"Expanded Assessment and RBCA Evaluation at former Merritt Fire Sales, 3730 Castro Valley Blvd. Castro Valley

March 4, 1997

EMCON

RO 474

The Goodyear Tire & Rubber Company
Akron, Ohio 44316 - 0001

STID 7175

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

August 22, 2001

Alameda County Health Care Services Agency
Environmental Protection Division
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

AUG 2 9 2001

Attention: Mr. Amir Gholami, Hazardous Materials Specialist

Reference: Former Merritt Tire Sales / Goodyear Leased Location (#9578)
3430 Castro Valley Boulevard
Castro Valley, Alameda County, CA

Mr. Gholami:

The Goodyear Tire & Rubber Company (Goodyear) is pleased to submit one copy of the Expanded Assessment and Risk-Based Corrective Action report (dated March 4, 1997) which was completed for this facility. Based on you correspondence dated July 10, 2001, your office has no record of previously receiving this report. Please advise as to what your agency will require in order to receive closure for this former UST location.

Please do not hesitate to contact myself at (330) 796-1735 if you have any questions or wish to discuss this further.

Respectfully,

Karen D. Burlingame
Corporate Environmental Engineering, D/110F
The Goodyear Tire & Rubber Company

Enclosure

EMCON
1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

March 4, 1997
Project 22148-001.001

AUG 2 9 2001

Brad E. Loerger
The Goodyear Tire & Rubber Company
1144 East Market Street
Akron, Ohio, 44316

Re: Expanded Assessment, and Risk-Based Corrective Action Evaluation at former Merritt Tire Sales, 3430 Castro Valley Boulevard, Castro Valley, California

Dear Mr. Loerger:

EXPANDED ASSESSMENT

EMCON has prepared this letter report to document the results of an expanded soil and groundwater assessment and Tier 1 risk-based corrective action (RBCA) evaluation at Goodyear Tire and Rubber Company's facility located at 3430 Castro Valley Boulevard in Castro Valley, California (Figure 1). The purpose of the soil and groundwater assessment was to assess soil and groundwater conditions adjacent to and downgradient (south) of a former waste oil tank located in front of the service area at the site (Figure 2). The Tier 1 RBCA evaluation was prepared to evaluate the potential risk posed by a chemical release at the site, determine what corrective action, if any, is necessary at the site. This scope of work was performed consistent with EMCON's proposal dated September 9, 1997.

FIELD ACTIVITIES

On December 13, 1996, four borings (PB-1 through PB-4) were drilled by Vironex Environmental Field Services at the locations shown in Figure 2. The borings were drilled to approximately 10 to 16 feet below ground surface (BGS) using a Geoprobe continuous sampling system. Boring PB-4 was converted to a 1-inch-diameter polyvinylchloride (PVC) groundwater monitoring well (MW-4). All coring and sampling equipment was cleaned before beginning drilling activities and between each boring to eliminate the potential for cross-contamination.

Materials encountered beneath the asphalt surface in each of the boreholes consisted of approximately 1 to 3 feet of non-native gravel baserock and fill on native alluvium. The upper 9 to 14 feet of alluvium is composed of clay, and sandy to silty clay. In boring PB-4, wet clayey sand was observed in soil samples collected between 14 and 16 feet BGS. Upon

EMCON
1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

PROTECTION
97 MAR 18 PM 3:24

March 4, 1997
Project 22148-001.001

Brad E. Loerger
The Goodyear Tire & Rubber Company
1144 East Market Street
Akron, Ohio, 44316

Re: Expanded Assessment, and Risk-Based Corrective Action Evaluation at former Merritt Tire Sales, 3430 Castro Valley Boulevard, Castro Valley, California

Dear Mr. Loerger:

EXPANDED ASSESSMENT

EMCON has prepared this letter report to document the results of an expanded soil and groundwater assessment and Tier 1 risk-based corrective action (RBCA) evaluation at Goodyear Tire and Rubber Company's facility located at 3430 Castro Valley Boulevard in Castro Valley, California (Figure 1). The purpose of the soil and groundwater assessment was to assess soil and groundwater conditions adjacent to and downgradient (south) of a former waste oil tank located in front of the service area at the site (Figure 2). The Tier 1 RBCA evaluation was prepared to evaluate the potential risk posed by a chemical release at the site, determine what corrective action, if any, is necessary at the site. This scope of work was performed consistent with EMCON's proposal dated September 9, 1997.

FIELD ACTIVITIES

On December 13, 1996, four borings (PB-1 through PB-4) were drilled by Vironex Environmental Field Services at the locations shown in Figure 2. The borings were drilled to approximately 10 to 16 feet below ground surface (BGS) using a Geoprobe continuous sampling system. Boring PB-4 was converted to a 1-inch-diameter polyvinylchloride (PVC) groundwater monitoring well (MW-4). All coring and sampling equipment was cleaned before beginning drilling activities and between each boring to eliminate the potential for cross-contamination.

Materials encountered beneath the asphalt surface in each of the boreholes consisted of approximately 1 to 3 feet of non-native gravel baserock and fill on native alluvium. The upper 9 to 14 feet of alluvium is composed of clay, and sandy to silty clay. In boring PB-4, wet clayey sand was observed in soil samples collected between 14 and 16 feet BGS. Upon

completion of drilling and sampling, the borings were backfilled to ground surface with neat cement. All soil borings were logged, and the geologic logs and well construction details for well MW-4 are presented in Appendix A.

Selected soil samples from each of the borings samples were reserved and transported with appropriate chain-of-custody documentation to Columbia Analytical Services (CAS), a state-certified laboratory.

SOIL AND GROUNDWATER SAMPLING

Soil samples were collected from borings PB-1, PB-2, PB-3, and PB-4 at 3.0 to 3.5 feet BGS. The samples were screened in the field for the presence of chemical impact using visual and olfactory observations, and a photoionization detector. No indication of chemical impact was detected in the samples from borings PB-2, PB-3, and PB-4. For this reason, samples from borings PB-2 and PB-3 were not submitted for chemical analysis. Although the results of the field screening did not indicate the presence of chemcals in the soil sample from boring PB-4, this sample was submitted for chemical analysis to confirm the limits of on-site impact. The samples from borings PB-1 and PB-4 were analyzed for total petroleum hydrocarbons as gasoline (TPHG), and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by US EPA method 8020, and total recoverable petroleum hydrocarbons (TRPH) by method 418.1. Additionally, the sample from boring PB-1 was analyzed for total organic carbon (TOC) by the Walkley-Black method.

Groundwater elevations were measured in wells MW-1, MW-2, MW-3, and MW-4 on December 28, 1996. These data were used to contour the groundwater surface, and are presented in Figure 3. The approximate direction of groundwater flow was found to be to the southeast.

On December 31, 1996 a groundwater sample was collected from monitoring well MW-4 according to the procedures outlined in Appendix B (Field and Laboratory Procedures). The sample was collected using a Teflon bailer and submitted to CAS in San Jose and analyzed for semivolatile organic compounds (SVOCs) by US EPA method 8270, halogenated volatile organic compounds by method 8010, TPHG and BTEX by method 8020, TRPH by method 418.1, and total petroleum hydrocarbons as diesel (TPHD) by the LUFT method. Certified analytical reports and chain-of-custody documentation for soil and groundwater samples are presented in Appendix C.

ANALYTICAL RESULTS

The soil sample collected from boring PB-1 at 3.0 to 3.5 feet contained 8200 mg/kg TRPH, 120 mg/kg TPHG, 0.6 to 10 mg/kg BTEX, and 20,000 mg/kg TOC. Total petroleum hydrocarbons as gasoline, BTEX, and TRPH were not detected in the sample collected from PB-4. The groundwater sample collected from monitoring well MW-4 did not contain detectable concentrations of SVOCs, halogenated volatile organic compounds, TPHG, BTEX, TRPH, or TPHD.

TIER 1 RISK-BASED CORRECTIVE ACTION EVALUATION

This section presents the results of the Tier 1 risk-based corrective action (RBCA). This assessment addresses potential exposures to current and future on-site workers.

This RBCA evaluation was prepared in accordance with the guidelines contained in *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (American Society of Testing Materials [ASTM] E-1739-95, November, 1995). In general, the tiered approach recommended in the ASTM guidelines is designed as a step-wise process to evaluate the potential risk posed by a chemical release, determine what corrective action, if any, is needed, and tailor that action to those risks. The RBCA evaluation results indicate that no acceptable levels of risk are exceeded, and that no remedial action is necessary at this site.

The steps that make up the tiered RBCA approach are summarized in Figure 3. This report will follow these steps.

INITIAL SITE ASSESSMENT AND SITE CLASSIFICATION

Steps 1 and 2 of RBCA are designed to screen for the possibility that the site presents an imminent threat to public health and the environment. This refers primarily to sites where an unconfined release to the surface has taken place in which a danger of an explosion is present or direct contact to product is a possibility. Chemical impact to soil and groundwater at this site has been characterized, and are summarized in *Initial Subsurface Investigation, Waste Oil UST 3430 Castro Valley, California*, Touchstone Developments, November 1, 1994 (Appendix D), and in this report. Briefly, the site appears to have been used only for brake repair and changing tires. No fuel was stored at the site, and the source of the release appears to have been from the only waste oil tank on the site. The subsurface investigation report indicated that a review of agency files did not show any surface releases at the site.

Although petroleum product and dissolved VOCs has been detected in the subsurface, these compounds do not present a potential risk of explosion or direct contact. In accordance with

ASTM guidelines, the next step in the RBCA process is a comparison of site-measured soil and groundwater data to conservative, non-site-specific, health-based screening levels. This is referred to in the ASTM guidelines as a Tier 1 evaluation.

TIER 1 EVALUATION

The first step in a Tier 1 evaluation is to determine the chemical nature of the release, and to characterize the extent of the impact. Briefly, the release at this site centers around the former waste oil tank on the northeastern portion of the site, as shown in Figure 2. Soil and groundwater have apparently been impacted from the former contents of the tank. Field investigation results indicate that soil immediately adjacent to the tank contains high boiling point petroleum hydrocarbons, benzene, toluene, ethylbenzene, and xylenes (BTEX), tetrachloroethene (PCE: a chlorinated volatile organic compound [VOC]), naphthalene and 2-methylnaphthalene (polyaromatic hydrocarbons [PAHs]). Groundwater in well MW-3, immediately downgradient of the former tank, has been found to contain the same types of compounds identified in the soil. Evidence of floating product has been noted in Well MW-3. A sample of the floating product was analyzed, and found to also contain the same types of compounds. The maximum concentration of chemicals detected in soil and product were used in this evaluation, and are summarized in Table 1. The maximum concentration of chemicals detected in groundwater were found in monitoring well MW-3. For the purpose of this evaluation, the maximum concentration of chemicals in well MW-3 were used to assess the potential health risks. These concentrations are summarized in Table 1.

The extent of the soil impact appears to be limited to the area adjacent to the former tank. Soil concentrations of gasoline, diesel fuel, oil and grease, and BTEX from soil samples collected by SEMCO in 1993 (Touchstone Developments, November 1, 1994) just north and south of the former tank location, and from Boring PB-1 just south of the tank excavation are much higher than the concentrations of these parameters detected in the boring from Well MW-3 located about 10 feet south of the excavation.

The extent of the groundwater impact appears to be less than 40-feet downgradient of the former tank because photo-ionization readings from the headspace above soil samples collected just above the water table from Boring PB-2 indicate the absence of chemicals (Figure 2, and Appendix A). No chemicals were detected in the groundwater from well MW-4, located 80 feet downgradient of the former tank.

The next step in a Tier 1 evaluation is to identify potentially significant environmental transport pathways by which receptors may be exposed to site-related chemicals in order to identify complete exposure pathways. For a potential exposure pathway to be considered complete, it must contain the following three elements:

- a source of specific chemicals (e.g., benzene, toluene, ethyl benzene, and, xylenes [BTEX])
- a transport mechanism (e.g., groundwater migration)
- a potential receptor (e.g., groundwater must be considered potable for a groundwater ingestion exposure pathway to be considered complete)

First encountered groundwater at this site is not considered potable because it is so shallow (i.e., less than 5 feet below the surface), and for this reason potential exposure pathways involving groundwater (e.g., infiltration from subsurface soil to groundwater and direct groundwater ingestion) were not evaluated. Similarly, direct exposure to surface and subsurface soil at this site is not considered a complete exposure pathway because this site is covered by asphalt and a concrete slab structure, and thus access on a routine basis to these potential sources is eliminated. Since impacted soil is present only in association with the former underground tank, no impacted soil is likely to be present beneath the structure, and thus volatilization from subsurface soil to indoor airspace in not considered a significant pathway, and will not be evaluated further.

at this time (current site configuration)

The only complete potential exposure pathways at this site are: ok

- Volatilization from subsurface soil and floating product to ambient air
- Volatilization of chemicals in groundwater through the unsaturated zone to ambient air

construction worker

Representative Soil Concentrations

Soil appears to be impacted only in association with the former waste oil tanks. The results from Boring PB-1 represent the most recently collected samples closest to the former tanks, and were thus used to represent impacted soil for this evaluation.

Results for the floating product were also evaluated. Although the ASTM Tier 1 guidance does not include floating product as one of the environmental media for which risk-based goals are calculated, they were evaluated as if these were soil results because the models used for soil impact are more applicable to product than are those used for groundwater.

not appropriate per M. Logan

The concentrations used to evaluate soil and product are presented in Table 1.

Representative Groundwater Concentrations

Groundwater monitoring events have shown groundwater impact from only one well; MW-3. Groundwater monitoring has taken place since April, 1995. As discussed above, the highest concentrations reported for the chemicals detected in Well MW-3 will be used for the Tier 1 evaluation.

Exposure Assumptions and Evaluation Parameters

The site is currently operated as a tire changing facility, and was assumed to remain one for the purpose of this evaluation. For this reason, the commercial/industrial exposure scenario was used to evaluate the potential exposure of receptors at this site. The values for the exposure parameters associated with this scenario are summarized in Table 3. — missing

Although the workers at this site are expected to spend most of their time within the structure during work hours, the structure is an open garage with roughly half of its wall space open to the ambient air. The exchange of indoor air with outdoor air within this structure is therefore expected to be essentially instantaneous. For this reason, the potential exposure pathway from groundwater to indoor air was evaluated using the groundwater-to-ambient air pathway to more accurately represent this potential exposure route. ok for current site configuration

Acceptable risk-based soil and groundwater screening levels (i.e., RBSLs) were calculated based on a 1×10^{-5} (i.e., 1 in 100,000) probability of developing cancer from cancer-causing substances, and a hazard quotient of 1 for noncancer-causing substances.

The next step in this Tier 1 evaluation is to review the assumptions used to derive the RBSLs for contaminated media (i.e., groundwater, soil and product) and potential exposure routes (i.e., inhalation of ambient air), and determine whether they are likely to be conservative for this site.

The emission and air dispersion models, and the default modeling values used in the ASTM guidelines to generate the RBSLs are suitable to generate conservative RBSLs for the following reasons:

- Losses due to biodegradation and adsorption onto soil during volatilization from the unsaturated zone are not accounted for by the models.

- Volatilization of BTEX and VOCs to ambient air was considered a complete pathway for the purposes of this assessment. This assumption is extremely conservative because the site is covered by concrete and asphalt, which although not completely impermeable, limits vapor diffusion to a much greater degree than the vapor emission models can account for.

- The RBSLs for volatilization from soil and groundwater are based on the assumption that volatilization takes place through a sandy material. In fact, the soils at this site are an bedded assemblage of different soil types. Underlying the one to three feet of sands and gravels are clayey soils extending to below the water table. These less porous materials will result in lower volatilization rates than predicted assuming sandy materials throughout. The RBSLs, therefore, are based on significantly higher rates of volatile emissions than are expected at this site.

The assumptions used to develop RBSLs for the pertinent potential exposure pathways are conservative and are thus appropriate for the purpose of screening. The only modification necessary to the RBSLs presented in Table X2.1 of the ASTM guidelines is to adjust the RBSLs for benzene by multiplying them by 0.29 (California Regional Water Quality Control Board, San Francisco Bay Region, memorandum, January 5, 1996). For example, the adjusted RBSL from Table X2.1 for exposure to benzene through volatilization from groundwater to ambient air is presented below.

Target levels (ASTM Lookup Table X2.1) for benzene (mg/l), for the vapor intrusion from groundwater-to-ambient air pathway, and the commercial/industrial receptor scenario:

- For benzene, the 10^{-6} risk - (i.e., 1E-06 risk) = 1.84E+01 mg/l

The RBSL for benzene corresponding to an on-site 10^{-5} risk is:

- 1E-05 risk = 1.84E+02 mg/l or 184 mg/l

RWQCB benzene correction:

- 184 mg/l x 0.29 = 53.4 mg/l

Therefore, the RBSL for benzene for the groundwater-to-ambient air pathway = 53.4 mg/l

The representative site concentrations and their corresponding Tier 1 RBSLs are summarized in Table 1. The results in the table show that the RBSLs are not exceeded.

SUMMARY AND CONCLUSION

The waste oil tank on the property of the former Merritt Tire Sales was removed from the site prior to 1993. Residual chemicals in the soil and groundwater associated with the former underground tank were evaluated to determine what risk, if any, they might present to current and future on-site receptors. This evaluation was conducted using the ASTM RBCA guidelines. The results show concentrations of chemicals detected in soil and groundwater at

this site do not exceed levels that correspond to an acceptable level of risk. This evaluation is considered conservative due to the conservative nature of the modeling assumptions and the models used, and because the portion of the site selected to represent the entire property is actually a relatively small portion of the entire site. Therefore, even though floating product is present at this site, these results indicate that no additional remedial measures, and no additional evaluation, are necessary to protect the health of the current or future on-site receptors evaluated in this assessment. ? Since when does hydraulic oil contain PNA's & HVOC's ?

Based on the results of this evaluation, and the occasional presence of a limited amount of floating product (hydraulic oil), we propose that future work at this site consist of limited groundwater monitoring to verify that impacted groundwater continues to pose no significant risk. Furthermore, EMCON recommends that a No Further Action letter for this site be prepared following the next annual monitoring event.

Sincerely,

EMCON

Ray Kaminsky

Dr. Ray Kaminsky
Environmental Chemist

John C. Young R.G. 6407
Senior Geologist

REGISTERED GEOLOGIST
JOHN CHARLES YOUNG
7/98
NO. 6407
STATE OF CALIFORNIA

Attachments: Table 1 - Tier 1 Results
Table 2 - Groundwater Historical Results
Table 3 - Exposure Assumptions for the Tier 1 RBCA
Figure 1 - Site Location
Figure 2 - Site Plan
Figure 3 - Risk-Based Corrective Action Process Flowchart
Appendix A - Well Construction Details, and Logs of Exploratory Borings
Appendix B - Field and Laboratory Procedures
Appendix C - Certified Analytical Reports
Appendix D - *Initial Subsurface Investigation, Waste Oil UST 3430 Castro Valley, California*, Touchstone Developments, November 1, 1994

cc: Ms. Amy Leech, ACHCSA
Mr. Kevin Graves, RWQCB

Table 1

Risk-Based Corrective Action Results

Former Merritt Tire Sales, 3430 Castro Valley Boulevard

Compounds	Groundwater-to-Ambient Air Pathway			Product-to-Ambient Air Pathway			Soil-to-Ambient Air Pathway		
	Representative Concentrations in Groundwater [1] (mg/L)	RBSL (mg/L)	Note	Representative Concentrations in Product (mg/kg)	RBSL (mg/kg)	Note	Representative Concentrations in Soil [2] (mg/kg)	RBSL (mg/kg)	Note
Benzene	0.095	53.4	RBSL not exceeded	65	98.6	RBSL not exceeded	0.6	98.6	RBSL not exceeded
Benzo(a)anthracene	ND	NA	RBSL not exceeded	73	>res	RBSL not exceeded	NT	NA	RBSL not exceeded
1,1-Dichloroethane	0.038	>sol	RBSL not exceeded	6.8	>res	RBSL not exceeded	NT	NA	RBSL not exceeded
1,2-Dichloroethane	0.0012	>sol	RBSL not exceeded	nd	110	RBSL not exceeded	NT	NA	RBSL not exceeded
cis-1,2-Dichloroethene [3]	0.051	130	RBSL not exceeded	11	>res	RBSL not exceeded	NT	NA	RBSL not exceeded
Ethylbenzene	0.019	580	RBSL not exceeded	84	>res	RBSL not exceeded	1.6	>res	RBSL not exceeded
Fluoranthene	ND	NA	RBSL not exceeded	46	>res	RBSL not exceeded	NT	NA	RBSL not exceeded
Naphthalene [4]	1.6	>sol	RBSL not exceeded	840	>res	RBSL not exceeded	NT	NA	RBSL not exceeded
Phenanthrene	ND	NA	RBSL not exceeded	75	>res	RBSL not exceeded	NT	NA	RBSL not exceeded
bis(2-ethylhexyl)Phthalate	0.8	>sol	RBSL not exceeded	110	>res	RBSL not exceeded	NT	NA	RBSL not exceeded
Butylbenzylphthalate	ND	NA	RBSL not exceeded	52	>res	RBSL not exceeded	NT	NA	RBSL not exceeded
Pyrene	ND	NA	RBSL not exceeded	57	>res	RBSL not exceeded	NT	NA	RBSL not exceeded
Tetrachloroethene	0.012	>sol	RBSL not exceeded	28	41,000	RBSL not exceeded	NT	NA	RBSL not exceeded
Toluene	0.007	>sol	RBSL not exceeded	13	>res	RBSL not exceeded	3.8	>res	RBSL not exceeded
1,1,1-Trichloroethane	0.021	>sol	RBSL not exceeded	15	>res	RBSL not exceeded	NT	NA	RBSL not exceeded
Trichloroethene	0.008	220	RBSL not exceeded	6.4	>res	RBSL not exceeded	NT	NA	RBSL not exceeded
Vinyl chloride	0.015	1.5	RBSL not exceeded	nd	33	RBSL not exceeded	NT	NA	RBSL not exceeded
Xylenes	0.053	>sol	RBSL not exceeded	320	>res	RBSL not exceeded	10	>res	RBSL not exceeded

mg/L = milligrams per liter

mg/kg = milligrams per kilogram

ND = Not detected

NA = Not applicable

NT = Not tested

>sol = RBSL exceeds the solubility of compound in water

>res = RBSL exceeds the ability of soil to adsorb the compound

RBSL = Risk-based screening level, see text

1 The highest concentrations from Well MW-3 (December 31, 1996 sampling event)

2 Data from Boring PB-1 (December 31, 1996 sampling event)

3 The concentrations of 1,1- and cis-1,2-dichlorethenes were combined and treated as cis-1,2-dichloroethene

4 The concentrations of naphthaene and 2-methylnaphthalene were combined and treated as naphthalene

Table 2

Summary of Groundwater Results from Well MW-3
Former Merritt Tire Sales, 3430 Castro Valley Boulevard

Well MW-3	Benzene	Toluene	Ethylbenzene	Xylenes	Vinyl chloride	1,1-DCE	1,1-DCA	cis-1,2-DCE	1,1,1-TCA	1,2-DCA	TCE	PCE	Cadmium	Chromium	Lead	Nickel	Zinc
Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L
9/30/94	29	3.2	3.3	29	8.3	1.6	17	8.4	12	1.2	1.9	12	<0.01	0.01	<0.01	<0.01	0.02
4/24/95	12	0.84	0.69	2.4	15	0.89	15	4.6	4.4	<0.5	0.91	2.2	<0.01	0.029	0.0071	0.075	0.084
8/2/95	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
10/23/95	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2/9/96	9.6	1.4	1.2	2	8.5	<0.5	10	3.5	1.1	<0.5	0.73	0.77	NT	NT	NT	NT	NT
5/31/96	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
12/31/96	95	7	19	53	8	4	38	47	21	<1	8	8	NT	NT	NT	NT	NT

1,1-DCE is 1,1-dichloroethene

1,1-DCA is 1,1-dichloroethane

cis-1,2-DCE is cis-1,2-dichloroethene

NS : not sampled

NT : not tested

µg/L : micrograms per liter

mg/L : milligrams per liter

1,1,1-TCA is 1,1,1-trichloroethene

1,2-DCA is 1,2-dichloroethane

TCE is trichloroethene

PCE is tetrachloroethene

Site Name: Goodyear
Site Location: Castro Valley

Job Identification:
Date Completed: 1/22/97
Completed By: EMCON

Software: GSI RBCA Spreadsheet
Version: v 1.0

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

DEFAULT PARAMETERS

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
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	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Matrix of Exposed Persons to Complete Exposure Pathways		Residential	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
Groundwater Pathways:				
GW.i	Groundwater Ingestion	FALSE	FALSE	
GW.v	Volatilization to Outdoor Air	FALSE	TRUE	
GW.b	Vapor Intrusion to Buildings	FALSE	FALSE	
Soil Pathways				
S.v	Volatiles from Subsurface Soils	FALSE	[illegible]	
SS.v	Volatiles and Particulate Inhalation	FALSE	FALSE	FALSE
SS.d	Direct Ingestion and Dermal Contact	FALSE	FALSE	FALSE
S.l	Leaching to Groundwater from all Soils	FALSE	FALSE	
S.b	Intrusion to Buildings - Subsurface 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-05***	
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	Commercial/Industrial Chronic	Commercial/Industrial Construction
t	Exposure duration (yr)	30	25	1
A	Contaminated soil area (cm^2)	2.2E+06		1.0E+06
W	Length of affected soil parallel to wind (cm)	1.5E+03		1.0E+03
W.gw	Length of affected 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	Definition of surficial soils (cm)	1.0E+02		
Pe	Particulate areal emission rate (g/cm^2/s)	2.2E-10		

Groundwater	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	2.0E+02
I	Groundwater infiltration rate (cm/yr)	3.0E+01
Ugw	Groundwater Darcy velocity (cm/yr)	2.5E+03
Ugw.tr	Groundwater Transport velocity (cm/yr)	6.6E+03
Ks	Saturated Hydraulic Conductivity(cm/s)	
grad	Groundwater Gradient (cm/cm)	
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
BC	Biodegradation Capacity (mg/L)	1.6E+00
BIO?	Is Bioattenuation Considered	FALSE
phi.eff	Effective Porosity in Water-Bearing Unit	3.8E-01
foc.sat	Fraction organic carbon in water-bearing unit	1.0E-03

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 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	

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

© Groundwater Services, Inc. (GSI), 1995. All Rights Reserved

Base map from USGS 7.5' Quad. Map:
Hayward, California. Photorevised 1980.

0 2000 4000

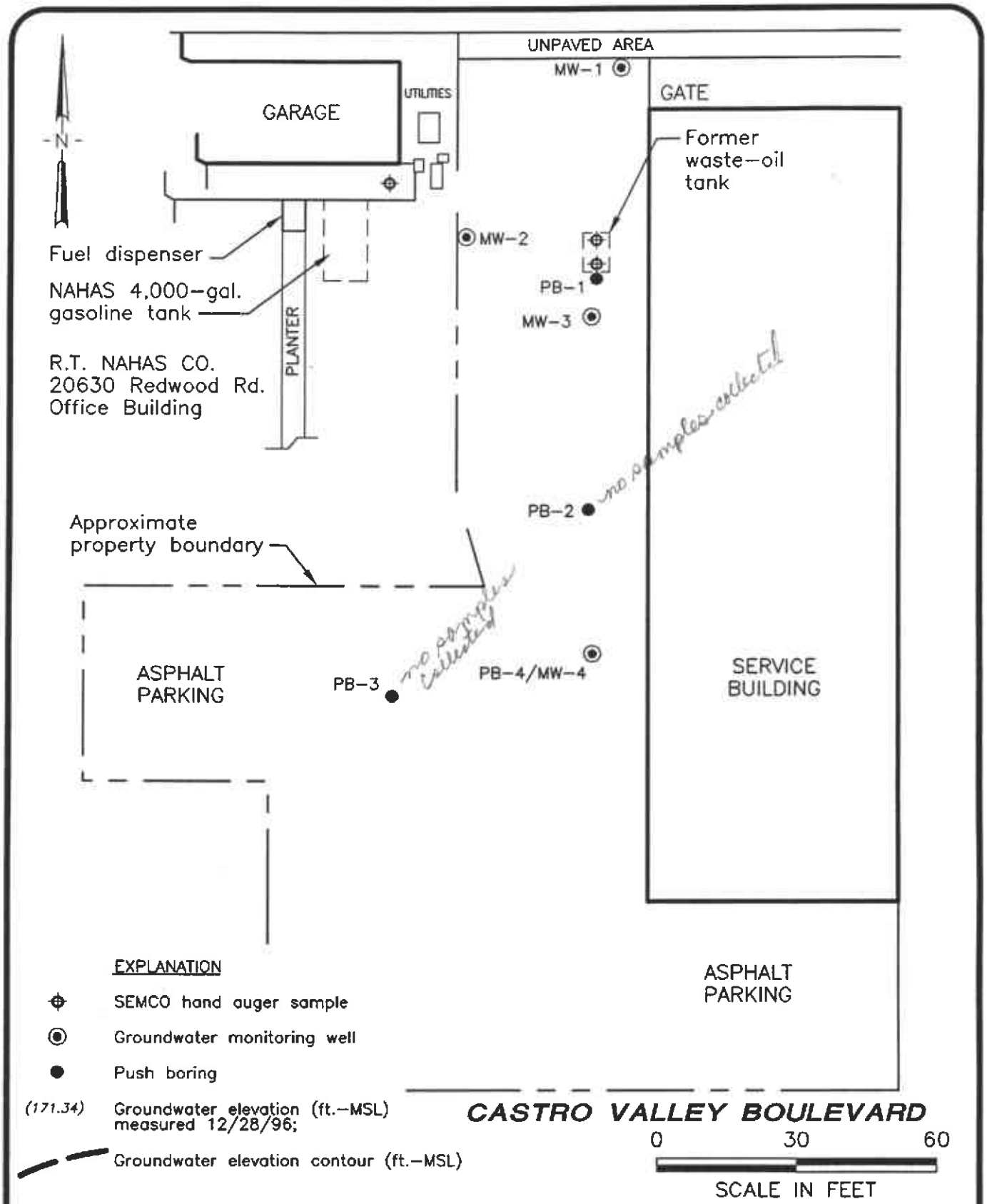
SCALE IN FEET

EMCON

DATE FEB. 1997
DWN KAJ
APP
REV
PROJECT NO.
2148-001.001

FIGURE 1
FORMER MERRITT TIRE SALES
GOODYEAR SERVICE CENTER NO. 9578
CASTRO VALLEY, CALIFORNIA
SITE LOCATION

EA-SANJOSE-CAD/DRAWINGS: I:\2148001\SITELOC2.dwg Xrefs: <NONE>
Scale: 1 = 1.00 DimScale: 1 = 1.00 Date: 3/5/97 Time: 9:23 AM Operator: KAJ

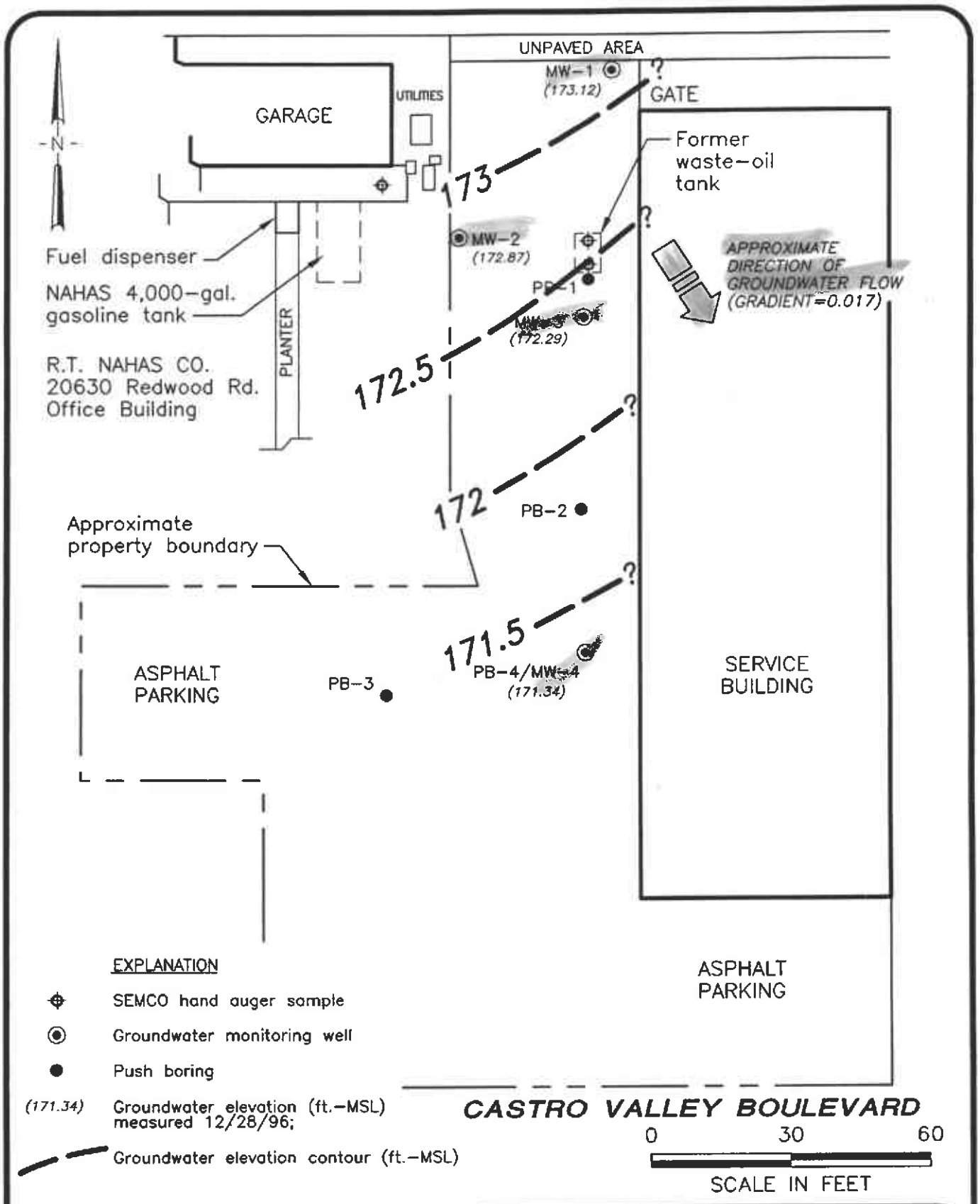


EA-SANJOSE-CAD/DRAWINGS: I:\2148001\SAMPLOC.dwg Xrefs: <NONE>
Scale: 1 = 30.00 DimScale: 1 = 30.00 Date: 3/5/97 Time: 10:42 AM Operator: KAJ

EMCON

DATE FEB. 1997
DWN KAJ
APP
REV
PROJECT NO.
2148-001.001

FIGURE 2
FORMER MERRITT TIRE SALES
GOODYEAR SERVICE CENTER NO. 9578
CASTRO VALLEY, CALIFORNIA
SAMPLE LOCATIONS

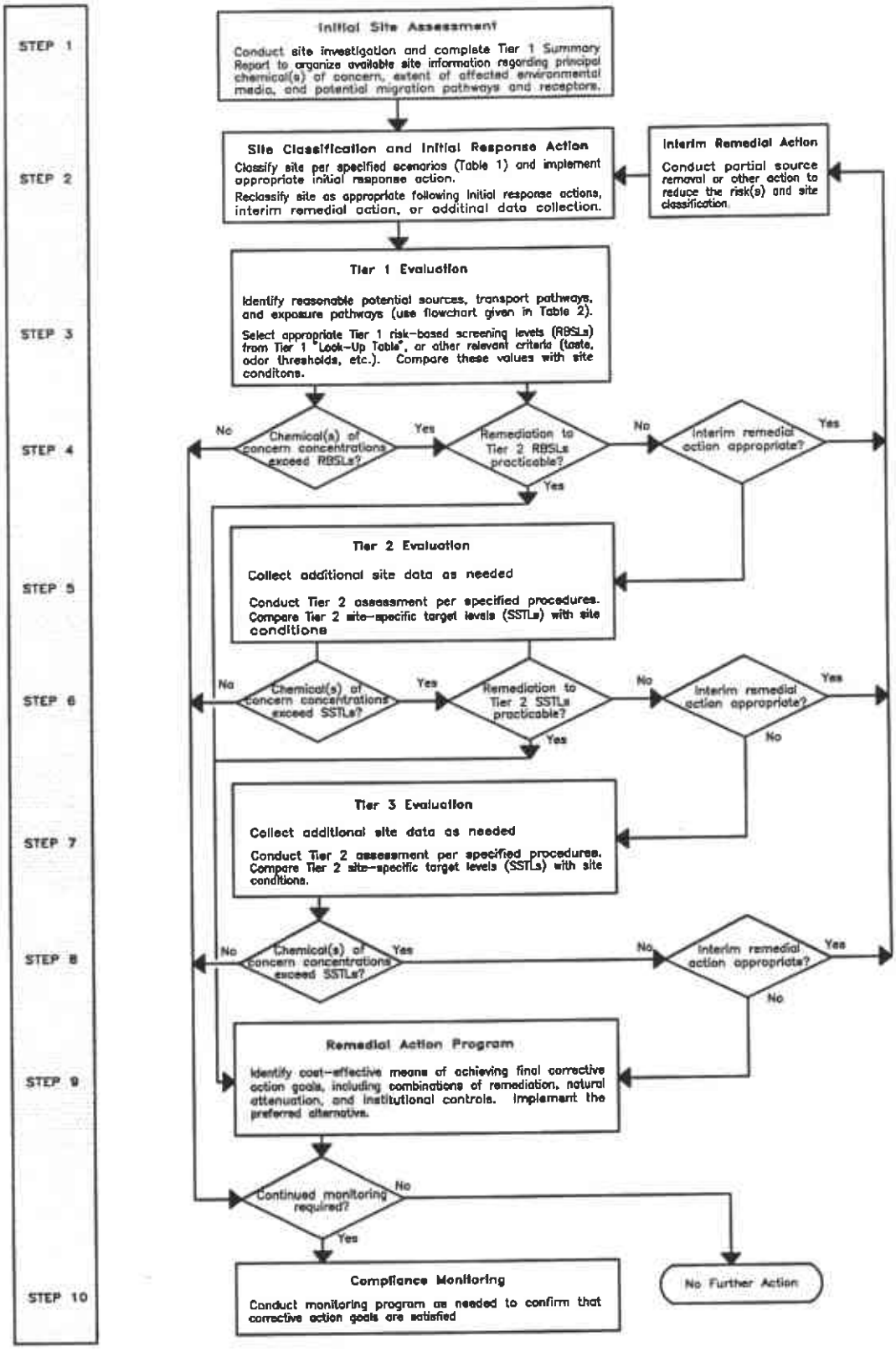


EA-SANJOSE-CAD/DRAWINGS: I:\2148001\GWELEV2.dwg Xrefs: <NONE>
Scale: 1 = 30.00 DimScale: 1 = 30.00 Date: 3/5/97 Time: 9:36 AM Operator: KAJ

emcon

DATE FEB. 1997
DWN KAJ
APP
REV
PROJECT NO.
2148-001.001

FIGURE 3
FORMER MERRITT TIRE SALES
GOODYEAR SERVICE CENTER NO. 9578
CASTRO VALLEY, CALIFORNIA
GROUNDWATER CONTOURS



EMCON

DATE FEB. 1997
DWN KAJ
APP
REV
PROJECT NO.
2148-001.001

FIGURE 4
FORMER MERRITT TIRE SALES
GOODYEAR SERVICE CENTER NO. 9578
CASTRO VALLEY, CALIFORNIA
RISK-BASED CORRECTIVE ACTION PLAN PROCESS FLOWCHART

EA-SANJOSE-CAD/DRAWINGS: I:\2148001\RBCA.dwg Xrefs: <NONE>
Scale: 1 = 1.00 DimScale: 1 = 1.00 Date: 3/5/97 Time: 9:42 AM Operator: KAJ

APPENDIX A

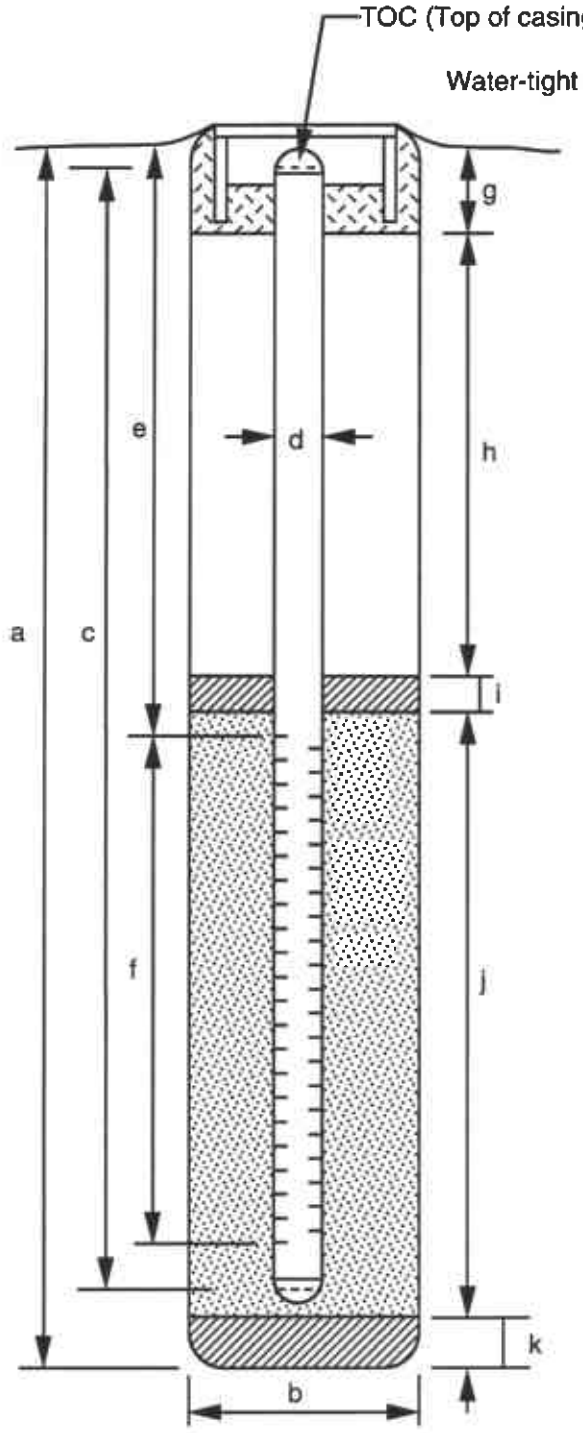
WELL CONSTRUCTION DETAILS, AND LOGS OF EXPLORATORY BORINGS

WELL DETAILS

EMCON ASSOCIATES

PROJECT NUMBER 2148-001.001
PROJECT NAME Goodyear
LOCATION 3430 Castro Valley Blvd., Castro Valley
WELL PERMIT NO. 96844 (Zone 7)

BORING / WELL NO. MW-4
TOP OF CASING ELEV. 176.98
GROUND SURFACE ELEV. NA
DATUM M.S.L.
INSTALLATION DATE 12/13/96



EXPLORATORY BORING

a. Total depth 16.0 ft.
b. Diameter 2.0* in.
Drilling method Geoprobe
* 0-5 ' reamed to 4" dia. w/ hand auger

WELL CONSTRUCTION

c. Total casing length 15.08 ft.
Material Schedule 40 PVC
d. Diameter 1.0 in.
e. Depth to top perforations 5.03 ft.
f. Perforated length 5.0 ft.
Perforated interval from 5.03 to 14.55 ft.
Perforation type Machine Slotted
Perforation size 0.020 inch
g. Surface seal 0.5 ft.
Material Concrete
h. Backfill 3.2 ft.
Material Cement
i. Seal 0.4 ft.
Material Bentonite
j. Gravel pack 11.0 ft.
Gravel pack interval from 4.0 to 15.0 ft.
Material #2/12 Sand
k. Bottom seal/fill 1.0 ft.
Material Bentonite

Form prepared by R. Davis

LOG OF EXPLORATORY BORING

PROJECT NUMBER: **2148-001.001**

BORING NO.: **MW-4**

PROJECT NAME: **Goodyear, Castro Valley**

PAGE: **1 of 1**

BY: **R. Davis**

DATE: **12/13/98**

SURFACE ELEVATION: **NA**

RECOVERY (ft/ft)	PID (ppm)	PENETRATION (blws/6")	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
1.5/2	0						CONCRETE. GRAVEL (GP), ROADBASE, FILL, dry; no odor. SILTY GRAVEL (GM), FILL, damp; no odor.	
1.6/2	0						CLAY (CL), yellowish brown (10YR, 5/4); 90-95% medium-plasticity fines; 5-10% fine to coarse sand; gray and dark brown mottling; stiff; damp; no odor.	
2/2	0			5				
2/2	0							
2/2				10			@11.0': very stiff. @11.5': moist.	
1/2								
2/2			▽ 12/13/98	15			@14.3': wet. CLAYEY SAND (SC), yellowish brown (10YR, 5/4); 30-35% medium-plasticity fines; 65-70% fine to coarse sand; wet; no odor. BORING TERMINATED AT 16.0 FEET.	
				20				

EMCON

REMARKS

Boring completed using 2" diameter drive casing with 1.5" diameter stainless-steel sample sleeve installed inside the drive casing. The sample sleeves were pushed into undisturbed soil. Boring was converted into a 1" diameter polyvinyl chloride (PVC) groundwater monitoring well. See explanation sheet for definition of symbols used in well detail and sample columns of this log.

LOG OF EXPLORATORY BORING

PROJECT NUMBER: **2148-001.001**

BORING NO.: **PB-1**

PROJECT NAME: **Goodyear, Castro Valley**

PAGE: **1 of 1**

BY: **R. Davis**

DATE: **12/13/96**

SURFACE ELEVATION: **NA**

RECOVERY (ft/ft)	PID (ppm)	PENETRATION (blks/6")	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
3.5/4	23.2						CONCRETE GRAVEL (GP), FILL.	
	14.9						GRAVEL (GM), ROADBASE, olive gray; 25-30% low-plasticity fines; 30-35% fine to coarse sand, (1:1:1); 40% fine to coarse gravel to 1" diameter; damp; hydrocarbon odor.	
4/4	44.8						CLAY (CL), black; 90-95% medium-plasticity fines; 5-10% fine to coarse sand; organic fragments common; stiff; damp; hydrocarbon odor.	
	93.7			5			@5.0': moist.	
	27.1						SILTY CLAY (CL), olive (2.5Y, 4/4); low- to medium-plasticity fines; orange mottling becoming more common with depth; stiff; moist; hudrocarbon odor.	
	3.5						@7.0': hard.	
	2.9			10			@8.0': yellowish brown (10YR, 5/4).	
							BORING TERMINATED AT 10.0 FEET.	
				15				
				20				

EMCON

REMARKS

Boring completed using 2" diameter drive casing with 1.5" diameter stainless-steel sample sleeve installed inside the drive casing. The sample sleeves were pushed into undisturbed soil. Boring was backfilled with cement and capped with concrete or asphalt upon completion.

LOG OF EXPLORATORY BORING

PROJECT NUMBER: **2148-001.001**

BORING NO.: **PB-2**

PROJECT NAME: **Goodyear, Castro Valley**

PAGE: 1 of 1

BY: **R. Davis**

DATE: **12/13/98**

SURFACE ELEVATION: **NA**

RECOVERY (ft/ft)	PID (ppm)	PENETRATION (blws/6")	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
2/2	0						CONCRETE GRAVEL (GM), ROADBASE, FILL, SILTY SAND with GRAVEL (SM), FILL, no odor; damp.	
	0						CLAY (CL), black; 90-95% medium-plasticity fines; 5-10% sand; organic fragments common; no odor; damp.	
2/2								
	0							
2/2								
	0			5			SILTY CLAY (CL), olive (2.5Y, 4/4); low- to medium-plasticity fines; orange mottling; very stiff; damp; no odor.	
2/2								
	0							
2/2								
2.3				10			BORING TERMINATED AT 10.0 FEET.	
				15				
				20				

EMCON

REMARKS

Boring completed using 2" diameter drive casing with 1.5" diameter stainless-steel sample sleeve installed inside the drive casing. The sample sleeves were pushed into undisturbed soil. Boring was backfilled with cement and capped with concrete or asphalt upon completion.

LOG OF EXPLORATORY BORING

PROJECT NUMBER: **2148-001.001**

BORING NO.: **PB-3**

PROJECT NAME: **Goodyear, Castro Valley**

PAGE: **1 of 1**

BY: **R. Davis**

DATE: **12/13/98**

SURFACE ELEVATION: **NA**

RECOVERY (ft/ft)	PID (ppm)	PENETRATION (blws/6")	GROUND WATER LEVELS	DEPTH IN FEET	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
1.3/2	0						ASPHALT. GRAVEL (GP), ROADBASE, FILL.	
	0						CLAY (CL), black; 95-100% medium-plasticity fines; trace to 5% sand; organic fibers common; stiff; damp; no odor.	
1.3/2	0							
	0						@4.0': very stiff.	
1.8/2	0			5				
1.8/2	0						@6.5': yellowish brown (10YR, 5/4); rootlets and iron oxide staining; damp to moist; no odor.	
1.8/2				10			SANDY CLAY (CL), yellowish brown (10YR, 5/4); 60-70% medium-plasticity fines; 30-40% fine to coarse sand, (5:1:1); gray and black mottling, pervasive; very stiff; damp; no odor. BORING TERMINATED AT 10.0 FEET.	
				15				
				20				

EMCON

REMARKS

Boring completed using 2" diameter drive casing with 1.5" diameter stainless-steel sample sleeve installed inside the drive casing. The sample sleeves were pushed into undisturbed soil. Boring was backfilled with cement and capped with concrete or asphalt upon completion.

APPENDIX B

FIELD AND LABORATORY PROCEDURES

FIELD AND LABORATORY PROCEDURES

Well permits are obtained from local and state regulatory agencies preparatory to drilling exploratory borings that will be completed as groundwater wells.

The exploratory borings to be converted to verification monitoring wells or extraction wells are drilled no deeper than 20 feet into saturated soil, or until a layer at least 3 feet thick of relatively impermeable clayey material (aquitard) is encountered, whichever comes first. If the aquitard is sufficiently thick, it is backfilled with bentonite through a tremie pipe. Borings are converted to verification monitoring wells with 2-inch-diameter, flush-threaded, polyvinyl chloride (PVC) casing with a screened section of machine-perforated, 0.020-inch slots. For extraction wells, the boring is reamed with a 12-inch-diameter auger, and 6-inch-diameter casing is installed inside the enlarged borehole.

Boring depths and screen lengths are determined from geologic profiles of the boring. Screened sections of casing extend through the saturated interval as much as 5 feet above first-encountered groundwater. A well is completed by the placement of various materials in the annular space around the casing. The annulus is filled to approximately 2 feet above the screen with a sand pack of a grain size predetermined by sieve analysis of the soil. The sand pack is covered with a bentonite plug at least 1-foot thick, and the remaining annular space is sealed within 1 foot of the surface with a sanitary seal of neat cement in compliance with regulatory guidelines. The wells are completed to ground surface with PVC casing. The well heads are protected with traffic-proof vault boxes set in concrete and capped with water-tight locking devices. Well locations are surveyed and top-of-casing elevations measured to the nearest 0.01 foot. Detailed well completion diagrams are prepared. Water well drillers' reports containing geological data, well locations and construction details are submitted to the California Department of Water Resources.

EMCON's sampling and analysis procedures for water-quality monitoring are designed to provide consistent and reproducible results and ensure that the objectives of the monitoring program are met.

The following publications were used as guidelines for developing these procedures:

- Procedures Manual for Ground-Water Monitoring at Solid Waste Disposal Facilities (EPA-530/SW-611, August 1977)

- RCRA Ground-Water Monitoring Technical Enforcement Guidance Document (OSWER 9950.1, September 1986)
- Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (EPA SW-846, 3rd edition, November 1986)
- Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater (EPA-600/4-82-057, July 1982)
- Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020, revised March 1983)

Sample Collection

Sample collection procedures include equipment cleaning, well purging, and water-level, floating-hydrocarbon thickness, and total well-depth measuring.

Equipment Cleaning

The bottles, caps, and septa used to hold samples for volatile and semivolatile organic analysis are triple-rinsed with high-purity deionized water and dried overnight, the bottles at 200°C, the caps and septa at 60°C. The bottles, caps, and septa are protected from solvent contact between drying and use at the site.

The plastic bottles and caps used to hold samples for metals analysis are soaked overnight in a 1 percent nitric acid solution, triple-rinsed with deionized water, and air-dried.

Equipment for sampling groundwater (i.e., pumps, bailers, etc.) is first disassembled, cleaned thoroughly with diluted detergent, and steam-rinsed with deionized water. Parts such as plastic pump valves and bladders, which may absorb contaminants, are cleaned before each use or replaced. The inside of the positive-displacement (bladder) pump tubing is cleaned overnight with a low-flow, inert air source heated to 120°C.

A pump blank made of organic-free water is pumped through the clean bladder-pump assembly, and the resulting effluent is sampled and analyzed by EPA Method 601 or 602. Analytical results must be below the method reporting limit for each constituent analyzed before the pump is used at the site.

The surfaces of well equipment that comes in contact with groundwater during well purging and sampling are steam-cleaned with deionized water between each use.

Water-Level, Floating Hydrocarbon, and Total Well-Depth Measurements

Water levels, floating-hydrocarbon thickness, and total well-depth are measured before wells are purged and sampled. An electric sounder, a bottom-filling, clear Teflon bailer, or an oil-water interface probe is used to make these measurements. The electric sounder is a transistorized instrument with a reel-mounted, two-conductor, coaxial cable which connects the control panel to the sensor. The cable is stamped in 1-foot increments. The sensor is lowered into the well and as it makes contact with the water, which acts as an electrolyte, a low-current circuit is completed. The current is amplified and fed into an indicator light and an audible buzzer, which produce a signal as the sensor touches the water. A sensitivity control compensates for highly saline or conductive water. The sounder is decontaminated after each use with a deionized-water rinse. The bailer is lowered to a point just below the liquid level, retrieved, and inspected for floating hydrocarbon.

Alternately, an oil-water interface sonic probe can be used to measure floating-hydrocarbon thickness. The probe emits a continuous tone when immersed in a nonconductive fluid, such as oil or gasoline, and an intermittent tone when immersed in a conductive fluid, such as water. Fluid levels are recorded relative to which tone is emitted. The sonic probe is decontaminated after each use with a deionized-water rinse.

Fluid measurements are recorded to the nearest 0.01 foot in a field logbook. The groundwater elevation at the monitoring wells is calculated by subtracting the measured depth to water from the surveyed top-of-casing elevation. When possible, depth to water is measured in all wells on the same day. Water levels are converted to elevations above mean sea level (MSL) and contoured on a groundwater map. Total well depth, recorded to the nearest 0.5 foot, is measured by means of an electric sounder which is lowered to the bottom of a well. This measurement is used for calculating purge volumes and determining the degree to which silt may have obstructed the well screen.

Well Purging

Before a monitoring well is sampled, it is purged of standing water in the casing and gravel pack by one of several devices: a bladder pump, a pneumatic displacement pump, a centrifugal pump, or a Teflon bailer. Water will be evacuated from the well until the amount equals the calculate purge volume (as shown in Monitoring Well Purging Protocol, Figure 3), which will allow indicator parameters to stabilize, or until the well is evacuated to practical limits of dryness, if this occurs before the calculated purge volume is removed. These low-yield monitoring wells are allowed to recharge until the volume of water is sufficient for sampling, but not longer than 24 hours. If insufficient water has recharged after 24 hours, a monitoring well is recorded as dry for the sampling event.

The pH, specific conductance, and the temperature meter are calibrated daily before field activities are begun. Meter calibration is checked daily during field activities to verify

performance. Field measurements are recorded on a water-sample field-data sheet (Figure 4) and kept in a waterproof logbook. Data sheets are reviewed by the sampling coordinator at the end of the sampling event.

Well Sampling

A Teflon bailer or a bladder pump is the only acceptable equipment for well sampling. When samples are collected for volatile organic compound (VOC) analysis with a bladder pump, the pump flow is regulated to approximately 100 milliliters per minute to minimize pump-effluent turbulence and aeration. Samples for VOC analysis are preserved in 40-milliliter glass bottles (or larger), which are fitted with Teflon-lined septa. The bottles are filled completely to force out air and to aid in forming a positive meniscus. Bottles are capped with convex Teflon septa to seal out air, and are inverted and tapped to verify that no air bubbles remain. Containers of samples to be analyzed for other constituents are filled, filtered as required, and capped.

When required, an appropriate field-filtration technique is used to determine dissolved concentrations of metals. When a Teflon bailer is used, the contents are emptied into a pressure transfer vessel. A disposable 0.45-micron acrylic copolymer filter is threaded onto the transfer vessel at the discharge point and the vessel is sealed. The vessel is pressurized with a hand pump and the filtrate directed into appropriate containers. Each filter is used once and discarded.

When a bladder pump is used to collect samples for dissolved constituents, a sample is filtered through a disposable 0.450-micron acrylic copolymer filter attached directly to the pump effluent line with a pressure fitting. As the pump cycles, the effluent is pressured through the filter and directed into an appropriate container. Each filter is used once and discarded.

Sample Preservation and Handling

Procedures for handling and preserving samples are consistent with the guidelines referenced in the Introduction. Sample containers vary depending on the type of analysis required (e.g., volatile organics, hydrocarbons, or dissolved metals) and are nonreactive with a given chemical.

Sample Handling

Sample containers are labeled immediately after sample collection, and are kept on cold packs which are replaced daily until the containers are received at the laboratory. As a sample is collected, it is logged on the chain-of-custody record that accompanies samples to the laboratory.

Samples are transferred from the site to EMCON's laboratory by the sampling team. Laboratory personnel assign a different number to each sample container and the number is recorded on the chain-of-custody record and used to identify the sample on all subsequent internal chain-of-custody and analytical records. Within 24 hours of sample receipt, samples are routinely shipped from EMCON to laboratories performing the selected analyses. EMCON's laboratory manager ensures that the holding times for requested analyses are not exceeded.

Sample Documentation

The procedures for sample handling provide chain-of-custody control from collection through storage. Sample documentation includes the following:

- Field logbooks for documenting sampling activities in the field
- Labels for identifying individual samples
- Chain-of-custody records for documenting possession and transfer of samples
- Laboratory analysis requests for documenting analyses to be performed

Field Logbook

In the field, the sampler records the following information on the water sample field data sheet (Figure 4) for each sample:

- Project number
- Client name
- Location
- Sampler's name
- Date and time
- Well accessibility and integrity
- Pertinent well data (e.g., casing diameter, depth to water, well depth)
- Calculated and actual purge volumes
- Purging equipment

- Sampling equipment
- Appearance of each sample (e.g., color, turbidity, sediment)
- Results of field analyses (temperature, pH, specific conductance)
- General comments

The field logbooks are signed by the sampler.

Labels

Sample labels contain the following information:

- Project number
- Sample number (i.e., well designation)
- Sampler's initials
- Date and time of collection
- Type of preservative used (if any)

Sampling and Analysis Chain-of-Custody Record

The sampling and analysis chain-of-custody record (Figure 1), initiated at the time of sampling, includes the well number, sample type, analytical request, date of sampling, the name of the sampler, and other information deemed pertinent. The sampler signs his name and records the date and time on the record sheet when transferring the samples to another person. Custody transfers are recorded for every sample; for example, if samples are split and sent to more than one laboratory, a record sheet accompanies each sample. The number of custodians in the chain of possession is kept to a minimum. A copy of the sampling and analysis chain-of-custody-record is returned to EMCON with the analytical results.

Groundwater Sampling and Analysis Request

The Groundwater Sampling and Analysis Request or the purchase order that accompanies samples to the laboratory serves as official communication of the particular analysis(es) required for each sample and is evidence that the chain of custody is complete (Figure 5).

At a minimum, the groundwater sampling and analysis request includes the following:

- Date submitted
- Specific analytical parameters
- Well number
- Sample source

APPENDIX C

CERTIFIED ANALYTICAL REPORTS

Columbia Analytical Services inc.

January 6, 1997

Service Request No.: S9602261

Mr. John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: Goodyear/20148-001.001

Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on December 20, 1996. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 7, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: Goodyear/#20148-001.001
Sample Matrix: Soil

Service Request: L9605104
Date Collected: 12/13/96
Date Received: 12/20/96
Date Extracted: 12/24/96
Date Analyzed: 12/24/96

Total Recoverable Petroleum Hydrocarbons (TRPH)
EPA Method 418.1
Units: mg/Kg (ppm)

Sample Name	Lab Code	MRL	Result
PB-4, 3-3.5'	L9605104-001	10	ND
PB-1, 3-3.5'	L9605104-002	10	8200
Method Blank	L961224-MB	10	ND

1AMRL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9602261
Project:	Goodyear/20148-001.001	**Date Collected:**	12/13/96
Sample Matrix:	Soil	**Date Received:**	12/20/96
		Date Extracted:	12/23/96
		Date Analyzed:	12/23-26/96

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
As Received Basis

Analyte:	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes, Total
Units:	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)	mg/Kg (ppm)
Method Reporting Limit:	1	0.005	0.005	0.005	0.005
Sample Name	**Lab Code**				
PB-4, 3-3.5'	S9602261-001	ND	ND	ND	ND	ND
PB-1, 3-3.5'	S9602261-002	120	0.6	3.8	1.6	10
Method Blank	S961223-SB1	ND	ND	ND	ND	ND

5ABTXGAS/061694

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9602261
Project:	Goodyear/20148-001.001	**Date Collected:**	12/13/96
Sample Matrix:	Soil	**Date Received:**	12/20/96
		Date Extracted:	1/3/97

Inorganic Parameters [1]
Units: mg/Kg (ppm)
As Received Basis

			Sample Name:	**PB-1, 3-3.5'**	**Method Blank**
			Lab Code:	S9602261-002	S9602261-MB1
			Date Analyzed:	1/3/97	1/3/97
Analyte	**EPA Method**	**MRL**			
Carbon, Total Organic (TOC)	Walkley-Black [2]	10		20000	ND

1 Unless otherwise noted, all analyses were performed within EPA recommended maximum holding times specified in *Test Methods for Evaluating Solid Waste*, (SW-846, 3rd Edition) and *Methods for Chemical Analysis of Water and Waste* (EPA-600/4-79-020, revised March 1983).

2 Method of Soil Analysis, Part 2, 2nd Edition pp. 570-571.

3S22EPA/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: Goodyear/20148-001.001
Sample Matrix: Soil

Service Request: S9602261
Date Collected: 12/13/96
Date Received: 12/20/96
Date Extracted: 12/23/96
Date Analyzed: NA

Surrogate Recovery Summary
TPH as Gasoline/BTEX
EPA Methods 5030/8020/California DHS LUFT Method

Sample Name	Lab Code	PID Detector Percent Recovery 4-Bromofluorobenzene	FID Detector Percent Recovery α,α,α-Trifluorotoluene
PB-4, 3-3.5'	S9602261-001	106	97
PB-1, 3-3.5'	S9602261-002	112	95
Method Blank	S961223-SB1	100	91
CAS Acceptance Limits:		51-137	51-137

SUR2/060194

Columbia Analytical Services, Inc.

2059 Junction Avenue • San Jose, CA 95131 • (408) 428-1280 • FAX (408) 437-9356

CHAIN OF CUSTODY/LABORATORY ANALYSIS REPORT FORM

SERVICE REQUEST NO. S960226 / P.O.# _____ PAGE 1 OF 1

PROJECT NAME Goodyear # 20148-001.001

PROJECT MGR. John Young

COMPANY/ADDRESS Emcon - SJ

PHONE (408) 453-7300

FAX (408) 437-9526

SAMPLERS SIGNATURE Robert K. Davis

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	PRESERVATIVE	NP	HCl	HCl	HCl	NP	HCl	HCl	HNO_3	NP	H_2SO_4	H_2SO_4	H_2SO_4				REMARKS
						Base/Neu/Acid Organics GC/MS 625/8270	Volatile Organics GC/MS 624/8240/8260	Halogenated or Aromatic Volatiles 601/8010 ? 602/8020 ?	TPH as Gas/BTEX DHS LUFT / 8020	TPH as Diesel/HBHC DHS LUFT	TRPH (418.1)	Oil and Grease Method	Metals (total or dissolved) List Below	pH, Cond, Cl, SO_4, F, TDS, TSS Alk (circle)	NH_3-N, COD, Total-P, TKN, NO_3 / NO_2 (circle)	Total Organic Carbon TOC	Total Phenols	Total Organic Carbon				
PB-4, 3-3.5'	12/13/96		1	SOIL	1				/		/								/			
PB-1, 3-3.5'	↓		2	↓	↓				/		/								/			

RELINQUISHED BY:
Signature: Robert K. Davis
Printed Name: ROB DAVIS
Firm: EMCON - SJ
Date/Time: 12/20/96 17:20

RECEIVED BY:
Signature: Joanne Brown
Printed Name: JOANNE BROWN
Firm: CAS
Date/Time: 12-20-96 17:20

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

TURNAROUND REQUIREMENTS
___ 24 hr ___ 48 hr. ___ 3-5 day
/ Standard (10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX preliminary Results
Requested Report Date _____

REPORT REQUIREMENTS
/ I. Routine Report
___ II. Report (includes DUP.MAS. MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ RWQCB (MDLs/PQLs/TRACE#)

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:

Circle which metals are to be analyzed:

Metals: Al Sb Ba Be B Cd Ca Cr Cu Co Fe Mg Mn Mo Ni K Ag Na Sn V Zn
As Pb Se Tl Hg

R8

DISTRIBUTION: WHITE - return to originator; YELLOW - lab; PINK - retained by originator

Columbia Analytical Services™

2059 Junction Avenue • San Jose, CA 95131 • (408) 428-1280 • FAX (408) 437-9356

Subcontract

CHAIN OF CUSTODY/LABORATORY ANALYSIS REPORT FORM

SERVICE REQUEST NO. L960226 / 5960226 P.O.# PAGE 1 OF 1

PROJECT NAME Goodyear # 2148-001.001

PROJECT MGR. John Young

COMPANY/ADDRESS EMCON - SJ

PHONE (408) 453-7300

FAX (408) 437-9526

SAMPLERS SIGNATURE Robert K. Davis

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX	NUMBER OF CONTAINERS	ANALYSIS REQUESTED	REMARKS
						PRESERVATIVE: NP / HCl / HCl / HCl / NP / HCl / HCl / HNO_3 / NP / H_2SO_4 / H_2SO_4 / H_2SO_4	
						Base/Neut/Acid Organics GC/MS 625/8270	
						Volatile Organics GC/MS 624/8240/8260	
						Halogenated or Aromatic Volatiles 601/8010 / 602/8020	
						TPH as Gas/BTEX DHS LUFT / 8020	
						TPH as Diesel/HBHC DHS LUFT	
						TRPH (418.1)	
						Oil and Grease Method	
						Metals (total or dissolved) List Below	
						pH Cond. Cl, SO_4, F, TDS, TSS Alk (circle)	
						NH_3-N, COD, Total-P, TKN NO_3 / NO_2 (circle)	
						Total Organic Carbon TOC	
						Total Phenols	
						Total Oil & Grease (Gravimetric)	
PB-4, 3-3.5'	12/13/96		1	SOIL	1		
PB-1, 3-3.5'	↓		2	↓	↓		

RELINQUISHED BY:
Robert K. Davis
Signature
ROB DAVIS
Printed Name
EMCON - SJ
Firm
12/20/96 17:20
Date/Time

RECEIVED BY:
Joanne Brown
Signature
Joanne Brown
Printed Name
CAS
Firm
12-20-96 17:20
Date/Time

RELINQUISHED BY:
Signature
Printed Name
Firm
Date/Time

RECEIVED BY:
Signature
Printed Name
Firm
Date/Time

TURNAROUND REQUIREMENTS
___ 24 hr ___ 48 hr. ___ 3-5 day
✓ Standard (10-15 working days)
___ Provide Verbal Preliminary Results
___ Provide FAX preliminary Results
Requested Report Date

REPORT REQUIREMENTS
✓ I. Routine Report
___ II. Report (includes DUP, LAS, MSD, as required, may be charged as samples)
___ III. Data Validation Report (includes All Raw Data)
___ RWQCB
(MDLs/PQLs/TRACE#)

RELINQUISHED BY:
Debbie Brown
Signature
Joanne Brown
Printed Name
CAS, SJ
Firm
12/20/96 1930
Date/Time
Via Fedex

RECEIVED BY:
Signature
A BRADSHAW
Printed Name
CAS-CP
Firm
12/21/96 0820
Date/Time

SPECIAL INSTRUCTIONS/COMMENTS:
Cal/Intact
Circle which metals are to be analyzed:
Metals: Al Sb Ba Be B Cd Ca Cr Cu Co Fe Mg Mn Mo Ni K Ag Na Sr V Zn
As Pb Se Tl Hg
If SAT, Draft Invoice to ...

LLAB: 418.1

12/24/96 01:55 FAX CAS CAMPBELL PARK +++ CAS SAN JOSE 007/009

Touchstone Developments
Environmental Management

INITIAL SUBSURFACE INVESTIGATION
WASTE OIL UST
3430 CASTRO VALLEY BOULEVARD
CASTRO VALLEY, CALIFORNIA

Project Number: 94-14

Prepared For:

THE GOODYEAR TIRE & RUBBER COMPANY

Prepared By:

TOUCHSTONE DEVELOPMENTS ENVIRONMENTAL MANAGEMENT

Marc W. Seeley, CEG 1014
Project Geologist

Michael Tambroni
Technical Review

November 1, 1994

P.O. Box 2554 • Santa Rosa, CA 95405 • Office: (707) 538-8818 • Fax: (707) 538-8812 • Mobile/Fax: (707) 484-5112

TABLE OF CONTENTS

I. INTRODUCTION

Touchstone Developments (TD) has prepared this report describing our initial subsurface investigation and monitoring well installation at the site of a former underground waste oil storage tank (UST) at 3430 Castro Valley Boulevard, Castro Valley, California. This work was conducted in conformance with our Work Plan and Health & Safety Plan for the referenced project dated August 10, 1994. The work was initiated at the request of the Alameda Health Care Services Agency, Department of Environmental Health, letter dated May 19, 1994; in which they requested that an initial investigation in the form of a preliminary site assessment (PSA) be conducted at the site to determine the extent of environmental impact resulting from the potential release of petroleum hydrocarbons and related materials from the previously removed underground storage tank. The local regulatory agency for this project is the Alameda County Department of Environmental Health.

Scope of Work

The scope of work for this project was to drill and log three soil borings to approximately 20 feet below first-encountered groundwater, and convert those borings into monitoring wells. After installation of the monitoring wells and after the wells had been allowed to stabilize, the wells were developed and sampled, and the well head elevations were surveyed relative to mean sea level. Following this, groundwater elevations in three wells were measured to determine the local groundwater gradient. Groundwater samples were collected from each well and analyzed for suspect constituents. The details of the work conducted under this scope are described in following report sections.

Site Location

The site is located in the central part of Castro Valley, California at 3430 Castro Valley Boulevard, on the north side of Castro Valley Boulevard and west of Redwood Road (Plate 1).

Background

The subject property is a commercial site presently owned by the Aimee L. West Trust, and was previously leased to Merritt Tire & Brake, which was owned by Richard A. Gorkoska, Ben Tsurumoto, and Yoko Tsurumoto. The commercial site was used for a tire and brake repair business and included an underground storage tank for the containment of waste oil and related products. In January of 1990 Goodyear issued a form letter to all of their lessors, who according to their records had underground storage tanks (USTs) on their leased facilities. The form letter was to obtain general information for permission to remove those USTs if that became necessary, and if Goodyear chose to remove those tanks. A review of records indicated that the tank was removed, but there was no indication Goodyear Tire & Rubber Company contracted for the removal of those tanks. It appears the tenant, Merritt Tire & Brake, had the tanks removed, although there is no record or permit on file. Our review of Alameda County files indicates that this removal was done without a permit. Therefore, the time, date and conditions of the removal are not recorded, nor is the disposition of the UST.

On September 22, 1993, SEMCO was retained by Goodyear to conduct an investigation of the former UST location using hand auger sampling methods. According to the chain-of-custody records, a soil sample south of the former UST location at the 8-foot depth was collected, as was an 8-foot deep sample from north of the former tank location. The soils were analyzed at Superior Analytical Laboratory in Martinez, California. The compounds for which the soils were analyzed and the results of that analysis is presented in their September 29, 1993 report and is summarized below in Table I.

TABLE 1

RESULTS OF ANALYSES
SUPERIOR ANALYTICAL REPORT, SEPTEMBER 29, 1993

Laboratory No.	No. 1 - South	No. 2 - North
Gasoline	230	22
Benzene	0.88	0.099
Toluene	7.6	0.88
Ethylbenzene	3.6	0.34
Total Xylenes	24	2.4
Diesel Range	2,400	388
Oil & Grease	6,100	1,600

Note: All concentrations are in mg/Kg (or ppm)

Based on the initial sampling conducted by SEMCO, the Alameda County Department of Environmental Health requested that a preliminary investigation be conducted to determine the extent of potential contamination. Since the time of SEMCO's report in late 1993, there have been efforts between Goodyear Tire & Rubber and the Department of Environmental Health to determine the responsible party or parties. Although it is our understanding that this matter has not been resolved, Goodyear Tire & Rubber is proceeding with the investigation in accordance with the County's letter dated July 7, 1994. The work described in this report has been conducted in accordance with that letter and with our previously stated Work Plan of August 1994.

Site History

Little direct information is known about the site history and operations because the operators of Merritt Tire & Brake have not been available to be interviewed. Records regarding their operations are not available to

us. However, based on the type of business it has been inferred that general automotive repair was conducted at the site. The presence of the waste oil tank would indicate that oil changing and related automotive work was performed on-site. The types of materials that typically are discharged into waste oil tanks in an automotive operation would include things such as used motor oil, as well as solvents and other liquid wastes resulting from automotive repair and servicing operations.

Based on records reviewed, it is believed that the tank was not registered and there has been no discovery of a record of its removal or disposition. Also, the capacity of the tank is not known. However, available information indicates that only one tank was present at the site and it was used as a waste oil disposal tank. For the same reasons (i.e. lack of historical information) we do not have available information regarding manifests or disposal of the tank, filing status, copies of unauthorized release forms (if they exist), previous tank testing results (if conducted), or an estimate of the total quantity of product that might have been lost.

With the exception of the apparent unauthorized discharge from the above referenced tank, we have no information relating to any other removed tanks or any other accidental discharges at the site. Previous subsurface work consisted of removal and disposal of the tank by unknown persons on an unknown date. Subsequently, as reported, SEMCO was retained to collect samples from the waste-oil tank excavation area using hand augers. Two samples were taken at an 8-foot depth; one from the north and one from the south end of the former UST area. The results from the analyses of those samples are presented in Table I in a preceding report section. During our site work, described in a following section, evidence of SEMCO's collection of samples was observed in the form of two borings which were backfilled and sealed with asphalt patch material.

II. SITE DESCRIPTION

The site is a commercial property located near the center of Castro Valley on a nearly flat to gently south-sloping parcel. It fronts on Castro Valley Boulevard and is slightly to the west of Redwood Boulevard. The site is underlain by alluvial fan deposits derived predominantly of materials from the hills to the north. These materials as identified in soil borings on the adjacent property to the west consist of clayey silts, silty clays, clayey sand, and sand. In those borings, groundwater was determined to be at depths of 10.5 feet below the ground surface. The nearest surface water sources are San Leandro Creek, which lies approximately 6,000

feet to the south. In addition, the U.S.G.S. topographic quadrangle (Hayward Quadrangle, scale 1" = 2,000') indicates there is a small drainage approximately 1,000 feet to the east that is a tributary to San Leandro Creek. There is also shown an intermittent tributary drainage approximately 3,000 feet to the west. The attached Site Location Map, Plate 1, shows the locations of these drainages as well as surface water bodies such as ponds and reservoirs in the general area. Plate 2 presents a Site Map showing the location of the buildings and the former tank location, as well as an underground storage tank location on the adjacent property to the west. That property is referred to as 20630 Redwood Road and is owned by the R.T. Nahas Company.

The tank on the R.T. Nahas property is a 4,000-gallon, fiberglass tank that was installed in 1975 and permitted by Alameda County in 1992. Precision test in 1989 and 1992 indicated a failure near the top portion of the tank. No repair was performed and during this period it was reported the tank was not filled. The tank was emptied of remaining gasoline in 1993 after the failed tests and has not been used since that time. BSK Associates performed an investigation and reported their results in a report dated May 26, 1994. Their investigation consisted of drilling two soil borings in the vicinity of the UST. Samples were collected from depths of 12 and 10 feet, and they were analyzed for TPH-gasoline, TPH-diesel, oil and grease, and BTXE, as well as total lead. In addition, a water sample was collected form each of the two borings. The analytical results of the water samples indicated no detection for any of the contaminants. However, the soil sample collected from the presumed down-gradient boring (SP-2 at 10 feet) indicated the presence of oil and grease at 22 ppm and possible TPH-diesel contamination at the concentration of 1.6 ppm. However, the laboratory indicated that the chromatograph for the TPH-diesel report was not consistent with the diesel standard. Our experience suggests that this is possibly related to motor oil, some other heavier petroleum hydrocarbon, or possibly biogenic hydrocarbon not related to petroleum hydrocarbon.

On the subject site, the report by SEMCO dated September 29, 1993 indicates there is petroleum hydrocarbon contamination in the soil at the 8-foot depth at the site of the previous waste oil UST. The results of that report are summarized in a previous section of this report.

Based on the borings on the adjacent property (R.T. Nahas), we assumed the depth to groundwater was in the range of 10 to 12 feet. As discussed in a following report section, we found groundwater at a similar depth (about 10 feet) below the ground surface. The soil types were likewise found to be similar to those

reported by BSK on the R.T. Nahas property. The site's subsurface conditions are described in a following section and on the boring logs (Plates 3 through 5).

The analytical results from the previous soil sampling by SEMCO is presented in a previous report section. The location of SEMCO's sampling points are shown on Plate 2, the Site Plan. A copy of the SEMCO report was attached to our August 1994 Work Plan for your reference.

III. SITE INVESTIGATION

On September 28, 1994 Marc W. Seeley, Certified Engineering Geologist for Touchstone Developments, arrived at the site with Greg Drilling & Testing, Inc. Three soils borings were drilled at the locations shown on the Site Plan, Plate 2. The borings extended to depths of approximately 20 feet, as shown on the boring logs MW-1 through MW-3 attached to this report (Plates 3, 4 and 5). The borings were logged using the Uniform Soil Classification System to describe the soils encountered. Precleaned, hollow-stem augers were used to drill the borings and soils samples were collected by using a modified California drive sampler equipped with clean, brass liners. Soils cuttings were logged on a continuous basis and relatively undisturbed soil samples were collected at a minimum of every 5 feet by driving the soil sampler into undisturbed soils ahead of the auger. The locations of the undisturbed soils sample points are shown on the attached boring logs.

The augers were precleaned prior to arrival on site and no steam cleaning was conducted on-site. A sufficient number of clean augers were available such that on-site decontamination of the augers was not required. However, to minimize the potential for cross-contamination between samples within a boring and between borings, the drive sampler was decontaminated by washing in a Alconox solution and triple-rinsing with potable water. The procedure was used between each drive sample. Precleaned, brass liners were inserted into the sampler prior to sample collection.

Upon retrieval of the sampler, the soils were observed visually and classified in accordance with the Uniform Soil Classification System and the descriptions were annotated on the field logs. Selected samples were retained for laboratory analysis by covering the ends of the sample tubes with aluminum foil and then capping with plastic end-caps. These samples were then labeled and logged onto a chain-of-custody form and placed

in an ice chest with frozen blue ice for transport to our subcontract analytical laboratory, Superior Precision Laboratory, in San Francisco, California.

The results of the analysis of the retained soil samples are summarized in Table 2 on the following page, and the complete laboratory reports are attached in Appendix A for reference.

As a part of our logging, we made observations of hydrocarbon odors throughout the drilling procedure and of the specific samples collected. Where hydrocarbon odors were noted, these are annotated on the boring logs. The borings drilled for Monitoring Wells #1 and #2 encountered no visible indications of petroleum hydrocarbon contamination and no such odors were noted. However, during the drilling of Monitoring Well #3, we did detect distinct hydrocarbon odors. Verification of the presence of petroleum hydrocarbons is dependent upon the laboratory analytical results discussed in a following report section.

Soil cuttings generated during the construction of the soil borings were placed in steel DOT drums, which were sealed and labeled as to the boring from which they came. These drums were stored on site at a location determined by the on-site facility manager. No decontamination water was retained on site. However, as described in the following section, well purge water was retained in drums labeled as to content.

TABLE 2
RESULTS OF SOIL SAMPLE ANALYSIS
SUPERIOR ANALYTICAL REPORT, OCTOBER 4, 1994

Sample # and depth	TPH-D ppm or mg/kg	TPH-G ppm or mg/kg	Benzene ppm or mg/kg	Toluenep pm or mg/kg	Xylene ppm or mg/kg	Ethyl-benzene ppm or mg/kg	Oil & Grease ppm or mg/kg	8010 Halogenated Volatile Organics	8270 Semivolatile Organics
1-1-3/6'	ND	ND	ND	ND	ND	ND	ND	ND	ND
1-2-2/10'	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-1-1/6'	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-2-1/10'	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-3-3/16'	NA	NA	NA	NA	NA	NA	NA	NA	NA
3-1-1/6'	210 [1]	4	0.022	0.072	0.28	0.067	550	ND	2-MN [2] @ 500 ppb
3-2-2/10'	560 [1]	14	0.047	0.016	0.28	0.068	1300	~~TCE~~ @ 31 PCE ppb	NAPH @ 600 ppb 2-MN @ 700 ppb
3-3-1/16'	NA	NA	NA	NA	NA	NA	NA	NA	NA

Sample # and depth	M	E	T	A	L
mg/Kg or ppm	Cd	Cr	Pb	Zn	Ni
1-1-3/6'	0.3	28	7	26	30
All others	ND	ND	ND	ND	ND

[1] Does not match diesel pattern, heavier hydrocarbon present

[2] See Laboratory report in Appendix A for key to chemical name abbreviations in this table

NA = Soil sample collected but not analyzed.

Materials Encountered

General uniform soils materials were encountered in all three soil borings. The initial material encountered was pavement, either asphaltic or concrete, underlain by base rock sequence extending 16 to 18 inches below grade. Below this the upper most native materials consist of dark black-brown to dark grayish-brown silty clay. These clays were moist to damp and plastic. However, no hydrocarbon odors were noted in these clays. Underlying these dark plastic clays was a sequence of brown silty clays with weathered sand and rock fragments, and some orange mottling. This zone generally was found from 4.5 to approximately 6 feet deep. These materials were also damp and were in turn underlain by somewhat more sandy material extending to approximately 9 to 9.5 feet deep. From approximately 9 to 9.5 feet deep to approximately 20 feet was a zone of interfingering silty sands to sandy silty clays with some interbedded gravel to sandy gravel zones. First groundwater was generally encountered at approximately 10 feet below ground surface (bgs), and at approximately 20 feet a dark brown, very stiff, dry silty clay was encountered. In the boring for Monitoring Well #1 this material was penetrated for approximately 3 feet, and the depth to the base of it was not determined. The details of the materials encountered in each of the borings vary somewhat and these details are presented on Boring Logs #1 through #3 presented in Plates 3 through 5, respectively.

IV. MONITORING WELL CONSTRUCTION

The details of each monitoring well's construction is presented on the boring log associated with that monitoring well (Plates 3 through 5). As described in the Work Plan and shown on the logs, 8¼-inch nominal diameter, hollow stem augers were used for drilling. Once the boring penetrated to approximately 10 feet below first encountered water, the boring was terminated and an approximately 10-foot section of 2-inch diameter, Schedule 40 PVC well screen with 0.002 factory-installed slots was placed into the boring through the hollow stem auger. Blank casing was attached by threading, without solvents, to the top of the well screen. The annulus between the well screen and the outside of the auger was filled with clean, No. 2-12 Lone Star, washed sand. The sand pack extended from approximately 12 to 18 inches above the slotted well screen, as

shown on each of the individual boring logs. Above the sand pack an 18- to 24-inch bentonite pellet seal was placed, above which neat cement grout was placed to the ground surface. The wells were completed with traffic-rated Christy boxes, and caps with locks. The Christy boxes were set in a cement finish, raised slightly above grade to allow for surface runoff away from the well heads.

Well Development

The wells were allowed to stabilize for a minimum of 48 hours prior to development. On September 30, 1994, Tim Walker of Touchstone Developments developed each of the wells by surging and bailing until water produced was sediment free. Approximately 21 to 22 gallons of water were purged from each well while the pH, conductivity, temperature and turbidity were monitored and recorded. The water generated in developing the wells was placed in steel DOT drums stored on site adjacent to the soil cutting storage drums. These drums were labeled as to their content.

Well Sampling

After completion of well development the wells were allowed to recover and then the wells were sampled using a clean disposable Teflon bailer. A bottom-emptying device was used to decant the water into the VOA vials to minimize the degassing of volatile components. Other laboratory supplied containers were also used as appropriate.

Prior to purging of the wells, the static groundwater level was measured relative to the top of the well casing for purposes of determining the groundwater gradient.

On collection of the water samples, the sample containers were sealed, labeled, and placed in an ice chest with frozen blue ice for transport to our subcontractor analytical laboratory, Superior Precision Laboratory in San Francisco, California. The results of the groundwater analyses are summarized below in Table 3.

TABLE 3
RESULTS OF GROUNDWATER ANALYSIS
SUPERIOR ANALYTICAL REPORT, OCTOBER 11, 1994

Well #	TPH-D ppb or ug/L	TPH-G ppb or ug/L	Benzene ppb or ug/L	Toluene ppb or ug/L	Xylene ppb or ug/L	Ethyl-benzene ppb or ug/L	Oil & Grease ppb or ug/L	8010 Halogenated Volatile Organics	8270 Semivolatile Organics
MW-1	ND	ND	ND	ND	ND	ND	ND	ND[3]	ND[4]
MW-2	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-3	72	290	29	3.2	29	3.3	ND	ND[5]	ND

Well # in mg/L or ppm	M Cd	E Cr	T Pb	A Zn	L Ni
MW-1	ND	ND	ND	ND	0.03
MW-2	ND	ND	ND	ND	ND
MW-3	ND	0.01[6]	ND (< 0.05)	ND (< 0.02)	0.02

The details of the laboratory analyses are also presented in the laboratory reports attached to this report in Appendix A.

---

[3] Chloroform was detected in MW-1 and MW-2 groundwater samples at concentrations of 1.0 ug/L and 1.7 ug/L respectively. See the attached laboratory report for complete results.

[4] bis(2-ethylhexl)phtha is reported at 10 ug/L (10 ppb) which is the method detection limit of 10 ug/L. It is unlikely that this compound is present above the MDL.

[5] The following compounds and their concentrations were detected in the groundwater sample from MW-3: Vinyl Chloride @ 8.3 ug/L, 1,1-Dichloroethene @ 1.6 ug/L, 1,1-Dichloroethane @ 17 ug/L, c-1,2-Dichloroethene @ 8.4 ug/L, 1,1,1-Trichloroethane @ 12 ug/L, 1,2-Dichloroethane @ 1.2 ug/L, Trichloroethene @ 1.9 ug/L, Tetrachloroethene @ 12 ug/L. For a complete report of the analytical results see Appendix A.

[6] Cr and Ni are reported at the reporting limit of 0.01 ppb and 0.02 ppb, respectively.

Groundwater Gradient Determination

As noted in the preceding subsection, the depth to groundwater was measured prior to purging the wells. These data were used along with the surveyed well head elevation data to determine the following depths to groundwater relative to mean sea level. These data are summarized below in Table 4. The data were then plotted on Plate 2, which shows the groundwater gradient across the site at the time of the initial sampling. The gradient is south 10° west at approximately 0.0068 feet per feet.

TABLE 4

DEPTH TO GROUNDWATER AND GROUNDWATER ELEVATIONS

SEPTEMBER 30, 1994

Well #	WELL DEPTH	DEPTH TO WATER	WELLHEAD ELEVATION [7]	GW ELEVATION
MW-1	18.91	6.77	177.17 ft	170.40 ft
MW-2	18.70	6.38	176.55 ft	170.17 ft
MW-3	17.30	6.90	176.97 ft	170.07 ft

[7] Reference point is from top of casing.

V. RESULTS OF INITIAL SITE ASSESSMENT

Subsurface Conditions

There is a local water bearing zone in the interval from approximately 10 to 20 feet below the ground surface. The soils in this zone consist of silty sandy clays and clayey sands with some gravels. This zone is underlain by a dry, very stiff, silty clayey aquitard at least three feet thick. Groundwater was encountered at approximately 10 feet deep in each boring.

Impacts

Through our exploration and analysis we have discovered contamination to the soil in boring MW-3 in the depth interval from approximately 6 to 10 feet below the ground surface. We have also discovered impacts to the uppermost groundwater zone. These impacts are summarized in the following sections.

Impacts to Soils - The soil in the area of the boring for MW-3 (the down gradient well placed approximately 10 feet from the tank excavation) is impacted by petroleum hydrocarbon compounds including diesel or a similar hydrocarbon (possibly motor oil or aged diesel), gasoline, benzene, toluene, ethylbenzene, xylene and oil & grease.

In addition the soil is impacted by halogenated volatile and semivolatile organic solvents (Tetrachloroethene or PCE @ 31 ppb, 2-methyl-naphthalene @ 700 ppb and naphthalene @ 600 ppb). Some heavy metals were detected, but they appear to be at or near back ground concentrations. The extent of impacted soil is not known.

Impacts to Groundwater - The groundwater has been locally impacted in the area of MW-3. The impacts include petroleum hydrocarbon compounds (gasoline, benzene, toluene and ethylbenzene). In addition the following compounds and their concentrations were detected in the groundwater sample from MW-3: Vinyl Chloride @ 8.3 ug/L, 1,1-Dichloroethene @ 1.6 ug/L, 1,1-Dichloroethane @ 17 ug/L, c-1,2-Dichloroethene @ 8.4 ug/L, 1,1,1-Trichloroethane @ 12 ug/L, 1,2-Dichloroethane @ 1.2 ug/L, Trichloroethene @ 1.9 ug/L, Tetrachloroethene @ 12 ug/L. Appendix A presents a complete report of the analytical results. The extent of impacted groundwater is not known, but groundwater in the area of MW-2 does not appear to be impacted. Groundwater in the area of MW-1 appears to be impacted to a lesser extent than groundwater in the area of MW-3, but to a much lesser extent, and possibly from an off-site up gradient source. The presence of an apparent aquitard below 20 feet indicates that deeper groundwater zones are probably not impacted by discharges that might have occurred from the previous UST in this site.

VI. CONCLUSIONS & RECOMMENDATIONS

We conclude from the results of our investigation that the previous waste oil tank has leaked and has impacted the adjacent soils and the local, upper groundwater zone. The contaminants in soils include benzene and halogenated and semivolatile organic solvents. The solvents have not yet been detected in the groundwater, although benzene is present. Because of the presence of these carcinogenic compounds, further investigative and remedial action at this site is recommended.

Touchstone Developments recommends that the soil adjacent to the previous UST be over excavated in an attempt to remove the remaining source of contaminants that can impact the groundwater. Over-excavation will likely entail destruction of MW-3. After removal of as much contaminated soil as possible, MW-3 should be replaced farther down gradient, and the groundwater should be monitored for at least four quarters. If groundwater in the down gradient direction has diminished concentrations of contaminants over time, a continuation of this passive groundwater remediation would be recommended. Because of the detection of contaminants in the up-gradient well, we recommend that research of know contaminated sites in the immediate area be conducted. There may be other responsible parties contributing to the groundwater contamination beneath this property.

Touchstone Developments recommends that the soil remediation phase of work proceed as soon as possible to mitigate future impacts on the groundwater and the possible need for an expensive (active) groundwater remediation program at this site.

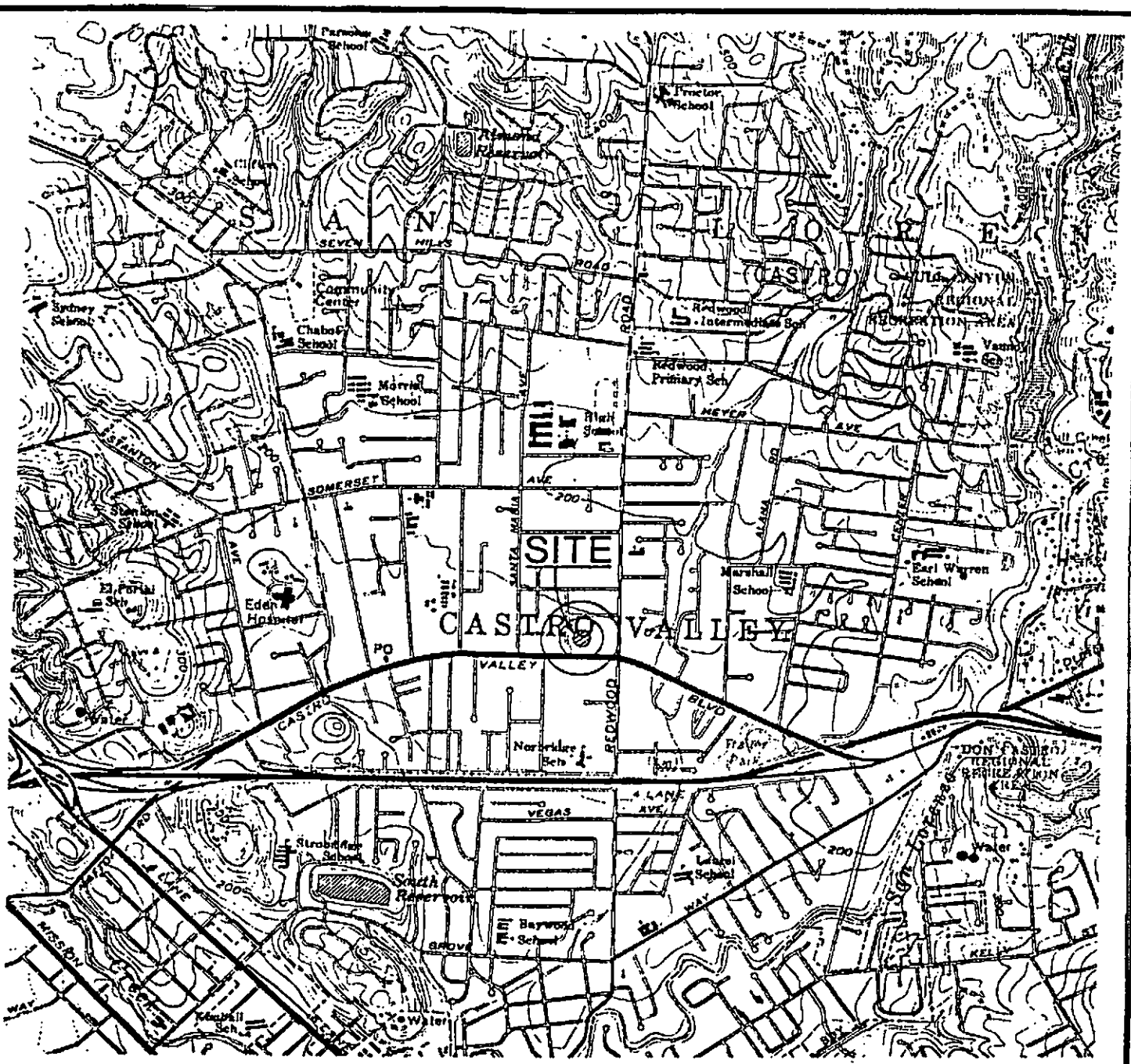
FIGURES AND PLATES

Figure 1: **SITE LOCATION MAP**
Figure 2: **MONITORING WELL LOCATION AND GROUNDWATER GRADIENT MAP**
Plate 3: **Log of Boring MW-1 and Well Construction Details**
Plate 4: **Log of Boring MW-2 and Well Construction Details**
Plate 5: **Log of Boring MW-3 and Well Construction Details**

APPENDIX A

SUPERIOR PRECISION ANALYTICAL LABORATORY REPORTS

FIGURES AND PLATES



NORTH

Base Map: USGS Topographic Survey, Hayward Quadrangle Scale: 1"=2000'

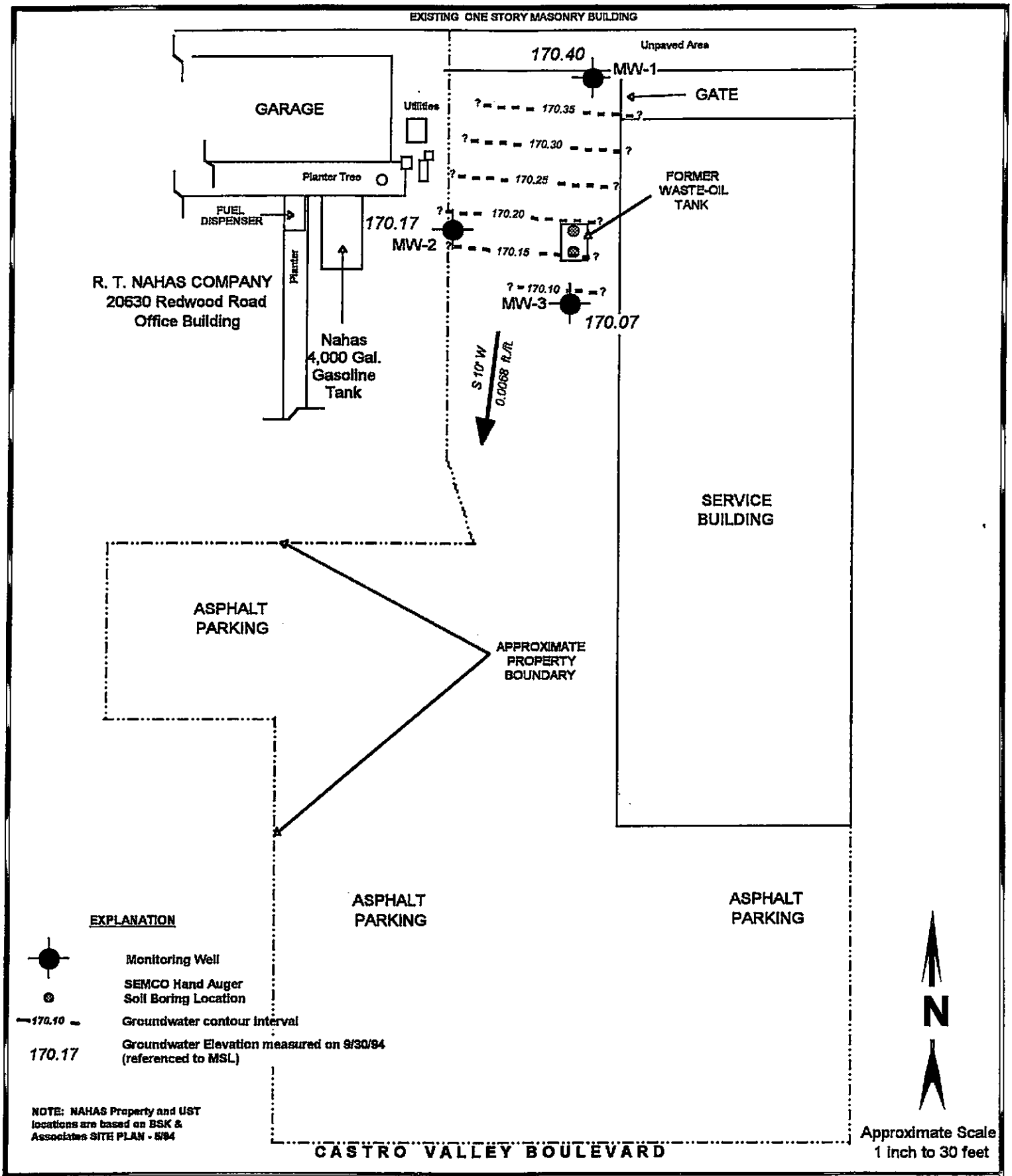
Touchstone Developments
Environmental Management

SITE LOCATION MAP

GOODYEAR TIRE & RUBBER COMPANY
3430 Castro Valley Boulevard
Castro Valley, California

FIGURE
1

PROJECT NO.	DATE	DRAWN BY:	BASE MAP:
94-14	8/94	WTJ	USGS TOPO MAP



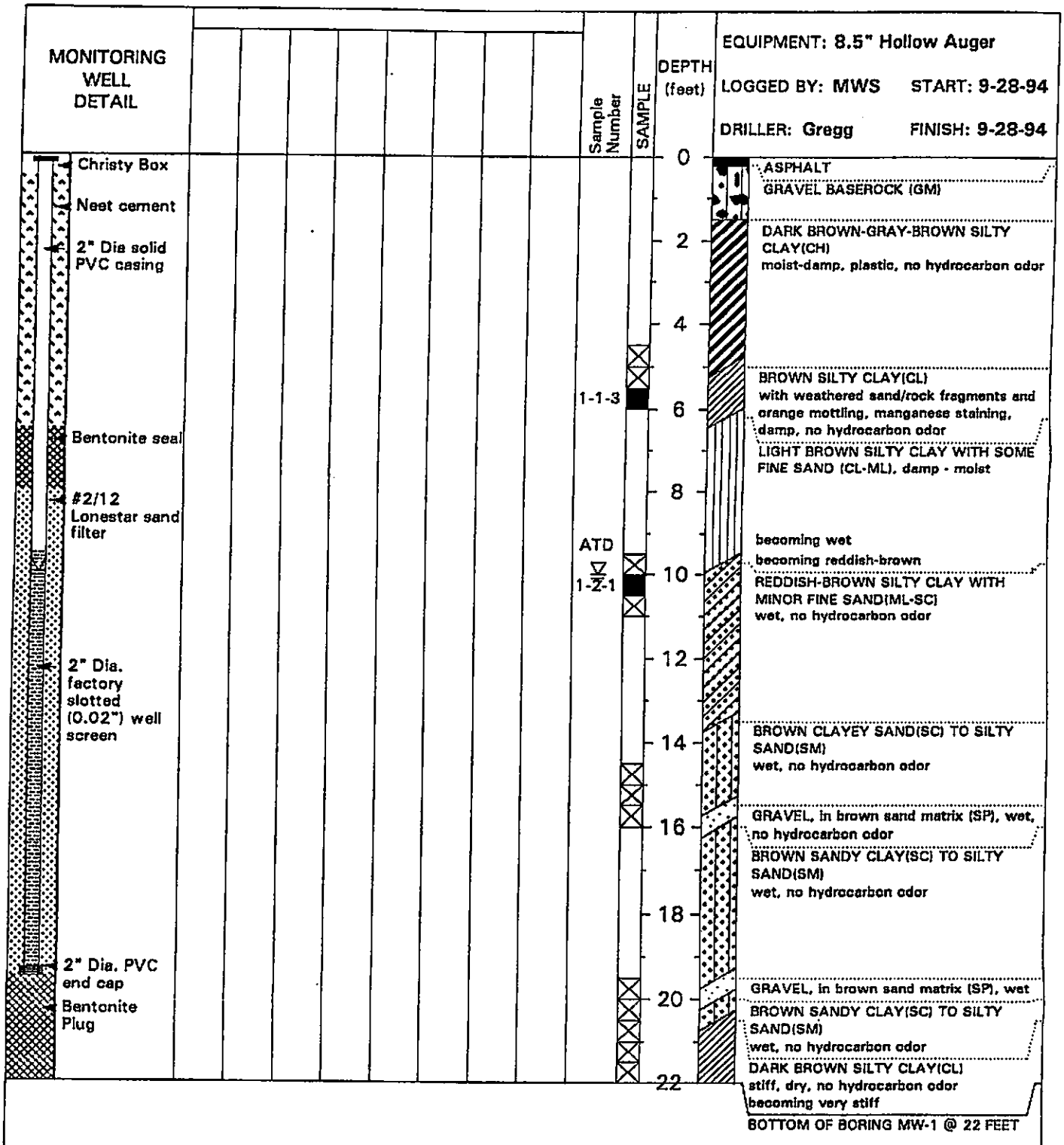
Touchstone Developments
Environmental Management

MONITORING WELL LOCATION AND GROUNDWATER GRADIENT MAP

GOODYEAR SERVICE CENTER
3430 Castro Valley Boulevard
Castro Valley, California

FIGURE
2

PROJECT NO.	DATE	DRAWN BY:	BASE MAP:
94-14	11/94	WTJ	GOODYEAR BLUEPRINT 10/73



LEGEND

■ Retained Samples

⊠ Record Samples

ND = Not Detected

NA = Not Analyzed

Touchstone Developments
Environmental Management

Job No: 94-14
CEG:
Lic No: 1014
Drwn: CD
Date: OCT 1994

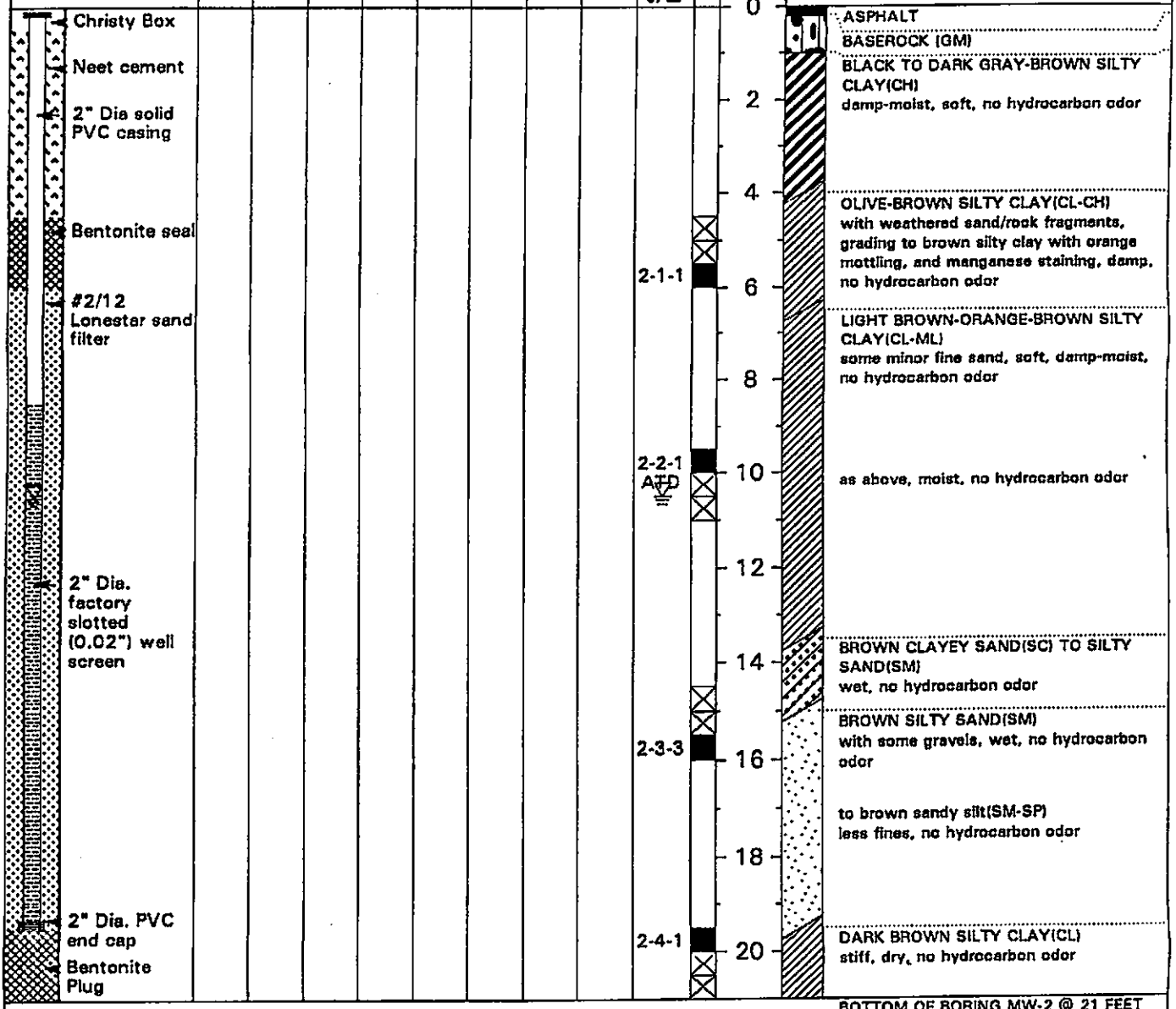
Log of Boring MW-1 and Well Construction Details
3420 CASTRO VALLEY BLVD.

PLATE 3

EQUIPMENT: 8.5" Hollow Auger

LOGGED BY: MWS START: 9-28-94

DRILLER: Gregg FINISH: 9-28-94



LEGEND

■ Retained Samples

⊠ Record Samples

ND = Not Detected

NA = Not Analyzed

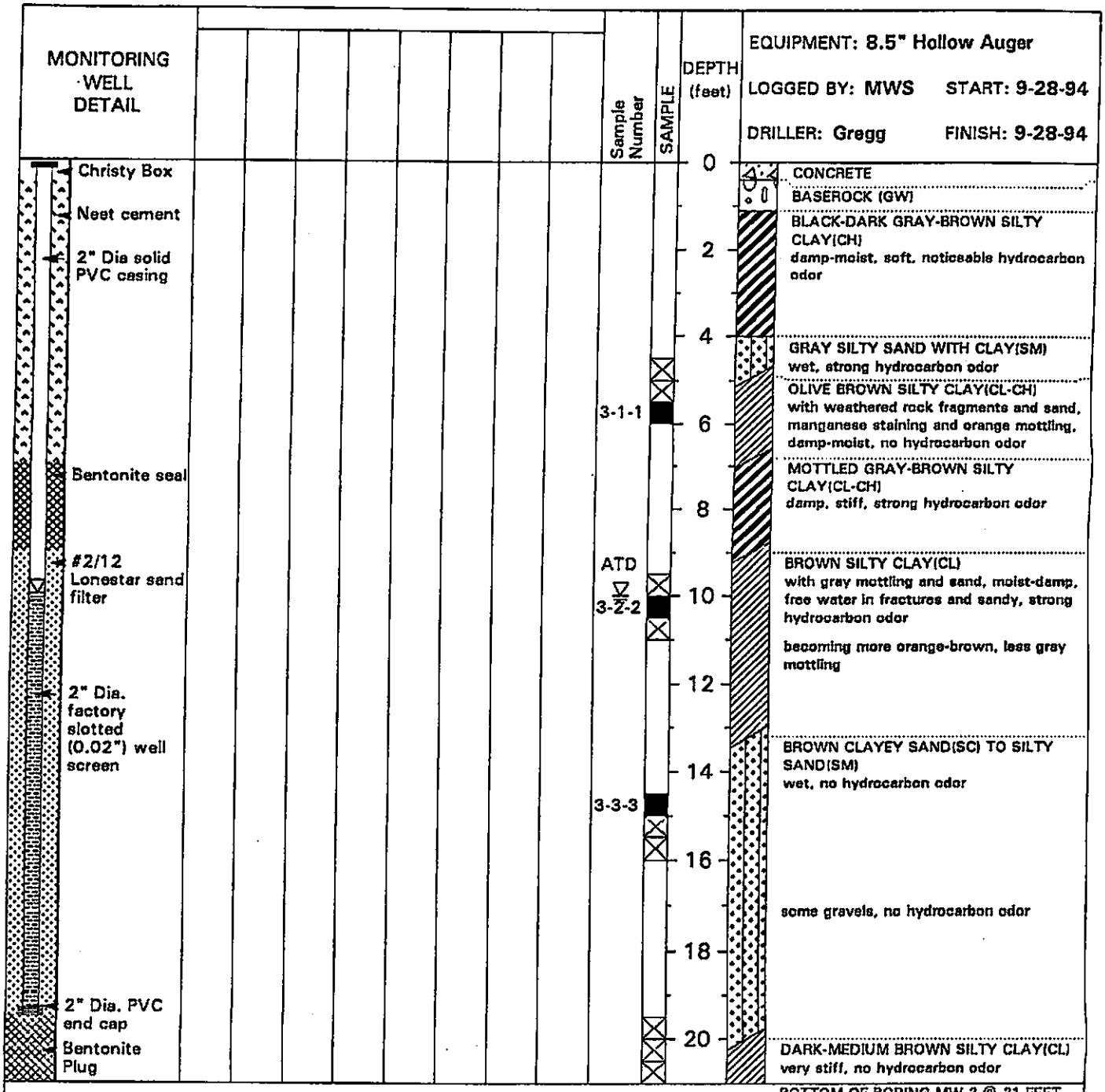
Touchstone Developments
Environmental Management

Job No: 94-14
CEG:
Lic No: 1014
Drwn: CD
Date: OCT 1994

Log of Boring MW-2 and Well Construction Details

3420 CASTRO VALLEY BLVD.

PLATE 4



LEGEND

■ Retained Samples

⊠ Record Samples

ND = Not Detected

NA = Not Analyzed

Touchstone Developments
Environmental Management

Job No: 94-14
CEG:
Lic No: 1014
Drwn: CD
Date: OCT 1994

Log of Boring MW-3 and Well Construction Details
3420 CASTRO VALLEY BLVD.

PLATE 5

APPENDIX A

Chemical Analytical Reports and Chain-of-Custody Forms

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 04-October-1994

ANALYSIS FOR CADMIUM, CHROMIUM, LEAD, NICKEL, & ZINC
by EPA Method SW-846 6010

Chronology

Laboratory Number 58759

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
1-1-3	09/28/94	09/29/94	10/03/94	10/03/94		1

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 04-October-1994

ANALYSIS FOR CADMIUM, CHROMIUM, LEAD, NICKEL, & ZINC

Laboratory Number	Sample Identification	Matrix
58759- 1	1-1-3	Soil

RESULTS OF ANALYSIS

Laboratory Number: 58759- 1

Cadmium	(Cd):	0.3
Chromium	(Cr):	28
Lead	(Pb):	7
Nickel	(Ni):	26
Zinc	(Zn):	30

Concentration: mg/Kg

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

ANALYSIS FOR CADMIUM, CHROMIUM, LEAD, NICKEL, & ZINC
Quality Assurance and Control Data - Soil

Laboratory Number 58759

Compound		Method Blank (mg/Kg)	RL (mg/Kg)	Spike Recovery (%)	Limits (%)	RPD (%)
Cadmium	(Cd):	ND<0.1	0.1	100/96	75-125	4%
Chromium	(Cr):	ND<0.2	0.2	103/90	75-125	13%
Lead	(Pb):	ND<2	2	105/94	75-125	11%
Nickel	(Ni):	ND<1	1	101/90	75-125	12%
Zinc	(Zn):	ND<0.5	0.5	115/95	75-125	19%

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
mg/Kg = Parts per million (ppm)
SPAC File No. 58759

Heather Sall 10/6/94
Senior Chemist
Account Manager

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

HALOGENATED VOLATILE ORGANICS by EPA SW-846 Methods 5030/8010.

Chronology

Laboratory Number 58759

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
1-1-3	09/28/94	09/29/94	10/05/94	10/05/94		1
1-2-2	09/28/94	09/29/94	10/05/94	10/05/94		2
2-1-1	09/28/94	09/29/94	10/05/94	10/05/94		3
2-2-1	09/28/94	09/29/94	10/05/94	10/05/94		4
3-1-1	09/28/94	09/29/94	10/05/94	10/05/94		6
3-2-8	09/28/94	09/29/94	10/05/94	10/05/94		7

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

HALOGENATED VOLATILE ORGANICS by EPA SW-846 Methods 5030/8010.

Laboratory Number	Sample Identification	Matrix
58759- 1	1-1-3	Soil
58759- 2	1-2-2	Soil
58759- 3	2-1-1	Soil
58759- 4	2-2-1	Soil
58759- 6	3-1-1	Soil

RESULTS OF ANALYSIS

Laboratory Number:	58759- 1	58759- 2	58759- 3	58759- 4	58759- 6
Chloromethane:	ND<5	ND<5	ND<5	ND<5	ND<5
Vinyl Chloride:	ND<5	ND<5	ND<5	ND<5	ND<5
Bromomethane:	ND<5	ND<5	ND<5	ND<5	ND<5
Chloroethane:	ND<5	ND<5	ND<5	ND<5	ND<5
Trichlorofluoromethane:	ND<5	ND<5	ND<5	ND<5	ND<5
1,1-Dichloroethene:	ND<5	ND<5	ND<5	ND<5	ND<5
Dichloromethane:	ND<10	ND<10	ND<10	ND<10	ND<10
t-1,2-Dichloroethene:	ND<5	ND<5	ND<5	ND<5	ND<5
1,1-Dichloroethane:	ND<5	ND<5	ND<5	ND<5	ND<5
c-1,2-Dichloroethene:	ND<5	ND<5	ND<5	ND<5	ND<5
Chloroform:	ND<5	ND<5	ND<5	ND<5	ND<5
1,1,1-Trichloroethane:	ND<5	ND<5	ND<5	ND<5	ND<5
Carbon tetrachloride:	ND<5	ND<5	ND<5	ND<5	ND<5
1,2-Dichloroethane:	ND<5	ND<5	ND<5	ND<5	ND<5
Trichloroethene:	ND<5	ND<5	ND<5	ND<5	ND<5
c-1,3-Dichloropropene:	ND<5	ND<5	ND<5	ND<5	ND<5
1,2-Dichloropropane:	ND<5	ND<5	ND<5	ND<5	ND<5
t-1,3-Dichloropropene:	ND<5	ND<5	ND<5	ND<5	ND<5
Bromodichloromethane:	ND<5	ND<5	ND<5	ND<5	ND<5
1,1,2-Trichloroethane:	ND<5	ND<5	ND<5	ND<5	ND<5
Tetrachloroethene:	ND<5	ND<5	ND<5	ND<5	ND<5
Dibromochloromethane:	ND<5	ND<5	ND<5	ND<5	ND<5
Chlorobenzene:	ND<5	ND<5	ND<5	ND<5	ND<5
Bromoform:	ND<5	ND<5	ND<5	ND<5	ND<5
1,1,2,2-Tetrachloroeth:	ND<5	ND<5	ND<5	ND<5	ND<5
1,3-Dichlorobenzene:	ND<5	ND<5	ND<5	ND<5	ND<5
1,2-Dichlorobenzene:	ND<5	ND<5	ND<5	ND<5	ND<5
1,4-Dichlorobenzene:	ND<5	ND<5	ND<5	ND<5	ND<5
Concentration:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

HALOGENATED VOLATILE ORGANICS by EPA SW-846 Methods 5030/8010.

Laboratory Number	Sample Identification	Matrix
58759- 7	3-2-2	Soil

RESULTS OF ANALYSIS

Laboratory Number: 58759- 7

Chloromethane:	ND<5
Vinyl Chloride:	ND<5
Bromomethane:	ND<5
Chloroethane:	ND<5
Trichlorofluoromethane:	ND<5
1,1-Dichloroethene:	ND<5
Dichloromethane:	ND<10
t-1,2-Dichloroethene:	ND<5
1,1-Dichloroethane:	ND<5
c-1,2-Dichloroethene:	ND<5
Chloroform:	ND<5
1,1,1-Trichloroethane:	ND<5
Carbon tetrachloride:	ND<5
1,2-Dichloroethane:	ND<5
Trichloroethene:	ND<5
c-1,3-Dichloropropene:	ND<5
1,2-Dichloropropane:	ND<5
t-1,3-Dichloropropene:	ND<5
Bromodichloromethane:	ND<5
1,1,2-Trichloroethane:	ND<5
Tetrachloroethene:	31
Dibromochloromethane:	ND<5
Chlorobenzene:	ND<5
Bromoform:	ND<5
1,1,2,2-Tetrachloroeth:	ND<5
1,3-Dichlorobenzene:	ND<5
1,2-Dichlorobenzene:	ND<5
1,4-Dichlorobenzene:	ND<5

Concentration: ug/Kg

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

HALOGENATED VOLATILE ORGANICS by EPA SW-846 Methods 5030/8010.
Quality Assurance and Control Data - Soil

Laboratory Number 58759

Compound	Method Blank (ug/Kg)	RL (ug/Kg)	Spike Recovery (%)	Limits (%)	RPD (%)
Chloromethane:	ND<5	5			
Vinyl Chloride:	ND<5	5			
Bromomethane:	ND<5	5			
Chloroethane:	ND<5	5			
Trichlorofluoromethane:	ND<5	5			
1,1-Dichloroethene:	ND<5	5	64/62	44-184	3%
Dichloromethane:	ND<10	10			
t-1,2-Dichloroethene:	ND<5	5			
1,1-Dichloroethane:	ND<5	5			
c-1,2-Dichloroethene:	ND<5	5			
Chloroform:	ND<5	5			
1,1,1-Trichloroethane:	ND<5	5			
Carbon tetrachloride:	ND<5	5			
1,2-Dichloroethane:	ND<5	5			
Trichloroethene:	ND<5	5	84/84	55-141	0%
c-1,3-Dichloropropene:	ND<5	5			
1,2-Dichloropropane:	ND<5	5			
t-1,3-Dichloropropene:	ND<5	5			
Bromodichloromethane:	ND<5	5			
1,1,2-Trichloroethane:	ND<5	5			
Tetrachloroethene:	ND<5	5			
Dibromochloromethane:	ND<5	5			
Chlorobenzene:	ND<5	5	109/105	63-158	4%
Bromoform:	ND<5	5			
1,1,2,2-Tetrachloroeth:	ND<5	5			
1,3-Dichlorobenzene:	ND<5	5			
1,2-Dichlorobenzene:	ND<5	5			
1,4-Dichlorobenzene:	ND<5	5			

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
ug/Kg = Parts per billion (ppb)
QC File No. 58759

Asael Sabatini 10/6/94
Senior Chemist
Account Manager

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 07-October-1994

OIL AND GREASE BY STANDARD METHODS 5520F

Chronology

Laboratory Number 58759

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
1-1-3	09/28/94	09/29/94	10/06/94	10/06/94		1
1-2-2	09/28/94	09/29/94	10/06/94	10/06/94		2
2-1-1	09/28/94	09/29/94	10/06/94	10/06/94		3
2-2-1	09/28/94	09/29/94	10/06/94	10/06/94		4
3-1-1	09/28/94	09/29/94	10/06/94	10/06/94		6
3-2-2	09/28/94	09/29/94	10/06/94	10/06/94		7

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 07-October-1994

OIL AND GREASE BY STANDARD METHODS 5520F

Laboratory Number	Sample Identification	Matrix
58759- 1	1-1-3	Soil
58759- 2	1-2-2	Soil
58759- 3	2-1-1	Soil
58759- 4	2-2-1	Soil
58759- 6	3-1-1	Soil
58759- 7	3-2-2	Soil

RESULTS OF ANALYSIS

Laboratory Number:	58759- 1	58759- 2	58759- 3	58759- 4	58759- 6
Oil and Grease:	ND<50	ND<50	ND<50	ND<50	550
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Laboratory Number:	58759- 7
Oil and Grease:	1300
Concentration:	mg/kg

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

OIL AND GREASE BY STANDARD METHODS 5520F
Quality Assurance and Control Data - Soil

Laboratory Number 58759

Compound	Method Blank (mg/kg)	RL (mg/kg)	Spike Recovery (%)	Limits (%)	RPD (%)
Oil and Grease:	ND<50	50	84/79	52-120	6%

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
mg/kg = Parts per million (ppm)
QC File No. 58759

Cecilia G. Joaquin 10/7/94
Senior Chemist
Account Manager

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS

Chronology

Laboratory Number 58759

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
1-1-3	09/28/94	09/29/94	10/01/94	10/02/94		1
1-2-2	09/28/94	09/29/94	10/01/94	10/02/94		2
2-1-1	09/28/94	09/29/94	10/01/94	10/02/94		3
2-2-1	09/28/94	09/29/94	10/01/94	10/02/94		4
3-1-1	09/28/94	09/29/94	10/01/94	10/02/94		6
3-2-2	09/28/94	09/29/94	10/01/94	10/02/94		7

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS

Laboratory Number	Sample Identification	Matrix
58759- 1	1-1-3	Soil
58759- 2	1-2-2	Soil
58759- 3	2-1-1	Soil
58759- 4	2-2-1	Soil
58759- 6	3-1-1	Soil

RESULTS OF ANALYSIS

Laboratory Number:	58759- 1	58759- 2	58759- 3	58759- 4	58759- 6
bis(2-chloroethyl)ethe:	ND<300	ND<300	ND<300	ND<300	ND<300
aniline:	ND<300	ND<300	ND<300	ND<300	ND<300
phenol:	ND<300	ND<300	ND<300	ND<300	ND<300
2-chlorophenol:	ND<300	ND<300	ND<300	ND<300	ND<300
1,3-dichlorobenzene:	ND<300	ND<300	ND<300	ND<300	ND<300
1,4-dichlorobenzene:	ND<300	ND<300	ND<300	ND<300	ND<300
1,2-dichlorobenzene:	ND<300	ND<300	ND<300	ND<300	ND<300
benzyl alcohol:	ND<300	ND<300	ND<300	ND<300	ND<300
bis-(2-chloroisopropyl:	ND<300	ND<300	ND<300	ND<300	ND<300
2-methylphenol:	ND<300	ND<300	ND<300	ND<300	ND<300
hexachloroethane:	ND<300	ND<300	ND<300	ND<300	ND<300
n-nitroso-di-n-propyla:	ND<300	ND<300	ND<300	ND<300	ND<300
4-methylphenol:	ND<300	ND<300	ND<300	ND<300	ND<300
nitrobenzene:	ND<300	ND<300	ND<300	ND<300	ND<300
isophorone:	ND<300	ND<300	ND<300	ND<300	ND<300
2-nitrophenol:	ND<300	ND<300	ND<300	ND<300	ND<300
2,4-dimethylphenol:	ND<300	ND<300	ND<300	ND<300	ND<300
bis(2-chloroethoxy)met:	ND<300	ND<300	ND<300	ND<300	ND<300
2,4-dichlorophenol:	ND<300	ND<300	ND<300	ND<300	ND<300
1,2,4-trichlorobenzene:	ND<300	ND<300	ND<300	ND<300	ND<300
naphthalene:	ND<300	ND<300	ND<300	ND<300	ND<300
benzoic acid:	ND<300	ND<300	ND<300	ND<300	ND<300
4-chloroaniline:	ND<300	ND<300	ND<300	ND<300	ND<300
hexachlorobutadiene:	ND<300	ND<300	ND<300	ND<300	ND<300
4-chloro-3-methylpheno:	ND<300	ND<300	ND<300	ND<300	ND<300
2-methyl-naphthalene:	ND<300	ND<300	ND<300	ND<300	500
hexaclorocyclopentadie:	ND<300	ND<300	ND<300	ND<300	ND<300
2,4,6-trichlorophenol:	ND<300	ND<300	ND<300	ND<300	ND<300
2,4,5-trichlorophenol:	ND<300	ND<300	ND<300	ND<300	ND<300
Concentration:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS

Laboratory Number	Sample Identification	Matrix
58759- 1	1-1-3	Soil
58759- 2	1-2-2	Soil
58759- 3	2-1-1	Soil
58759- 4	2-2-1	Soil
58759- 6	3-1-1	Soil

RESULTS OF ANALYSIS

Laboratory Number:	58759- 1	58759- 2	58759- 3	58759- 4	58759- 6
2-chloronaphthalene:	ND<300	ND<300	ND<300	ND<300	ND<300
2-nitroaniline:	ND<300	ND<300	ND<300	ND<300	ND<300
acenaphthylene:	ND<300	ND<300	ND<300	ND<300	ND<300
dimethylphthlate:	ND<300	ND<300	ND<300	ND<300	ND<300
2,6-dinitrotoluene:	ND<300	ND<300	ND<300	ND<300	ND<300
acenaphthene:	ND<300	ND<300	ND<300	ND<300	ND<300
3-nitroaniline:	ND<300	ND<300	ND<300	ND<300	ND<300
2,4-dinitrophenol:	ND<300	ND<300	ND<300	ND<300	ND<300
dibenzofuran:	ND<300	ND<300	ND<300	ND<300	ND<300
2,4-dinitrotoluene:	ND<300	ND<300	ND<300	ND<300	ND<300
4-nitrophenol:	ND<300	ND<300	ND<300	ND<300	ND<300
fluorene:	ND<300	ND<300	ND<300	ND<300	ND<300
4-chlorophenyl-phenyle:	ND<300	ND<300	ND<300	ND<300	ND<300
diethylphthlate:	ND<300	ND<300	ND<300	ND<300	ND<300
4-nitroaniline:	ND<300	ND<300	ND<300	ND<300	ND<300
4,6-dinitro-2-methylph:	ND<300	ND<300	ND<300	ND<300	ND<300
n-nitrosodiphenylamine:	ND<300	ND<300	ND<300	ND<300	ND<300
1,2-diphenylhydrazine:	ND<300	ND<300	ND<300	ND<300	ND<300
4-bromo-phenyl-phenyle:	ND<300	ND<300	ND<300	ND<300	ND<300
hexachlorobenzene:	ND<300	ND<300	ND<300	ND<300	ND<300
pentachlorophenol:	ND<300	ND<300	ND<300	ND<300	ND<300
phenanthrene:	ND<300	ND<300	ND<300	ND<300	ND<300
anthracene:	ND<300	ND<300	ND<300	ND<300	ND<300
di-n-butylphthlate:	ND<300	ND<300	ND<300	ND<300	ND<300
fluoranthene:	ND<300	ND<300	ND<300	ND<300	ND<300
benzidine:	ND<300	ND<300	ND<300	ND<300	ND<300
pyrene:	ND<300	ND<300	ND<300	ND<300	ND<300
butylbenzylphthlate:	ND<300	ND<300	ND<300	ND<300	ND<300
3.3'-dichlorobenzidine:	ND<300	ND<300	ND<300	ND<300	ND<300
Concentration:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS

Laboratory Number	Sample Identification	Matrix
58759- 1	1-1-3	Soil
58759- 2	1-2-2	Soil
58759- 3	2-1-1	Soil
58759- 4	2-2-1	Soil
58759- 6	3-1-1	Soil

RESULTS OF ANALYSIS

Laboratory Number:	58759- 1	58759- 2	58759- 3	58759- 4	58759- 6
benzo[a]anthracene:	ND<300	ND<300	ND<300	ND<300	ND<300
chrysene:	ND<300	ND<300	ND<300	ND<300	ND<300
bis(2-ethylhexyl)phtha:	ND<300	ND<300	ND<300	ND<300	ND<300
di-n-octylphthalate:	ND<300	ND<300	ND<300	ND<300	ND<300
benzo(b,k)fluoranthene:	ND<300	ND<300	ND<300	ND<300	ND<300
benzo[a]pyrene:	ND<300	ND<300	ND<300	ND<300	ND<300
indeno[1,2,3-cd]pyrene:	ND<300	ND<300	ND<300	ND<300	ND<300
dibenzo[a,h]anthracene:	ND<300	ND<300	ND<300	ND<300	ND<300
benzo[g,h,i]perylene:	ND<300	ND<300	ND<300	ND<300	ND<300
Concentration:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
-- Surrogate % Recoveries --					
2-fluorophenol:	78	83	76	82	80
phenol-d5:	83	88	80	88	84
nitrobenzene-d5:	89	91	85	100	93
2-fluorobiphenyl:	90	92	88	95	97
2,4,6-tribromophenol:	93	98	90	100	93
terphenyl-d14:	89	94	87	100	96

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS

Laboratory Number	Sample Identification	Matrix
58759- 7	3-2-2	Soil

RESULTS OF ANALYSIS

Laboratory Number: 58759- 7

bis(2-chloroethyl)ethe:	ND<300
aniline:	ND<300
phenol:	ND<300
2-chlorophenol:	ND<300
1,3-dichlorobenzene:	ND<300
1,4-dichlorobenzene:	ND<300
1,2-dichlorobenzene:	ND<300
benzyl alcohol:	ND<300
bis-(2-chloroisopropyl:	ND<300
2-methylphenol:	ND<300
hexachloroethane:	ND<300
n-nitroso-di-n-propyla:	ND<300
4-methylphenol:	ND<300
nitrobenzene:	ND<300
isophorone:	ND<300
2-nitrophenol:	ND<300
2,4-dimethylphenol:	ND<300
bis(2-chloroethoxy)met:	ND<300
2,4-dichlorophenol:	ND<300
1,2,4-trichlorobenzene:	ND<300
naphthalene:	600
benzoic acid:	ND<300
4-chloroaniline:	ND<300
hexachlorobutadiene:	ND<300
4-chloro-3-methylpheno:	ND<300
2-methyl-naphthalene:	700
hexaclorocyclopentadie:	ND<300
2,4,6-trichlorophenol:	ND<300
2,4,5-trichlorophenol:	ND<300
Concentration:	ug/kg

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-2429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS

Laboratory Number	Sample Identification	Matrix
58759- 7	3-2-2	Soil

RESULTS OF ANALYSIS

Laboratory Number: 58759- 7

2-chloronaphthalene:	ND<300
2-nitroaniline:	ND<300
acenaphthylene:	ND<300
dimethylphthlate:	ND<300
2,6-dinitrotoluene:	ND<300
acenaphthene:	ND<300
3-nitroaniline:	ND<300
2,4-dinitrophenol:	ND<300
dibenzofuran:	ND<300
2,4-dinitrotoluene:	ND<300
4-nitrophenol:	ND<300
fluorene:	ND<300
4-chlorophenyl-phenyle:	ND<300
diethylphthlate:	ND<300
4-nitroaniline:	ND<300
4,6-dinitro-2-methylph:	ND<300
n-nitrosodiphenylamine:	ND<300
1,2-diphenylhydrazine:	ND<300
4-bromo-phenyl-phenyle:	ND<300
hexachlorobenzene:	ND<300
pentachlorophenol:	ND<300
phenanthrene:	ND<300
anthracene:	ND<300
di-n-butylphthlate:	ND<300
fluoranthene:	ND<300
benzidine:	ND<300
pyrene:	ND<300
butylbenzylphthlate:	ND<300
3.3'-dichlorobenzidine:	ND<300
Concentration:	ug/kg

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS
Quality Assurance and Control Data - Soil

Laboratory Number 58759

Compound	Method Blank (ug/kg)	RL (ug/kg)	Spike Recovery (%)	Limits (%)	RPD (%)
2-chloronaphthalene:	ND<300	300			
2-nitroaniline:	ND<300	300			
acenaphthylene:	ND<300	300			
dimethylphthlate:	ND<300	300			
2,6-dinitrotoluene:	ND<300	300			
acenaphthene:	ND<300	300	91/89	35-137	2%
3-nitroaniline:	ND<300	300			
2,4-dinitrophenol:	ND<300	300			
dibenzofuran:	ND<300	300			
2,4-dinitrotoluene:	ND<300	300	88/87	28-118	1%
4-nitrophenol:	ND<300	300	63/62	1-111	2%
fluorene:	ND<300	300			
4-chlorophenyl-phenyle:	ND<300	300			
diethylphthlate:	ND<300	300			
4-nitroaniline:	ND<300	300			
4,6-dinitro-2-methylph:	ND<300	300			
n-nitrosodiphenylamine:	ND<300	300			
1,2-diphenylhydrazine:	ND<300	300			
4-bromo-phenyl-phenyle:	ND<300	300			
hexachlorobenzene:	ND<300	300			
pentachlorophenol:	ND<300	300	77/75	14-123	3%
phenanthrene:	ND<300	300			
anthracene:	ND<300	300			
di-n-butylphthlate:	ND<300	300			
fluoranthene:	ND<300	300			
benzidine:	ND<300	300			
pyrene:	ND<300	300	101/104	41-131	3%
butylbenzylphthlate:	ND<300	300			
3.3'-dichlorobenzidine:	ND<300	300			

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS

Laboratory Number	Sample Identification	Matrix
58759- 7	3-2-2	Soil

RESULTS OF ANALYSIS

Laboratory Number: 58759- 7

benzo[a]anthracene:	ND<300
chrysene:	ND<300
bis(2-ethylhexyl)phtha:	ND<300
di-n-octylphthalate:	ND<300
benzo(b,k)fluoranthene:	ND<300
benzo[a]pyrene:	ND<300
indeno[1,2,3-cd]pyrene:	ND<300
dibenzo[a,h]anthracene:	ND<300
benzo[g,h,i]perylene:	ND<300
Concentration:	ug/kg

-- Surrogate % Recoveries --	
2-fluorophenol:	73
phenol-d5:	77
nitrobenzene-d5:	88
2-fluorobiphenyl:	89
2,4,6-tribromophenol:	90
terphenyl-d14:	91

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS
Quality Assurance and Control Data - Soil

Laboratory Number 58759

Compound	Method Blank (ug/kg)	RL (ug/kg)	Spike Recovery (%)	Limits (%)	RPD (%)
2-chloronaphthalene:	ND<300	300			
2-nitroaniline:	ND<300	300			
acenaphthylene:	ND<300	300			
dimethylphthlate:	ND<300	300			
2,6-dinitrotoluene:	ND<300	300			
acenaphthene:	ND<300	300	91/89	35-137	2%
3-nitroaniline:	ND<300	300			
2,4-dinitrophenol:	ND<300	300			
dibenzofuran:	ND<300	300			
2,4-dinitrotoluene:	ND<300	300	88/87	28-118	1%
4-nitrophenol:	ND<300	300	63/62	1-111	2%
fluorene:	ND<300	300			
4-chlorophenyl-phenyle:	ND<300	300			
diethylphthlate:	ND<300	300			
4-nitroaniline:	ND<300	300			
4,6-dinitro-2-methylph:	ND<300	300			
n-nitrosodiphenylamine:	ND<300	300			
1,2-diphenylhydrazine:	ND<300	300			
4-bromo-phenyl-phenyle:	ND<300	300			
hexachlorobenzene:	ND<300	300			
pentachlorophenol:	ND<300	300	77/75	14-123	3%
phenanthrene:	ND<300	300			
anthracene:	ND<300	300			
di-n-butylphthlate:	ND<300	300			
fluoranthene:	ND<300	300			
benzidine:	ND<300	300			
pyrene:	ND<300	300	101/104	41-131	3%
butylbenzylphthlate:	ND<300	300			
3.3'-dichlorobenzidine:	ND<300	300			

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS
Quality Assurance and Control Data - Soil

Laboratory Number 58759

Compound	Method Blank (ug/kg)	RL (ug/kg)	Spike Recovery (%)	Limits (%)	RPD (%)
benzo[a]anthracene:	ND<300	300			
chrysene:	ND<300	300			
bis(2-ethylhexyl)phtha:	ND<300	300			
di-n-octylphthalate:	ND<300	300			
benzo(b,k)fluoranthene:	ND<300	300			
benzo[a]pyrene:	ND<300	300			
indeno[1,2,3-cd]pyrene:	ND<300	300			
dibenzo[a,h]anthracene:	ND<300	300			
benzo[g,h,i]perylene:	ND<300	300			
2-fluorophenol:	90			25-121	
phenol-d5:	95			24-113	
nitrobenzene-d5:	98			23-120	
2-fluorobiphenyl:	95			30-115	
2,4,6-tribromophenol:	101			19-122	
terphenyl-d14:	98			18-137	

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
ug/kg = Parts per billion (ppb)
QC File No. 58759

Cecilia G. Joaquin 10/7/94
Senior Chemist
Account Manager

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 04-October-1994

TOTAL PETROLEUM HYDROCARBONS AS DIESEL
BY EPA METHOD 8015M

Chronology

Laboratory Number 58759

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
1-1-3	09/28/94	09/29/94	10/03/94	10/04/94		1
1-2-2	09/28/94	09/29/94	10/03/94	10/04/94		2
2-1-1	09/28/94	09/29/94	10/03/94	10/04/94		3
2-2-1	09/28/94	09/29/94	10/03/94	10/04/94		4
3-1-1	09/28/94	09/29/94	10/03/94	10/04/94		6
3-2-2	09/28/94	09/29/94	10/03/94	10/04/94		7

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 04-October-1994

TOTAL PETROLEUM HYDROCARBONS AS DIESEL

Laboratory Number	Sample Identification	Matrix
58759- 1	1-1-3	Soil
58759- 2	1-2-2	Soil
58759- 3	2-1-1	Soil
58759- 4	2-2-1	Soil
58759- 6	3-1-1	Soil
58759- 7	3-2-2	Soil

RESULTS OF ANALYSIS

Laboratory Number:	58759- 1	58759- 2	58759- 3	58759- 4	58759- 6
Diesel Range:	ND<10	ND<10	ND<10	ND<10	210*
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Laboratory Number:	58759- 7
Diesel Range:	560*
Concentration:	mg/kg

* DOES NOT MATCH TYPICAL DIESEL PATTERN--HEAVIER HYDROCARBONS PRESENT

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOTAL PETROLEUM HYDROCARBONS AS DIESEL
Quality Assurance and Control Data - Soil

Laboratory Number 58759

Compound	Method Blank (mg/kg)	RL (mg/kg)	Spike Recovery (%)	Limits (%)	RPD (%)
Diesel Range:	ND<10	10	150/139	50-150	8%

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
mg/kg = Parts per million (ppm)
QC File No. 58759

Cecilia G. Joaquin 10/7/94
Senior Chemist
Account Manager

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

ANALYSIS FOR GASOLINE, BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
by EPA SW-846 Methods 5030/8015M/8020.

Chronology

Laboratory Number 58759

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
1-1-3	09/28/94	09/29/94	10/02/94	10/02/94		1
1-2-2	09/28/94	09/29/94	10/02/94	10/02/94		2
2-1-1	09/28/94	09/29/94	10/02/94	10/02/94		3
2-2-1	09/28/94	09/29/94	10/02/94	10/02/94		4
3-1-1	09/28/94	09/29/94	10/02/94	10/02/94		6
3-2-2	09/28/94	09/29/94	10/02/94	10/02/94		7

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

ANALYSIS FOR GASOLINE, BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES

Laboratory Number	Sample Identification	Matrix
58759- 1	1-1-3	Soil
58759- 2	1-2-2	Soil
58759- 3	2-1-1	Soil
58759- 4	2-2-1	Soil
58759- 6	3-1-1	Soil
58759- 7	3-2-2	Soil

RESULTS OF ANALYSIS

Laboratory Number:	58759- 1	58759- 2	58759- 3	58759- 4	58759- 6
Gasoline_Range:	ND<1	ND<1	ND<1	ND<1	4
Benzene:	ND<.005	ND<.005	ND<.005	ND<.005	0.022
Toluene:	ND<.005	ND<.005	ND<.005	ND<.005	0.072
Ethyl Benzene:	ND<.005	ND<.005	ND<.005	ND<.005	0.067
Total Xylenes:	ND<.005	ND<.005	ND<.005	ND<.005	0.28
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
-- Surrogate % Recoveries --					
Trifluorotoluene (SS):	87	92	84	95	111

Laboratory Number:	58759- 7
Gasoline_Range:	14
Benzene:	0.047
Toluene:	0.016
Ethyl Benzene:	0.068
Total Xylenes:	0.58
Concentration:	mg/kg
-- Surrogate % Recoveries --	
Trifluorotoluene (SS):	111

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

ANALYSIS FOR GASOLINE, BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
Quality Assurance and Control Data - Soil

Laboratory Number 58759

Compound	Method Blank (mg/kg)	RL (mg/kg)	Spike Recovery (%)	Limits (%)	RPD (%)
Gasoline_Range:	ND<1	1	78/87	50-123	11%
Benzene:	ND<.005	.005	70/70	59-153	0%
Toluene:	ND<.005	.005	83/82	59-153	1%
Ethyl Benzene:	ND<.005	.005	85/85	59-153	0%
Total Xylenes:	ND<.005	.005	99/96	59-153	3%

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
mg/kg = Parts per million (ppm)
QC File No. 58759

Cecilia G. Joaquin 10/7/94
Senior Chemist
Account Manager

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

58134

CHAIN-OF-CUSTODY-RECORD

Touchstone Developments
Environmental Management
684 30th Avenue
San Francisco, CA 94121
415-386-8791

Project Number 94-14
Project Address 3430 CASTRO Valley BLVD "Good year"

Project Manager Michael Tambroni
Phone (415) 386-8791 Fax (415) 386-8791

Laboratory Superior Precision Analytical Inc.
Samples Collected By ~~Michael Tambroni~~ MARC SEELEY
Collection Date 4-28-94
Signature

Sample ID	Lab Sample #	# of Containers	S=soil W=water	C=composite D=discrete G=grab	Time	Iced(yes or no)	TPH Gas + BTXE 8015 +8020	TPH Diesel 8015	Oil & Grease 5520	8010	8270	Metals Cd,Cr,Pb,Zn,Ni	Organic Lead				Remarks
1-1-3	1	1	S	D	0830	Y	✓	✓	✓	✓	✓	✓					
1-2-2	2	1	S	D	0840	Y	✓	✓	✓	✓	✓						
2-1-1	3	1	S	D	1000	Y	✓	✓	✓	✓	✓						
2-2-1	4	1	S	D	1020	Y	✓	✓	✓	✓	✓						
2-3-3	5	1	S	D	1044	Y											HOLD
3-1-4	6	1	S	D	1255	Y	✓	✓	✓	✓	✓						
3-2-8	7	1	S	D	1310	Y	✓	✓	✓	✓	✓						
3-3-1	8	1	S	D	1330	Y											HOLD

Please initial: SS
Samples Stored in ice 4 °C
Appropriate containers
Samples preserved OK
VOA's without headspace
Comments:

Relinquished By	Organization	Date/Time	Relinquished By	Organization	Date/Time
	TD	9/29/94 20:00			
	TD	9/29/94 20:00			
	TD	9-29-94 1515	Received for Laboratory By		Date/Time 9/29/94 1715

Turn Around Time
24 hour
48 hour
72 hour
5 day

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 11-October-1994

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS

Chronology

Laboratory Number 92709

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW-1	09/30/94	10/03/94	10/06/94	10/10/94		1
MW-2	09/30/94	10/03/94	10/06/94	10/10/94		2
MW-3	09/30/94	10/03/94	10/06/94	10/10/94		3

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 11-October-1994

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS

Laboratory Number	Sample Identification	Matrix
92709- 1	MW-1	Water
92709- 2	MW-2	Water
92709- 3	MW-3	Water

RESULTS OF ANALYSIS

Laboratory Number:	92709- 1	92709- 2	92709- 3
bis(2-chloroethyl)ethe:	ND<10	ND<10	ND<10
aniline:	ND<10	ND<10	ND<10
phenol:	ND<10	ND<10	ND<10
2-chlorophenol:	ND<10	ND<10	ND<10
1,3-dichlorobenzene:	ND<10	ND<10	ND<10
1,4-dichlorobenzene:	ND<10	ND<10	ND<10
1,2-dichlorobenzene:	ND<10	ND<10	ND<10
benzyl alcohol:	ND<10	ND<10	ND<10
bis-(2-chloroisopropyl:	ND<10	ND<10	ND<10
2-methylphenol:	ND<10	ND<10	ND<10
hexachloroethane:	ND<10	ND<10	ND<10
n-nitroso-di-n-propyla:	ND<10	ND<10	ND<10
4-methylphenol:	ND<10	ND<10	ND<10
nitrobenzene:	ND<10	ND<10	ND<10
isophorone:	ND<10	ND<10	ND<10
2-nitrophenol:	ND<10	ND<10	ND<10
2,4-dimethylphenol:	ND<10	ND<10	ND<10
bis(2-chloroethoxy)met:	ND<10	ND<10	ND<10
2,4-dichlorophenol:	ND<10	ND<10	ND<10
1,2,4-trichlorobenzene:	ND<10	ND<10	ND<10
naphthalene:	ND<10	ND<10	ND<10
benzoic acid:	ND<10	ND<10	ND<10
4-chloroaniline:	ND<10	ND<10	ND<10
hexachlorobutadiene:	ND<10	ND<10	ND<10
4-chloro-3-methylpheno:	ND<10	ND<10	ND<10
2-methyl-naphthalene:	ND<10	ND<10	ND<10
hexaclorocyclopentadie:	ND<10	ND<10	ND<10
2,4,6-trichlorophenol:	ND<10	ND<10	ND<10
2,4,5-trichlorophenol:	ND<10	ND<10	ND<10
Concentration:	ug/L	ug/L	ug/L

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763 2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 11-October-1994

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS

Laboratory Number	Sample Identification	Matrix
92709- 1	MW-1	Water
92709- 2	MW-2	Water
92709- 3	MW-3	Water

RESULTS OF ANALYSIS

Laboratory Number:	92709- 1	92709- 2	92709- 3
2-chloronaphthalene:	ND<10	ND<10	ND<10
2-nitroaniline:	ND<10	ND<10	ND<10
acenaphthylene:	ND<10	ND<10	ND<10
dimethylphthlate:	ND<10	ND<10	ND<10
2,6-dinitrotoluene:	ND<10	ND<10	ND<10
acenaphthene:	ND<10	ND<10	ND<10
3-nitroaniline:	ND<10	ND<10	ND<10
2,4-dinitrophenol:	ND<10	ND<10	ND<10
dibenzofuran:	ND<10	ND<10	ND<10
2,4-dinitrotoluene:	ND<10	ND<10	ND<10
4-nitrophenol:	ND<10	ND<10	ND<10
fluorene:	ND<10	ND<10	ND<10
4-chlorophenyl-phenyle:	ND<10	ND<10	ND<10
diethylphthlate:	ND<10	ND<10	ND<10
4-nitroaniline:	ND<10	ND<10	ND<10
4,6-dinitro-2-methylph:	ND<10	ND<10	ND<10
n-nitrosodiphenylamine:	ND<10	ND<10	ND<10
1,2-diphenylhydrazine:	ND<10	ND<10	ND<10
4-bromo-phenyl-phenyle:	ND<10	ND<10	ND<10
hexachlorobenzene:	ND<10	ND<10	ND<10
pentachlorophenol:	ND<10	ND<10	ND<10
phenanthrene:	ND<10	ND<10	ND<10
anthracene:	ND<10	ND<10	ND<10
di-n-butylphthlate:	ND<10	ND<10	ND<10
fluoranthene:	ND<10	ND<10	ND<10
benzidine:	ND<10	ND<10	ND<10
pyrene:	ND<10	ND<10	ND<10
butylbenzylphthlate:	ND<10	ND<10	ND<10
3.3'-dichlorobenzidine:	ND<10	ND<10	ND<10
Concentration:	ug/L	ug/L	ug/L

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 11-October-1994

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS

Laboratory Number	Sample Identification	Matrix
92709- 1	MW-1	Water
92709- 2	MW-2	Water
92709- 3	MW-3	Water

RESULTS OF ANALYSIS

Laboratory Number:	92709- 1	92709- 2	92709- 3
benzo[a]anthracene:	ND<10	ND<10	ND<10
chrysene:	ND<10	ND<10	ND<10
bis(2-ethylhexyl)phtha:	10	ND<10	ND<10
di-n-octylphthalate:	ND<10	ND<10	ND<10
benzo(b,k)fluoranthene:	ND<10	ND<10	ND<10
benzo[a]pyrene:	ND<10	ND<10	ND<10
indeno[1,2,3-cd]pyrene:	ND<10	ND<10	ND<10
dibenzo[a,h]anthracene:	ND<10	ND<10	ND<10
benzo[g,h,i]perylene:	ND<10	ND<10	ND<10
Concentration:	ug/L	ug/L	ug/L
-- Surrogate % Recoveries --			
2-fluorophenol:	32	40	15*
phenol-d5:	24	31	12
nitrobenzene-d5:	83	89	88
2-fluorobiphenyl:	82	89	87
2,4,6-tribromophenol:	71	109	84
terphenyl-d14:	80	88	81

* Surrogate low due to matrix interference.

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS
Quality Assurance and Control Data - Water

Laboratory Number 92709

ompound	Method Blank (ug/L)	RL (ug/L)	Spike Recovery (%)	Limits (%)	RPD (%)
is(2-chloroethyl)ethe:	ND<10	10			
niline:	ND<10	10			
henol:	ND<10	10	54/54	9-61	0%
-chlorophenol:	ND<10	10	90/90	30-113	0%
,3-dichlorobenzene:	ND<10	10			
,4-dichlorobenzene:	ND<10	10	81/81	42-111	0%
,2-dichlorobenzene:	ND<10	10			
enzyl alcohol:	ND<10	10			
is-(2-chloroisopropyl:	ND<10	10			
-methylphenol:	ND<10	10			
exachloroethane:	ND<10	10			
-nitroso-di-n-propyla:	ND<10	10	72/74	43-119	3%
-methylphenol:	ND<10	10			
itrobenzene:	ND<10	10			
sophorone:	ND<10	10			
-nitrophenol:	ND<10	10			
,4-dimethylphenol:	ND<10	10			
is(2-chloroethoxy)met:	ND<10	10			
,4-dichlorophenol:	ND<10	10			
,2,4-trichlorobenzene:	ND<10	10	98/98	44-118	0%
aphthalene:	ND<10	10			
enzoic acid:	ND<10	10			
-chloroaniline:	ND<10	10			
exachlorobutadiene:	ND<10	10			
-chloro-3-methylpheno:	ND<10	10	90/88	28-117	2%
-methyl-naphthalene:	ND<10	10			
exaclorocyclopentadie:	ND<10	10			
,4,6-trichlorophenol:	ND<10	10			
,4,5-trichlorophenol:	ND<10	10			

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1576

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS
Quality Assurance and Control Data - Water

Laboratory Number 92709

›mpound	Method Blank (ug/L)	RL (ug/L)	Spike Recovery (%)	Limits (%)	RPD (%)
-chloronaphthalene:	ND<10	10			
-nitroaniline:	ND<10	10			
:enaphthylene:	ND<10	10			
imethylphthlate:	ND<10	10			
,6-dinitrotoluene:	ND<10	10			
:enaphthene:	ND<10	10	92/93	51-125	1%
-nitroaniline:	ND<10	10			
,4-dinitrophenol:	ND<10	10			
ibenzofuran:	ND<10	10			
,4-dinitrotoluene:	ND<10	10	92/93	38-104	1%
-nitrophenol:	ND<10	10	32/33	10-80	3%
luorene:	ND<10	10			
-chlorophenyl-phenyle:	ND<10	10			
iethylphthlate:	ND<10	10			
-nitroaniline:	ND<10	10			
,6-dinitro-2-methylph:	ND<10	10			
-nitrosodiphenylamine:	ND<10	10			
,2-diphenylhydrazine:	ND<10	10			
-bromo-phenyl-phenyle:	ND<10	10			
exachlorobenzene:	ND<10	10			
entachlorophenol:	ND<10	10	79/81	16-118	3%
henanthrene:	ND<10	10			
nthracene:	ND<10	10			
i-n-butylphthlate:	ND<10	10			
luoranthene:	ND<10	10			
enzidine:	ND<10	10			
yrene:	ND<10	10	110/109	16-116	1%
utylbenzylphthlate:	ND<10	10			
.3'-dichlorobenzidine:	ND<10	10			

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

EPA SW-846 METHOD 8270 SEMIVOLATILE ORGANICS BY GC/MS
Quality Assurance and Control Data - Water

Laboratory Number 92709

ompound	Method Blank (ug/L)	RL (ug/L)	Spike Recovery (%)	Limits (%)	RPD (%)
enzo[a]anthracene:	ND<10	10			
rysene:	ND<10	10			
s(2-ethylhexyl)phtha:	ND<10	10			
-n-octylphthalate:	ND<10	10			
enzo(b,k)fluoranthene:	ND<10	10			
enzo[a]pyrene:	ND<10	10			
deno[1,2,3-cd]pyrene:	ND<10	10			
benzo[a,h]anthracene:	ND<10	10			
enzo[g,h,i]perylene:	ND<10	10			
-fluorophenol:	38			21-110	
enol-d5:	27			10-110	
trobenzene-d5:	82			35-114	
-fluorobiphenyl:	83			43-116	
4,6-tribromophenol:	85			10-123	
rphenyl-d14:	82			33-141	

finitions:
) = Not Detected
D = Relative Percent Difference
. = Reporting Limit
/L = Parts per billion (ppb)
: File No. 92709

Cecilia G. Joaquin 10/11/94
Senior Chemist
Account Manager

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 10-October-1994

VOLATILE PETROLEUM HYDROCARBONS

Sample preparation by Purge and Trap (EPA SW-846 method 5030). Gasoline analysis by SW-846 method 8015 modified. Gasoline range quantified as all compounds between C6 and C10. Benzene, Toluene, Ethyl Benzene, and Xylenes analyses by EPA SW-846 method 8020.

Chronology

Laboratory Number 92709

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW-1	09/30/94	10/03/94	10/07/94	10/07/94		1
MW-2	09/30/94	10/03/94	10/07/94	10/07/94		2
MW-3	09/30/94	10/03/94	10/07/94	10/07/94		3

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553

1555 Burke St., Unit I
San Francisco, California 94124

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 10-October-1994

VOLATILE PETROLEUM HYDROCARBONS

Laboratory Number	Sample Identification	Matrix
92709- 1	MW 1	Water
92709- 2	MW-2	Water
92709- 3	MW-3	Water

RESULTS OF ANALYSIS

Laboratory Number:	92709- 1	92709- 2	92709- 3
Gasoline:	ND<50	ND<50	290
Benzene:	ND<0.5	ND<0.5	29
Toluene:	ND<0.5	ND<0.5	3.2
Ethyl Benzene:	ND<0.5	ND<0.5	3.3
Total Xylenes:	ND<0.5	ND<0.5	29
Concentration:	ug/L	ug/L	ug/L
-- Surrogate % Recoveries --			
Trifluorotoluene (SS):	129	127	129

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

VOLATILE PETROLEUM HYDROCARBONS
Quality Assurance and Control Data - Water

Laboratory Number 92709

ompound	Method Blank (ug/L)	RL (ug/L)	Spike Recovery (%)	Limits (%)	RPD (%)
asoline:	ND<50	50	102/99	56-117	3%
enzene:	ND<0.5	0.5	94/86	59-149	9%
oluene:	ND<0.5	0.5	98/92	59-149	6%
thyl Benzene:	ND<0.5	0.5	99/94	59-149	5%
otal Xylenes:	ND<0.5	0.5	102/98	59-149	4%

efinitions:
D = Not Detected
PD = Relative Percent Difference
L = Reporting Limit
g/L = Parts per billion (ppb)
C File No. 92709

10/10/94
Senior Chemist
Account Manager

Regional Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1517 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 08-October 1994

OIL & GREASE BY METHOD 5520

Chronology

Laboratory Number 92709

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW-1	09/30/94	10/03/94	10/07/94	10/07/94		1
MW-2	09/30/94	10/03/94	10/07/94	10/07/94		2
MW-3	09/30/94	10/03/94	10/07/94	10/07/94		3

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 08-October-1994

Laboratory Number	Sample Identification	Matrix
92709- 1	MW-1	Water
92709- 2	MW-2	Water
92709- 3	MW-3	Water

RESULTS OF ANALYSIS

Laboratory Number:	92709- 1	92709- 2	92709- 3
Oil and Grease:	ND<5000	ND<5000	ND<5000
Concentration:	ug/L	ug/L	ug/L

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Quality Assurance and Control Data - Water

Laboratory Number 92709

ompound	Method Blank (ug/L)	RL (ug/L)	Spike Recovery (%)	Limits (%)	RPD (%)
il and Grease:	ND<5000	5000	73/77	50-135	5%

)efinitions:
ID = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
ug/L = Parts per billion (ppb)
QC File No. 92709

10/10/94
Senior Chemist
Account Manager

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-7081 / fax (415) 821 7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763 8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

TOTAL PETROLEUM HYDROCARBONS AS DIESEL
by EPA METHOD 8015 MODIFIED

Chronology

Laboratory Number 92709

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW-1	09/30/94	10/03/94	10/05/94	10/05/94		1
MW-2	09/30/94	10/03/94	10/05/94	10/05/94		2
MW-3	09/30/94	10/03/94	10/05/94	10/05/94		3

Accredited Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

TOTAL PETROLEUM HYDROCARBONS AS DIESEL

Laboratory Number	Sample Identification	Matrix
92709- 1	MW-1	Water
92709- 2	MW-2	Water
92709- 3	MW-3	Water

RESULTS OF ANALYSIS

Laboratory Number:	92709- 1	92709- 2	92709- 3
Diesel:	ND<50	ND<50	72
Concentration:	ug/L	ug/L	ug/L
-- Surrogate % Recoveries --			
Tetracosane Recovery:	108	106	117

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOTAL PETROLEUM HYDROCARBONS AS DIESEL
Quality Assurance and Control Data - Water

Laboratory Number 92709

Compound	Method Blank (ug/L)	RL (ug/L)	Spike Recovery (%)	Limits (%)	RPD (%)
Diesel:	ND<50	50	106/112	50-146	6%

Definitions:
ND = Not Detected
RPD = Relative Percent Difference
RL = Reporting Limit
ug/L = Parts per billion (ppb)
QC File No. 92709

Senior Chemist
Account Manager
10/10/94

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 871-7123

309 S. Cloverdale St., Suite B 24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

ANALYSIS FOR CADMIUM, CHROMIUM, LEAD, NICKEL, & ZINC
by EPA Method SW-846 6010

Chronology

Laboratory Number 92709

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW-1	09/30/94	10/03/94	10/05/94	10/05/94		1
MW-2	09/30/94	10/03/94	10/05/94	10/05/94		2
MW-3	09/30/94	10/03/94	10/05/94	10/05/94		3

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 06-October-1994

ANALYSIS FOR CADMIUM, CHROMIUM, LEAD, NICKEL, & ZINC

Laboratory Number	Sample Identification	Matrix
92709- 1	MW-1	Water
92709- 2	MW-2	Water
92709- 3	MW-3	Water

RESULTS OF ANALYSIS

Laboratory Number:		92709- 1	92709- 2	92709- 3
Cadmium	(Cd):	ND<.005	ND<.005	ND<.005
Chromium	(Cr):	ND<0.01	ND<0.01	0.01
Lead	(Pb):	ND<0.05	ND<0.05	ND<0.05
Nickel	(Ni):	ND<0.02	ND<0.02	0.02
Zinc	(Zn):	0.03	ND<0.02	ND<0.02
Concentration:		mg/L	mg/L	mg/L

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

ANALYSIS FOR CADMIUM, CHROMIUM, LEAD, NICKEL, & ZINC
Quality Assurance and Control Data - Water

Laboratory Number 92709

mpound		Method Blank (mg/L)	RL (mg/L)	Spike Recovery (%)	Limits (%)	RPD (%)
dmium	(Cd):	ND<.005	.005	93/96	75-125	3%
romium	(Cr):	ND<0.01	0.01	101/102	75-125	1%
ad	(Pb):	ND<0.05	0.05	103/107	75-125	4%
ckel	(Ni):	ND<0.02	0.02	105/106	75-125	1%
nc	(Zn):	ND<0.02	0.02	109/111	75-125	2%

finitions:
= Not Detected
) = Relative Percent Difference
= Reporting Limit
/L = Parts per million (ppm)
File No. 92709

10/10/91
Senior Chemist
Account Manager

Chemical Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 08-October-1994

HALOGENATED VOLATILE ORGANICS by EPA SW-846 Methods 5030/8010.

Chronology

Laboratory Number 92709

Identification	Sampled	Received	Extracted	Analyzed	Run #	Lab #
MW-1	09/30/94	10/03/94	10/06/94	10/06/94		1
MW-2	09/30/94	10/03/94	10/06/94	10/06/94		2
MW-3	09/30/94	10/03/94	10/06/94	10/06/94		3

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

TOUCHSTONE
Attn: MICHAEL TAMBRONI

Project 94-14
Reported 08-October-1994

HALOGENATED VOLATILE ORGANICS by EPA SW-846 Methods 5030/8010.

Laboratory Number	Sample Identification	Matrix
92709- 1	MW 1	Water
92709- 2	MW-2	Water
92709- 3	MW-3	Water

RESULTS OF ANALYSIS

Laboratory Number:	92709- 1	92709- 2	92709- 3
Chloromethane:	ND<0.5	ND<0.5	ND<0.5
Vinyl Chloride:	ND<0.5	ND<0.5	8.3
Bromomethane:	ND<0.5	ND<0.5	ND<0.5
Chloroethane:	ND<0.5	ND<0.5	ND<0.5
Trichlorofluoromethane:	ND<0.5	ND<0.5	ND<0.5
1,1-Dichloroethene:	ND<0.5	ND<0.5	1.6
Dichloromethane:	ND<1.0	ND<1.0	ND<1.0
t-1,2-Dichloroethene:	ND<0.5	ND<0.5	ND<0.5
1,1-Dichloroethane:	ND<0.5	ND<0.5	17
c-1,2-Dichloroethene:	ND<0.5	ND<0.5	8.4
Chloroform:	1.0	1.7	ND<0.5
1,1,1-Trichloroethane:	ND<0.5	ND<0.5	12
Carbon Tetrachloride:	ND<0.5	ND<0.5	ND<0.5
1,2-Dichloroethane:	ND<0.5	ND<0.5	1.2
Trichloroethene:	ND<0.5	ND<0.5	1.9
c-1,3-Dichloropropene:	ND<0.5	ND<0.5	ND<0.5
1,2-Dichloropropane:	ND<0.5	ND<0.5	ND<0.5
t-1,3-Dichloropropene:	ND<0.5	ND<0.5	ND<0.5
Bromodichloromethane:	ND<0.5	ND<0.5	ND<0.5
1,1,2-Trichloroethane:	ND<0.5	ND<0.5	ND<0.5
Tetrachloroethene:	ND<0.5	ND<0.5	12
Dibromochloromethane:	ND<0.5	ND<0.5	ND<0.5
Chlorobenzene:	ND<0.5	ND<0.5	ND<0.5
Bromoform:	ND<0.5	ND<0.5	ND<0.5
1,1,2,2-Tetrachloroeth:	ND<0.5	ND<0.5	ND<0.5
1,3-Dichlorobenzene:	ND<0.5	ND<0.5	ND<0.5
1,2-Dichlorobenzene:	ND<0.5	ND<0.5	ND<0.5
1,4-Dichlorobenzene:	ND<0.5	ND<0.5	ND<0.5
Concentration:	ug/L	ug/L	ug/L

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429

Superior Precision Analytical, Inc.
A member of ESSCON Environmental Support Service Consortium

HALOGENATED VOLATILE ORGANICS by EPA SW-846 Methods 5030/8010.
Quality Assurance and Control Data - Water

Laboratory Number 92709

ompound	Method Blank (ug/L)	RL (ug/L)	Spike Recovery (%)	Limits (%)	RPD (%)
hloromethane:	ND<0.5	0.5			
inyl Chloride:	ND<0.5	0.5			
romomethane:	ND<0.5	0.5			
hloroethane:	ND<0.5	0.5			
richlorofluoromethane:	ND<0.5	0.5			
,1-Dichloroethene:	ND<0.5	0.5	76/77	48-189	1%
ichloromethane:	ND<1.0	1.0			
-1,2-Dichloroethene:	ND<0.5	0.5			
,1-Dichloroethane:	ND<0.5	0.5			
-1,2-Dichloroethene:	ND<0.5	0.5			
hloroform:	ND<0.5	0.5			
,1,1-Trichloroethane:	ND<0.5	0.5			
arbon tetrachloride:	ND<0.5	0.5			
,2-Dichloroethane:	ND<0.5	0.5			
richloroethene:	ND<0.5	0.5	95/95	63-150	0%
-1,3-Dichloropropene:	ND<0.5	0.5			
,2-Dichloropropane:	ND<0.5	0.5			
-1,3-Dichloropropene:	ND<0.5	0.5			
romodichloromethane:	ND<0.5	0.5			
,1,2-Trichloroethane:	ND<0.5	0.5			
etrachloroethene:	ND<0.5	0.5			
ibromochloromethane:	ND<0.5	0.5			
hlorobenzene:	ND<0.5	0.5	112/109	70-158	3%
romoform:	ND<0.5	0.5			
,1,2,2-Tetrachloroeth:	ND<0.5	0.5			
,3-Dichlorobenzene:	ND<0.5	0.5			
,2-Dichlorobenzene:	ND<0.5	0.5			
,4-Dichlorobenzene:	ND<0.5	0.5			

efinitions:
D = Not Detected
PD = Relative Percent Difference
L = Reporting Limit
g/L = Parts per billion (ppb)
C File No. 92709

10/10/94
Senior Chemist
Account Manager

Certified Laboratories

825 Arnold Dr., Suite 114
Martinez, California 94553
(510) 229-1512 / fax (510) 229-1526

1555 Burke St., Unit I
San Francisco, California 94124
(415) 647-2081 / fax (415) 821-7123

309 S. Cloverdale St., Suite B-24
Seattle, Washington 98108
(206) 763-2992 / fax (206) 763-8429