represents concentration detected at or above the method detection limit

TOG = Total oil and grease

TPHd = Total petroleum hydrocarbons as diesel

TPHg = Total petroleum hydrocarbons as gasoline

VOCs = Volatile organic compounds

TABLE 3 - HISTORICAL GROUNDWATER ANALYTICAL DATA

Well ID	Date	TPHd	TPHg	Benzene	Toluene	thylbenzen	Xylenes
MW-1	12/2/98(a)	<50	<50	<0.05	<0.05	<0.05	<0.05
	03/08/99	190	<50	<0.3	<0.3	<0.3	<0.3
	07/01/99	<50	<50	<0.5	<0.5	<0.5	<0.5D
	09/15/99	<50	3,100	<0.5	9.6	7.8	12
	12/27/99	<50	<50	< 0.5	< 0.5	< 0.5	< 0.5
	12/27/99	well destroyed					
MW-2	12/2/98(a)	99	<50	4.6	0.85	0.57	5
	03/08/99	210	180	200(a)	0.74	1.3	2.3
	07/01/99	<50	1,100	190	13	33	36
	09/15/99	100*	990	330	9.7	11	19
	12/27/99	<50	1,000	260	7.2	1.3	10.0
	03/29/00	31,000	1,900	110	4.8	9.5	12.0
MW-3	12/2/98(a)	300	970	160	6.5	16	9
	03/08/99	1,400	2,600	1,800(b)	30(c)	67(c)	26(c)
	07/01/99	150*	3,000	1	<0.5	32	36
	09/15/99	110*	1,100	350	8.3	5.4	10
	12/27/99	70	560	170	2.1	7.6	3.1
	03/24/00	1,000	8,400	4,100	71	190	75
MW-4	12/2/98(a)	620	<50	1.1	0.37	<0.3	2.0
	03/08/99	<50	1,300	1,900(b)	9.4	1.2	11
	07/01/99	<50	610**	120	<0.5	<0.5	<0.5
	09/15/99	59*	830	320	6.5	1.7	<2.0
	12/27/99	<50	55	5.8	< 0.5	< 0.5	< 0.5
	03/24/00	77	430	240	3.3	0.98	1.5
MW-5	12/2/98(a)	620	<50	1.1	0.37	<0.3	2.0
	03/08/99	<50	58	23	0.31	<0.3	1.8
	07/01/99	64*	1,900	160	10	13	22
	09/15/99	<50	410	64	2.1	1.3	2.7
	12/27/99	<50	130	15	0.73	< 0.5	< 0.5
	03/24/00	460	2,500	560	57	18	87
MW-6	03/24/00	470	2,400	430	16	340	73
	MCLs	NE	NE	1	100	680	1,750

$\frac{4600}{4} \sim 1.1$

Notes:

Concentrations in micrograms per liter (ug/L)

Values shaded exceed MCLs

NE = No MCL or Action Level has been established for this substance

MCLs = Maximum Contaminant Levels per State Office of Drinking Water Standards

TPHd = Total petroleum hydrocarbons as diesel

TPHg = Total petroleum hydrocarbons as gasoline

* = Analytical results within quantitation range for diesel, however chromatographic pattern not typical of fuel

** = Analytical results within quantitation range for diesel, however chromatographic pattern not typical of fuel

(a) = Reporting limit for this monitoring event are elevated 10 times due to matrix interference

(b) = Reporting limit is elevated 100 times due to matrix interference

(c) = Reporting limit is elevated 5 times due to matrix interference

APPENDIX A

NWEI LETTER 02/28/97

February 28, 1997
Project No. 050-000428

428297.doc

Ms. Sandra Hutson
Property Manager
The Voit Company
Post Office Box 689
Orinda, California 94563

Subject: - **Current Project Status, Existing Soil Stockpile and Underground Tank and Clarifier Removal**
444 Hegenberger Road, Oakland, California

Dear Ms. Hutson:

Northwest Envirocon, Inc. (NWE) has prepared this letter to describe the results of work conducted to date at the subject site and outline a review the existing proposal for the next phase of work intended to comply with the requirements of the Alameda County Health Care Services Agency, Environmental Health Services Division (Alameda County). Two areas of concern are discussed in this letter: the existing soil stockpile and the removal of the underground storage tank and oil/water separator or clarifier.

Existing Soil Stockpile

Initially, NWE was directed to use a portion of the existing soil stockpile (consisting of approximately 350 cubic yards of soil) for backfill of the excavations resulting from removal of the underground tank and the clarifier and to spread the balance of the stockpiled soil on the subject Property. To get permission from Alameda County to use the stockpile in this way, sampling of the stockpile was required. Initially, since all available information indicated that the site had previously been used as a service station, the stockpile was sampled in February 1996 for petroleum constituents only. Analytical results for petroleum constituents indicated that the soil was acceptable for use at the site, but in reviewing our proposal to spread the soil on the site, Alameda County was concerned about the origin of the stockpiled soil. Since documentation of the exact origin of the stockpiled soil is lacking, Alameda County and the California Regional Water Quality Control Board, San Francisco Region (Regional Board) were concerned that the soil may have been generated elsewhere and then transported and stockpiled on the subject Property. If this were the case, then it would have been feasible that the soil could contain other contaminants, for example solvents or metals. Alameda

County and the Regional Board argued that even though our initial analyses for petroleum constituents were negative, other, unknown contaminants may have been present in the stockpiled soil.

In conversations with Mr. Barney Chan of Alameda County, it was agreed that additional soil samples from the stockpile would be collected and analyzed for:

- Semi-volatile Organic Compounds (EPA Method 8270)
- Solvents (EPA Method 8240)
- The metals lead, nickel, zinc, chromium, cadmium, and arsenic (EPA Methods 7000/6010)

After authorization by The Voit Company (Voit), the additional sampling and analyses were conducted in May 1996. The results were submitted to the County and the Regional Board and permission was granted by Alameda County to use the stockpiled soils on site, as originally proposed.

On June 10, 1996 (the day that the underground storage tank and clarifier were removed), NWE's subcontractor began to move the stockpile in preparation for loading and spreading the soil at the site. The stockpile was found to contain up to 40% concrete blocks and pieces roughly 4 to 6 inches across. Additional debris, such as tires, wooden pallets, and even an old boiler were found within the soil stockpile. The stockpile was explored with the backhoe at three locations, widely separated, and at each location the blocks and pieces of concrete were present. Since the pile was vegetated and covered with soil at the surface, the presence of concrete and other debris was not discovered during soil sampling, which involved only the upper 6 to 12 inches of the pile and was accomplished by hand with an impact sampler approximately 3 inches in diameter. When the presence of the debris was discovered, NWE notified Voit immediately, because it was felt that spreading of concrete and other debris across the site may not be consistent with future potential uses of the property. As a result of this discussion of potential options for the existing soil stockpile, NWE was instructed to postpone the spreading until after Voit representatives had a chance to visit the property. After a field visit on June 13, 1996, Voit instructed NWE to leave the soil stockpile as is (replacing soil in spots where it had been disturbed) and to get an estimate for the charges to transport the stockpiled soil off site for disposal. The stockpile will be returned to its original configuration when the proposed additional work at the site (see below) is executed.

In accordance with your request, NWE solicited two bids for soil transport and off site disposal in June 1996. The lowest bid was $42.50 per ton, not including loading fees. For 350 cubic yards (and assuming 1.18 tons of soil in

each cubic yard), this translates to approximately $20,700 in transport and disposal fees (including markup). Loading fees would probably be approximately $2,000. These bids are now 8 months old and would need to be updated prior to implementation, but they should be indicative of current disposal costs.

Underground Tank and Clarifier Removal and Sampling

On June 10, 1996, in accordance with a permit issued by Alameda County and the Oakland Fire Department, the underground tank and clarifier were excavated and removed. The location and size (approximately 550-gallon capacity) of the underground tank indicated that it was used to store waste oil during the period when the site operated as a service station. The clarifier may or may not have been associated with the service station use.

The underground tank was removed after rinsing by NWE's subcontractor. After removal, the tank was inspected by representatives of Alameda County and the Oakland Fire Department. One small hole was observed along a seam at one end of the tank. Soil surrounding the tank contained a faint hydrocarbon odor and a septic odor. One soil sample was collected at a depth of approximately 8 feet below grade from beneath the waste oil tank.

At the time the tank was removed, groundwater was not present in the waste oil tank excavation. At one location, it appeared that groundwater was seeping into the pit. Groundwater is known to be present within 10 feet of the ground surface at nearby sites. Voit's representative indicated that water was present at the bottom of the excavation during their field visit.

The soil sample collected from beneath the waste oil tank was analyzed for:

- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020.
- Total petroleum hydrocarbons as gasoline (TPHg) and diesel (TPHd) by EPA Method 8015-modified.
- Oil and grease (O&G) by ASTM Standard Methods 5520, E and F.
- The metals lead, chromium, cadmium, nickel, and zinc by EPA Method 6010.
- Volatile halocarbons by EPA Method 8010.
- Polychlorinated biphenyl compounds (PCBs) and polynuclear aromatic compounds (PNAs) by EPA Method 8270

The soil sample collected from beneath the underground storage tank contained TPHg at a concentration of 560 milligrams per Kilogram (mg/Kg).

Benzene (6.7 mg/Kg), toluene (0.68 mg/Kg), ethylbenzene (8.1 mg/Kg), and total xylenes (7.6 mg/Kg) were also detected in this soil sample. O&G was present at a concentration of 360 mg/Kg. Neither TPHd nor volatile halocarbons were reported at detectable concentrations. Of the 8270 compounds, only napthalene was detected (at a concentration of 1.7 mg/Kg). The metals lead, chromium, nickel, and zinc were detected at concentrations consistent with ambient levels; cadmium was not present in this soil sample at detectable concentrations.

The clarifier apparently collected runoff water from a concrete slab via a grated inlet in the slab (there was no underground influent piping). After disconnecting the effluent piping, the concrete clarifier reservoir was removed intact by NWE's contractor. The clarifier appeared intact with no obvious cracks or holes. One soil sample was collected from beneath the clarifier at a depth of approximately 5 feet below grade. This sample was analyzed for the same list of constituents as the underground tank soil sample.

The clarifier soil sample was reported to contain TPHg (65 mg/Kg), BTEX (1.0, 0.24, 0.17, and 0.68 mg/Kg, respectively), and O&G (1,800 mg/Kg). Neither TPHd nor volatile halocarbons were detected in this soil sample. Several PNAs were reported at concentrations less than 2 mg/Kg. The concentrations of lead and zinc in this sample were substantially higher than in the sample collected from beneath the underground tank.

After the analytical results were received, they were forwarded to Mr. Barney Chan of Alameda County. Voit was subsequently contacted by Mr. Chan directly and notified that the sample results indicated additional sampling of soil and perhaps groundwater underlying the site would be required by Alameda County.

With Voit's authorization, NWE then prepared a "Tank Removal Results Report and Work Plan for Soil and Groundwater Sampling" report, dated July 23, 1996. This report summarized previous work and proposed additional investigation, to include advancement of four soil borings and collection and analysis of soil and groundwater samples. This results report/work plan was submitted to and approved (with modifications) by Alameda County on August 12, 1996.

In July 1996, NWE and Voit first discussed the possibility of reimbursement for environmental work associated with the underground storage tank by the State of California through the State Water Resources Control Board, Clean Water Programs, Underground Storage Tank (UST) Fund. The UST Fund application was completed and submitted in October 1996. Eligibility under the UST Fund requires that work be awarded on a competitive basis; at least

three bidders must be involved. For this reason, NWE prepared an "Invitation to Bid" package for Voit's use in soliciting bids from qualified contractors. Three bids were initially sought in October 1996. Due to lack of contractor response (only one qualified bid was received), the work was re-bid in November 1996. Three qualified bids were received by November 15, 1996. At that time, to insure that the proposed work and budget were to the maximum extent reimbursable through the UST Fund, a written pre-approval application was submitted to UST Fund staff for review and approval. Subsequently (in December 1996 and again in January 1997), UST Fund staff was contacted regarding the progress of the pre-approval process. On both occasions, UST Fund staff personnel indicated that they would research the status of the application.

On January 22, 1997, the UST Fund issued a notice of claim acceptance (claim number 012057) for the subject Property, with a placement in Priority Class "D" under the UST Fund reimbursement program. After receipt of this notice, NWE again contacted UST Fund staff regarding the pre-approval application. On this occasion, staff personnel indicated that the previously submitted application package had not been located. Accordingly, a copy of the pre-approval application was submitted to the UST Fund on February 18, 1997. UST Fund staff indicated that 5 to 10 working days would be required to process the pre-approval application.

NWE's cost estimate for the current approved Scope of Investigation (plan dated July 23, 1996; approved with revisions on August 12, 1996 by Alameda County) is $7,500. As soon as the pre-approval application is approved by the UST Fund, NWE will submit permit applications and schedule the mandated union drilling subcontractor. Upon receipt of permits, the proposed field work will be conducted. Depending upon the results of further sampling, several scenarios are possible. These are discussed below.

Possible Scenarios

This section discusses some possible results of the proposed work and possible consequences. Costs associated with these possible scenarios are necessarily approximate and should be used as rough guidelines only.

Scenario 1 The first potential scenario is that further testing documents that groundwater is not impacted and only overexcavation of soil in the areas of the existing pits is necessary. Based on the presence of groundwater in the underground tank excavation, this is not considered a likely outcome. If this was the case, the work scope (beyond the additional field work already proposed and budgeted) would consist of overexcavation, laboratory fees, and preparation of a results report. Approximate costs would be $8,000 to

$10,000. This estimated cost does not include treatment and/or disposal of excavated soil. Costs for this may range up to $50 per ton, but it is likely that the soil could be treated on the subject Property to reduce petroleum concentrations to levels that would be less expensive to dispose of.

Scenario 2 The second potential scenario is that groundwater is impacted, the impacts are defined by the next phase of sampling and petroleum constituent concentrations only marginally exceed Maximum Contaminant Levels (MCLs). In this case, if the contaminant plume is not extensive, and a risk-based analysis indicates negligible risks to human health, Alameda County may decide that additional investigation or monitoring is not necessary. It is assumed that overexcavation of impacted soil would be necessary. The work scope and estimated costs would be essentially the same as those under Scenario 1.

Scenario 3 Under this scenario, petroleum constituents are detected in groundwater at levels that require additional delineation and that delineation is not accomplished with the initial groundwater sampling already authorized. Additional (permanent) groundwater sampling wells are required at downgradient locations and monitoring for at least 4 quarters (one year) is required. Petroleum constituent concentrations in groundwater are assumed to be below those levels requiring active remediation. Overexcavation of impacted soil is required. The work scope, in addition to that described under Scenario 1 (with the associated estimated costs), would also include preparation of a subsequent work plan, permitting for permanent groundwater monitoring wells, field work to install the monitoring wells (including a union drilling subcontractor), analytical fees, and preparation of a results report. Costs for these tasks would be approximately $10,000 to $12,000. Each quarter, each monitoring well (assume 3) would be sampled, and a quarterly monitoring report prepared. The costs for quarterly monitoring and reporting would be approximately $2,300 per quarter.

Scenario 4 Under this scenario, petroleum constituents are detected in groundwater at concentrations that warrant active remediation. In addition to the work and associated costs for Scenario 3, additional investigative costs of $20,000 to $40,000 would likely be incurred for additional investigation. Remediation capital costs may range from $20,000 to $60,000 and operation and maintenance costs may range up to $2,000 per month. Typically, remedial systems operate for 18 to 24 months.

I hope this letter adequately explains the current status of the project and some potential future scenarios. It is impossible to cover every possible future occurrence, but some of the more common courses for a typical project of this nature have been described. Please contact me immediately if you have any questions.

Sincerely,

NORTHWEST ENVIROCON, INC.

Dale A. van Dam, R.G.
Hydrogeologist

APPENDIX B

NWEI BORING LOG FOR WELL MW-2

NORTHWEST ENVIROCON, INC.
1828 TRIBUTE ROAD, SUITE A
SACRAMENTO, CA. 95815
(916) 649-3570 FAX: (916) 649-3819

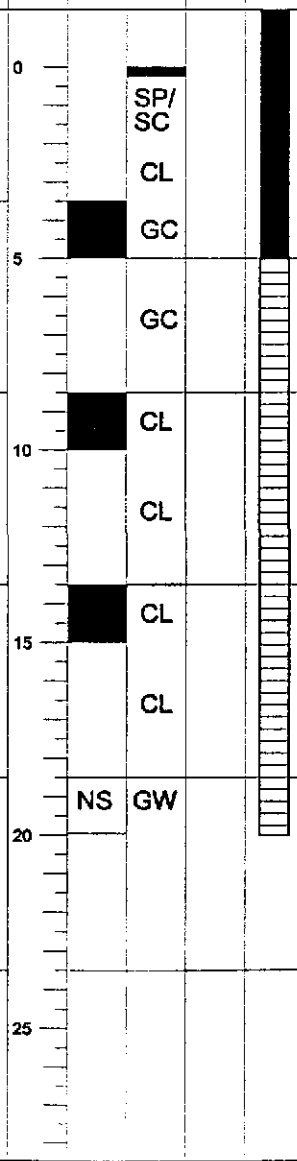
BORING LOG

PROJECT NAME: 444 HEGENBERGER LOOP
PROJECT NUMBER: 05-001594
SOIL BORING ☐ MONITORING WELL ☒ ☐

BORING NO.: MW2
SHEET 1 of 1

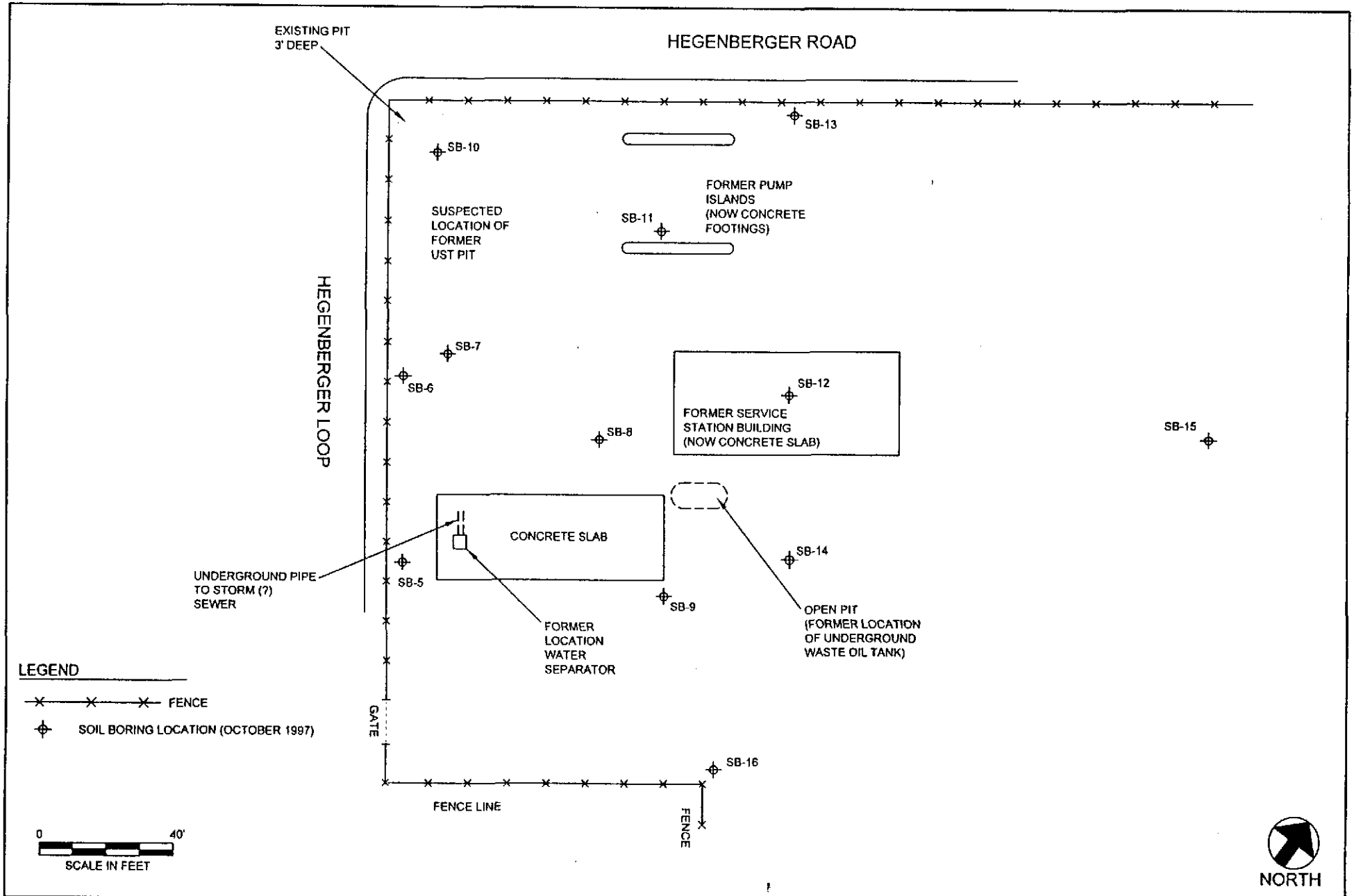
PROJECT LOCATION: 444 HEGENBERGER LOOP, OAKLAND, CA		START DATE: 11/23/98	COMPLETION DATE: 11/23/98
		COMPLETED DEPTH (FEET): 20	GROUNDWATER DEPTH (FEET): 17-ENCOUNTERED
DRILLING CONTRACTOR: WEEKS DRILLING/PUMP	DRILLER: RICHARD LARSEN	WELL CONSTRUCTION	
DRILLING EQUIPMENT: HSA-MOBILE	BORING DIAMETER: 8"Ø	TYPE AND DIAMETER OF WELL CASING: 2-INCH Ø SCHEDULE 40 PVC/FLUSH-THREADED	
SAMPLING METHOD: California Modified ☒ Hand Auger ☐ Geoprobe ☐		SLOT SIZE: 0.020-INCH	FILTER MATERIAL: MONTEREY 2/12
LOGGED BY: MHS	BACKFILL MATERIAL:	WELL DEPTH: 20FT	PERFORATED INTERVAL: 5-20FT

TIME	DESCRIPTION	BLOW COUNTS	SAMPLE	UCSC SOIL TYPE	PID/FID OVA (ppm)	REMARKS
	0.3' A/C **0.3' - 2.0' SAND W/CLAY.** SP/SC. 7.5YR4/6. POORLY GRADED, MED/SUBROUNDED, PLASTIC CLAY/SOFT, MOIST, SL. ODOR. **2.0' - 3.5' CLAY.** CL. 5Y4/2. MOIST/PLASTIC/SOFT, ODOR			SP/SC CL	4.4	AGGREGATE BASE
1306	**3.5' - 8.5' GRAVELLY CLAY.** GC. 5Y4/2. FINE/SUBROUNDED, PLASTIC CLAY/SOFT, STRONG ODOR	3 7 5		GC GC	321	MW1 3.5'-5.0'
1315	**8.5' - 13.5' CLAY.** CL. 2.5Y2/0, MOIST, PLASTIC, SOFT, ODOR	1 2 1		CL CL	626	MW1 8.5'-10.0'
1324	**13.5' - 18.5' SILTY CLAY.** CL. 5B4/1, MOIST, MOD. PLASTIC, STIFF, NO ODOR	3 7 5		CL CL	0.2	MW1 13.5'-15.0' SATURATED @ 17'
1334	**18.5' - 20.0' GRAVELLY SAND.** GW. 2.5Y/6, FINE GRAIN/SUBROUNDED, MED-COARSE SAND/SUBROUNDED, SATURATED, NO CEMENTATION, NO ODOR. 3-5% GRAVEL, 40-50% SAND, 40-50% COARSE SAND		NS	GW	0.0	NO SAMPLE- BARREL EMPTY
1350						TD@20FT



APPENDIX C

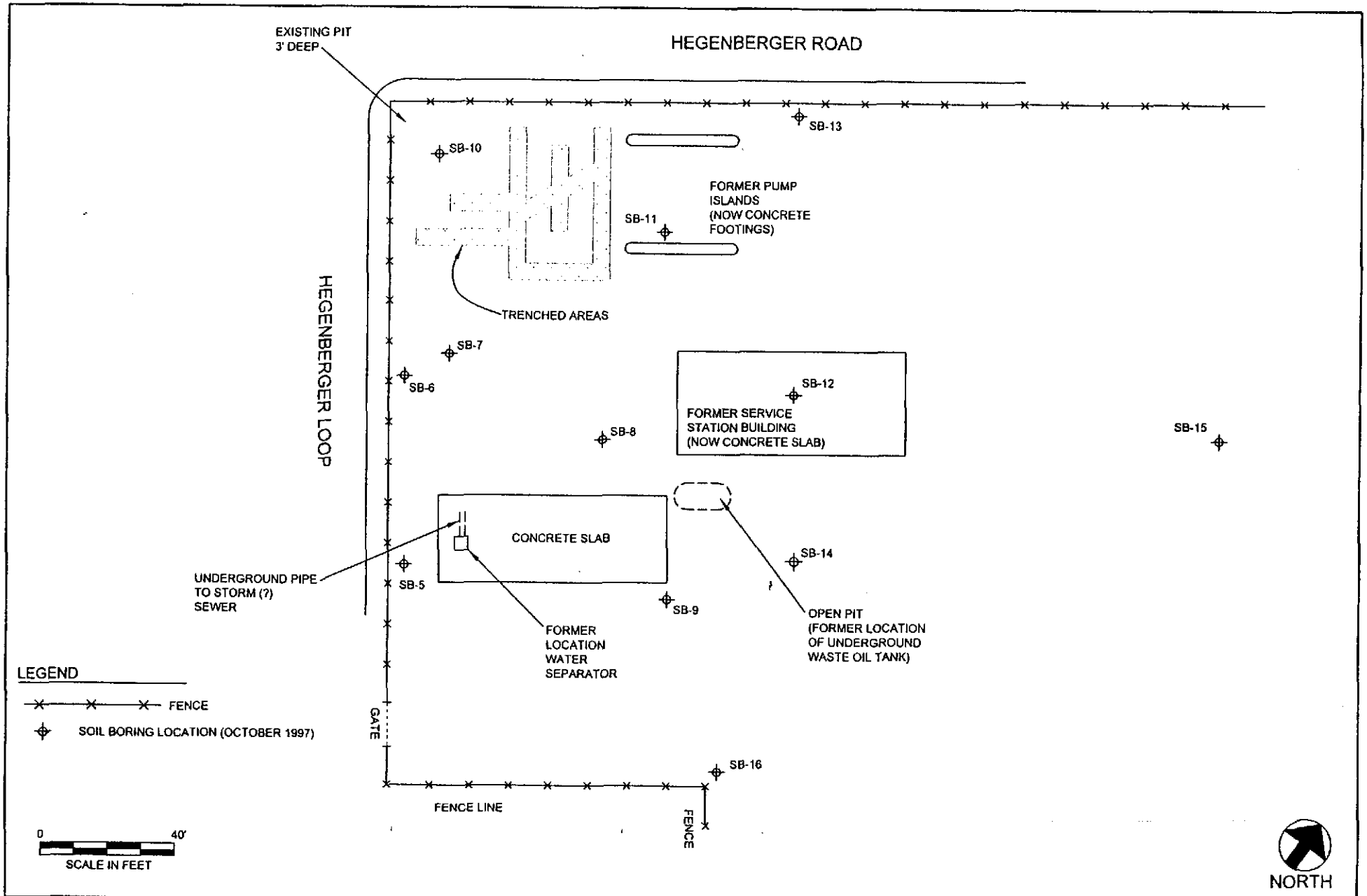
NWEI SITE PLAN – DECEMBER 1997



NORTHWEST ENVIROCON, INC. 1828 TRIBUTE ROAD, SUITE A, SACRAMENTO, CA. 95815 (916) 649-3570 FAX: (916) 649-3819	SITE: FORMER SERVICE STATION 444 HEGENBERGER ROAD OAKLAND, CALIFORNIA	DATE: DECEMBER 1997	PROJECT#: 05-000428
		SCALE: 1"=40'	PLATE: 3
DRAWN: CEB	APPROVED: KFG	CLIENT: THE VOIT COMPANIES	DRAWING TITLE: SOIL BORING & GROUNDWATER SAMPLING LOCATION MAP

APPENDIX D

NWEI SITE PLAN DEPICTING TRENCHING AREAS



NORTHWEST ENVIROCON, INC. 1828 TRIBUTE ROAD, SUITE A, SACRAMENTO, CA. 95815 (916) 649-3570 FAX: (916) 649-3819	SITE: FORMER SERVICE STATION 444 HEGENBERGER ROAD OAKLAND, CALIFORNIA		DATE: DECEMBER 1997	PROJECT#: 05-000428
			SCALE: 1"=40'	PLATE: 5
DRAWN: CEB	APPROVED: KFG	CLIENT: THE VOIT COMPANIES	DRAWING TITLE: EXPLORATORY TRENCH LOCATIONS	

APPENDIX E

NWEI BORING LOG FOR WELL MW-2

NORTHWEST ENVIROCON, INC.
1828 TRIBUTE ROAD, SUITE A
SACRAMENTO, CA. 95815
(916) 649-3570 FAX: (916) 649-3819

BORING LOG

BORING NO.: MW1

PROJECT NAME: 444 HEGENBERGER LOOP
PROJECT NUMBER: 05-001594
SOIL BORING ☐ MONITORING WELL ☒ ☐ SHEET 1 of 1

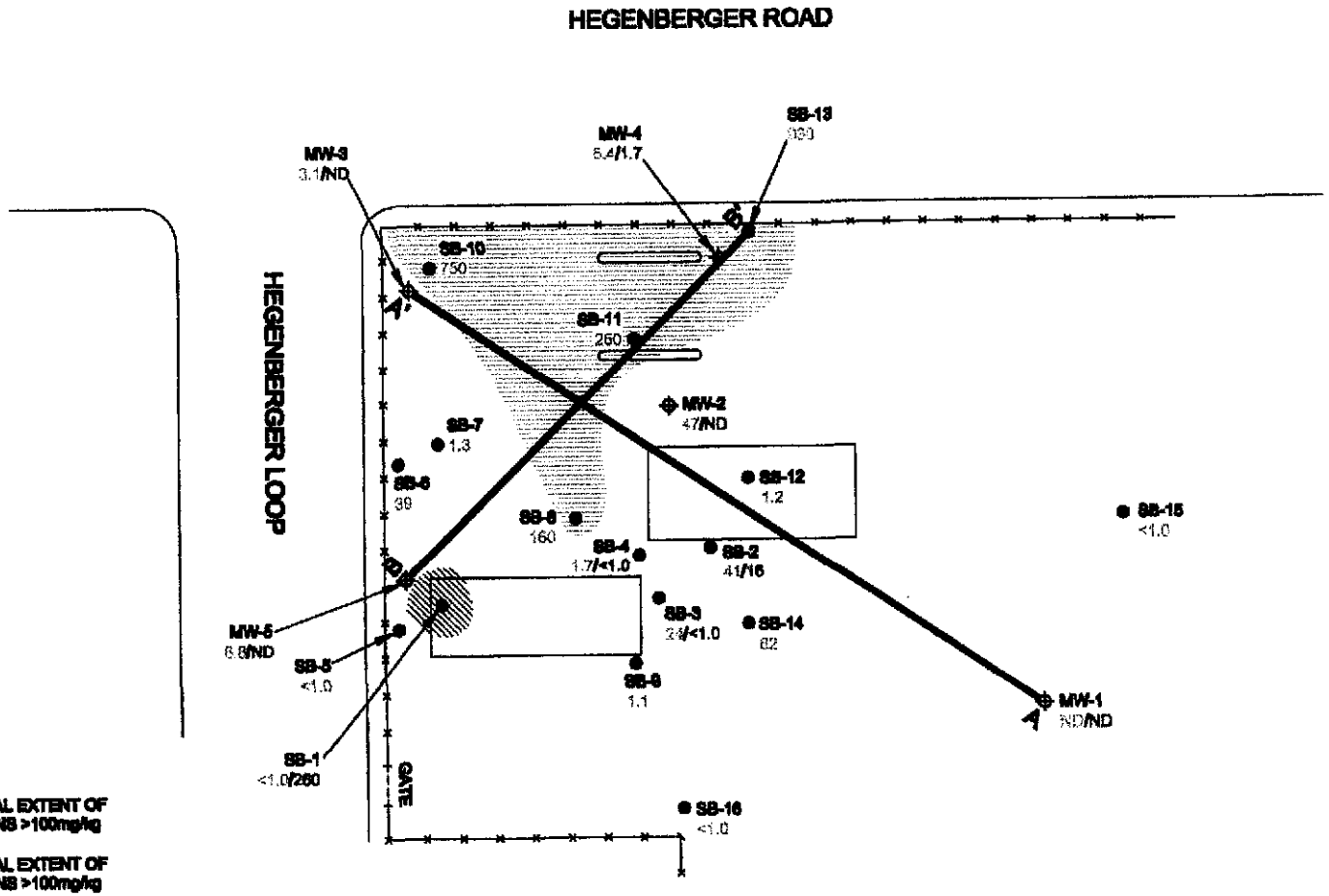
PROJECT LOCATION: 444 HEGENBERGER LOOP OAKLAND, CA		START DATE: 11/23/98	COMPLETION DATE: 11/23/98
		COMPLETED DEPTH (FEET): 20	GROUNDWATER DEPTH (FEET): 15-ENCOUNTERED
DRILLING CONTRACTOR: WEEKS DRILLING/PUMP	DRILLER: RICHARD LARSEN	WELL CONSTRUCTION	
DRILLING EQUIPMENT: HSA-MOBILE	BORING DIAMETER: 8"Ø	TYPE AND DIAMETER OF WELL CASING: 2-INCH Ø SCHEDULE 40 PVC/FLUSH-THREADED	
SAMPLING METHOD: California Modified ☒ Hand Auger ☐ Geoprobe ☐		SLOT SIZE: 0.020-INCH	FILTER MATERIAL: MONTEREY 2/12
LOGGED BY: MHS	BACKFILL MATERIAL:	WELL DEPTH: 20FT	PERFORATED INTERVAL: 5-20FT

TIME	DESCRIPTION	BLOW COUNTS	SAMPLE	UCSC SOIL TYPE	LITHOLOGY	WELL	PID/FID READINGS OVA (ppm)	REMARKS
1010	0.3'A/C **0.3'-3.5' SAND W/CLAY.** SP/SC. 7.5YR4/6. POORLY GRADED, MED/SUBROUNDED, PLASTIC CLAY/MED. STIFF, MOIST, NO ODOR.			SP/SC			0.1	AGGREGATE BASE
1030	**3.5' - 13.5' CLAY.** CL. 2.5Y2/0, MOIST, MOD. PLASTIC, STIFF, NO ODOR	3 4 3		CL CL			0.1	MW1 3.5'-5.0'
1040	**CLAY.** CL 2.5Y2/0, MOIST, MOD. PLASTIC, STIFF. NO ODOR	1 4 1		CL CL			0.3	MW1 8.5'-10.0'
1047	**13.5' - 18.5' SAND W/CLAY.** SW. 2.5Y6/6, MED. TO COARSE/SUBROUNDED, PLASTIC CLAY/MOD. STIFF, WET, NO ODOR	3 8 5		SW			0.0	MW1 13.5'-15.0' SATURATED @ 15'
1052 1100	**18.5' - 20.0' GRAVELLY SAND.** GW. 2.5Y6/6, FINE GRAIN/ROUNDED, MED-COARSE SAND/SUBROUNDED, SATURATED, NO CEMENTATION, NO ODOR, 3% GRAVEL 40% MED. SAND/57% COARSE SAND	8 25 15	NS	GW			0.0	NO SAMPLE- BARREL EMPTY TD@20FT

DEPTH (FEET): 0, 5, 10, 15, 20, 25

APPENDIX F

NWEI SITE PLOTS – 12/1898



EXPLANATION

- ⌖ = MONITORING WELL LOCATION
- ● = SOIL BORING LOCATION

TPHg CONCENTRATION

160 = 3'-6' FBGS

8.8 = 6'-16' FBGS

= APPROXIMATE LATERAL EXTENT OF TPHg CONCENTRATIONS >100mg/kg 3' - 6' FBGS

= APPROXIMATE LATERAL EXTENT OF TPHg CONCENTRATIONS >100mg/kg 6' - 16' FBGS

A——A' = CROSS-SECTION

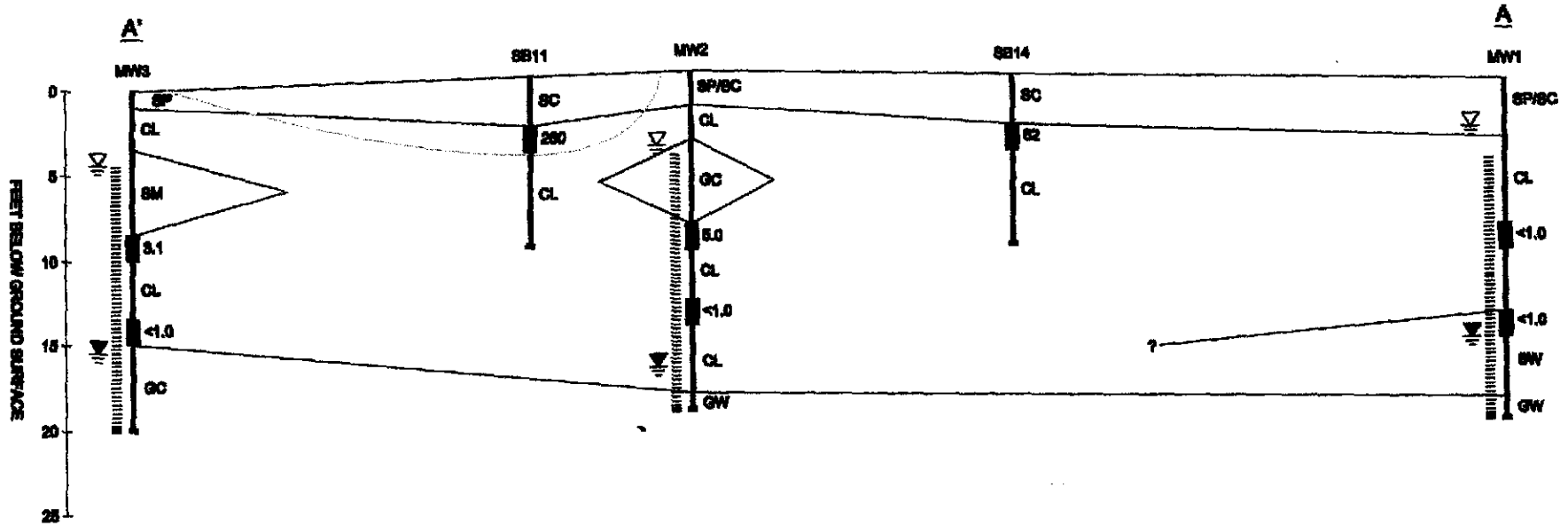
-x-x-x- = FENCE

SCALE IN FEET

0 10' 20' 30' 40' 60' 80'

NORTH

NORTHWEST ENVIROCON, INC. 1828 TRIBUTE ROAD, SUITE A, SACRAMENTO, CA 95815 (916) 649-3570 FAX: (916) 649-3819	SITE: 444 HEGENBERGER LOOP OAKLAND, CALIFORNIA			PROJECT#: 05-001594	REVISIONS
				DATE: DECEMBER 18, 1996	
DRAWN: CEB	APPROVED: MHS	CLIENT: McMORGAN AND COMPANY	TITLE: TPHg CONCENTRATIONS IN SOIL	PLATE: 4	SCALE: 1"=60'



EXPLANATION

80 = SOIL SAMPLE INTERVAL-TPHg CONCENTRATION (mg/kg)

= GROUND WATER ENCOUNTERED DURING DRILLING (11/23-11/24, 1986)

= GROUNDWATER LEVEL MEASURED IN WELL (12/2/86)

= WELL SCREEN INTERVAL

= APPROXIMATE VERTICAL EXTENT OF TPHg CONCENTRATIONS >100mg/kg

0 10' 20' 30'

HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 3X

NORTHWEST ENVIROCON, INC. 1828 TRIBUTE ROAD, SUITE A, SACRAMENTO, CA 95815 (916) 649-3570 FAX: (916) 649-3519		SITE: 444 HEGENBERGER LOOP OAKLAND, CALIFORNIA		PROJECT#: 06-001594 DATE: DECEMBER 16, 1986	REVISIONS
DRAWN: CEB	APPROVED: MHS	CLIENT: McMORGAN AND COMPANY	TITLE: GEOLOGIC CROSS-SECTION	PLATE: 5a	SCALE: AS NOTED

APPENDIX G

TIER I RBCA EVALUATION DATA SHEETS

Site Name: 444 Hegenberger Rd
Site Location: Oakland, California

Completed By: William A. Lawson
Date Completed: 5/1/2000

TIER 1 BASELINE RISK SUMMARY TABLE

	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
EXPOSURE PATHWAY	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	1.9E-8	1.0E-6	1.9E-8	N/A	☐	3.1E-4	1.0E+0	3.1E-4	N/A	☐
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	4.7E-6	1.0E-6	4.7E-6	N/A	■	7.7E-2	1.0E+0	7.8E-2	N/A	☐
SOIL EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	4.7E-6	1.0E-6	4.7E-6	N/A	■	7.7E-2	1.0E+0	7.8E-2	N/A	☐

RBCA SITE ASSESSMENT

Tier 1 Worksheet 6.1

Site Name: 444 Hegenberger Rd
Site Location: Oakland, California

Completed By: William A. Lawson
Date Completed: 5/1/2000

SURFACE SOIL RBSL VALUES (< 3.3 FT BGS)

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

■ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 1

RBSL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater			Ingestion, Inhalation and Dermal Contact		Construction Worker	Applicable RBSL	RBSL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-2	Benzene	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	☐	<1
100-41-4	Ethylbenzene	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	☐	<1
108-88-3	Toluene	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	☐	<1
1330-20-7	Xylene (mixed isomers)	0.0E+0	NA	NA	NA	NA	NA	NA	>Res	☐	<1

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-419-VGX-488

RBCA SITE ASSESSMENT

Tier 1 Worksheet 6.2

Site Name: 444 Hegenberger Rd
Site Location: Oakland, California

Completed By: William A. Lawson
Date Completed: 5/1/2000

SUBSURFACE SOIL RBSL VALUES (> 3.3 FT BGS)

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

■ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 1

RBSL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater			Soil Volatilization to Indoor Air		Soil Volatilization to Outdoor Air		Applicable RBSL	RBSL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-2	Benzene	0.0E+0	NA	NA	NA	NA	NA	NA	NA	>Res	☐	<1
100-41-4	Ethylbenzene	0.0E+0	NA	NA	NA	NA	NA	NA	NA	>Res	☐	<1
108-88-3	Toluene	0.0E+0	NA	NA	NA	NA	NA	NA	NA	>Res	☐	<1
1330-20-7	Xylene (mixed isomers)	0.0E+0	NA	NA	NA	NA	NA	NA	NA	>Res	☐	<1

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-419-VGX-488

RBCA SITE ASSESSMENT

Tier 1 Worksheet 6.3

Site Name: 444 Hegenberger Rd
Site Location: Oakland, California

Completed By: William A. Lawson
Date Completed: 5/1/2000

GROUNDWATER RBSL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

■ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 1

RBSL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration		Groundwater Ingestion			X	Groundwater Volatilization to Indoor Air		X	Groundwater Volatilization to Outdoor Air		Applicable RBSL	RBSL Exceeded ?	Required CRF
CAS No.	Name	(mg/L)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)		Residential: (on-site)	Commercial: (on-site)		Residential (on-site)	Commercial: (on-site)	(mg/L	"■" If yes	Only if "yes" left
71-43-2	Benzene	1.0E-1	NA	NA	NA		NA	2.1E-2		NA	5.3E+0	2.1E-2	■	5.0E+00
100-41-4	Ethylbenzene	4.3E-3	NA	NA	NA		NA	>Sol		NA	>Sol	>Sol	☐	<1
108-88-3	Toluene	8.1E-3	NA	NA	NA		NA	8.5E+1		NA	>Sol	8.5E+1	☐	<1
1330-20-7	Xylene (mixed isomers)	9.9E-3	NA	NA	NA		NA	>Sol		NA	>Sol	>Sol	☐	<1

>Sol indicates risk-based target concentration greater than constituent solubility

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-419-VGX-488

$\frac{.10}{.02} = 5$ ✓

Site Name: 444 Hegenberger Rd | Site Location: Oakland, California | Completed By: William A. Lawso | Date Completed: 5/1/2000 |

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS: VAPOR AND DUST INHALATION

Constituents of Concern	Exposure Concentration 1) Source Medium: Surface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2)		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day)		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4)	
Benzene	0.0E+0								
Ethylbenzene	0.0E+0								
Toluene	0.0E+0								
Xylene (mixed isomers)	0.0E+0								

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Inhalation rate (m^3/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: 444 Hegenberger Rd | Site Location: Oakland, California | Completed By: William A. Lawso | Date Completed: 5/1/2000 | 2 OF 9

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS: VAPOR INHALATION

Exposure Concentration

Constituents of Concern	1) Source Medium: Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2)		4) Exposure Multiplier: ((IRxEFxED)/(BWxAT) (m^3/kg-day)		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4)	
Benzene	0.0E+0								
Ethylbenzene	0.0E+0								
Toluene	0.0E+0								
Xylene (mixed isomers)	0.0E+0								

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposue area (cm^2/day)

Site Name: 444 Hegenberger Rd | Site Location: Oakland, California | Completed By: William A. Lawson | Date Completed: 5/1/2000 | 3 OF 9

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INHALATION

Constituents of Concern	Exposure Concentration 1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor: On-Site Commercial		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2: On-Site Commercial		4) Exposure Multiplier ((IRxEFxED)/(BWxAT) (m^3/kg-day): On-Site Commercial		5) Average Daily Intake Rate (mg/kg-day) (3) X (4): On-Site Commercial		TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from surface, subsurface & groundwater routes.): On-Site Commercial	
Benzene	1.0E-1	3.7E+4		2.7E-6		7.0E-2		1.9E-7		1.9E-7	
Ethylbenzene	4.3E-3	3.6E+4		1.2E-7		2.0E-1		2.3E-8		2.3E-8	
Toluene	8.1E-3	3.7E+4		2.2E-7		2.0E-1		4.3E-8		4.3E-8	
Xylene (mixed isomers)	9.9E-3	4.0E+4		2.5E-7		2.0E-1		4.9E-8		4.9E-8	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: 444 Hegenberger Rd | Site Location: Oakland, California | Completed By: William A. Lawso | Date Completed: 5/1/2000 | 4 OF 9

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS:
VAPOR INTRUSION TO BUILDINGS

Constituents of Concern	Exposure Concentration 1) Source Medium: Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor		3) Exposure Medium: Indoor Air: POE Conc. (mg/m^3) (1) / (2)		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day)		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4)	
Benzene	0.0E+0								
Ethylbenzene	0.0E+0								
Toluene	0.0E+0								
Xylene (mixed isomers)	0.0E+0								

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: 444 Hegenberger Rd | Site Location: Oakland, California | Completed By: William A. Lawson | Date Completed: 5/1/2000 | 5 OF 9

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INTRUSION TO BUILDINGS

Constituents of Concern	Exposure Concentration 1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor: On-Site Commercial	3) Exposure Medium: Indoor Air: POE Conc. (mg/m^3) (1) / (2): On-Site Commercial	4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day): On-Site Commercial	5) Average Daily Intake Rate: (mg/kg-day) (3) X (4): On-Site Commercial	TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from subsurface & groundwater routes.): On-Site Commercial
Benzene	1.0E-1	1.5E+2	6.7E-4	7.0E-2	4.7E-5	4.7E-5
Ethylbenzene	4.3E-3	1.4E+2	3.1E-5	2.0E-1	6.1E-6	6.1E-6
Toluene	8.1E-3	1.5E+2	5.6E-5	2.0E-1	1.1E-5	1.1E-5
Xylene (mixed isomers)	9.9E-3	1.6E+2	6.4E-5	2.0E-1	1.2E-5	1.2E-5

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: 444 Hegenberger Rd Site Location: Oakland, California Completed By: William A. Date Completed: 5/1/2000 *6 OF 9*

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS OR SEDIMENTS: DERMAL CONTACT

	Exposure Concentration	2) Exposure Multiplier (SAxAFxABSxCFxEFxED)/(BWxAT) (kg/kg-day)		3) Average Daily Intake Rate (mg/kg-day) (1) x (2)	
	1) Source Medium				
Constituents of Concern	Surface Soil Conc. (mg/kg)	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial
Benzene	0.0E+0				
Ethylbenzene	0.0E+0				
Toluene	0.0E+0				
Xylene (mixed isomers)	0.0E+0				

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/y
ET = Exposure time (hrs/day)
IR = Intake rate (mg/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: 444 Hegenberger Rd Site Location: Oakland, California Completed By: William A. Lawso Date Completed: 5/1/2000

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS OR SEDIMENTS: INGESTION

	Exposure Concentration	1) Source Medium	2) Exposure Multiplier (IRxCFxEFxED)/(BWxAT) (kg/kg-day)		3) Average Daily Intake Rate (mg/kg-day) (1) x (2)		TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from dermal & ingestion routes.)	
Constituents of Concern	Surface Soil Conc. (mg/kg)		On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial
Benzene	0.0E+0							
Ethylbenzene	0.0E+0							
Toluene	0.0E+0							
Xylene (mixed isomers)	0.0E+0							

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Intake rate (mg/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: 444 Hegenberger Rd Site Location: Oakland, California Completed By: William A. Lawso Date Completed: 5/1/2000

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

SOIL: LEACHING TO GROUNDWATER/ GROUNDWATER INGESTION

Exposure Concentration

Constituents of Concern	1) Source Medium: Soil Concentration (mg/kg)	2) NAF Value (L/kg) Receptor		3) Exposure Medium: Groundwater: POE Conc. (mg/L) (1)/(2)		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (L/kg-day)		5) Average Daily Intake Rate: (mg/kg-day) (3) x (4)	
Benzene	0.0E+0								
Ethylbenzene	0.0E+0								
Toluene	0.0E+0								
Xylene (mixed isomers)	0.0E+0								

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body Weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Intake rate (L/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: 444 Hegenberger Rd Site Location: Oakland, California Completed By: William A. Lawson Date Completed: 5/1/2000

TIER 1 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: INGESTION Constituents of Concern	Exposure Concentration 1) Source Medium Groundwater Conc. (mg/L)	2) NAF Value (dim) Receptor		3) Exposure Medium Groundwater: POE Conc. (mg/L) (1)X(2)		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (L/kg-day)		5) Average Daily Intake Rate (mg/kg-day) (3) x (4)		MAX. PATHWAY INTAKE (mg/kg-day) *(Maximum intake of active pathways soil leaching & groundwater routes.)*	
Benzene	1.0E-1										
Ethylbenzene	4.3E-3										
Toluene	8.1E-3										
Xylene (mixed isomers)	9.9E-3										

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Intake rate (L/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-419-VGX-488

RBCA SITE ASSESSMENT | **Tier 1 Worksheet 8.2**

Site Name: 444 Hegenberger Rd | Site Location: Oakland, California | Completed By: William A. Lawson | Date Completed: 5/1/2000 |

TIER 1 PATHWAY RISK CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

	CARCINOGENIC RISK						TOXIC EFFECTS				
	(1) EPA	(2) Total Carcinogenic Intake Rate (mg/kg/day)		(3) Inhalation Slope Factor	(4) Individual COC Risk (2) x (3)		(5) Total Toxicant Intake Rate (mg/kg/day)		(6) Inhalation Reference Dose	(7) Individual COC Hazard Quotient (5) / (6)	
Constituents of Concern	Carcinogenic Classification	On-Site Commercial		(mg/kg-day)^-1	On-Site Commercial		On-Site Commercial		(mg/kg-day)	On-Site Commercial	
Benzene	A	1.9E-7		1.0E-1	1.9E-8		5.3E-7		1.7E-3	3.1E-4	
Ethylbenzene	D						2.3E-8		2.9E-1	8.2E-8	
Toluene	D						4.3E-8		1.1E-1	3.7E-7	
Xylene (mixed isomers)	D						4.9E-8		2.0E+0	2.4E-8	
Total Pathway Carcinogenic Risk =					1.9E-8	0.0E+0	*Total Pathway Hazard Index =*			3.1E-4	0.0E+0

Site Name: 444 Hegenberger Rd | Site Location: Oakland, California | Completed By: William A. Lawson | Date Completed: 5/1/2000 | 2 OF 4

TIER 1 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK: (2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Commercial	(3) Inhalation Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Commercial	TOXIC EFFECTS: (5) Total Toxicant Intake Rate (mg/kg/day) On-Site Commercial	(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Commercial
Benzene	A	4.7E-5	1.0E-1	4.7E-6	1.3E-4	1.7E-3	7.7E-2
Ethylbenzene	D				6.1E-6	2.9E-1	2.1E-5
Toluene	D				1.1E-5	1.1E-1	9.5E-5
Xylene (mixed isomers)	D				1.2E-5	2.0E+0	6.2E-6
Total Pathway Carcinogenic Risk =				**0.0E+0**	**4.7E-6**	***Total Pathway Hazard Index =***	**0.0E+0**	**7.8E-2**

Site Name: 444 Hegenberger Rd | Site Location: Oakland, California | Completed By: William A. Lawson | Date Completed: 5/1/2000 | 3 OF 4

TIER 1 PATHWAY RISK CALCULATION

SOIL EXPOSURE PATHWAYS ☑ (CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK: (2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Commercial	(3) Oral Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential	(4) Individual COC Risk (2) x (3) On-Site Commercial	TOXIC EFFECTS: (5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential	(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Commercial	(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	(7) Individual COC Hazard Quotient (5) / (6) On-Site Commercial
Benzene	A			1.0E-1							
Ethylbenzene	D								1.0E-1		
Toluene	D								2.0E-1		
Xylene (mixed isomers)	D								2.0E+0		
Total Pathway Carcinogenic Risk =					0.0E+0	0.0E+0			*Total Pathway Hazard Index =*	0.0E+0	0.0E+0

Site Name: 444 Hegenberger Rd | Site Location: Oakland, California | Completed By: William A. Lawson | Date Completed: 5/1/2000 | 4 OF 4

TIER 1 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAYS ARE ACTIVE)

	CARCINOGENIC RISK						TOXIC EFFECTS			
Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day)		(3) Oral Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3)		(5) Total Toxicant Intake Rate (mg/kg/day)		(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)	
Benzene	A			1.0E-1							
Ethylbenzene	D								1.0E-1		
Toluene	D								2.0E-1		
Xylene (mixed isomers)	D								2.0E+0		
Total Pathway Carcinogenic Risk =					0.0E+0	0.0E+0	*Total Pathway Hazard Index =*			0.0E+0	0.0E+0

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: 444 Hegenberger Rd | Job Identification: 1124SC01 | Software: GSI RBCA Spreadsheet
Site Location: Oakland, California | Date Completed: 5/1/2000 | Version: 1.0.1
Completed By: William A. Lawson

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

Exposure Parameter	Definition (Units)	Residential Adult	Residential (1-6yrs)	Residential (1-16 yrs)	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (L/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m^3/day)	15			20	
IRa.out	Inhalation rate outdoor (m^3/day)	20			20	10
SA	Skin surface area (dermal) (cm^2)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm^2-yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	***TRUE***			***TRUE***	
AAFd	Age adjustment on skin surface area	***TRUE***			***TRUE***	
tox	Use EPA tox data for air (or PEL based)?	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	TRUE				

Matrix of Exposed Persons to Complete Exposure Pathways		Residential	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
Outdoor Air Pathways:				
SS.v	Volatiles and Particulates from Surface Soils	FALSE	FALSE	FALSE
S.v	Volatilization from Subsurface Soils	FALSE	FALSE	
GW.v	Volatilization from Groundwater	FALSE	TRUE	
Indoor Air Pathways:				
S.b	Vapors from Subsurface Soils	FALSE	FALSE	
GW.b	Vapors from Groundwater	FALSE	TRUE	
Soil Pathways:				
SS.d	Direct Ingestion and Dermal Contact	FALSE	FALSE	FALSE
Groundwater Pathways:				
GW.i	Groundwater Ingestion	FALSE	FALSE	
S.l	Leaching to Groundwater from all Soils	FALSE	FALSE	

Matrix of Receptor Distance and Location On- or Off-Site		Residential Distance	Residential On-Site	Commercial/Industrial Distance	Commercial/Industrial On-Site
GW	Groundwater receptor (cm)		TRUE		TRUE
S	Inhalation receptor (cm)		TRUE		TRUE

Matrix of Target Risks		Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-06	
TRc	Target Risk (class C carcinogens)	1.0E-05	
THQ	Target Hazard Quotient	1.0E+00	
Opt	Calculation Option (1, 2, or 3)	1	
Tier	RBCA Tier	1	

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm^2)	2.2E+06	1.0E+06
W	Length of affect. soil parallel to wind (cm)	1.5E+03	1.0E+03
W.gw	Length of affect. soil parallel to groundwater (cm	1.5E+03	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)	1.0E+02	
Pe	Particulate areal emission rate (g/cm^2/s)	6.9E-14	

Groundwater	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	***4.9E+02***
I	Groundwater infiltration rate (cm/yr)	3.0E+01
Ugw	Groundwater Darcy velocity (cm/yr)	***1.5E+03***
Ugw.tr	Groundwater seepage velocity (cm/yr)	***3.9E+03***
Ks	Saturated hydraulic conductivity(cm/s)	1.0E-03
grad	Groundwater gradient (cm/cm)	4.7E-02
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
phi.eff	Effective porosity in water-bearing unit	3.8E-01
foc.sat	Fraction organic carbon in water-bearing unit	1.0E-03
BIO?	Is bioattenuation considered?	FALSE
BC	Biodegradation Capacity (mg/L)	

Soil	Definition (Units)	Value		
hc	Capillary zone thickness (cm)	5.0E+00		
hv	Vadose zone thickness (cm)	3.0E+02		
rho	Soil density (g/cm^3)	1.7		
foc	Fraction of organic carbon in vadose zone	0.01		
phi	Soil porosity in vadose zone	0.38		
Lgw	Depth to groundwater (cm)	3.0E+02		
Ls	Depth to top of affected subsurface soil (cm)	1.0E+02		
Lsubs	Thickness of affected subsurface soils (cm)	2.0E+02		
pH	Soil/groundwater pH	6.5		
		capillary	vadose	foundation
phi.w	Volumetric water content	0.342	0.12	0.12
phi.a	Volumetric air content	0.038	0.26	0.26

Building	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersivity (cm)		
ay	Transverse dispersivity (cm)		
az	Vertical dispersivity (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBCA SITE ASSESSMENT

EXPOSURE LIMITS IN GROUNDWATER AND AIR

CONSTITUENT	Exposure Limits Applied to Receptors	
	Groundwater (MCL) (mg/L)	Air (Comm. only) (PEL/TLV) (mg/m^3)
Benzene	5.0E-3	
Ethylbenzene	7.0E-1	
Toluene	1.0E+0	
Xylene (mixed isomers)	1.0E+1	

Site Name: 444 Hegenberger Rd
Site Location: Oakland, California

Completed By: William A. Lawson
Date Completed: 5/1/2000

RBCA SITE ASSESSMENT | Input Screen 6.3

CONSTITUENT MOLE FRACTIONS

(Complete the following table)

CONSTITUENT	Mole Fraction of Constituent in Source Material
Benzene	
Ethylbenzene	
Toluene	
Xylene (mixed isomers)	

Site Name: 444 Hegenberger Rd
Site Location: Oakland, California

Completed By: William A. Lawson
Date Completed: 5/1/2000

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration					
	in Groundwater		in Surface Soil		in Subsurface Soil	
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note
Benzene	1.0E-1	mean				
Ethylbenzene	4.3E-3	mean				
Toluene	8.1E-3	mean				
Xylene (mixed isomers)	9.9E-3	mean				

Site Name: 444 Hegenberger Rd
Site Location: Oakland, California

Completed By: William A. Lawson
Date Completed: 5/1/2000

RBCA SITE ASSESSMENT | Input Screen 9.1

CONSTITUENT HALF-LIFE VALUES

(Complete the following table)

CONSTITUENT	Half-Life of Constituent (day)
Benzene	720
Ethylbenzene	228
Toluene	28
Xylene (mixed isomers)	360

Site Name: 444 Hegenberger Rd
Site Location: Oakland, California

Completed By: William A. Lawson
Date Completed: 5/1/2000

RBCA SITE ASSESSMENT | Input Screen 9.4

GROUNDWATER DAF VALUES

(Enter DAF values in the grey area of the following table)

CONSTITUENT	Dilution Attenuation Factor (DAF) in Groundwater	
	Residential Receptor	Comm./Ind. Receptor
Benzene	1.0E+0	1.0E+0
Ethylbenzene	1.0E+0	1.0E+0
Toluene	1.0E+0	1.0E+0
Xylene (mixed isomers)	1.0E+0	1.0E+0

Site Name: 444 Hegenberger Rd
Site Location: Oakland, California

Completed By: William A. Lawson
Date Completed: 5/1/2000

RBCA CHEMICAL DATABASE

Toxicity Data

CAS Number	Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Inhalation RfD_inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Inhalation SF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
71-43-2	Benzene	-		1.70E-03	R	1.00E-01	A	1.00E-01	A	A	TRUE
100-41-4	Ethylbenzene	1.00E-01	A	2.86E-01	A	-		-		D	FALSE
108-88-3	Toluene	2.00E-01	A,R	1.14E-01	A,R	-		-		D	FALSE
1330-20-7	Xylene (mixed isomers)	2.00E+00	A,R	2.00E+00	A	-		-		D	FALSE

Site Name: 444 Hegenberger Rd Site Location: Oakland, California Completed By: William A. Lawson Date Completed: 5/1/2000

Software version: 1.0.1

RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	Maximum Contaminant Level MCL (mg/L)	reference	Permissible Exposure Limit PEL/TLV (mg/m3)	ref	Relative Absorption Factors Oral	Dermal	Detection Limits Groundwater (mg/L)	ref	Soil (mg/kg)	ref	Half Life (First-Order Decay) (days) Saturated	Unsaturated	ref
71-43-2	Benzene	5.00E-03	52 FR 25690	3.20E+00	OSHA	1	0.5	0.002	C	0.005	S	720	720	H
100-41-4	Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.002	C	0.005	S	228	228	H
108-88-3	Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	1	0.5	0.002	C	0.005	S	28	28	H
1330-20-7	Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.005	C	0.005	S	360	360	H

Site Name: 444 Hegenberger Rd Site Location: Oakland, California Completed By: William A. Lawson Date Completed: 5/1/2000

Software version: 1.0.1