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GEOMATRIX

SOIL QUALITY ASSESSMENT

PIE FREIGHT TERMINAL SITE

Emeryville, California

prepared for

THE MARTIN COMPANY
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GEOMATRIX

January 28, 1987
Project 1175A

The Martin Company
4256 Hacienda Drive, Suite 101
Pleasanton, California 94566

Attention: Mr. Walt Kaczmarek

Gentlemen:

As requested by Alan McKay, we have made a preliminary assessment of soil quality at the Pacific Intermountain Express (PIE) Freight Terminal in Emeryville, California. The initial scope of work included the present 14-acre truck terminal site. However, the study was expanded on December 4, 1986 to include the westernmost parking lot of the adjacent Days Inn facility. The accompanying report describes the historical development of the site and presents the results of the field exploration and laboratory testing programs undertaken to evaluate shallow soil quality at the site.

A draft report covering the 14 acre PIE site was issued for review on October 28, 1986. The accompanying report includes the initial field and laboratory test data for the PIE site as well as data for the adjacent Days Inn parking lot. In addition, review comments received from the draft report have been considered in preparing the final report.

Should questions regarding the results of the site assessment study arise, please contact either of the undersigned.

Sincerely yours,
GEOMATRIX CONSULTANTS

Philip T. Tringale
Senior Engineer

Carl Basore
Principal Engineer

wcm

Enclosure

cc: Alan McKay

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INTRODUCTION

This report presents the results of our preliminary assessment of soil quality at the Pacific Intermountain Express (PIE) Freight Terminal site in Emeryville, California. The site encompasses approximately 14 acres and is bounded on the west by the Eastshore Freeway (I-80), on the north by the Day Inns development and on the east by Shellmound Street. The site location is shown in Figure 1.

The purpose of the study is to make a general assessment of shallow soil quality at the site. The assessment consisted of reviewing the historical development of the site, drilling 12 exploratory borings at the property and testing selected soil samples for anticipated soil contaminants. The study is limited to a general assessment of the presence of certain constituents in the fill that overlies the site. An assessment of soil quality adjacent to underground fuel tanks and of groundwater quality is being undertaken by others and are not included in the scope of this study. Accordingly, the depth of drilling and sampling was generally kept above groundwater level.

SITE DEVELOPMENT

The PIE site has been reclaimed from the bay by placing fill along the shoreline. The actual date of fill placement is not known, but is estimated to have occurred about 50 years ago. An old street map printed between 1928 and 1932 shows the bay shoreline at about the present location of Shellmound Street. An aerial photograph of the site taken in 1949 shows the site completely filled-in and the main freight terminal building in operation. In addition, the existing two-story concrete building at the intersection of Powell Street and the Eastshore Freeway is in use and a truck terminal occupies the present Days Inn site.

In 1953, the northern half of the site was still vacant and an additional paved area had been constructed at the southern end of the site. However, by 1957, the entire site had been paved, a shop building constructed at the south end of the property and the main terminal building expanded toward the north. Site development remained essentially unchanged until sometime between June 1983 and May 1985, when the northern leg of the main truck terminal was removed and construction of the Days Inn high rise building commenced.

The results of borings drilled for this study and for a separate geotechnical study indicate that the site is overlain with 8 to 18 feet of mixed clayey and sandy fill containing some construction debris. The average thickness of fill was generally found to be 10 to 11 feet. Over most of the site, the fill is underlain by soft bay sediments that increase in thickness toward the west and southwest across the site.

In addition to reviewing old maps and aerial photographs, several agencies were contacted to obtain additional information about the site. Specifically, the following information was obtained from these contacts:

Emeryville Department of Public Works (Wally Kolb, August 21, 1986)
The area was probably filled-in during the 1930's. The PIE terminal has been there "for years". This area is not part of the old dump.

California Department of Health Services (Howard Hatayama, August 29, 1986)
No reports regarding hazardous materials or studies in the vicinity of the PIE site are on file with the State.

Alameda County Public Works Department (Water Resources, August 22, 1986)
A review of the county files indicated that there is only one water well located within one-half mile of the site. The well is located south of the PIE site on the Judson Steel Corp. property and is 487 feet deep. However, several shallow groundwater monitoring wells have been installed on-site to collect samples for water quality testing and evaluation.

In summary, the site was reclaimed from the bay by placing 10 to 12 feet of fill over soft bay sediments about 50 years ago. The fill is primarily soil but contains some construction debris. The PIE Freight Terminal appears to have been the first development on the property. Reportedly, there are no water supply wells on the property and there are no records of previous problems associated with hazardous materials at the site. Studies of soil and groundwater quality adjacent to underground fuel tanks at the site are in progress and results of these studies will be presented in a separate report by others.

FIELD EXPLORATION AND LABORATORY TESTS

A total of 12 borings was drilled to depths of 6 to 8 feet at the approximate locations shown in Figure 1. Borings EB1 through EB7 were drilled on September 16, 1986 and Borings EB8 through EB12 were completed on December 10, 1986. The drilling and sampling were performed by Bay Area Exploration, Inc. of Suisun, California under the direction of Geomatrix Consultants. Before drilling and sampling started at each borehole, all downhole equipment (augers, sampler and sampler liners) was steam-cleaned to minimize the possibility of cross-contamination, either from hole to hole or vertically within each hole.

The borings were advanced to depths of six to eight feet using 8-inch hollow-stem augers. The borings were kept shallow in an effort to stay above the current groundwater level at the site. Samples were obtained using a modified California drive sampler having an inside diameter of 2 inches and an outside diameter of 2-1/2 inches. The sampler contained thin-walled, segmented brass tubes and was driven into the soil at each sampling depth prior to advancing the borehole with the drill bit. After the sampler was driven, it was withdrawn from the borehole and the brass tubes removed. The samples were then examined in the field to identify soil type and the presence of odors. An apparent petroleum odor was detected in Borings EB5, EB9 and EB10, but no free petroleum was observed in any of the soil samples. As shown in the boring logs (Figures 2 through 13), soils encountered between the surface pavement and the groundwater

interface (at depths of approximately 6-1/2 to at least 8 feet) are primarily silty clay and silty sand fill materials with some construction debris.

Selected soil samples from each borehole were retained for chemical analysis. The sample tubes were sealed in aluminum foil, plastic end caps, and polyvinyl tape. The tubes were then labelled and stored in an ice-cooled chest for delivery to the analytical laboratory. A chain-of-custody record (Appendix A) was completed for the sample shipment and accompanied the shipment until the samples were received by the laboratory.

The soil samples were analyzed by Brown and Caldwell Analytical Laboratories in Emeryville, California for concentrations of PCBs, total lead, and/or total petroleum hydrocarbons as diesel. Specifically, a total of 51 laboratory chemical tests were preformed on 36 soil samples obtained from the 12 exploratory borings. The testing program consisted of 21 tests for total petroleum hydrocarbons as diesel, 20 tests for lead (including one retest) and 10 tests for polychlorinated biphenyls (PCB). The test results are presented at the corresponding sample location on the logs of borings, Figures 2 through 13, and in Appendix B.

FINDINGS AND CONCLUSIONS

Laboratory analysis indicated concentrations of total petroleum hydrocarbons as diesel of less than 10 mg/kg (detection limit) in 20 of the 21 samples tested for hydrocarbons. One sample obtained from Boring EB5 at a depth of approximately 4-1/2 feet contained petroleum hydrocarbons at a concentration of 390 mg/kg. Based on currently available information, it is not known whether the hydrocarbons detected in Boring EB5 are associated with a localized leak or with the fuel tanks recently removed from the southern portion of the site.

All samples tested for PCBs were below the total threshold limit concentration of 50 mg/kg. Detectable levels of total PCB were found only

in boring EB5 and EB7 at depths of approximately 4-1/2 feet (3 mg/kg) and 2 feet (1 mg/kg), respectively.

Total lead was detected in all samples at concentrations generally ranging from 10 mg/kg to 380 mg/kg. The one sample containing lead at a concentration greater than the total threshold limit concentration of 1000 mg/kg, was obtained at a depth of approximately two feet in Boring EB8. The original test results for this sample and the results from retesting the sample are 24,000 mg/kg and 11,000 mg/kg, respectively.

The soil quality assessment program described herein is preliminary in nature and was intended to assess the possibility of shallow soil contamination at the site. Based on the results of this phase of work, extensive, area-wide soil contamination relating to petroleum hydrocarbons, lead, and PCB does not appear to exist in the on-site fill above the groundwater level. There is evidence that at least localized contamination of petroleum hydrocarbons and lead does exist and that these results should be discussed with appropriate regulatory agencies before construction activities commence at the site. In addition, site grading work should be observed for evidence of poor soil quality or obvious subsurface contamination. If encountered, appropriate mitigation measures should then be taken.

3. RESULTS OF CONTAMINANT CHARACTERIZATION

HEAVY METALS ANALYSES. Initial testing at the Bay Center site screened lead, zinc and chromium contamination in preliminary soils borings (1-18). Results are listed in Table 3.1. Site characterization also focused on lead contamination in stockpiled excavated fill from fuel tank removal operations, and in foundation fill material in the Delta and Garrett truck line terminal buildings (see Figure 3.1). These results are listed in Table 3.2. Additional heavy metals analyses recently have been made of the stockpiled foundation fill, tank pit excavation materials, and utility line or foundation footing trench spoils. These recent results are included in Table 3.6 (page 3-11).

Pursuant to site characterization goals stated in the Draft Work Plan, submitted to the Alameda County Health Department, a testing program for a spectrum of priority anticipated heavy metal contaminants was implemented. Samples submitted for heavy metals analysis included three water samples (see Figure 2.1), nine cores (see Figures 2.2 to 2.5), one cuttings sample composite from the drilling of Monitor Well A (see Figure 2.1), and three composite samples from stockpiled surface soils removed during the grading of the Christie Street extension (see Figure 2.6). The 17 metals for which these 16 samples were tested correspond to those listed in Title 22 - California Environmental Health and Safety Code: antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), total chromium (Cr), cobalt (Co), copper (Cu), lead (Pb), mercury (Hg), molybdenum (Mo), nickle (Ni), selenium (Se), silver (Ag), thallium (Tl), vanadium (V) and zinc (Zn). These results are listed in Table 3.3.

Heavy metals concentrations measured were compared with the "Soluble Threshhold Limit Concentrations" (STLC) for water samples and with the "Total Threshhold Limit Concentration" (TTLC) for soils. Note that chromium can occur in toxic quantities as either bivalent, trivalent or hexavalent chromium. Hexavalent chromium is by far the most toxic, requiring only 500(*) mg/kg (TTLC) or 5.0(*) mg/liter (STLC) as compared to 2,500 mg/kg (TTLC) or 560 mg/liter (STLC) for bivalent/trivalent chromium. The heavy metals analysis run was for total chromium, and results indicate negligible quantities, even in a worst case situation which assumes all chromium present is hexavalent. Sample EM5-II(**) (see Table 3.1) was split in half and run separately to ensure accuracy of the testing. Results indicate excellent repeatability.

Metals that were consistently found to be either absent, or only present in minute quantities were then eliminated from future tests. Although zinc was detected at a level above the TTLC in sample EM14-II, the metal is not considered a high priority contaminant by the County Health Department (Miller, 1986). Seven metals are therefore considered a priority for additional testing at the Bay Center site: arsenic (AS), barium (Ba), cadmium (Cd), copper (Cu), lead (Pb), mercury (Hg) and nickle (Ni). Twenty five additional core samples were subsequently submitted for analysis, and results are listed in Table 3.1.

HALOGENATED HYDROCARBONS ANALYSIS (INCLUDING EPA METHODS 9022 AND 608). Of the initial tests run at the Bay Center site, two composite soil samples of exposed Garrett (A1) and Delta (D6) foundation fill were submitted for EPA test Method 608 (organochlorine pesticides). These results are listed in

TABLE 3.1. SOIL MONITORING RESULTS FROM PRELIMINARY AUGER BORINGS AT BAY CENTER, EMERYVILLE

BORING LOG NO. (a)	DEPTH OF PETROLEUM ODOR OR OILY DESCRIPTION	DEPTH OF SAMPLE FOR METALS ANALYSIS	LEAD LEVEL MG/KG	ZINC	CHROMIUM	IRON
1	10'± to 11'	1.5'	51	55	34	-
		4.5'	170*	120	36	-
	"	7.5'	66*	160	41	-
2	10'± to 11'	2.25'	4,400**	4,800*	100	-
		3.75'	2,400**	1,700	7	-
3		2.25'	17	77	77	-
		3.75'	7,000**	860	72	-
4	9.5'± to 10.5'	0.75'	5,000**	5,700**	86	-
5	10.5'± to 14.5'	-	-	-	-	-
6	-	-	-	-	-	-
7	10'±	-	-	-	-	-
8	7+.10'	-	-	-	-	-
9	14'±	-	-	-	-	-
10	-	-	-	-	-	-
11	-	-				
12	-	-	-	-	-	-
13	-	-	-	-	-	-
14	-	-	-	-	-	-
15	-	1.5'	690*	1,700	-	140,000
		2.25'	4,800**	2,800*	-	-
		3.75'	1,100**	1,700	-	21,000
		4.5'	1,600**	2,000	-	-
16	-	1.5'	30,000**	480	-	13,000
		2.25'	4,000**	1,800	-	-
		3.75'	10	48	-	6,700
		4.5'	14	26	-	-
		7.5'	400*	640	-	10,000

(CONTINUED)

TABLE 3.1 (CONTINUED). SOIL MONITORING RESULTS FROM PRELIMINARY AUGER BORINGS AT BAY CENTER, EMERYVILLE

BORING LOG NO. (a)	DEPTH OF PETROLEUM ODOR OR OILY DESCRIPTION	DEPTH OF SAMPLE FOR METALS ANALYSIS	LEAD LEVEL MG/KG	ZINC	CHROMIUM	IRON
17	-	0.75'	<5	23	-	15,000
		2.25'	330*	300	-	14,000
		4.5'	3,500**	3,900*	-	70,000
		5.25'	1,800**	2,000	-	-
		7.5'	34	60	-	14,000
		8.25'	78	100	-	-
18	-	0.75'	4,100**	4,200*	-	-
		1.5'	3,800**	5,500**	-	51,000
		3.75'	1,600**	7,800**	-	64,000
		4.5'	2,600**	3,200*	-	-
		7.5'	1,600**	2,600*	-	-
		11.25'	890*	360	-	14,000

* Potentially toxic
** Categorically toxic
\- Information not available

(a) See Figure 2.1

Source: Earth Metrics Incorporated, 1986; ERG, 1986; Geomatrix, 1985.