Pacific Trust Company

March 6, 1991

Ms. Pamela Evans
ACHCSA
80 Swan Way, Room 200
Oakland, CA 94621

Re: 21450 Mission Blvd., Hayward, CA

Dear Pamela:

Enclosed is a further response from our geologist, Christopher French, in hopes of receiving a closure recommendation from the ACHCSA of this L.U.F.T. site located at 21450 Mission Blvd., Hayward (Alameda County).

We are in need of this clearance, so as to effect clear title to the property upon sale, or transfer by distribution to the residual heirs of the trust estate. As trustee, we have expended significant funds to date to remediate the soil into acceptable parameters with the guidance of Mr. French. He has been retained because of his expertise and experience in resolving these environmental issues. Specifically Pacific Trust Company has undertaken financial obligations in excess of $36,000 to address the small amount of contamination present on this property. As trustee, we acknowledge our fiduciary responsibility to the agencies which govern such issues and believe we have faithfully complied to the current date. Our request for closure is based upon our consultants opinion that a realistic threat to groundwater could not possibly exist and is itemized by 7 points in the last paragraph of his Summary and Conclusions shown on page 9.

Please give us your thorough review, analysis and acceptance of the detailed information provided.

Thank you very much.

Sincerely yours,

Leonard R Overholser

Leonard R. Overholser
Vice President

91 MAR -8 AM 11:02

LRO/bo

cc:

1245 South Winchester Boulevard, San Jose, California 95128 (408) 244-9605

EIRRA CORPORATION

11828 Dublin Blvd., Ste. C
Dublin, CA 94568
Bus: (415) 833-8464
Fax: (415) 833-2526

February 27, 1991

Ms. Pamela Evans
ACHCSA
80 Swan Way, Room 200
Oakland, CA 94621

Subject: 21450 Mission Blvd., Alameda County (unincorporated), CA

Dear Ms. Evans:

Your letter dated 8 January 1991 pertaining to requirements for additional work at the above referenced site has been reviewed and discussed. In the letter, you have agreed that 1) the trace amount of xylene present in soil of the site is unlikely to impact groundwater, and 2) the horizontal extent of diesel concentrations has been defined. We are very pleased with your concurrence in these matters. It is apparent, however, that the ACHCSA perceives a level of discomfort associated with the trace quantities of diesel remaining in site soil. We are confident that the discussion provided below will lay these concerns to rest.

Specifically, the ACHCSA letter states that "the remediation and follow up sampling done so far has indicated that petroleum concentrations have not dropped significantly in the base of the pit...In order for your case to be referred to the Regional Water Quality Control Board for closure review, the extent of this soil contamination must be fully investigated." We concur additional further investigative activities could possibly be warranted in the event that such investigation had not already been performed. As you are aware from previous correspondences submitted to the ACHCSA and the RWQCB, two borings have already been installed at the site. Analysis of samples obtained from those borings has provided for definition of the vertical extent of contamination (French, C.M., 1990a). Further investigation might also be warranted if, for example, the loss of product had been associated with a larger capacity tank (1,000 to 10,000 gallons), rather than the minuscule eighty (80) gallon tank in question which still contained substantial quantities of product after a period of thirty years.

The small source strength and clearly limited extent of this source notwithstanding, we have elected to review the allegations made by the ACHCSA. These are that 1) the vertical extent of soil contamination has not been defined, and 2) the petroleum hydrocarbons have not diminished in magnitude. Our defense is concluded with a review of appropriate and relevant regulatory guidelines and standards, including those contained within 1) the Porter Cologne Water Quality Control Act, 2) the "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground

Tanks" (revised 18 May 1989), and 3) the LUFT manual (State of California, Leaking Underground Fuel Tank Task Force, revised May 5, 1989). By all regulatory standards and guidelines, it is clearly and conclusively demonstrated herein, as it has repeatedly been demonstrated in previous correspondence (French, C. M., R.G., 1990b and c), that the burden, including cost, of additional monitoring or reporting bears no reasonable relationship to the need for the reporting or any benefit to be derived therefrom. In our opinion as environmental consultants, the RWQCB is legally bound to act in accordance with the limitations proscribed by law in the statutory requirements referenced herein. It is our opinion that the ACHCSA as the LIA should also be aware of these statutory requirements and should act in accordance with them.

Defined Vertical Extent of Soil Contamination

The ACHCSA has thrice been made aware (letter to ACHCSA dated 26 July, 1990 and letter reports dated 2 October 1990 and 18 December 1990) that Pacific Trust has undertaken significant obligations to define the extent of soil contamination beneath the site. We find it curious and distressing that the ACHCSA has refused to acknowledge that this work has been performed. This behavior exceeds all standards for fairness and reasonableness.

Two borings, EB-1 and EB-2 have been drilled within the immediate vicinity of the UST area, as shown in Plate 1, Attachment A. The first boring was located directly adjacent to the edge of the small 80 gallon diesel tank, at a distance of less than 1.5 feet. The second boring was located less than ten feet away. Boring EB-1 was continuously sampled to a depth of 31 feet. Field monitoring with a photoionization detector was performed throughout the full extent of the boring. Sensory indications (odor) of contamination were encountered between 2.0 and 5.0 feet. Soil samples were submitted from 6.5 feet and 31 feet for minimum verification of the field observations in accordance with RWQCB guidelines. For purposes of assurance, a separate soil sample was collected from 31 feet in the second boring (EB-2). All soil samples were analyzed for medium boiling point petroleum hydrocarbons. Certified analytical reports have been submitted to you previously (letter to ACHCSA dated 26 July, 1990).

The ACHCSA may find it curious that soil sampling was twice performed at a depth of 31 feet, from two separate boreholes. A geologic cross section, provided in Plate 2, illustrates geologic conditions across the site for the purpose of explanation. It is noted that continuous sampling beneath the site has identified a very homogeneous sandy silt to silty clay layer which extends from the ground surface to 31 feet. A sharp transition to a distinctly different lithology occurs at this depth. The second lithologic unit is of great

hydrogeologic significance.

Were the unsaturated zone beneath this site unstratified, a contaminant introduced continuously over time within the fine grained soils located at or near the surface would likely migrate vertically downward and outward. As seen in Plate 2, however, the site is stratified. In many groundwater problems, and especially in those related to the release of pollutants at or near the land surface, the effect of stratification on movement of fluids across the unsaturated zone is of great importance (U.S. E.P.A., 1985). With reference to the strata encountered at 31 feet, it is noted that it is composed of a dense, clayey sand characterized by a high moisture content ($\hat{w}$). This second strata will certainly exhibit a high capillary potential, moderate to high unsaturated hydraulic conductivity under low $\hat{w}$ conditions and low hydraulic conductivity under high $\hat{w}$ conditions (Freeze and Cherry, 1979, pp. 38-45; Bouwer, 1978, pp. 25-31; Luckner and Schestakow, 1986, pp. 44-48). Because of the strong capillary force and the low hydraulic conductivity of the second strata, contaminants migrating downward through the subsurface from the uppermost strata would likely migrate laterally as well as vertically at this interface. Consequently, if contaminant transport were occurring, the greatest probability of detecting contamination would be at this interface, which has been sampled twice, from separate boreholes. A copy of the brief U.S. E.P.A. (1985) explication regarding these unsaturated zone flow phenomena has been submitted as Attachment B for purposes of edification in the event that these technical considerations should be unfamiliar to the representative of the ACHCSA.

With reference to the soil samples collected from 6.5 feet and 31 feet beneath the tank, we are at a loss to explain the allegation made by the ACHCSA that the vertical extent of contaminant migration has not been defined. The vertical locations of these samples relative to the diameter and base of the tank are shown in Plate 2. With reference to Plate 2, a sample collected vertically beneath the edge of the tank at a depth of 6.5 feet contained nondetectable levels of contamination (TPHD < 10 milligrams per kilogram [mg/Kg, or ppm]). Were this a significant source of contamination, the sample from a depth of 6.5 feet would certainly have contained detectable levels of contamination. For further assurance that there is no threat to groundwater, two additional samples have been collected at the first change in lithology, which is of significant hydrogeologic significance for the reasons explained above. Please note also that the analytical non detection of contaminants at a depth of 31 feet still provides for a buffer zone to groundwater in excess of thirty feet. Two clayey units of low to extremely low hydraulic conductivity are present within this buffer, including a clay zone in excess of five feet thickness.

The allegation that the vertical extent of contamination has not been defined is completely lacking in evidentiary support. To refuse to acknowledge the results of the previous subsurface investigation and associated certified analysis constitutes arbitrary and capricious action on the part of the ACHCSA.

Efficacy of Remediation

The ACHCSA has made the allegation that remediation of the site has not been effective. As a technical basis for this statement, the ACHCSA provides the observation that "while sidewall samples showed little or no contamination, the two basal samples showed no significant drop in concentration when compared to the original basal sample."

While it is true to say that there is no difference between the two analytical results referred to by the ACHCSA, it is incorrect to draw any technical conclusions from the comparison. First, the lack of difference in analytical results referenced by the ACHCSA is derived from comparison of soil samples taken from approximately 1.0 - 1.5 feet of vertical separation. The bulk of contamination had already been removed from the source. Second, the two numbers are, after all, only part of a larger data set of certified analytical results collected during remedial activities. All data which have a direct bearing on technical evaluation of the efficacy of remedial action must be considered. Third, the analytical result for a soil sample collected at 6.5 feet, which indicates the presence of nondetectable concentrations of contamination, attests to the rapid vertical attenuation of residual contamination, as is characteristic of a highly localized source.

For the purpose of illustrating the efficacy of remedial action, copies of the original gas chromatograph for two of the soil sampling results derived from remedial action activities are provided in Plate 3, Attachment A. The very strong chromatographic response illustrated in the upper diagram is derived from soil which has been removed from the source. The very low response depicted in the lower diagram is derived from soil remaining in place at the base of the excavation. The comparison in peak areas clearly shows a very dramatic decrease in contaminant concentrations and is conclusive evidence attesting to the efficacy of remedial action and the localized nature of the contamination.

When taking all points of the data set into consideration, it is very clear that soil remaining in place has a concentration at least six fold less than that which has been removed. This six-fold decrease has been accomplished within three feet of the tank bottom. This data is clearly indicative of successful remedial action. Further, with

reference to State LUFT criteria, the residual concentration remaining in place is a full order of magnitude lower (X10) than the allowable limit established by the State of California LUFT task force, as described in greater detail below.

Localized Nature of Source

With reference to the results of sidewall sampling and the results of vertical sampling, it can be conclusively demonstrated that the source does not exhibit any of the characteristics which would be expected of a significant source and therefore must be considered a localized condition. Recognizing the propensity for contamination in fine grained soils to be transported downward and outward from a source by advective transport and dispersion, as illustrated, for example, by the configuration of the moisture front shown in the uppermost strata of Figure 21 presented in the EPA (1985) documentation provided in Attachment B, the fact that sidewall contamination from an excavation, measuring 4.5 feet on a side, contained little or no detectable contamination ought to be accepted as a significant indicator of the limited extent of this source. Second, were this a significant source of contamination, the sample collected from Boring EB-1 at a depth of 6.5 feet would also certainly have contained detectable levels of contamination.

It has been demonstrated that the efficacy of remedial action has been substantive, and that the source is of limited, localized extent.

Regulatory Criteria

The ACHCSA has stated that the RWQCB has provided concurrence with the opinion that groundwater monitoring wells should be installed at this site. Mr. Hiett of the RWQCB has been referenced by the ACHCSA as stating that, "should further investigation yield convincing evidence that the contamination under the ... tank is localized, then no monitoring wells would be required at this time." The convincing evidence referenced by Mr. Hiett, it is hoped, has been presented herein. It is nonetheless appropriate to reference appropriate regulatory standards and guidelines prior to evaluating the requirement for additional work.

Regional Board Guidelines

This particular case falls under category III.2 of the RWQCB guidelines contained within "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks" (revised 18 May 1989). This guideline states:

> "In cases where a soil/groundwater investigation has been required and the depth to the seasonal high ground water is greater than 50 feet, the responsible party must complete the following work:
>
> III.2.a. Determine the extent of the soil contamination.
>
> > Field meters are acceptable screening tools, but laboratory analysis of soil samples are required for verification of the extent of soil contamination.
>
> III.2.b. Install monitoring well(s) per Regional Board guidance.
>
> > The Regional Board will assess the necessity of monitoring wells on a site specific basis."

It is clear that, in drafting the guidelines, the Board has recognized that in some cases, an actual threat to groundwater may not exist. As stated in the guidelines:

> "The intent of these divisions" (in assessing the type of soil/groundwater investigation to be performed) "is to insure the protection of the shallow groundwater zones while allowing flexibility in situations where the groundwater zone is deep and less likely to be impacted by leaks from underground storage tanks" ... "'deep' ground water has a minimum 35 - 40 foot buffer zone from the tank bottom to the ground water. Regional Board staff believe that this zone may, <u>in specific instances</u>, adequately prevent pollution migration into the ground water. Therefore, in cases where the depth to ground water is greater than 50 feet, a site specific approach is warranted."

With reference to the work performed at the site, it is noted that a soil/groundwater investigation has already been performed. The vertical extent of contamination has been evaluated in accordance with section III. 2. a. of the RWQCB guidelines. As discussed in a previous section of this report, two separate borings, the first utilizing continuous sampling and both utilizing field screening with a photoionization detector, have been drilled within ten feet of the former source. The contamination extends to no more than a depth of 6.5 feet, approximately 10 percent of the total depth to groundwater. This allows for a "buffer" of 55 feet. Two soil samples collected at 50 % of the distance to groundwater from separate borings also contain no detectable contamination. This still allows for a "buffer" of over thirty feet. A large interval of this subsurface "buffer"

contains a significant fine grained fraction, which causes substantial water retention and inhibits vertical contaminant migration. Lastly, a five foot thick clay layer separates the groundwater from overlying units.

State LUFT Criteria

The State LUFT manual (State of California, Leaking Underground Fuel Tank Task Force, revised May 5, 1990) contains criteria for determining the level of TPHD concentrations remaining in site soil from an UST release which would require remediation. These State LUFT criteria have been evaluated within the context of the site conditions utilizing Table 2-1 of the State LUFT manual. The result is provided in Attachment C. By application of the criteria established by the State of California, it is demonstrated that the maximum allowable concentration remaining in site soil is 1,000 ppm. This level is one order of magnitude (X10) greater than the amount remaining in place.

Porter-Cologne Water Quality Control Act

The above referenced criteria are technical guidelines, and are legally enforceable only within the limitations proscribed within the body of law contained within the Porter Cologne Water Quality Control Act. The RWQCB is legally bound to perform within the limitations established by this Act. The section of the Act from which the LIA and the RWQCB derive their authority to require monitoring and investigation states:

> §13267 (a): "A regional board,"..."in connection with any action relating to any plan or requirement or authorized by this division, may investigate the quality of any waters of the state within its region."

Limitations are proscribed in the next section:

> §13267 (b): "In conducting an investigation specified in subdivision (a), the regional board may require that any person" ... "shall furnish, under penalty of perjury, those technical or monitoring program reports as the board may specify. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports."

With reference to the overwhelming body of technical data and documentation provided to the ACHCSA previously and herein, which has consistently demonstrated that the

conditions present at this site pose absolutely no threat to water of the State now or in the future, it is clear that the burden of additional reporting bears no reasonable relationship to the need for the report and the benefit to be derived therefrom.

SUMMARY AND CONCLUSIONS

The ACHCSA has expressed concern regarding the efficacy of remedial action, citing the results of a portion of the soil analyses collected during remedial activities. The data referenced by the ACHCSA constitutes only a portion of the complete data set. As seen in Plate 3 of Attachment A, a comparison of contaminant concentrations for soil removed from the source to the residual levels remaining in place illustrates that the source has been reduced in strength by a factor of 65 % within 2.5 feet of the tank bottom. By evaluation of all relevant data provided herein and in two previous reports, it has been clearly and conclusively demonstrated that the remedial action has been largely effective, and that the source is of localized extent.

The ACHCSA has indicated that in order for this case to be referred to the RWQCB for closure review, the vertical extent of contamination must be defined. With reference to Plate 2 and the certified results of analysis of soil samples collected from 6.5 feet and 31 feet beneath the tank, we are at a loss to explain this statement. The vertical extent of contamination has been defined. The insinuation made by the ACHCSA is clearly lacking in evidentiary support.

According to the ACHCSA, the RWQCB has been closely following this case and has stated that should further investigation yield convincing evidence that the contamination beneath the case is localized, then no monitoring wells would be required at this time. It is difficult to understand the rationale behind this statement. We are puzzled by the contradictory statement but are pleased that the criteria for suspension of further work have been met. The results of this closely watched case have twice been submitted to the ACHCSA and to the RWQCB and thoroughly discussed. The investigation required of this closely watched case has already been performed and thrice submitted. The results have clearly have provided for definition of the vertical extent of soil contamination. The data and discussions have conclusively demonstrated the localized nature of residual contamination. In accordance with Mr. Hiett's criteria, then, further work need not be performed.

Applicable and relevant regulatory criteria contained within the "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks" (revised 18 May 1989), the State LUFT manual (State of California, Leaking

Underground Fuel Tank Task Force, revised May 5, 1989), and the Porter-Cologne Water Quality Control Act have been reviewed.

It has been demonstrated that this case falls within category III.2 of the RWQCB guidelines for "'deep' ground water" conditions, where "a minimum 35 - 40 foot buffer zone from the tank bottom to the ground water", is present. "Regional Board staff believe that this zone may, in specific instances" (such as in the case where a five foot thick clay lens separates groundwater from overlying units), adequately prevent pollution migration into the ground water. Therefore, in cases where the depth to ground water is greater than 50 feet, a site specific approach is warranted."

By application of Table 2-1 of the State LUFT guidance, provided in Attachment C, it has been demonstrated that the maximum allowable concentration remaining in site soil is 1,000 ppm. This level is one order of magnitude (X10) greater than the amount actually remaining in place.

With reference to the criteria contained within the Water Quality Control Act, the limitations proscribed by law pertaining to the reasonableness of monitoring and reporting requirements have been referenced. The RWQCB is legally bound to act within the limits of this law.

The data, interpretations and references to statutory requirements discussed herein have twice previously been submitted to the RWQCB and the ACHCSA. These data and criteria have never been acknowledged. This behavior, in our opinion, constitutes arbitrary and capricious action completely lacking in evidentiary support. Based upon our considerable direct experience in contaminant hydrogeology, it is considered extremely unlikely that a competent, unbiased person with a basic understanding of hydrogeologic principles and contaminant transport behavior could even remotely construe that a realistic hazard exists from a source which 1) is derived from an 80 gallon tank containing residual product after a period of thirty years, 2) is limited in areal extent to dimensions less than 4.5 feet on a side and less than two feet in thickness, 3) has been defined both vertically and horizontally, 4) appears to have not migrated more than 4.5 feet from the source over a period of 30 years, in which time the propensity to migrate would surely have been brought into equilibrium with the retentive capacity of site soils, 5) has been excavated to the limits of field instrument and organoleptic detection, 6) is present at a residual strength one tenth of the magnitude proscribed in the State LUFT guidance and 7) is separated from groundwater by a "buffer" in excess of 60 foot thickness.

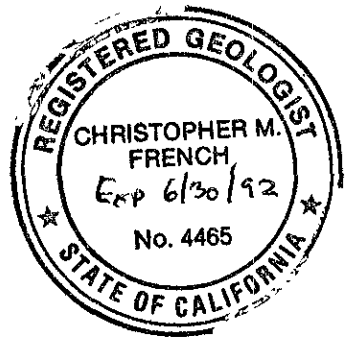
In closing, it should be stated that Pacific Trust has always conveyed to us a willingness to follow through with whatever is necessary to accomplish the intent and objectives set forth in the environmental regulations and guidelines. In our opinion, Pacific Trust has performed far above the normal standards for investigation, tank removal and remediation of this site. Activities at this site have been performed in accordance with all applicable regulations and guidelines. All data have been thoroughly documented. Any technical documentation pertaining to site activities requested by the ACHCSA has been forthcoming.

In our opinion, Pacific Trust is being asked to undertake obligations which have been previously and adequately performed. The rationale submitted by the ACHCSA for requiring further work at this site are made on the basis of an unfortunate misinterpretation of data. We are hopeful that these actions have not been willful and intentional. We consider it unlikely that regulatory action can be upheld which is found to be arbitrary, capricious and lacking in evidentiary support. With reference to the limitations proscribed by law within §13267 (b) of the Porter Cologne Water Quality Control Act, which the RWQCB is legally required to enforce, there is no benefit to be derived from further investigation of this site and, accordingly, it is recommended that this case be closed.

Should you have any further questions regarding this case, please call.

Very truly yours,

EIP/RA CORPORATION



Christopher M. French, R.G., R.E.A.
Registered Geologist No. 4465 (Exp. 6/30/92)
Registered Environmental Assessor No. 307 (Exp. 6/30/91)

cc: Mr. Ed Howell, ACHCSA
Mr. Gil Jensen, Alameda County District Attorney's Office
Mr. Richard Hiett, RWQCB
Mr. Lester Feldman, RWQCB

CMF/dd

Attachment

REFERENCES

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Freeze, R. Allan and Cherry, J.A. 1979. Groundwater. Prentice-Hall, Inc. New Jersey. 603pp.

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French, Christopher M., R.G. 1990b. Letter Submittal to Pacific Trust dated 18 December 1990. Submitted by Pacific Trust to ACHCSA and RWQCB.

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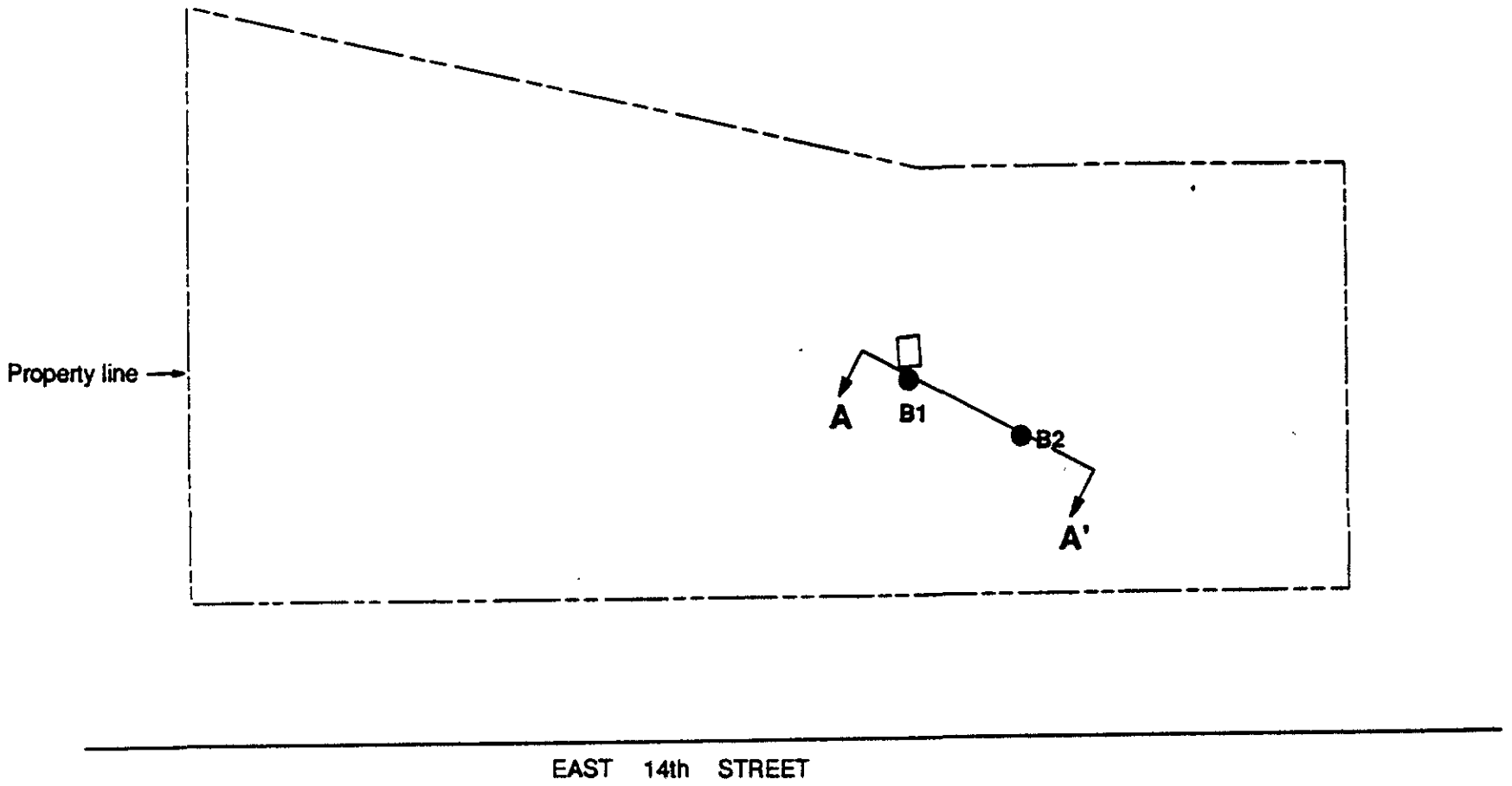
ATTACHMENT A

Plates



EXPLANATION

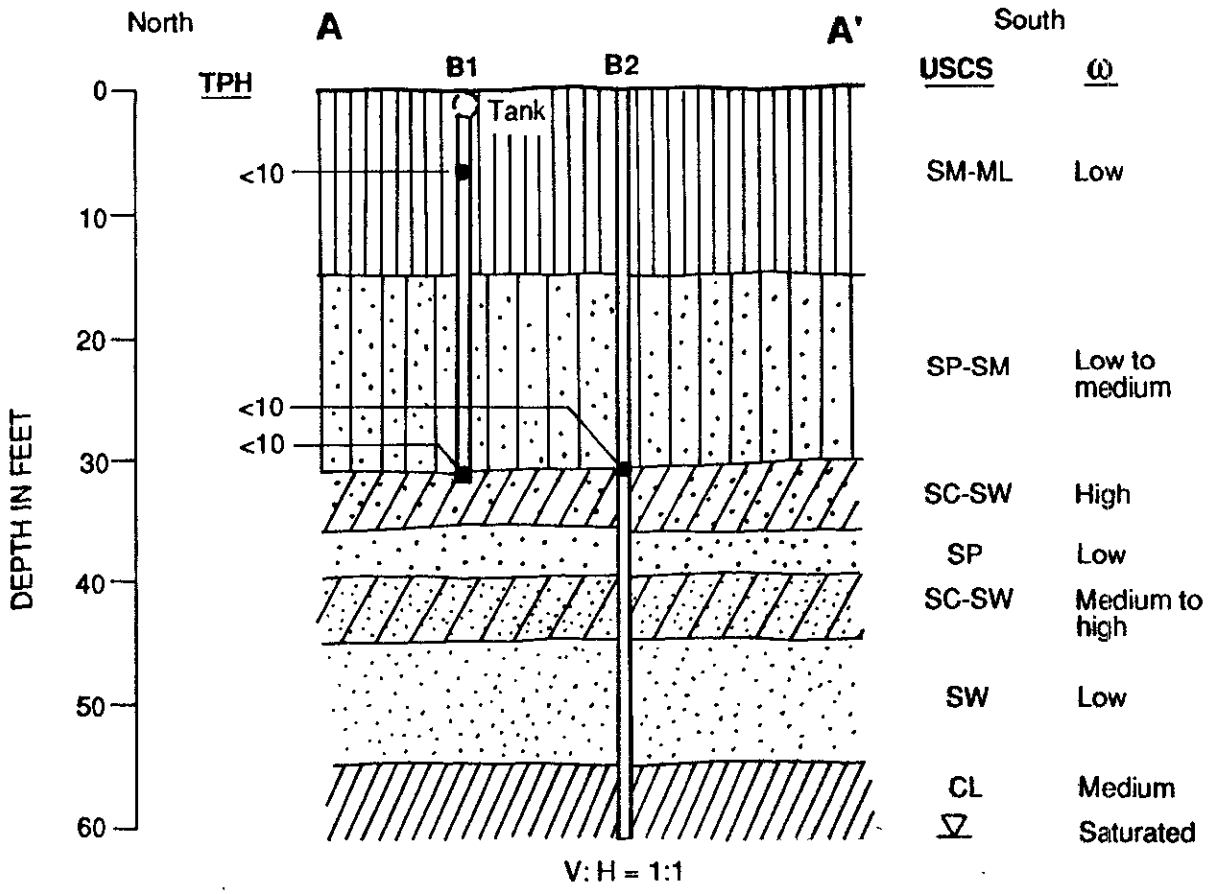
B1 ● Boring location and designation

▭ Eighty (80) gallon underground storage tank

Geologic section A - A'

0 20 Feet

Christopher M. French, R.G. ENVIRONMENTAL INVESTIGATION, REMEDIATION, AND RISK ASSESSMENT	**BORING LOCATION MAP**	Pacific Trust Company		
		Job Number 9023	Date 2/91	Plate 1



EXPLANATION

- 80 gallon diesel tank (base of tank at 2.0 feet)
- USCS: United Soil Classification System
- ML-SM: Silt to Silty Sand
- SM-SP: Silty Sand to Sand
- SC-SW: Clayey Sand to Sand
- SP: Sand, poorly graded
- SW: Sand, well graded
- CL: Clay
- Water table
- TPH: Total petroleum hydrocarbons (medium boiling point)
- ω: Volumetric water content (qualitative measure)

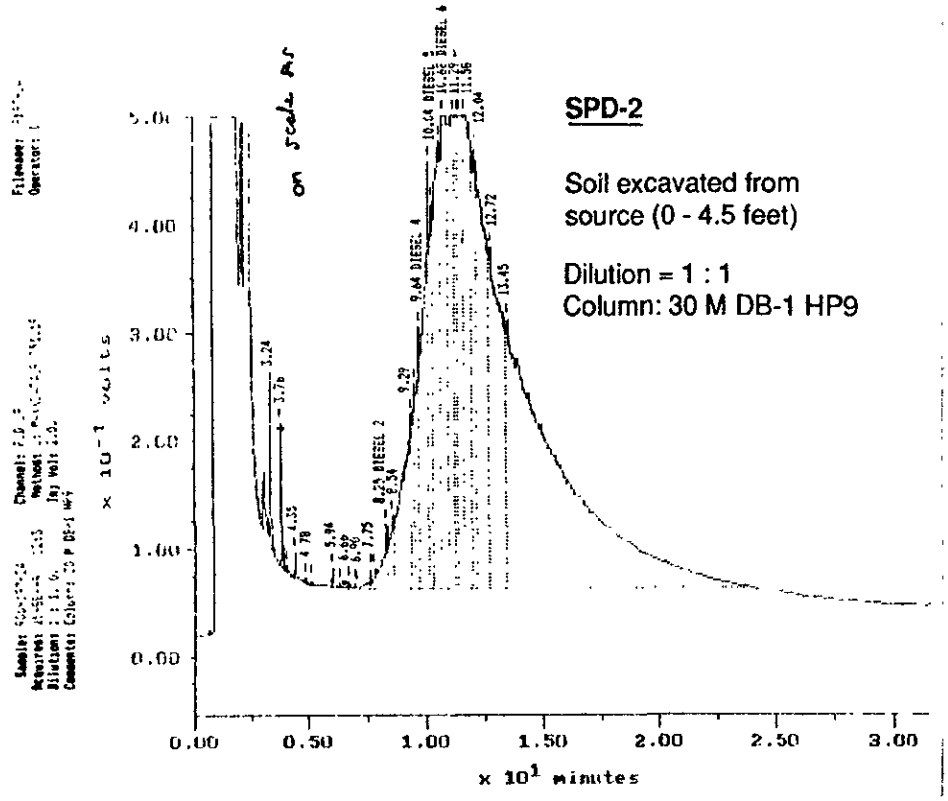
GEOLOGIC CROSS SECTION

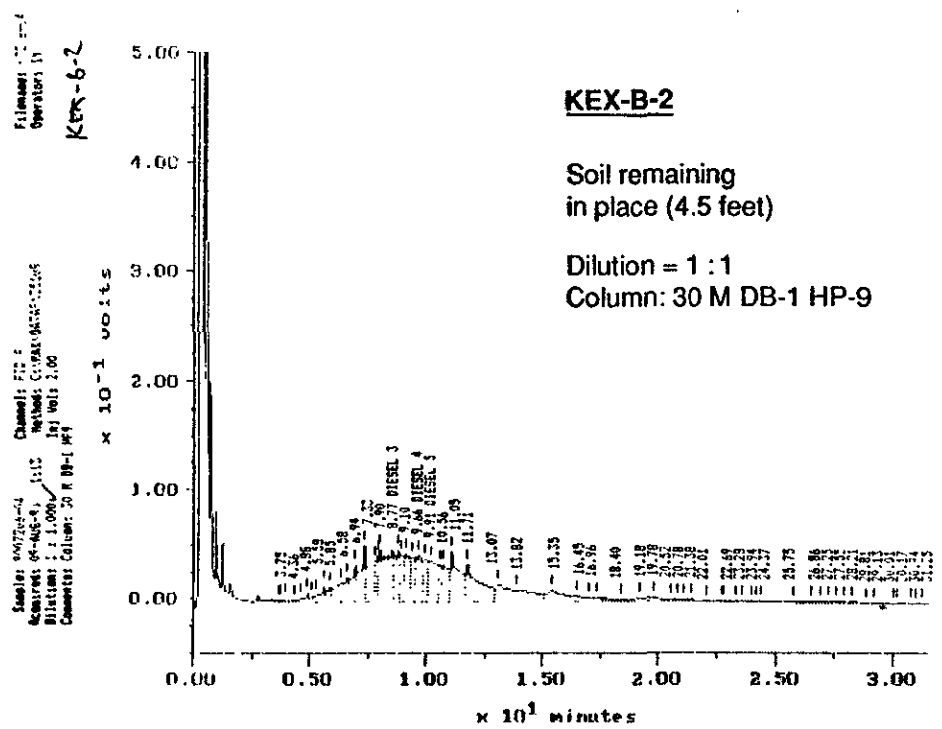
Christopher M. French, R.G.

ENVIRONMENTAL INVESTIGATION, REMEDIATION, AND RISK ASSESSMENT

Pacific Trust Company

Job Number	Date	Plate
9023	2/91	2





TPHD GAS CHROMATOGRAPHIC COMPARISON FOR DEMONSTRATION OF EFFICACY OF REMEDIAL ACTION

Pacific Trust Company

Christopher M. French, R.G.

ENVIRONMENTAL INVESTIGATION, REMEDIATION, AND RISK ASSESSMENT

Job Number	Date	Plate
9023	2/91	3

ATTACHMENT B

EPA (1985) Technical Documentation

1985

Technology Transfer EPA/625/4-85/016

Seminar Publication

Protection of Public Water Supplies from Ground-Water Contamination

September 1985

Center for Environmental Research
Information
Cincinnati, OH 45268

Capillarity and Unsaturated Flow

Most recharge of ground-water systems occurs during the percolation of water across the unsaturated zone. The movement of water in the unsaturated zone is controlled by both gravitational and capillary forces.

Capillarity results from two forces: the mutual attraction (cohesion) between water molecules and the molecular attraction (adhesion) between water and different solid materials. Figure 16 shows that a consequence of these forces, water will rise in small-diameter glass tubes to a height h_c above the water level in a large container.

Most pores in granular materials are of capillary size, and as a result, water is pulled upward into a capillary fringe above the water table in the same manner that water would be pulled up into a column of sand whose lower end is immersed in water, as Figure 17 shows. Table 4 shows the approximate capillary rise in selected granular materials.

Table 4. Approximate Height of Capillary Rise (h_c) in Granular Materials

Material	Rise (mm)
Sand:	
Coarse	125
Medium	250
Fine	400
Silt	1,000

Steady-state flow of water in the unsaturated zone can be determined from a modified form of Darcy's law. Steady state in this context refers to a condition in which the moisture content remains constant, as it would, for example, beneath a waste-disposal pond whose bottom is separated from the water table by an unsaturated zone.

Steady-state unsaturated flow (Q) is proportional to the effective hydraulic conductivity (K_e), the cross-sectional area (A) through which the flow occurs, and the gradients due to both capillary forces and gravitational forces. Thus,

$$Q = K_e A \left(\frac{h_c - z}{z}\right) \pm \left(\frac{dh}{dl}\right) \qquad (8)$$

where Q is the quantity of water, K_e is the hydraulic conductivity under the degree of saturation existing in

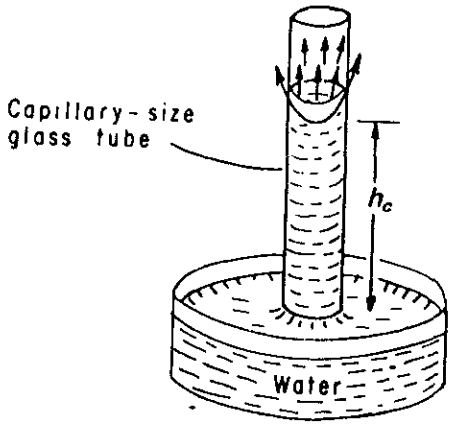


Figure 16. Capillarity

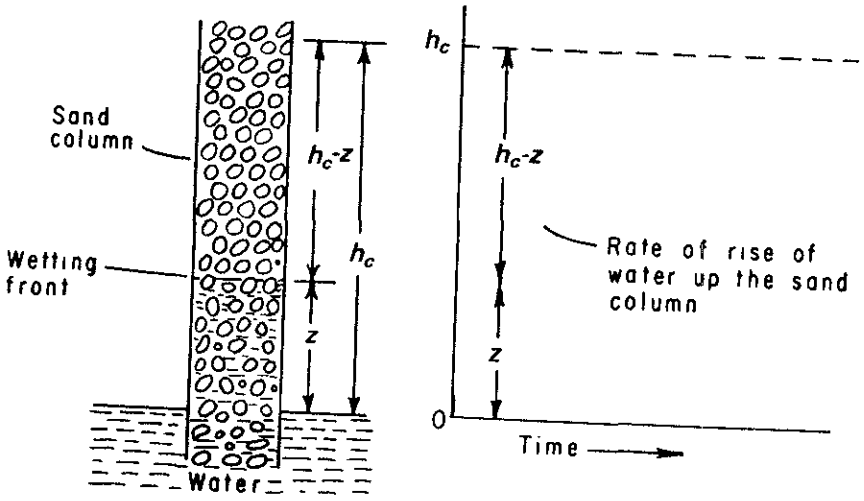


Figure 17. Capillary Action in a Column of Sand

the unsaturated zone, $(h_c - z)/z$ is the gradient due to capillary (surface tension) forces, and dh/dl is the gradient due to gravity.

The plus or minus sign is related to the direction of movement—plus for downward and minus for upward. For movement in a vertical direction, either up or down, the gradient due to gravity is 1/1, or 1. For lateral (horizontal) movement in the unsaturated zone, the term for the gravitational gradient can be eliminated.

Figure 17 shows that the capillary gradient at any time depends on the length of the water column (z) supported by capillarity in relation to the maximum possible height of capillary rise (h_c). For example, if the lower end of a sand column is suddenly submerged in water, the capillary gradient is at a maximum, and the rate of rise of water is fastest. As the wetting front advances up the column, the capillary gradient declines, and the rate of rise decreases.

The capillary gradient can be determined from tensiometer measurements of hydraulic pressures. To determine the gradient, Figure 18 shows it is necessary to measure the negative pressures (h_p) at two levels in the unsaturated zone. The equation for total head (h_t) is

$$h_t = z + h_p \qquad (5)$$

where z is the elevation of a tensiometer. Substituting values in this equation for tensiometer No. 1 in Figure 18, we obtain

$$h_t = 32 + (-1) = 32 - 1\,\text{d} = 31\,\text{m}$$

The total head at tensiometer No. 2 if 26 m. The vertical distance between the tensiometers is 32 m minus 28 m, or 4 m. Because the combined gravitational and capillary hydraulic gradient equals the head loss divided by the distance between tensiometers, the gradient is

$$\frac{h_L}{L} = \frac{h_{t(1)} - h_{t(2)}}{z_{(1)} - z_{(2)}} = \frac{31 - 26}{32 - 28} = \frac{5\,\text{m}}{4\,\text{m}} = 1.25$$

This gradient includes both the gravitational gradient (dh/dl) and the capillary gradient ($[h_c - z]/z$). Because the head in tensiometer No. 1 exceeds that in tensiometer No. 2, we know that flow is vertically downward and that the gravitational gradient is 1/1, or 1. Therefore, the capillary gradient is 0.25 m m^{-1} (1.25 – 1.00).

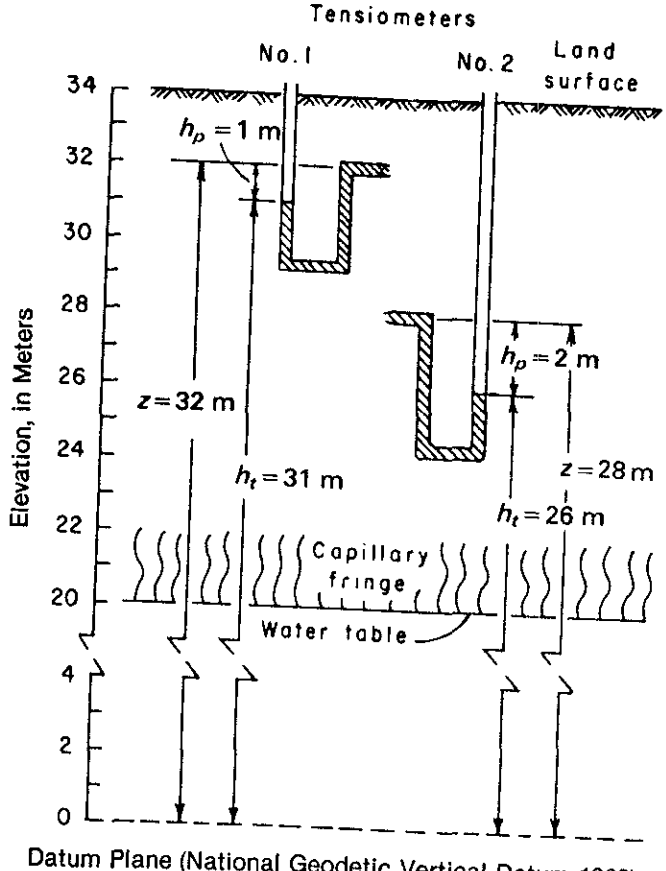


Figure 18. Tensiometer Measurements for Measuring the Capillary Gradient

The effective hydraulic conductivity (K_e) is the hydraulic conductivity of material that is not completely saturated. It is thus less than the (saturated) hydraulic conductivity (K_s) for the material. Figure 19 shows the relation between degree of saturation and the ratio of saturated and unsaturated hydraulic conductivity for coarse sand. The hydraulic conductivity (K_s) of coarse sand is about 60 m d^{-1}.

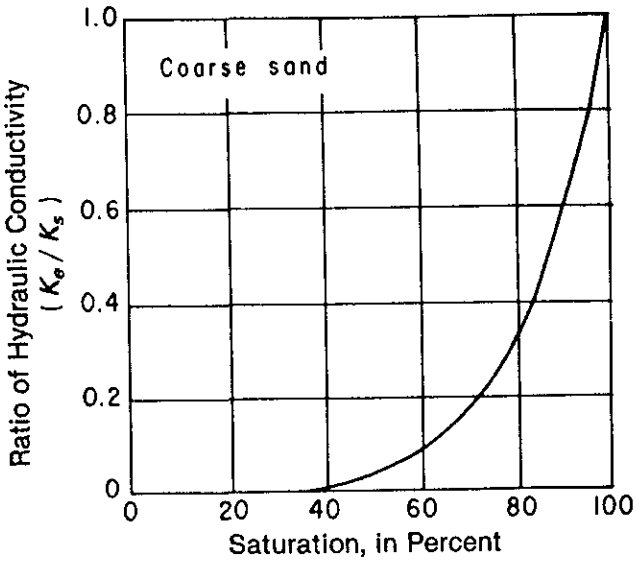


Figure 19. Relation Between Degree of Saturation and the Ratio of Saturated and Unsaturated Hydraulic Conductivity for Coarse Sand

Stratification and Unsaturated Flow

Most sediments are deposited in layers (beds) that have a distinct grain size, sorting, or mineral composition. Where adjacent layers differ in one of these characteristics or more, the deposit is said to be *stratified,* and its layered structure is referred to as *stratification.*

The layers comprising a stratified deposit commonly differ from one another in both grain size and sorting and, consequently, differ from one another in hydraulic conductivity. These differences in hydraulic conductivity significantly affect both the percolation of water across the unsaturated zone and the movement of groundwater.

In most areas, the unsaturated zone is composed of horizontal or nearly horizontal layers. The movement of water, on the other hand, is predominantly in a vertical direction. In many ground-water problems, and especially in those related to the release of pollutants at the land surface, the effect of stratification on movement of fluids across the unsaturated zone is of great importance.

The manner in which water moves across the unsaturated zone has been studied by using models containing glass beads. Figure 20 illustrates one model containing beads of a single size representing a nonstratified deposit, and Figure 21 shows another model consisting of five layers, three of which were finer grained and more impermeable than the other two. The dimensions of the models were about 1.5 m × 1.2 m × 76 mm.

In the nonstratified model, water introduced at the top moved vertically downward through a zone of con-

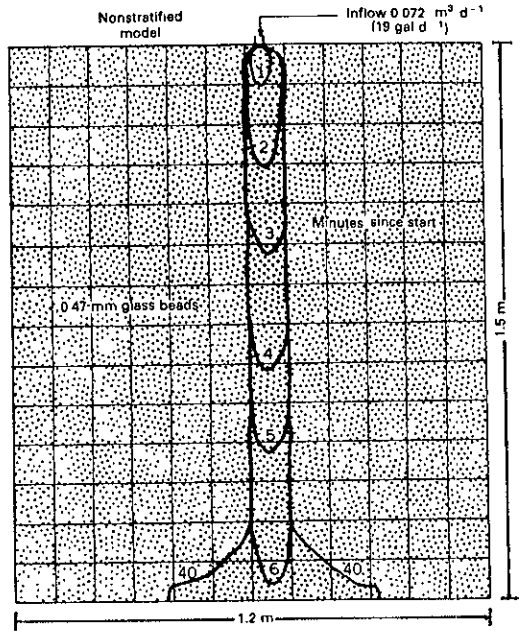


Figure 20. Single-Size Bead Model Illustrating Water Movement Across the Unsaturated Zone.

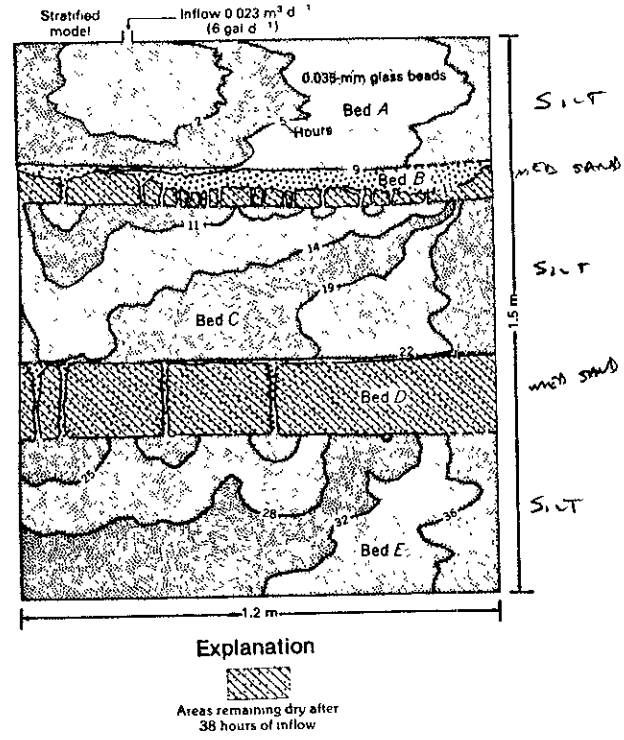


Figure 21. Five-Layer Model Illustrating Water Movement Across the Unsaturated Zone.

stant width to the bottom of the model. In the stratified model, beds *A*, *C*, and *E* consisted of silt-sized beads (diameters of 0.036 mm) having a capillary height (h_c) of about 1,000 mm and a hydraulic conductivity (K) of 0.8 m d^{-1}. Beds *B* and *D* consisted of medium-sand-sized beads (diameters of 0.47 mm) having a capillary height of about 250 mm and a hydraulic conductivity of 82 m d^{-1}.

Because of the strong capillary force and the low hydraulic conductivity in bed *A*, the water spread laterally at almost the same rate as it did vertically, and it did not begin to enter bed *B* until 9 hours after the start of the experiment. At that time, the capillary saturation in bed *A* had reached a level where the unsatisfied (remaining) capillary pull in bed *A* was the same as that in bed *B*. In other words, z in bed *A* at that time equaled 1,000 mm – 250 mm, or 750 mm. (For a definition of z, see the "Capillarity and Unsaturated Flow" section of this Chapter.)

Because the hydraulic conductivity of bed *B* was 100 times that of bed *A*, water moved across bed *B* through narrow vertical zones. We can guess that the glass beads in these zones were packed somewhat more tightly than those in other parts of the beds.

ATTACHMENT C

State LUFT Criteria

Table 2-1
Leaching Potential Analysis for Gasoline and Diesel
Using Total Petroleum Hydrocarbons(TPH)
and Benzene, Toluene, Xylene and Ethylbenzene (BTX&E)

The following table was designed to permit estimating the concentrations of TPH and BTX&E that can be left in place without threatening ground water. Three levels of TPH and BTX&E concentrations were derived (from modeling) for sites which fall into categories of low, medium or high leaching potential. To use the table, find the appropriate description for each of the features. Score each feature using the weighting system shown at the top of each column. Sum the points for each column and total them. Match the total points to the allowable BTX&E and TPH levels.

SITE FEATURE	SCORE	SCORE 10 PTS IF CONDITION IS MET	SCORE	SCORE 9 PTS IF CONDITION IS MET	SCORE	SCORE 5 PTS IF CONDITION IS MET
Minimum Depth to Ground Water from the Soil Sample (feet)		>100	9	51-100		25-50\1
Fractures in subsurface (applies to foothills or mountain areas)	10	None		Unknown		Present
Average Annual Precipitation (inches)		<10	9	10-25		26-40\2
Man-made conduits which increase vertical migration of leachate	10	None		Unknown		Present
Unique site features: recharge area, coarse soil, nearby wells, etc		None	9	At least one		More than one
COLUMN TOTALS→TOTAL PTS	20	+	27	+	0	= 47
RANGE OF TOTAL POINTS	49pts or more		41 - 48 pts		40pts or less	
MAXIMUM ALLOWABLE B/T/X/E LEVELS (PPM)	1/50/50/50		.3/.3/1/1		NA\3	
MAXIMUM ALLOWABLE TPH LEVELS (PPM) GASOLINE	1000		100		10	
MAXIMUM ALLOWABLE TPH LEVELS (PPM) DIESEL	10000		1000 *		100	

\1 If depth is greater than 5 ft. and less than 25 ft., score 0points.
If depth is 5 ft. or less, this table should not be used.
\2 If precipitation is over 40 inches, score 0 points.
\3 Levels for BTX&E are not applicable at a TPH concentration of 10ppm (gasoline) or 100ppm (diesel)

Pacific Trust Company

June 25, 1991

Alameda County Health Care Agency
80 Swan Way #200
Oakland, California 94621

Attention: Ms. Pam Evans

Re: 21450 Mission Blvd., Alameda County, CA

Dear Ms. Evans:

Enclosed is a copy of the results of the Supplemental Investigation for the real property located at 21450 Mission Blvd, Alameda County by EIRRA Consultants for your review.

Please let me know if anything further is needed.

Sincerely yours,

Leonard R. Overholser
Vice President/Manager

LRO/bo

Encl.

cc: Christopher French

91 JUN 26 AM 11:18

1245 South Winchester Boulevard, San Jose, California 95128 (408) 244-9605

EIRRA CONSULTANTS
Environmental Investigation,
Remediation and Risk Assessment
11828 Dublin Blvd., Ste. C
Dublin, CA 94568
Bus: (415) 833-8464
Fax: (415) 833-2526

RECEIVED
JUN 18 1991
PACIFIC TRUST CO.

June 14, 1991

Mr. Len Overholser
Pacific Trust Company
1245 South Winchester Blvd.
San Jose, CA 95128

Subject: Supplemental Investigation, 21450 Mission Blvd., Alameda County (unincorporated), CA

Dear Mr. Overholser:

This report presents the results of the supplemental investigation performed at the above referenced address for evaluation of the vertical extent of diesel concentrations in soil beneath the former location of an eighty (80) gallon diesel underground storage tank (UST). The supplemental investigation has been conducted at the request of Ms. Pamela Evans of the Alameda County Health Care Services Agency, as described in a letter from Ms. Evans to Pacific Trust dated 14 March, 1991.

SCOPE OF WORK

The scope of work proceeded in accordance with the work plan dated 12 April, 1991, which was submitted to and approved by the ACHCSA. Work proceeded under the direct supervision of a California Certified Engineering Geologist (CEG). The ACHCSA was notified of boring activities prior to commencement of work, and the presence of an ACHCSA inspector was requested in order that the level of contamination could be personally evaluated by regulatory personnel.

Prior analysis, described in a letter to the ACHCSA dated 27 February, 1991, indicated the presence of non detectable diesel concentrations at a depth of approximately thirty feet, based upon analysis of two soil samples collected from separate boreholes (Plate 1, Attachment A). Accordingly, the work plan provided for advancement of one soil boring to a total depth of thirty feet. One boring was drilled in the center of the former 80 gallon UST tank excavation. Samples were collected at five foot intervals utilizing a dual wall soil sampling system. The exploratory drilling was performed by Precision Sampling, Inc., of Mountain View, California. Soil samples were retained in brass sleeves, capped with teflon and plastic, preserved on ice and transported to a California Department of Health Services laboratory under appropriate chain of custody documentation. Due to auger refusal at a depth of 30 feet (the lithologic contact with a dense, clayey sand), the sixth and last sample could unfortunately not be collected.

HYDROGEOLOGIC EVALUATION

A lithologic log of the drilled interval and geologic cross section are provided in Attachment A. The drilled interval consisted of a uniform sandy silt to silty sand to the depth of refusal. The lithologic contact at refusal consisted of a dense clayey sand. Ground water was not encountered during drilling. Moisture content, measured qualitatively, was low in the silty sand interval, and medium to high at the lithologic contact. A barely discernable petroleum-like odor was detected at 12 feet.

LABORATORY ANALYSIS

Five soil samples, collected from 6.0, 12.0, 17.0, 22.0 and 27.0 feet, were submitted for analysis of total petroleum hydrocarbons as diesel. Analytical results are summarized in Table 1, Attachment B, and the Certified Analytical Report is provided in Attachment C. The analytical results indicate that average concentrations of medium boiling point hydrocarbons are less than 100 parts per million (ppm) over the vertical interval tested. The two deepest soil samples, previously collected from depths of 30 and 30.5 feet, contained nondetectable concentrations (<10 ppm).

Estimate of Hydrocarbon Remaining in Site Soil

An estimate of the quantity of hydrocarbon remaining in site soil may be prepared by making the following assumptions: 1) Site soil has a density of 2.65 grams per cubic centimeter (g/cm^3); 2) an average hydrocarbon concentration of 69 mg/Kg is present in a soil column with a length and width of 4.5 feet and a depth of 30.5 feet, for a total of volume of 618 ft^3 (1.75 E+7 cm^3); and 3) the fluid density of the hydrocarbon is approximately 0.85 grams per liter (g/L).

By multiplying the total mass of contaminated soil by the average concentration of hydrocarbon in soil, it is possible to provide an approximation of the mass of hydrocarbon present. The total mass of potentially contaminated soil is approximately:

Mass = Vol. x Dens. = [1.75E+7 cm^3] x [2.65 g/cm^3 x 1 Kg / 1E+3 g] = 4.6 E+4 Kg (1)

The total mass of hydrocarbon present is approximately:

$Mass = Mass_{soil} \times Conc_{ave}$ = [4.6E+4 Kg] x [69 mg/Kg] x [1 Kg/1E+6 mg] = 3.2 Kg (2)

From equation (2), it is evident that a maximum possible residual mass of 3.2 Kg

hydrocarbon is present in site soil. By multiplying the mass of hydrocarbon present by the inverse of the fluid density, it is possible to approximate the volume of hydrocarbon present:

Vol. = Mass x 1/Dens. = [3.2 Kg] x [1 / 0.85 Kg/L] = 3.8 L (1.0 gallons) (3)

Based upon the assumptions presented above and the calculations presented in equations (1), (2) and (3), it is estimated that a residual volume of 1.0 gallon of hydrocarbon is present in site soil.

REGULATORY GUIDELINES

Regulatory guidelines have been referenced in several previous correspondences. As previously explained, this particular case falls under category III.2 of the RWQCB guidelines contained within "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks" (revised 1990). This guideline states:

> "In cases where a soil/groundwater investigation has been required and the depth to the seasonal high ground water is greater than 50 feet, the responsible party must complete the following work:
>
> III.2.a. Determine the extent of the soil contamination.
>
> Field meters are acceptable screening tools, but laboratory analysis of soil samples are required for verification of the extent of soil contamination.
>
> III.2.b. Install monitoring well(s) per Regional Board guidance.
>
> The Regional Board will assess the necessity of monitoring wells on a site specific basis."

It is clear that, in drafting the guidelines, the Board has recognized that in some cases, an actual threat to groundwater may not exist. As stated in the guidelines:

> "The intent of these divisions" (in assessing the type of soil/groundwater investigation to be performed) "is to insure the protection of the shallow groundwater zones while allowing flexibility in situations where the

> groundwater zone is deep and less likely to be impacted by leaks from underground storage tanks" ... "'deep' ground water has a minimum 35 - 40 foot buffer zone from the tank bottom to the ground water. Regional Board staff believe that this zone may, in specific instances, adequately prevent pollution migration into the ground water. Therefore, in cases where the depth to ground water is greater than 50 feet, a site specific approach is warranted."

State LUFT Criteria

The State LUFT manual (State of California, Leaking Underground Fuel Tank Task Force, revised May 5, 1990) contains criteria for determining the level of TPHD concentrations remaining in site soil from an UST release which would require remediation. These State LUFT criteria have been evaluated within the context of the site conditions utilizing Table 2-1 of the State LUFT manual. The result is provided in Attachment B. By application of the criteria established by the State of California, it is demonstrated that the maximum allowable concentration remaining in site soil is 1,000 ppm. This level is greater than one order of magnitude (X10) than the average amount remaining in place.

Porter-Cologne Water Quality Control Act

The above referenced criteria are technical guidelines, and are legally enforceable only within the limitations proscribed within the body of law contained within the Porter Cologne Water Quality Control Act. The RWQCB is legally bound to perform within the limitations established by this Act. The section of the Act from which the LIA and the RWQCB derive their authority is limited to those activities from which a meaningful benefit is derived:

> §13267 (b): "In conducting an investigation specified in" (§13267 (a)), "the regional board may require that any person" ... "shall furnish, under penalty of perjury, those technical or monitoring program reports as the board may specify. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports."

Recommendation For Closure

The technical and regulatory evaluations and criteria provided above allow the following

conclusions concerning the Hayward Motors site:

1) The characteristics of the hydrogeologic setting preclude any significant impact to waters of the state. As previously described in the letter report of 27 February 1991 (EIRRA, 1991), the measured concentration most likely represents a residual liquid quantity in equilibrium with the retention capacity of site soil, and is unlikely to migrate. The potential to migrate is extremely low because 1) the source has been removed, precluding further downward propogation, 2) the site and vicinity are paved, precluding infiltration and percolation of recharge and 3) the subsurface conditions include the presence of dry, stratified coarse grained deposits interbedded with moist fine grained deposits, which act as a natural barrier to vertical migration (EIRRA, 1991). It is further noted, with reference to Plate 1 of Attachment A, that groundwater is located at a depth of 61 feet below grade and is separated from the overlying unsaturated zone by a five foot thick confining clay layer. Lastly, the observed concentration and known physicochemical behavior of the contaminant of concern also preclude significant impact to the waters of the state. The amount of residual contamination present in site soil is calculated to total a volume of 1.0 gallons of product, and the hydrocarbon is readily biodegradable.

2) Although the site is located within a designated groundwater basin, it has been demonstrated in previous discussions and on the basis of available data that the past, present and future beneficial uses of water have not and will not be impacted by the small quantity of hydrocarbon remaining in site soil.

4) The residual contaminant concentrations are not likely to have any significant risk with respect to human health or the environment. For impact to occur, the contaminant must travel from the source, through the environmental medium, to a receptor. It has been demonstrated that contaminant transport is not likely to occur.

5) The average concentration of hydrocarbon remaining in site soil is approximately 69 ppm. The RWQCB criteria for requiring a groundwater investigation is 100 ppm.

6) The State LUFT guidance criteria for residual hydrocarbon (diesel) which may be allowed to remain in place is 1,000 ppm. The amount of hydrocarbon remaining in place is less than one-tenth the referenced amount.

7) It is our professional opinion that the burden, including costs, of further reporting at this site bear no reasonable relationship to the need for the reporting and the benefits to be obtained from the reporting [Porter Cologne Water Quality Control Act, §13267 (b).

REPORT SUBMITTAL

Copies of this report should be submitted to:

Regional Water Quality Control Board
Attn: Mr. Richard Hiett
2101 Webster Street, Ste. 500
Oakland, CA 94607

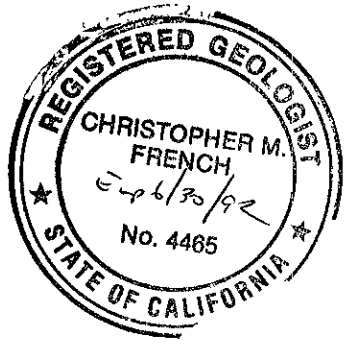
Alameda County Health Care Agency
Attn: Ms. Pam Evans
80 Swan Way
Suite 200
Oakland, CA 94621

Additional copies of this report have been provided for the purpose of regulatory submittal.

Should you have any questions or comments regarding the evaluations presented in this report, please call.

Very truly yours,

CHRISTOPHER M. FRENCH, C.E.G., R.E.A.



Christopher M. French, C.E.G., R.G., R.E.A.
Certified Engineering Geologist # 1614 (Exp. 6/30/92)
Registered Geologist # 4465 (Exp. 6/30/92)
Registered Environmental Assessor #307 (Exp. 6/30/91)

CMF/lp/9023

Attachments (3)

ATTACHMENT A

Plate and Lithologic Log

FIELD LOG OF BORING SHEET 1 OF 1

LOCATION OF BORING:

PROJECT: Pacific Trust | BORING NO. EB-1 | TOTAL DEPTH: 30

JOB NO.: 9023 | LOGGED BY: CMF

PROJ. MGR: CMF | EDITED BY: CMF

DRILLING CONTRACTOR: PRECISION

DRILL RIG TYPE: DIAL WALL; 2" DRIVE

DRILLERS NAME: MCL

SAMPLING METHODS: DRIVE

HAMMER WT.: N/A | DROP: N/A

STARTED, TIME: 0800 | DATE: 5-10-91

COMPLETED, TIME: 1300 | DATE: 5-10-91

BORING DEPTH (ft.): 30

CASING DEPTH (ft.): N/A

WATER DEPTH (ft.): N/A

TIME:

DATE:

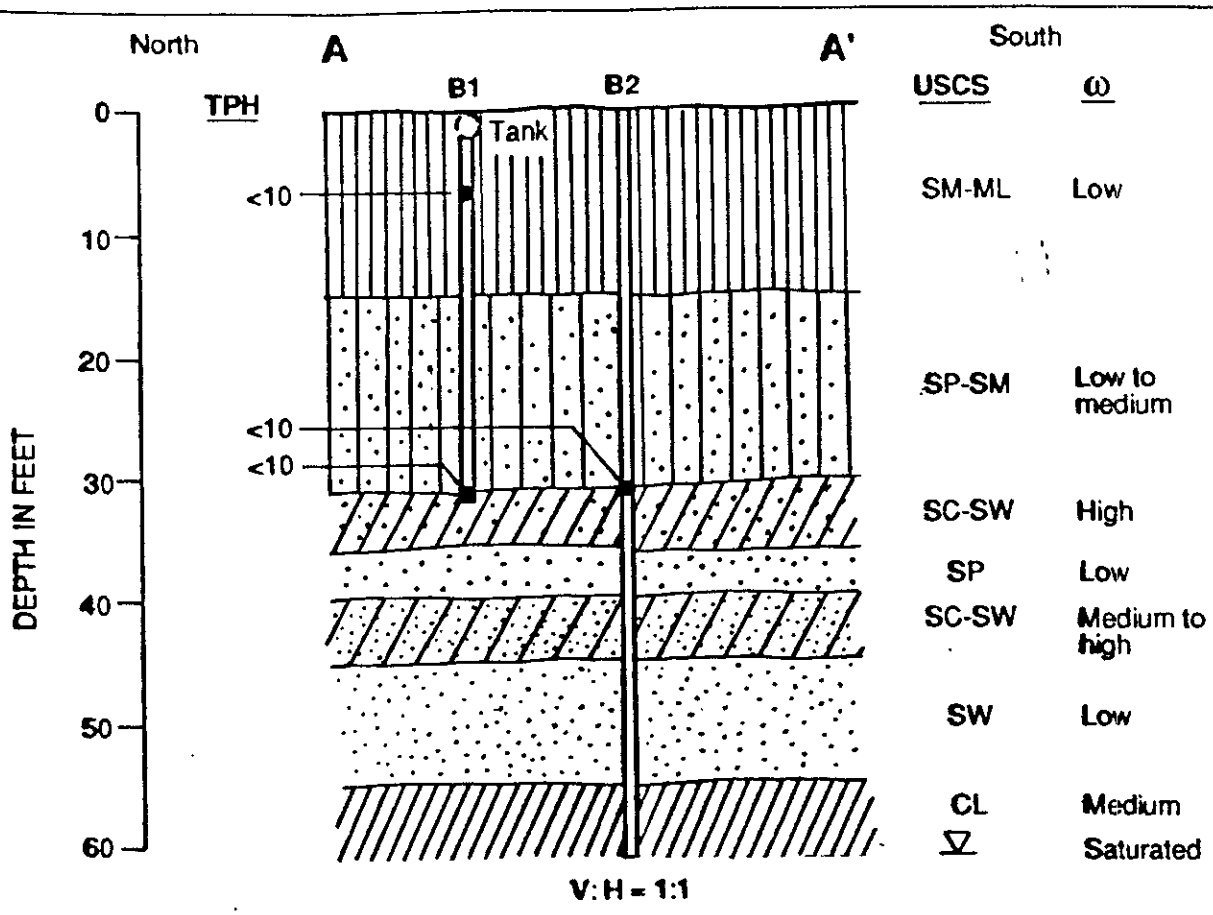
BACKFILLED, TIME: 12:30 DATE: 5/09/91 BY: MCL

SURFACE ELEV.: | DATUM:

CONDITIONS:

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	SAMPLE CONDITION	DRILLING RATE (min/ft)	DEPTH IN FEET	GRAPHIC LOG	
								GP	CONCRETE CAP AND GRAVEL FILL
6	SP	NA	18	16	GD		5	ML	SANDY SILT; light yellowish brown; very fine to fine; very well sorted; medium dense; dry to damp.
12	SP	NA	18	18	GD		10		
16	SP	NA	18	8	PR		15		
21	SP	NA	18	18	GD		20	SM	SILTY SAND; light yellowish brown; very fine to fine; very well sorted; medium dense; dry to damp.
27	SP	NA	18	16	GD		25		
		SAMPLER REFUSAL					30	SC	CLAYEY SAND; dark yellowish brown to dark brown; 30% clay; fine to coarse; well graded; very dense; highly weathered; secondary cementation and well indurated; moist.

EE7



EXPLANATION

- 80 gallon diesel tank (base of tank at 2.0 feet)
- USCS United Soil Classification System
- ML-SM: Silt to Silty Sand
- SM-SP: Silty Sand to Sand
- SC-SW: Clayey Sand to Sand
- SP: Sand, poorly graded
- SW: Sand, well graded
- CL: Clay
- Water table
- TPH Total petroleum hydrocarbons (medium boiling point)
- ω Volumetric water content (qualitative measure)

GEOLOGIC CROSS SECTION

Pacific Trust Company

EIRRA CONSULTANTS

ENVIRONMENTAL INVESTIGATION, REMEDIATION, AND RISK ASSESSMENT

Job Number	Date	Plate
9023	6/91	2

ATTACHMENT B

Tables

Table 1. Summary of Analytical Results for Vertical Evaluation of Soil Hydrocarbon Concentrations, Hayward Motors, Alameda County (unincorporated), California.

SAMPLE	DATE	DEPTH	TVPH	TEPH
EB1-1	5/25/91	6.0	N.A.	40
EB1-2	5/25/91	12.0	N.A.	100
EB1-3	5/25/91	16.0	N.A.	92
EB1-4	5/25/91	21.0	N.A.	170
EB1-5	5/25/91	27.0	N.A.	73
EB1-2	2/15/90	30.5	< 1.0	<10
EB2-6	2/15/90	30.0	< 1.0	<10
AVE:			----	69

Note: All concentrations expressed in milligrams per kilogram (mg/kg), or parts per million (ppm). Average concentration calculated by assuming a value of one-half the detection limit (5 ppm) for samples containing <10 ppm TEPH.

Abbreviations

TVPH - Total volatile (low boiling point) hydrocarbons by EPA Method 5030.
TEPH - Total extractable (medium boiling point) hydrocarbons by EPA Method 3550.
AVE - Average value over vertical interval.

Table 2-1
Leaching Potential Analysis for Gasoline and Diesel
Using Total Petroleum Hydrocarbons(TPH)
and Benzene, Toluene, Xylene and Ethylbenzene (BTX&E)

The following table was designed to permit estimating the concentrations of TPH and BTX&E that can be left in place without threatening ground water. Three levels of TPH and BTX&E concentrations were derived (from modeling) for sites which fall into categories of low, medium or high leaching potential. To use the table, find the appropriate description for each of the features. Score each feature using the weighting system shown at the top of each column. Sum the points for each column and total them. Match the total points to the allowable BTX&E and TPH levels.

SITE FEATURE	SCORE	SCORE 10 PTS IF CONDITION IS MET	SCORE	SCORE 9 PTS IF CONDITION IS MET	SCORE	SCORE 5 PTS IF CONDITION IS MET
Minimum Depth to Ground Water from the Soil Sample (feet)		>100	9	51-100		25-50\1
Fractures in subsurface (applies to foothills or mountain areas)	10	None		Unknown		Present
Average Annual Precipitation (inches)		<10	9	10-25		26-40\2
Man-made conduits which increase vertical migration of leachate	10	None		Unknown		Present
Unique site features: recharge area, coarse soil, nearby wells, etc		None	9	At least one		More than one
COLUMN TOTALS→TOTAL PTS	20	+	27	+	0	= 47
RANGE OF TOTAL POINTS		49pts or more		41 - 48 pts		40pts or less
MAXIMUM ALLOWABLE B/T/X/E LEVELS (PPM)		1/50/50/50		.3/.3/1/1		NA\3
MAXIMUM ALLOWABLE TPH LEVELS (PPM) GASOLINE		1000		100		10
MAXIMUM ALLOWABLE TPH LEVELS (PPM) DIESEL		10000		1000 *		100

\1 If depth is greater than 5 ft. and less than 25 ft., score 0points.
If depth is 5 ft. or less, this table should not be used.
\2 If precipitation is over 40 inches, score 0 points.
\3 Levels for BTX&E are not applicable at a TPH concentration of 10ppm (gasoline) or 100ppm (diesel)

ATTACHMENT C

Certified Analytical Report

ANAMETRIX INC
Environmental & Analytical Chemistry
1961 Concourse Drive Suite E San Jose CA 95131
(408) 432-8192 • Fax (408) 432-8198

REPORT

CHRISTOPHER FRENCH
EIRRA CORPORATION
11828 DUBLIN BLVD. STE C
DUBLIN, CA 94568

Workorder # : 9105145
Date Received : 05/13/91
Project ID : 910501 PACIFIC TR
Purchase Order: N/A

The following samples were received at Anametrix, Inc. for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9105145- 1	EB1-1
9105145- 2	EB1-2
9105145- 3	EB1-3
9105145- 4	EB1-4
9105145- 5	EB1-5

This report consists of 3 pages not including the cover letter, and is organized in sections according to the specific Anametrix laboratory group or section which performed the analysis(es) and generated the data. The Report Summary that precedes each section will help you determine which Anametrix group is responsible for those test results, and will bear the signatures of the department supervisor and the chemist who have reviewed the analytical data. Please refer all questions to the department supervisor who signed the form.

Anametrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234. A detailed list of the approved fields of testing can be obtained by calling our office, or the DHS Environmental Laboratory Accreditation Program at (415)540-2800.

If you have any further questions or comments on this report, please give us a call as soon as possible. Thank you for using Anametrix.

Sarah Schoen, Ph.D.
Laboratory Manager

5-29-91
Date

Anametrix Inc uses 100% Recycled Paper

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

CHRISTOPHER FRENCH
EIRRA CORPORATION
11828 DUBLIN BLVD. STE C
DUBLIN, CA 94568

Workorder # : 9105145
Date Received : 05/13/91
Project ID : 910501 PACIFIC TRU
Purchase Order: N/A
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9105145- 1	EB1-1	SOIL	05/10/91	TPHd
9105145- 2	EB1-2	SOIL	05/10/91	TPHd
9105145- 3	EB1-3	SOIL	05/10/91	TPHd
9105145- 4	EB1-4	SOIL	05/10/91	TPHd
9105145- 5	EB1-5	SOIL	05/10/91	TPHd

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

CHRISTOPHER FRENCH
EIRRA CORPORATION
11828 DUBLIN BLVD. STE C
DUBLIN, CA 94568

Workorder # : 9105145
Date Received : 05/13/91
Project ID : 910501 PACIFIC TRU
Purchase Order: N/A
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- No QA/QC problems encountered for these samples.

Cheryl Balgner 5/20/91
Department Supervisor Date

Irene Tsisin 05-28-91
Chemist Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS AS DIESEL
ANAMETRIX, INC. (408) 432-8192

Anametrix W.O.: 9105145
Matrix : SOIL
Date Sampled : 05/10/91
Date Extracted: 05/22/91

Project Number : 910-501 PACIFIC TRUS
Date released : 05/28/91
Instrument I.D.: HP23

Anametrix I.D.	Client I.D.	Date Analyzed	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
9105145-01	EB1-1	05/25/91	50	40
9105145-02	EB1-2	05/25/91	20	100
9105145-03	EB1-3	05/25/91	10	92
9105145-04	EB1-4	05/25/91	10	170
9105145-05	EB1-5	05/25/91	20	73
DSBL052291	METHOD BLANK	05/24/91	10	ND

Note : Reporting limit is obtained by multiplying the dilution factor times 10mg/Kg.
ND - Not detected at or above the practical quantitation limit for the method.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following sample extraction by EPA Method 3550.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Analyst 5.28.91 Date

Supervisor 5/29/91 Date

EIRRA (EIK)

(2) 125 ml's

9105145

CHAIN OF CUSTODY RECORD

PROJECT	SAMPLERS:
910501 Pacific Trust	

LAB #	STATION	DATE	TIME	SAMPLE TYPE: WATER	SEDIMENT	TISSUE				NUMBER OF CONTAINERS	REMARKS
(1)	EB1-1	5/10/91	0920		X						10 DAY
(2)	EB1-2		0937								TAT
(3)	EB1-3		1047								Sample (1)
(4)	EB1-4		1127								labeled. EB1-1
(5)	EB1-5	Y	1207		X						#1, (2) status
											EB1-1 2
											(3) - status EB1 #3
											(4) - EB1 #4
											cold, no headspace
											nls

RELINQUISHED BY:	RECEIVED BY: Tammy L. Campos	DATE/TIME 5/13/91 0940
RELINQUISHED BY:	RECEIVED BY:	DATE/TIME
RELINQUISHED BY: 5-13-91 1010 Tammy L. Campos	RECEIVED BY:	DATE/TIME
RELINQUISHED BY:	REC'V'D BY MOBILE LAB FOR FIELD ANAL.:	DATE/TIME
DISPATCHED BY:	DATE/TIME	RECEIVED FOR LAB BY: R Hartzog — DATE/TIME 5/13 1010
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