Erler &
Kalinowski, Inc.

SOIL AND CONCRETE RELOCATION SAMPLING PLAN

CITY OF EMERYVILLE/PG&E SITE
53RD & HOLLIS STREETS
EMERYVILLE, CALIFORNIA

5 April 1994
EKI 930028.00

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1.0 INTRODUCTION

Erler & Kalinowski, Inc. ("EKI") is pleased to submit this Sampling Plan ("Sampling Plan") for materials relocation from the City of Emeryville/PG&E Site ("Site"). This sampling plan is being submitted on behalf of the City of Emeryville and Chiron Corporation ("Chiron"). The Sampling Plan describes sampling procedures and analytical methods to be performed for characterizing chemical concentrations in soil, asphalt, and/or concrete selected for relocation. The material that is selected for relocation and meets acceptance criteria set forth by the California Department of Toxic Substances Control ("DTSC")(formerly the Department of Health Services) for relocation will be transported to the Shellmound properties for use as aggregate or subbase in the construction of roadways by the City of Emeryville. The Shellmound properties consist of three adjacent, undeveloped parcels located at the southwestern corner of the intersection of Shellmound Street and Eastshore Highway in the City of Emeryville. The materials selected for relocation will be based, in part, on the potential future development plans for the Site.

Materials selected for relocation may include soil, asphalt, and/or concrete on the Site located generally at or above the elevation of the surrounding street grade. The current ground surface of the Site is elevated between approximately two and three feet above the surrounding street grade.

2.0 BACKGROUND

This section presents a brief description and history of the Site as well as an overview of investigations and remedial activities conducted at the Site.

2.1 Site Description

The Site consists of a 4.54 acre parcel located at the northwest corner of the intersection of Hollis Street and 53rd Street in the City of Emeryville, Alameda County,

California (Figures 1 and 2). The Site is listed with the Alameda County Assessor as Parcel No. 49-1041-28.

2.2 Site Use History

This summary of the Site use history is based primarily upon information presented in reports by NUS Corporation (NUS, 1991) and Harding Lawson Associates (HLA, 1991).

The Site was formerly part of the Pacific Gas & Electric Company ("PG&E") Materials Distribution Facility located between Stanford Avenue and 45th Street. PG&E has used the materials distribution facility since the 1920s as a warehouse facility, repair shop, and storage yard for the maintenance of transformers, capacitors, oil circuit breakers, and other electrical equipment.

The Site (Parcel No. 49-1041-28) was acquired by the City of Emeryville in March 1992. It is vacant and no longer used by PG&E. A portion of the PG&E Materials Distribution Facility located south of 53rd Street (Parcel No. 49-1041-29) was also acquired by the City of Emeryville in March 1992. PG&E currently uses this Parcel (No. 49-1041-29) in conjunction with its operations on the remainder of the Materials Distribution Facility.

The Site has had two primary uses. Between the 1920s and 1950s, PG&E used the Site for wrapping steel pipes with coal tar and asbestos-containing fabric (NUS, 1991). Pipe-wrapping operations occurred along the abandoned railroad track that passes through the center of the Site and now serves as an access road (Figure 2). Wrapped and unwrapped pipes were stored east and west of the track. The pipe-wrapping process involved coating the outer portion of the pipe with tar and then wrapping in fabric. The tar was reported to be a "coal tar" and the fabric reportedly contained asbestos.

The second major use of the Site began in 1955 when the pipe-wrapping operations by PG&E were discontinued. The Site was then utilized for storing transformers and capacitors. The storage took place on the two concrete pads (Figure 2) located on the southern portion of the Site, just north of 53rd Street. Minor repairs of transformers and capacitors were also reportedly conducted on the Site.

A small concrete building is present adjacent to Hollis Street in the central portion of the Site. NUS indicated that the building was utilized for storage. HLA indicated that the building may have been associated with a truck scale located adjacent to the building.

Based upon available information, the Site was unpaved up to the mid-1950's. In 1955 and 1960, the existing concrete pads which flank the former railroad tracks were constructed (Figure 2). Additionally, it has been reported that oil may have been sprayed on surface soil in the past as a dust control measure (HLA, 1991).

2.3 Previous Investigations and Remedial Activities

Soil and groundwater investigations were conducted by PG&E on the Site between 1983 and 1990 (Ecology & Environment, 1988, 1989a, and 1989b), the City of Emeryville in 1991 (HLA, 1991), and Chiron in 1993 (EKI, 1993). Soil and groundwater data were also collected by Chiron in 1993 on the City of Emeryville parcel (No. 49-1041-29) located south of 53rd Street.

The investigations conducted by PG&E revealed the presence of elevated concentrations of polychlorinated biphenyls ("PCBs") in two areas on the Site. These areas were located along the western boundary at the northern and southern-central portions of the Site (Figure 2). In the late 1980s, PG&E excavated these areas to remove PCB-affected soil that exceeded the DTSC approved clean-up level of 25 milligrams per kilogram ("mg/kg")(Ecology & Environment, 1988; DTSC 1988b).

Confirmation samples were collected by PG&E at the boundaries of each excavation. PCBs were not detected in confirmation samples collected from the southern excavation area and minor concentrations (10.9 mg/kg) were detected from the northern excavation area. Additionally, confirmation samples of soil used to backfill the excavation in the northern excavation area were reported to contain PCBs at concentrations up to 19.3 mg/kg. Upon completion of the excavation project by PG&E, the DTSC issued a Remedial Action Certification Form dated 22 June 1989, indicating that no further action was required.

The Site investigations conducted by the City of Emeryville in 1991 and Chiron in 1993, acquired the following information regarding PCB concentrations on the Site not including the former areas of excavation: 20 of 34 samples analyzed reportably contained detectable PCBs. The maximum concentration detected was 2.1 mg/kg. The average of PCB concentrations detected was 0.26 mg/kg.

Laboratory analyses for compounds other than PCBs were also conducted on samples collected during the PG&E, City of Emeryville, and Chiron investigations. A summary detailing the number of samples analyzed and the compounds detected from these investigations follows:

- Total extractable petroleum hydrocarbons ("TEPH"): 15 of 17 samples analyzed contained TEPH by EPA Method 8015m. The maximum concentration of TEPH detected was 260 mg/kg. The average of TEPH concentrations detected was 44 mg/kg. Six of the 19 samples were collected from the ground surface where asphaltic material may have been present in the samples.

- Oil and grease: Two samples analyzed contained oil and grease by EPA Method 5520E&F. Maximum concentration detected was 4,000 mg/kg. The average of oil and grease concentrations detected was 2,175 mg/kg.

- Benzene, toluene, ethyl benzene, and total xylenes ("BTEX"): Five of 21 samples analyzed contained toluene, total xylenes, or both by either EPA Method 8020 or 8240. The maximum concentration detected was 0.39 mg/kg. The average of BTEX concentrations detected was 0.53 mg/kg. Benzene and ethyl benzene were not detected in the samples.

- Arsenic: Seven of 19 samples analyzed contained arsenic. The maximum concentration detected was 340 mg/kg. The average of arsenic concentrations detected was 41 mg/kg. A waste extraction test ("WET") was conducted on three samples; Maximum concentration detected from the WET was 7.7 milligrams per liter ("mg/l") and the average concentration detected from the WET was 6.0 mg/l.

- Total Chromium: 18 of 19 samples analyzed contained chromium. The maximum concentration detected was 54 mg/kg. The average of total chromium concentrations detected was 33 mg/kg. WET conducted on two samples. Maximum concentration detected from WET was 0.40 mg/l and the average of WET concentrations detected from WET was 0.38 mg/l.

- Cadmium: 10 of 19 samples analyzed contained cadmium. the maximum concentration detected was 4.8 mg/kg. The average of cadmium concentrations detected was 1.5 mg/kg.

- Total Lead: 15 of 19 samples analyzed contained lead. The maximum concentration detected was 190 mg/kg. The average of total lead concentrations detected was 39 mg/kg. A WET was conducted on five samples. The maximum concentration detected

from the WET was 4.2 mg/l and the average of WET concentrations detected was 2.2 mg/l.

- Mercury: Eight of 19 samples analyzed contained mercury. The maximum concentration detected was 0.82 mg/kg. The average of mercury concentrations detected was 0.14 mg/kg.

Tables 1 through 4 present the available laboratory analytical data for soil and concrete samples collected between 0 and 3 feet below ground surface on the Site. The tables include laboratory data from confirmation samples collected by PG&E after excavation and from samples collected on the remainder of the Site outside the excavated areas. They do not include analytical data for samples collected at locations that were subsequently excavated by PG&E. A complete summary of pre-excavation and post-excavation soil and concrete samples collected on the Site is presented in the analytical data summary tables in EKI "Preliminary Site Investigation Report," dated 8 September 1993 (EKI, 1993).

Table 5 summarizes the analytical data for soil and concrete samples collected between 0 and 3 feet below ground surface on the Site. Incorporated into this table are acceptance criteria established by the DTSC for materials relocation to the Shellmound properties, and the California Code of Regulations, Title 22 Criteria for identifying hazardous wastes.

Table 5 shows that:

(a) soil and concrete samples collected from the Site were analyzed for fourteen distinct compounds or groups of compounds (i.e. method of analysis) and

(b) DTSC's acceptance criteria for materials relocation were only exceeded for PCBs, TEPH, and arsenic and only in a limited number of samples.

Table 6 summarizes the estimated volumes of soil and concrete materials that may be relocated from the Site and summarizes analytical data for compounds identified as chemicals of concern based on a review of available data with DTSC staff at a meeting on 17 March 1994.

3.0 OBJECTIVES OF SAMPLING EFFORT

The objective of the sampling to be performed on the materials selected for relocation is to verify that chemicals of concern are not present above the regulatory

criteria in the relocation materials transported to the Shellmound properties.

4.0 REGULATORY CRITERIA

The regulatory criteria as well as sample analyses (type and quantity) to be implemented during construction for the materials relocation were discussed at a meeting conducted on 17 March 1994, and attended by personnel representing DTSC, the City of Emeryville, and Chiron.

4.1 Compounds and Chemical Concentrations

The compound analyses to be performed during construction include PCB, TEPH, and arsenic. These analyses were selected and agreed upon by the DTSC based on data obtained from prior investigations conducted on the Site by several organizations (see Section 2 above). The following acceptance criteria were specified by the DTSC for these compounds for the materials relocation:

Compound	Regulatory Acceptance Criteria
PCBs	1.0 mg/kg
TEPH	100 mg/kg
Arsenic	TTLC: 500 mg/kg STLC: 5.0 mg/l

TEPH	Total extractable petroleum hydrocarbons (EPA Method 8015m)
TTLC	Total threshold limit concentration
STLC	Soluble threshold limit concentration
mg/kg	Milligrams per kilogram (in soil or concrete)
mg/l	Milligrams per liter (in WET extract solution)

4.2 Discussion of Regulatory Criteria for Compound Concentrations

The regulatory criteria will be observed during the materials relocation subject to the following qualifications:

4.2.1 PCBs

PCB-affected materials on the Site will be managed in accordance with the above listed regulatory criteria as well as previous remedial goals approved by DTSC for the Site. Previous DTSC soil excavation criteria allowed for soil containing less than 25 mg/kg to remain on-Site. The 25 mg/kg designated PCB removal criterion for soil was confirmed by DTSC in the DTSC letter dated 9 December 1988 (DTSC, 1988b) and the "Remedial Action Certification Form" dated 22 June 1989 (DTSC, 1989) for the Site. The 25 mg/kg value is also considered by the U.S. Environmental Protection Agency ("EPA") as a clean-up level for industrial or restricted use areas (EPA, 1990; 40 CFR Part 761).

Given the current regulatory criteria for the Site as well as incorporating previous PCB remediation goals for areas previously excavated on the Site, soil and concrete debris from the Site will be handled in accordance with the following criteria:

a. Materials with PCB concentrations less than 1.0 mg/kg in representative samples will be transported to the Shellmound properties for use as aggregate or subbase beneath roadways.

b. Materials with PCB concentrations greater than 1.0 mg/kg but less than 25 mg/kg in representative samples will be left on-Site.

c. Materials with PCB concentrations greater than 25 mg/kg in representative samples will be removed from the Site and disposed off-Site at an appropriately permitted waste facility.

4.2.2 TEPH

Concentrations of TEPH detected in several samples at the Site may have resulted from the inclusion of asphaltic material in the analyzed sample. Asphalt paving covers approximately 7,000 square feet of the Site and asphalt berming is present along sections of the perimeter and interior of the Site. Due to the presence of asphalt on the Site, laboratory analysis for TEPH will not be conducted on samples containing visible asphaltic debris.

In addition, a revised acceptance criterion of 400 mg/kg is proposed for TEPH that reflects the analytical data of samples collected during investigations conducted at the Site and nature of the materials. The 400 mg/kg criteria

results from the knowledge that the TEPH detected has the following characteristics:

a. The material does not contain polynuclear aromatic compounds or other extractable hydrocarbons as determined through EPA Method 8270.

b. The material contains low levels of BTEX; five of 15 samples contained toluene or total xylenes at a maximum concentration of 0.088 mg/kg. No other aromatic hydrocarbon compounds were detected.

c. Available laboratory data indicates that the extractable hydrocarbons detected were reported as non-diesel hydrocarbon with carbon number greater than C16 to C18 or ranging from C16 to C21. High molecular weight hydrocarbons in these ranges are considered to have very low to no mobility, being highly sorbed to soil especially at the concentrations detected.

d. Transformer oils used on-Site are likely to have been highly refined napthenic oils, i.e., mineral oils which are considered non-carcinogenic and of low acute and chronic toxicity (Lipscomb, 1988).

Thus, soil and concrete debris from the Site will be handled in accordance with the following criteria:

a. Materials with TEPH concentrations less than 400 mg/kg in representative samples will be transported to the Shellmound properties for use as aggregate or subbase beneath roadways or other paving.

b. Materials with TEPH concentrations of 400 mg/kg or more will be left on-Site.

4.2.3 Arsenic

Regulatory criteria for arsenic are based on TTLC and STLC values stated in Title 22. In accordance with Title 22, a waste extraction test ("WET") is required if detected concentrations are greater than STLC but less than the TTLC, disregarding units. The WET {CCR Title 22, Section 66261.24(a)(2)(Appendix II)} requires a ten to one dilution of extraction solution to solid sample material. Theoretically, if the STLC is to be exceeded, then total metal concentration must exceed ten times the STLC. Therefore, the WET will only be conducted on soil and concrete debris samples where total concentrations are

detected that exceed 50 mg/kg or ten times the STLC value of 5.0.

Thus, soil and concrete debris from the Site will be handled in accordance with the following criteria:

a. Materials with total arsenic concentrations less then 50 mg/kg in representative samples will be transported to the Shellmound properties for use as aggregate or subbase beneath roadways or other paving.

b. Materials with total arsenic concentrations greater than or equal to 50 mg/kg in representative samples will be tested promptly using the WET.

   1) If the WET results find extractable arsenic less than 5 mg/l, the materials will be transported to the Shellmound properties for use as aggregate or subbase beneath roadways or other paving.

   2) If the WET results find extractable arsenic equal to or greater than 5.0 mg/l, the materials will be left on-Site.

c. Materials with total arsenic concentrations of 500 mg/kg or more in representative samples will be left on-Site.

4.3 Sample Collection Frequency

The sampling frequency (i.e., quantity of samples per volume of material) of materials for relocation will be conducted on the basis of one representative sample per approximately 50 yards of material. Representative samples will be collected from stockpiles or loaded trucks, depending on the construction contractor's activities. The "representative sample" will consist of no more than ten scoops of material combined in a clean glass jar provided by the laboratory.

5.0 MATERIALS RELOCATION ACTIVITIES

As indicated in Section 1.0, this Sampling Plan addresses the sampling tasks and analytical methods to be performed as part of the materials relocation work on the City of Emeryville/PG&E Site.

5.1 Materials Handling and Removal

The handling and removal of the materials on the Site will be conducted by a contractor experienced in the removal, handling, and transportation of large quantities of soil or concrete containing potentially hazardous constituents. The contractor will handle the materials in a manner that minimizes the generation of dust and will be responsible for the control of dust to prevent migration off the Site. Dust control measures to prevent potential migration of dust during materials relocation activities will be established prior to the commencement of the materials relocation project.

The contractor will separately manage and handle material located in the area of the former northern excavation and adjacent areas. This former excavation area is shown on Figure 2 and comprises approximately 13,000 square feet with an estimated soil and debris volume of 1,200 cubic yards. PCBs were detected in a composite of near surface soil samples collected from borings C-19, C-20, and C-21 (2.1 mg/kg) in this area. Samples collected from the backfill material for the excavation were reported by PG&E to contain PCBs up to 19.3 mg/kg). Thus, the likelihood of encountering PCBs in this area is greater than the remainder of the Site and the materials from this area will be segregated.

The contractor conducting the relocation of the materials shall provide or respond to pertinent items or procedures as requested by the resident engineer or other designated representative of the City, responsible for characterizing the materials selected for relocation. These contractor-supplied activities or items include:

a. Providing access to materials stockpiles at all times for sampling.

b. Providing access to materials loaded on trucks for transportation to the relocation destination.

c. Segregating and unloading trucks for materials remaining on-Site following testing.

d. Segregating portions of stockpiled materials remaining on-Site following testing.

e. Cooperating with regulatory agency personnel as needed.

5.2 Sample Collection from Stockpiles or Trucks

Sampling of the materials selected for relocation to the Shellmound properties will be conducted in a manner deemed appropriate by the resident engineer for accurately characterizing the materials destined for relocation. One representative sample will be collected per approximately 50 cubic yards of material. To expedite the removal of the material from the Site, sampling may be conducted using either or both of the following temporary materials storage methods: 1) stockpiles formed on the Site by the contractor or 2) the beds of the transportation trucks loaded by the contractor. Both methods are discussed below.

5.2.1 Sampling from Stockpiles

Excavated materials will be stockpiled for sampling prior to loading onto trucks for removal from the Site. The volume of soil within each stockpile, at any given time, will be estimated on the basis of either the estimated volume of the equipment used to handle the materials (e.g., counting backhoe bucket loads) or measurements of the stockpile dimensions and height. Stockpiles consisting of greater than 50 cubic yards will be divided into approximate 50 cubic yard sections by means of flagging or other suitable marking devices. Each 50 cubic yard section will be distinctly labeled for subsequent identification. A maximum of 10 scoops of material will be collected from random locations throughout each 50 cubic yard section and combined to form one representative sample for submittal to the laboratory.

5.2.2 Sampling from Trucks

Excavated materials will be placed directly into the transportation trucks and samples will be collected from each truck. It is anticipated that each truck will be able to carry approximately 10 to 13 cubic yards of material. Thus, one representative sample will be obtained by combining portions of material from up to five trucks. A maximum of two scoops of material will be collected from random locations in each truck (to form a representative subsample) and combined to form one representative sample for submittal to the laboratory. Each representative subsample collected from the trucks will be retained to allow for retesting of material from separate trucks, if necessary.

5.3 Materials Sample Collection

Samples of soil or crushed concrete debris will be collected using a cleaned stainless steel trowel or disposable plastic

spoon. Since volatile organic compounds are not an issue for the materials relocation, each representative sample or subsample will be formed by combining scoops of material into one laboratory-supplied, eight-ounce wide mouth glass jar. The soil in the glass jar will then be mixed to make the sample more homogeneous. The glass jar will be placed in a resealable plastic bag. The sample will then be placed in a chilled cooler for storage. A complete description of sample handling procedures is included in Appendix A.

5.4 Laboratory Analysis of Samples

Samples collected during the materials relocation project will be analyzed by an analytical laboratory certified by the State of California for hazardous waste analyses. Laboratory analysis will consist of the following compounds and respective U.S. EPA Methods.:

- PCBs using EPA Method 8080 with a detection limit of 0.5 mg/kg or lower.
- TEPH using EPA Methods 3550/8015 with a detection limit of 10 mg/kg or lower.
- Arsenic using either EPA Method 6010 (Inductively Coupled Plasma) or EPA Method 7060 (Atomic Absorption Graphite Furnace) with a detection limit of 10.0 mg/kg or lower.

In addition, the California WET will be conducted on samples where total arsenic concentrations measured in samples exceed 50 mg/kg (i.e., ten times the STLC value of 5.0) as described in Section 4.2.3. WET analyses will have a detection limit of 1.0 mg/l or lower.

Either an on-Site mobile laboratory or an off-Site laboratory will be used for conducting the sample analyses. Brief discussions on the sample handling for on-Site mobile laboratory or an off-Site laboratory are below.

5.4.1 On-Site Mobile Laboratory

All samples transferred to the mobile on-Site laboratory will be accompanied the a chain-of-custody record (See Appendix A). When transferring samples to the mobile on-Site laboratory, the individuals relinquishing and receiving the samples will sign, date, and note the time on the chain-of-custody record. Samples will be stored in the field on ice in a cooler prior to transfer to the laboratory.

5.4.2 Off-Site Laboratory

All samples sent to off-Site laboratory for analysis will be placed in a chilled cooler for shipment. Any empty space left in the top of a cooler will be filled with padding to prevent jostling and damage during shipping. The samples will be accompanied by a chain-of-custody record that is completed as detailed in Appendix A. The completed chain-of-custody form will be placed in a resealable plastic bag to protect against wetness and will be included inside the cooler.

All coolers will be sealed with strapping tape and transported to the designated off-Site laboratory. Shipments will be made via overnight delivery or local courier. All samples will be shipped either by the end of the day of sampling or the following day.

When transferring samples, the individuals relinquishing and receiving the samples will sign, date, and note the time on the chain-of-custody record. A separate chain-of-custody record will accompany each shipment. The method of shipment and courier name(s) will be entered on the chain-of-custody record.

5.4.3 Sample Analysis Turnaround Times

The turnaround times ("TAT") for analysis of representative samples collected during the materials relocation project will be dependent on the use of either the on-Site mobile laboratory or off-Site laboratory. The anticipated TAT for analysis of samples using the on-Site mobile laboratory is approximately four hours from the time of sample receipt at the laboratory. The anticipated TAT for analysis of samples using the off-Site laboratory is approximately 12 hours from the time of sample receipt at the laboratory.

6.0 SITE HEALTH AND SAFETY PLAN FOR MATERIALS RELOCATION PROJECT

A Site Health and Safety Plan ("HSP") for resident engineer personnel relating the materials relocation project will be drafted prior to the commencement of the materials relocation project. The HSP will be prepared in accordance with applicable occupational health and safety standards and other applicable laws including 40 CFR 1910.120. The contractor hired that conducts the materials relocation work shall be required by the Construction Documents to develop its own HSP.

7.0 DOCUMENTATION OF MATERIALS RELOCATION

Following completion of the materials relocation activities, a report documenting the activities will be prepared by the resident engineer and will include:

- A discussion of material excavation and relocation activities including the quantity and final destination of excavated materials.
- A summary of laboratory analytical results of materials samples.
- Figures showing the extent of excavation and locations of materials left on-Site.
- Appropriate appended documents, i.e. permits, field observation reports, laboratory data sheets, and transportation manifests for any hazardous wastes transported from the Site.

8.0 REFERENCES

40 CFR 761.125 (c)(3)(v); Code of Federal Regulations, "Environmental Protection Agency Rules for Controlling Polychlorinated Biphenyls Under the Toxic Substances Control Act," Title 40-Protection of Environment, Chapter I-Environmental Protection Agency, Subchapter R-Toxic Substances Control Act, Part 761-Polychlorinated Biphenyls (PCBs) Manufacturing, Distribution in Commerce, and Use Prohibitions.

DTSC, 1988a, Letter to PG&E approving PG&E's plan to excavate PCB contaminated soil at the PG&E-Emeryville site, dated 23 November 1988.

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DTSC, 1989, "Remedial Action Certification Form," Issued to PG&E certifying remediation of PCB contaminated soil and that no further removal/remedial action is necessary, form signed between 22 and 30 June 1989.

Ecology & Environment, 1988, "Release Sampling Plan, PG&E Materials Distribution Center, Emeryville, California," dated November 1988.

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Lipscomb, T.G. II, 1988, "Mineral Insulating Oil Manufacture and Safekeeping," in Electrical Insulating Oils, STP 998, H.G. Erdman, Editor, American Society for Testing and Materials, Philadelphia, pp. 5-24.

NUS Corporation, 1991, "Preliminary Assessment of PG&E Emeryville," dated 31 May 1991.

TABLE 1

POLYCHLORINATED BIPHENYL CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

SAMPLE NUMBER	COMPOSITED SAMPLES	MATRIX	DATE SAMPLED	SOURCE OF DATA (1)	SAMPLE COLLECTION DEPTH (Feet BGS)	PCB1248 (mg/kg)	PCB1260 (mg/kg)	TOTAL PCB (2) (mg/kg)
HISTORIC DATA (Prior to 1993)								
EE-15	---	SOIL	8/27/87	NUS (5/31/91)	1.5	<0.01	<0.01	<0.02
EE-16	---	SOIL	8/27/87	NUS (5/31/91)	1.5	<0.01	<0.01	<0.02
EE-17	---	SOIL	8/27/87	NUS (5/31/91)	1.5	<0.01	<0.01	<0.02
EE-18	---	SOIL	8/27/87	NUS (5/31/91)	1.5	<0.01	<0.01	<0.02
EE-19	---	SOIL	8/27/87	NUS (5/31/91)	1.5	<0.01	0.32	0.32
EE-22	---	SOIL	8/27/87	NUS (5/31/91)	1.5	<0.01	<0.01	<0.02
EE-23	---	SOIL	8/27/87	NUS (5/31/91)	1.5	<0.01	<0.01	<0.02
EE-35	---	SOIL	8/27/87	NUS (5/31/91)	1.5	<0.01	<0.01	<0.02
EE-37	---	SOIL	8/27/87	NUS (5/31/91)	1.5	<0.01	<0.01	<0.02
MW-11 (1.5)	---	SOIL	6/21/91	HLA (10/18/91)	1.5	<1.0	<1.0	<1.0
MW-13 (1.5)	---	SOIL	6/21/91	HLA (10/18/91)	1.5	<1.0	<1.0	<1.0
SB-1 (1.5)	---	SOIL	6/21/91	HLA (10/18/91)	1.5	<1.0	<1.0	<1.0
SB-2 (2.0)	---	SOIL	6/21/91	HLA (10/18/91)	2.0	<1.0	<1.0	<1.0
SB-3 (1.5)	---	SOIL	6/21/91	HLA (10/18/91)	1.5	<1.0	<1.0	<1.0
Post-Excavation Samples collected during Soil Removal in Northern Area of Property in 1989 (4)								
SE12B	---	SOIL	6/2/89	E&E (8/89)	0.5	<0.1	4.9	4.9
SE13B	---	SOIL	6/2/89	E&E (8/89)	0.5	<0.1	10.9	10.9
SE14B	---	SOIL	6/2/89	E&E (8/89)	0.5	<0.1	0.6	0.6
SE15	---	SOIL	5/20/89	E&E (8/89)	0.5	<0.1	0.7	0.7
SE16	---	SOIL	5/20/89	E&E (8/89)	0.5	<0.1	0.4	0.4
SE17	---	SOIL	5/20/89	E&E (8/89)	0.5	<0.1	0.6	0.6
RECENT DATA (1993)								
C-1,2,3A	C-1A,2A,3A	SOIL	7/21/93	EKI (9/8/93)	2.5, 2, 2	<0.02	<0.02	<0.04
C-10,11,12A	C-10A,11A,12A	SOIL	7/20/93	EKI (9/8/93)	1.5, 2, 2.5	<0.02	0.04	0.04
C-10,11,12BC	C-10B,10C,11B,11C,12C	SOIL	7/20/93	EKI (9/8/93)	3, 6, 3, 5.5, 5.5	<0.02	<0.02	<0.04

TABLE 1

POLYCHLORINATED BIPHENYL CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

Notes:

PCB	Polychlorinated biphenyls
BGS	Below ground surface
mg/kg	Milligrams per kilogram
<0.01	Not detected at or above indicated laboratory detection limit
---	Compound not analyzed and/or data not obtained

(1) Data obtained from the following sources:

NUS: NUS Corporation, Preliminary Assessment of PG & E Emeryville, report dated 31 May 1991.

HLA: Harding Lawson Associates, Soil and Groundwater Investigation, PG&E Materials Distribution Facility, 53rd and Hollis Streets, Emeryville, California, report dated 18 October 1991.

E&E: Ecology & Environment, Inc., Final Documentation Report Post-Excvation Sampling, PG&E Materials Distribution Center, Emeryville, California, report dated August 1989.

EKI: Erler & Kalinowski, Inc., Preliminary Site Investigation Report, Chiron Corporation, Emeryville, California, report dated 8 September 1993.

(2) Total PCB concentration is the sum of PCB1248 and PCB1260 concentrations.

(3) Soil samples may have contained asphaltic material.

(4) These soil samples were collected from 0.5 feet below the pre-excavation ground surface. E&E post excavation sampling report indicates that excavation was backfilled with soil containing less than 25 parts per million PCBs. Actual concentrations in backfill may be lower.

TABLE 1

POLYCHLORINATED BIPHENYL CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

SAMPLE NUMBER	COMPOSITED SAMPLES	MATRIX	DATE SAMPLED	SOURCE OF DATA (1)	SAMPLE COLLECTION DEPTH (Feet BGS)	PCB1248 (mg/kg)	PCB1260 (mg/kg)	TOTAL PCB (2) (mg/kg)
RECENT DATA (1993) CONTINUED								
C-13,14,15A	C-13A,14A,15A	SOIL	7/20/93	EKI (9/8/93)	0.5, 1, 1	<0.20	0.77	0.77
C-13,14,15BC	C-13B,13C,14B,14C,15B,15C	SOIL	7/20/93	EKI (9/8/93)	2, 5.5, 2.5, 5.5, 3, 5.5	<0.02	0.14	0.14
C-13B	---	SOIL	7/20/93	EKI (9/8/93)	2.5	<0.02	0.04	0.04
C-14B	---	SOIL	7/20/93	EKI (9/8/93)	2	<0.02	0.76	0.76
C-15B	---	SOIL	7/20/93	EKI (9/8/93)	3	<0.02	<0.02	<0.04
C-16,17,18A	C-16A,17A,18A	SOIL	7/20/93	EKI (9/8/93)	2, 1.5, 1.5	<0.02	0.25	0.25
C-16,17,18BC	C-16B,16C,17B,17C,18B,18C	SOIL	7/20/93	EKI (9/8/93)	3.5, 5, 3, 6, 2.5, 6	<0.02	<0.02	<0.04
C-16-0	---	SOIL (3)	7/20/93	EKI (9/8/93)	Surface	<0.02	0.18	0.18
C-19,20,21A	C-19A,20A,21A	SOIL	7/20/93	EKI (9/8/93)	0.5, 2, 0.5	<0.20	2.1	2.1
C-19-0	---	SOIL	7/20/93	EKI (9/8/93)	Surface	0.27	1.2	1.47
C-20B	---	SOIL (3)	7/20/93	EKI (9/8/93)	3	<0.02	0.072	0.072
C-4,5,6A	C-4A,5A,6A	SOIL	7/21/93	EKI (9/8/93)	2, 2.5, 2.5	<0.02	<0.02	<0.04
C-4,5,6BC	C-4B,4C,5B,5C,6B,6C	SOIL	7/21/93	EKI (9/8/93)	3, 5.5, 3.5, 5.5, 4, 5.5	<0.02	<0.02	<0.04
C-7,8A	C-7A,8A	SOIL	7/20/93	EKI (9/8/93)	2, 2.5	<0.02	<0.02	<0.04
CC-1,2,3-0	CC-1,2,3	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.02	0.08	0.08
CC-1	---	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.02	<0.02	<0.04
CC-2	---	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.02	<0.02	<0.04
CC-3	---	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.02	0.065	0.065
CC-10,12-0	CC-10,12	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.02	0.03	0.03
CC-4,5,6-0	CC-4,5,6	CONCRETE	7/20/93	EKI (9/8/93)	Surface	0.02	0.11	0.13
CC-4	---	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.02	1.1	1.1
CC-5	---	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.02	0.62	0.62
CC-6	---	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.02	0.093	0.093
CC-7,8-0	CC-7,8	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.10	0.46	0.46
CC-7	---	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.02	0.18	0.18
CC-8	---	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.02	0.042	0.042

TABLE 2

PETROLEUM HYDROCARBON CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

SAMPLE NUMBER	COMPOSITED SAMPLES	MATRIX	DATE SAMPLED	SOURCE OF DATA (1)	SAMPLE COLLECTION DEPTH (Feet BGS)	OIL & GREASE (mg/kg)	TEPH (mg/kg)	CHROMATOGRAPHIC TEPH	TVPH (mg/kg)	CHROMATOGRAPHIC TVPH
HISTORIC DATA (Prior to 1993)										
SB-1 (1.5)	---	SOIL	6/21/91	HLA (10/18/91)	1.5	350	---	---	---	---
SB-2 (2.0)	---	SOIL	6/21/91	HLA (10/18/91)	2.0	4000	---	---	---	---
RECENT DATA (1993)										
C-1,2,3A	C-1A,2A,3A	SOIL	7/21/93	EKI (9/8/93)	2.5, 2, 2	---	5.1	NON-DIESEL MIX >C16	<1.0	---
C-10,11,12A	C-10A,11A,12A	SOIL	7/20/93	EKI (9/8/93)	1.5, 2, 2.5	---	3.1	NON-DIESEL MIX >C17	<1.0	---
C-10,11,12BC	C-10B,10C,11B,11C,12C	SOIL	7/20/93	EKI (9/8/93)	3, 6, 3, 5.5, 5.5	---	<1.0	---	<1.0	---
C-13,14,15A	C-13A,14A,15A	SOIL	7/20/93	EKI (9/8/93)	0.5, 1, 1	---	23	NON-DIESEL MIX >C16	<1.0	---
C-13,14,15BC	C-13B,13C,14B,14C, 15B,15C	SOIL	7/20/93	EKI (9/8/93)	2, 5.5, 2.5, 5.5, 3, 5.5	---	6.4	NON-DIESEL MIX >C16	<1.0	---
C-16,17,18A	C-16A,17A,18A	SOIL	7/20/93	EKI (9/8/93)	2, 1.5, 1.5	---	4.0	NON-DIESEL MIX >C17	<1.0	---
C-16,17,18BC	C-16B,16C,17B, 17C,18B,18C	SOIL	7/20/93	EKI (9/8/93)	3.5, 5, 3 6, 2.5, 6	---	<1.0	---	<1.0	---
C-16-0		SOIL	7/20/93	EKI (9/8/93)	Surface	---	51 (2)	NON-DIESEL MIX >C17	<1.0	---
C-19,20,21A	C-19A,20A,21A	SOIL	7/20/93	EKI (9/8/93)	0.5, 2, 0.5	---	30	NON -DIESEL MIX >C16	<1.0	---
C-19-0		SOIL	7/20/93	EKI (9/8/93)	Surface	---	110 (2)	NON-DIESEL MIX >C16	<1.0	---
C-4,5,6A	C-4A,5A,6A	SOIL	7/21/93	EKI (9/8/93)	2, 2.5, 2.5	---	6.7	NON-DIESEL MIX >C17	<1.0	---
C-4,5,6BC	C-4B,4C,5B,5C,6B,6C	SOIL	7/21/93	EKI (9/8/93)	3, 5.5, 3.5, 5.5, 4, 5.5	---	2.2	NON-DIESEL MIX >C18	<1.0	---
C-7,8A	C-7A,8A	SOIL	7/20/93	EKI (9/8/93)	2, 2.5	---	1.5	NON-DIESEL MIX >C17	<1.0	---
CC-1,2,3-0	CC-1,2,3	CONCRETE	7/20/93	EKI (9/8/93)	Surface	---	260 (2)	NON-DIESEL MIX C16-C21	<1.0	---
CC-10,12-0	CC-10,12	CONCRETE	7/20/93	EKI (9/8/93)	Surface	---	27 (2)	NON-DIESEL MIX >C16	<1.0	---
CC-4,5,6-0	CC-4,5,6	CONCRETE	7/20/93	EKI (9/8/93)	Surface	---	110 (2)	NON-DIESEL MIX C16-C21	<1.0	---
CC-7,8-0	CC-7,8	CONCRETE	7/20/93	EKI (9/8/93)	Surface	---	110 (2)	NON-DIESEL MIX C16-C21	<1.0	---

TABLE 2

PETROLEUM HYDROCARBON CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

Notes:

TEPH	Total extractable petroleum hydrocarbons
TVPH	Total volatile petroleum hydrocarbons
BGS	Below ground surface
mg/kg	Milligrams per kilogram
< 1.0	Not detected at or above indicated laboratory detection limit
---	Compound not analyzed and/or data not obtained

(1) Data obtained from the following sources:

HLA: Harding Lawson Associates, Soil and Groundwater Investigation, PG&E Materials Distribution Facility, 53rd and Hollis Streets, Emeryville, California, report dated 18 October 1991.

EKI: Erler & Kalinowski, Inc., Preliminary Site Investigation Report, Chiron Corporation, Emeryville, California, report dated 8 September 1993.

(2) Samples may have contained asphaltic material.

TABLE 3

BTEX CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

SAMPLE NUMBER	COMPOSITED SAMPLES	MATRIX	DATE SAMPLED	SOURCE OF DATA (1)	SAMPLE COLLECTION DEPTH (Feet BGS)	BENZENE (mg/kg)	ETHYL-BENZENE (mg/kg)	TOLUENE (mg/kg)	TOTAL XYLENES (mg/kg)
HISTORIC DATA (Prior to 1993)									
SB-1 (1.5)	---	SOIL	6/21/91	HLA (10/18/91)	1.5	---	---	---	---
SB-2 (2.0)	---	SOIL	6/21/91	HLA (10/18/91)	2.0	---	---	---	---
EE-15	---	SOIL	8/27/87	NUS (5/31/91)	1.5	<0.03	<0.03	0.088	---
Post Excavation Samples Collected during Soil Removal in Northern Area of Property in 1989 (2)									
SE12	---	SOIL	5/30/89	E&E (8/89)	0.5	<0.001	0.002	0.012	0.013
SE13	---	SOIL	5/30/89	E&E (8/89)	0.5	<0.001	<0.001	0.005	0.006
SE14	---	SOIL	5/30/89	E&E (8/89)	0.5	<0.001	<0.001	0.005	0.006
RECENT DATA (1993)									
C-1,2,3A	C-1A,2A,3A	SOIL	7/21/93	EKI (9/8/93)	2.5, 2, 2	<0.10	<0.10	<0.10	<0.10
C-10,11,12A	C-10A,11A,12A	SOIL	7/20/93	EKI (9/8/93)	1.5, 2, 2.5	<0.10	<0.10	<0.10	<0.10
C-10,11,12BC	C-10B,10C,11B,11C,12C	SOIL	7/20/93	EKI (9/8/93)	3, 6, 3, 5.5, 5.5	<0.10	<0.10	<0.10	<0.10
C-13,14,15A	C-14A,13A,15A	SOIL	7/20/93	EKI (9/8/93)	0.5, 1, 1	<0.10	<0.10	<0.10	<0.10
C-13,14,15BC	C-14B,14C,13B,13C, 15B,15C	SOIL	7/20/93	EKI (9/8/93)	2, 5.5, 2.5, 5.5, 3, 5.5	<0.10	<0.10	<0.10	<0.10
C-16,17,18A	C-16A,17A,18A	SOIL	7/20/93	EKI (9/8/93)	2, 1.5, 1.5	<0.10	<0.10	<0.10	<0.10
C-16,17,18BC	C-16B,16C,17B, 17C,18B,18C	SOIL	7/20/93	EKI (9/8/93)	3.5, 5, 3 6, 2.5, 6	<0.10	<0.10	<0.10	<0.10
C-16-0		SOIL (3)	7/20/93	EKI (9/8/93)	Surface	<0.10	<0.10	<0.10	<0.10
C-19,20,21A	C-19A,20A,21A	SOIL	7/20/93	EKI (9/8/93)	0.5, 2, 0.5	<0.10	<0.10	<0.10	<0.10
C-19-0		SOIL (3)	7/20/93	EKI (9/8/93)	Surface	<5.0	<5.0	<5.0	0.39
C-4,5,6A	C-6A,5A,4A	SOIL	7/21/93	EKI (9/8/93)	2, 2.5, 2.5	<0.10	<0.10	<0.10	<0.10

TABLE 3

BTEX CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

SAMPLE NUMBER	COMPOSITED SAMPLES	MATRIX	DATE SAMPLED	SOURCE OF DATA (1)	SAMPLE COLLECTION DEPTH (Feet BGS)	BENZENE (mg/kg)	ETHYL-BENZENE (mg/kg)	TOLUENE (mg/kg)	TOTAL XYLENES (mg/kg)
RECENT DATA (1993) CONTINUED									
C-4,5,6BC	C-6B,6C,5B,5C,4B,4C	SOIL	7/21/93	EKI (9/8/93)	5.5, 3.5, 5.5, 4,	<0.10	<0.10	<0.10	<0.10
C-7,8A	C-7A,8A	SOIL	7/20/93	EKI (9/8/93)	2, 2.5	<0.10	<0.10	<0.10	<0.10
CC-1,2,3-0	CC-1,2,3	CONCRETE (3)	7/20/93	EKI (9/8/93)	Surface	<0.10	<0.10	<0.10	<0.10
CC-10,12-0	CC-10,12	CONCRETE (3)	7/20/93	EKI (9/8/93)	Surface	<0.10	<0.10	<0.10	<0.10
CC-4,5,6-0	CC-4,5,6	CONCRETE (3)	7/20/93	EKI (9/8/93)	Surface	<0.10	<0.10	<0.10	<0.10
CC-7,8-0	CC-7,8	CONCRETE (3)	7/20/93	EKI (9/8/93)	Surface	<0.10	<0.10	<0.10	<0.10

Notes:

BTEX	Benzene, toluene, ethyl benzene, total xylenes
BGS	Below ground surface
mg/kg	Milligrams per kilogram
<0.10	Not detected at or above indicated laboratory detection limit
---	Compound not analyzed and/or data not obtained

(1) Data obtained from the following sources:

NUS: NUS Corporation, Preliminary Assessment of PG & E Emeryville, report dated 31 May 1991.

HLA: Harding Lawson Associates, Soil and Groundwater Investigation, PG&E Materials Distribution Facility, 53rd and Hollis Streets, Emeryville, California, report dated 18 October 1991.

E&E: Ecology & Environment, Inc., Final Documentation Report Post-Excvation Sampling, PG&E Materials Distribution Center, Emeryville, California, report dated August 1989.

EKI: Erler & Kalinowski, Inc., Preliminary Site Investigation Report, Chiron Corporation, Emeryville, California, report dated 8 September 1993.

(2) These soil samples were collected from 0.5 feet below the pre-excavation ground surface.

(3) Samples may have contained asphaltic material.

TABLE 4

METAL CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

SAMPLE NUMBER	COMPOSITED SAMPLES	MATRIX	DATE SAMPLED	SOURCE OF DATA (1)	SAMPLE COLLECTION DEPTH (Feet BGS)	ARSENIC (mg/kg)	ARSENIC 10 x STLC (mg/l)	ARSENIC (WET) (mg/l)	ARSENIC STLC (mg/l)
HISTORIC DATA (Prior to 1993)									
EE-16 Composite	EE-16-1,2,3,4	SOIL	8/27/87	NUS (5/31/91)	1.5, 6.5, 11.5, 16.5	12.9	50	---	5
EE-23 Composite	EE-23-1,2,3,4	SOIL	8/27/87	NUS (5/31/91)	1.5, 6.5, 11.5, 16.5	32.2	50	---	5
SB-1 (1.5)	---	SOIL	6/21/91	HLA (10/18/91)	1.5	340	50	6.2	5
RECENT DATA (1993)									
C-1,2,3A	C-1A,2A,3A	SOIL	7/21/93	EKI (9/8/93)	2.5, 2, 2	27	50	---	5
C-10,11,12A	C-10A,11A,12A	SOIL	7/20/93	EKI (9/8/93)	1.5, 2, 2.5	<5.0	50	---	5
C-10,11,12BC	C-10B,10C,11B,11C,12C	SOIL	7/20/93	EKI (9/8/93)	3, 6, 3, 5.5, 5.5	<5.0	50	---	5
C-13,14,15A	C-13A,14A,15A	SOIL	7/20/93	EKI (9/8/93)	0.5, 1, 1	<5.0	50	---	5
C-13,14,15BC	C-13B,13C,14B,14C,15B,15C	SOIL	7/20/93	EKI (9/8/93)	2, 5.5, 2.5, 5.5, 3, 5.5	<5.0	50	---	5
C-16,17,18A	C-16A,17A,18A	SOIL	7/20/93	EKI (9/8/93)	2, 1.5, 1.5	99	50	4.0	5
C-16,17,18BC	C-16B,16C,17B,17C,18B,18C	SOIL	7/20/93	EKI (9/8/93)	3.5, 5, 3, 6, 2.5, 6	<5.0	50	---	5
C-16-0	---	SOIL (2)	7/20/93	EKI (9/8/93)	Surface	<5.0	50	---	5
C-19,20,21A	C-19A,20A,21A	SOIL	7/20/93	EKI (9/8/93)	0.5, 2, 0.5	220	50	7.7	5
C-19-0	---	SOIL (2)	7/20/93	EKI (9/8/93)	Surface	<5.0	50	---	5
C-4,5,6A	C-4A,5A,6A	SOIL	7/21/93	EKI (9/8/93)	2, 2.5, 2.5	15	50	---	5
C-4,5,6BC	C-4B,4C,5B,5C,6B,6C	SOIL	7/21/93	EKI (9/8/93)	3, 5.5, 3.5, 5.5, 4, 5.5	---	50	---	5
C-7,8A	C-7A,8A	SOIL	7/20/93	EKI (9/8/93)	2, 2.5	<5.0	50	---	5
CC-1,2,3-0	CC-1,2,3	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<5.0	50	---	5
CC-10,12-0	CC-10,12	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<5.0	50	---	5
CC-4,5,6-0	CC-4,5,6	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<5.0	50	---	5
CC-7,8-0	CC-7,8	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<5.0	50	---	5

TABLE 4

METAL CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

SAMPLE NUMBER	COMPOSITED SAMPLES	MATRIX	DATE SAMPLED	SOURCE OF DATA (1)	SAMPLE COLLECTION DEPTH (Feet BGS)	CHROMIUM VI (mg/kg)	CHROMIUM VI 10 x STLC (mg/l)	CHROMIUM (mg/kg)	CHROMIUM 10 x STLC (mg/l)	CHROMIUM (WET) (mg/l)	CHROMIUM STLC (mg/l)
HISTORIC DATA (Prior to 1993)											
EE-16 Composite	EE-16-1,2,3,4	SOIL	8/27/87	NUS (5/31/91)	1.5, 6.5, 11.5, 16.5	---	50	39.3	50	---	5
EE-23 Composite	EE-23-1,2,3,4	SOIL	8/27/87	NUS (5/31/91)	1.5, 6.5, 11.5, 16.5	---	50	31.5	50	---	5
SB-1 (1.5)	---	SOIL	6/21/91	HLA (10/18/91)	1.5	---	50	<5	50	---	5
RECENT DATA (1993)											
C-1,2,3A	C-1A,2A,3A	SOIL	7/21/93	EKI (9/8/93)	2.5, 2, 2	<0.05	50	37	50	---	5
C-10,11,12A	C-10A,11A,12A	SOIL	7/20/93	EKI (9/8/93)	1.5, 2, 2.5	<0.50	50	32	50	---	5
C-10,11,12BC	C-10B,10C,11B,11C,12C	SOIL	7/20/93	EKI (9/8/93)	3, 6, 3, 5.5, 5.5	<0.50	50	42	50	---	5
C-13,14,15A	C-13A,14A,15A	SOIL	7/20/93	EKI (9/8/93)	0.5, 1, 1	<0.50	50	32	50	---	5
C-13,14,15BC	C-13B,13C,14B,14C, 15B,15C	SOIL	7/20/93	EKI (9/8/93)	2, 5.5, 2.5, 5.5, 3, 5.5	<0.50	50	54	50	0.40	5
C-16,17,18A	C-16A,17A,18A	SOIL	7/20/93	EKI (9/8/93)	2, 1.5, 1.5	<0.50	50	42	50	---	5
C-16,17,18BC	C-16B,16C,17B,17C, 18B,18C	SOIL	7/20/93	EKI (9/8/93)	3.5, 5, 3, 6, 2.5, 6	<0.50	50	47	50	---	5
C-16-0	---	SOIL (2)	7/20/93	EKI (9/8/93)	Surface	<0.05	50	33	50	---	5
C-19,20,21A	C-19A,20A,21A	SOIL	7/20/93	EKI (9/8/93)	0.5, 2, 0.5	---	---	---	---	---	---
C-19-0	---	SOIL (2)	7/20/93	EKI (9/8/93)	Surface	<0.05	50	25	50	---	5
C-4,5,6A	C-4A,5A,6A	SOIL	7/21/93	EKI (9/8/93)	2, 2.5, 2.5	<0.05	50	50	50	0.35	5
C-4,5,6BC	C-4B,4C,5B,5C, 6B,6C	SOIL	7/21/93	EKI (9/8/93)	3, 5.5, 3.5, 5.5, 4, 5.5	<0.05	50	36	50	---	5
C-7,8A	C-7A,8A	SOIL	7/20/93	EKI (9/8/93)	2, 2.5	<0.05	50	29	50	---	5
CC-1,2,3-0	CC-1,2,3	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.05	50	33	50	---	5
CC-10,12-0	CC-10,12	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.05	50	19	50	---	5
CC-4,5,6-0	CC-4,5,6	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.05	50	23	50	---	5
CC-7,8-0	CC-7,8	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.05	50	24	50	---	5

TABLE 4

METAL CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

SAMPLE NUMBER	COMPOSITED SAMPLES	MATRIX	DATE SAMPLED	SOURCE OF DATA (1)	SAMPLE COLLECTION DEPTH (Feet BGS)	CADMIUM (mg/kg)	CADMIUM 10 x STLC (mg/l)
HISTORIC DATA (Prior to 1993)							
EE-16 Composite	EE-16-1,2,3,4	SOIL	8/27/87	NUS (5/31/91)	1.5, 6.5, 11.5, 16.5	<2	10
EE-23 Composite	EE-23-1,2,3,4	SOIL	8/27/87	NUS (5/31/91)	1.5, 6.5, 11.5, 16.5	<2	10
SB-1 (1.5)	---	SOIL	6/21/91	HLA (10/18/91)	1.5	4.8	10
RECENT DATA (1993)							
C-1,2,3A	C-1A,2A,3A	SOIL	7/21/93	EKI (9/8/93)	2.5, 2, 2	0.72	10
C-10,11,12A	C-10A,11A,12A	SOIL	7/20/93	EKI (9/8/93)	1.5, 2, 2.5	<5.0	10
C-10,11,12BC	C-10B,10C,11B,11C,12C	SOIL	7/20/93	EKI (9/8/93)	3, 6, 3, 5.5, 5.5	<5.0	10
C-13,14,15A	C-13A,14A,15A	SOIL	7/20/93	EKI (9/8/93)	0.5, 1, 1	1.0	10
C-13,14,15BC	C-13B,13C,14B,14C,15B,15C	SOIL	7/20/93	EKI (9/8/93)	2, 5.5, 2.5, 5.5, 3, 5.5	<5.0	10
C-16,17,18A	C-16A,17A,18A	SOIL	7/20/93	EKI (9/8/93)	2, 1.5, 1.5	0.83	10
C-16,17,18BC	C-16B,16C,17B,17C,18B,18C	SOIL	7/20/93	EKI (9/8/93)	3.5, 5, 3, 6, 2.5, 6	<5.0	10
C-16-0	---	SOIL (2)	7/20/93	EKI (9/8/93)	Surface	<0.50	10
C-19,20,21A	C-19A,20A,21A	SOIL	7/20/93	EKI (9/8/93)	0.5, 2, 0.5	---	---
C-19-0	---	SOIL (2)	7/20/93	EKI (9/8/93)	Surface	<0.50	10
C-4,5,6A	C-4A,5A,6A	SOIL	7/21/93	EKI (9/8/93)	2, 2.5, 2.5	0.56	10
C-4,5,6BC	C-4B,4C,5B,5C,6B,6C	SOIL	7/21/93	EKI (9/8/93)	3, 5.5, 3.5, 5.5, 4, 5.5	0.51	10
C-7,8A	C-7A,8A	SOIL	7/20/93	EKI (9/8/93)	2, 2.5	0.57	10
CC-1,2,3-0	CC-1,2,3	CONCRETE	7/20/93	EKI (9/8/93)	Surface	2.8	10
CC-10,12-0	CC-10,12	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.50	10
CC-4,5,6-0	CC-4,5,6	CONCRETE	7/20/93	EKI (9/8/93)	Surface	3.7	10
CC-7,8-0	CC-7,8	CONCRETE	7/20/93	EKI (9/8/93)	Surface	0.61	10

TABLE 4

METAL CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

SAMPLE NUMBER	COMPOSITED SAMPLES	MATRIX	DATE SAMPLED	SOURCE OF DATA (1)	SAMPLE COLLECTION DEPTH (Feet BGS)	LEAD (mg/kg)	LEAD 10 x STLC (mg/l)	LEAD WET (mg/l)	LEAD STLC (mg/l)
HISTORIC DATA (Prior to 1993)									
EE-16 Composite	EE-16-1,2,3,4	SOIL	8/27/87	NUS (5/31/91)	1.5, 6.5, 11.5, 16.5	51.9	50	4.2	5
EE-23 Composite	EE-23-1,2,3,4	SOIL	8/27/87	NUS (5/31/91)	1.5, 6.5, 11.5, 16.5	62.3	50	---	5
SB-1 (1.5)	---	SOIL	6/21/91	HLA (10/18/91)	1.5	190	50	<1.0	5
RECENT DATA (1993)									
C-1,2,3A	C-1A,2A,3A	SOIL	7/21/93	EKI (9/8/93)	2.5, 2, 2	9.3	50	---	5
C-10,11,12A	C-10A,11A,12A	SOIL	7/20/93	EKI (9/8/93)	1.5, 2, 2.5	7.0	50	---	5
C-10,11,12BC	C-10B,10C,11B,11C,12C	SOIL	7/20/93	EKI (9/8/93)	3, 6, 3, 5.5, 5.5	7.4	50	---	5
C-13,14,15A	C-13A,14A,15A	SOIL	7/20/93	EKI (9/8/93)	0.5, 1, 1	120	50	2.6	5
C-13,14,15BC	C-13B,13C,14B,14C, 15B,15C	SOIL	7/20/93	EKI (9/8/93)	2, 5.5, 2.5, 5.5, 3, 5.5	30	50	---	5
C-16,17,18A	C-16A,17A,18A	SOIL	7/20/93	EKI (9/8/93)	2, 1.5, 1.5	120	50	2.8	5
C-16,17,18BC	C-16B,16C,17B,17C, 18B,18C	SOIL	7/20/93	EKI (9/8/93)	3.5, 5, 3, 6, 2.5, 6	56	50	0.69	5
C-16-0	---	SOIL (2)	7/20/93	EKI (9/8/93)	Surface	12	50	---	5
C-19,20,21A	C-19A,20A,21A	SOIL	7/20/93	EKI (9/8/93)	0.5, 2, 0.5	---	---	---	---
C-19-0	---	SOIL (2)	7/20/93	EKI (9/8/93)	Surface	<5.0	50	---	5
C-4,5,6A	C-4A,5A,6A	SOIL	7/21/93	EKI (9/8/93)	2, 2.5, 2.5	26	50	---	5
C-4,5,6BC	C-4B,4C,5B,5C, 6B,6C	SOIL	7/21/93	EKI (9/8/93)	3, 5.5, 3.5, 5.5, 4, 5.5	13	50	---	5
C-7,8A	C-7A,8A	SOIL	7/20/93	EKI (9/8/93)	2, 2.5	13	50	---	5
CC-1,2,3-0	CC-1,2,3	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<5.0	50	---	5
CC-10,12-0	CC-10,12	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<5.0	50	---	5
CC-4,5,6-0	CC-4,5,6	CONCRETE	7/20/93	EKI (9/8/93)	Surface	6.1	50	---	5
CC-7,8-0	CC-7,8	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<5.0	50	---	5

TABLE 4

METAL CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

SAMPLE NUMBER	COMPOSITED SAMPLES	MATRIX	DATE SAMPLED	SOURCE OF DATA (1)	SAMPLE COLLECTION DEPTH (Feet BGS)	MERCURY (mg/kg)	MERCURY 10 x STLC (mg/l)
HISTORIC DATA (Prior to 1993)							
EE-16 Composite	EE-16-1,2,3,4	SOIL	8/27/87	NUS (5/31/91)	1.5, 6.5, 11.5, 16.5	<0.2	2
EE-23 Composite	EE-23-1,2,3,4	SOIL	8/27/87	NUS (5/31/91)	1.5, 6.5, 11.5, 16.5	<0.2	2
SB-1 (1.5)	---	SOIL	6/21/91	HLA (10/18/91)	1.5	0.36	2
RECENT DATA (1993)							
C-1,2,3A	C-1A,2A,3A	SOIL	7/21/93	EKI (9/8/93)	2.5, 2, 2	<0.10	2
C-10,11,12A	C-10A,11A,12A	SOIL	7/20/93	EKI (9/8/93)	1.5, 2, 2.5	0.15	2
C-10,11,12BC	C-10B,10C,11B,11C,12C	SOIL	7/20/93	EKI (9/8/93)	3, 6, 3, 5.5, 5.5	<0.10	2
C-13,14,15A	C-13A,14A,15A	SOIL	7/20/93	EKI (9/8/93)	0.5, 1, 1	0.14	2
C-13,14,15BC	C-13B,13C,14B,14C, 15B,15C	SOIL	7/20/93	EKI (9/8/93)	2, 5.5, 2.5, 5.5, 3, 5.5	0.12	2
C-16,17,18A	C-16A,17A,18A	SOIL	7/20/93	EKI (9/8/93)	2, 1.5, 1.5	0.82	2
C-16,17,18BC	C-16B,16C,17B,17C, 18B,18C	SOIL	7/20/93	EKI (9/8/93)	3.5, 5, 3, 6, 2.5, 6	<0.10	2
C-16-0	---	SOIL (2)	7/20/93	EKI (9/8/93)	Surface	<0.10	2
C-19,20,21A	C-19A,20A,21A	SOIL	7/20/93	EKI (9/8/93)	0.5, 2, 0.5	---	---
C-19-0	---	SOIL (2)	7/20/93	EKI (9/8/93)	Surface	<0.10	2
C-4,5,6A	C-4A,5A,6A	SOIL	7/21/93	EKI (9/8/93)	2, 2.5, 2.5	0.11	2
C-4,5,6BC	C-4B,4C,5B,5C, 6B,6C	SOIL	7/21/93	EKI (9/8/93)	3, 5.5, 3.5, 5.5, 4, 5.5	0.13	2
C-7,8A	C-7A,8A	SOIL	7/20/93	EKI (9/8/93)	2, 2.5	0.16	2
CC-1,2,3-0	CC-1,2,3	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.10	2
CC-10,12-0	CC-10,12	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.10	2
CC-4,5,6-0	CC-4,5,6	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.10	2
CC-7,8-0	CC-7,8	CONCRETE	7/20/93	EKI (9/8/93)	Surface	<0.10	2

TABLE 4

METAL CONCENTRATIONS DETECTED IN SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

Notes:

WET	Waste extraction test
STLC	Soluble threshold limit concentration
BGS	Below ground surface
mg/kg	Milligrams per kilogram
mg/l	Milligram per liter
<2.0	Not detected at or above indicated laboratory detection limit
---	Compound not analyzed

(1) Data obtained from the following sources:

NUS: NUS Corporation, Preliminary Assessment of PG & E Emeryville, report dated 31 May 1991.

HLA: Harding Lawson Associates, Soil and Groundwater Investigation, PG&E Materials Distribution Facility, 53rd and Hollis Streets, Emeryville, California, report dated 18 October 1991.

EKI: Erler & Kalinowski, Inc., Preliminary Site Investigation Report, Chiron Corporation, Emeryville, California, report dated 8 September 1993.

(2) Soil samples may have contained asphaltic material.

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE (1)
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

COMPOUND	DTSC ACCEPTANCE CRITERIA FOR RELOCATION	GUIDANCE FOR REMOVAL CRITERIA	NUMBER OF ANALYSES CONDUCTED	NUMBER OF SAMPLES EXCEEDING CRITERIA	MAXIMUM CONCENTRATION DETECTED	ARITHMETIC AVERAGE OF CONCENTRATIONS DETECTED (2)
PCBs (EPA 8080)	1.0 mg/kg	DTSC (3)	43	3	2.1	0.19 mg/kg
TVPH	100 mg/kg	DTSC (3)	17	0	ND (<1.0 mg/kg)	NA
TEPH	100 mg/kg	DTSC (3)	17	4 (4)	260 mg/kg	44 mg/kg
Oil & Grease	---	---	2	0	4000 mg/kg	2200 mg/kg
BTEX	NS	---	21	0	0.39 mg/kg	0.53 mg/kg
EPA 8240 (excluding BTEX)	NS	---	28	---	0.42 mg/kg (5) (methylene chloride)	NA
EPA 8270	NS	---	14	---	ND (<5.0 mg/kg)	NA
Arsenic	TTLC: 500 mg/kg STLC: 5.0 mg/l	Title 22 Title 22	19 3 (WET)	0 2	340 mg/kg 7.7 mg/l	41 mg/kg 6.0 mg/l
Cadmium	TTLC: 100 mg/kg	Title 22	19	0	4.8 mg/kg	1.5 mg/kg
Total Chromium	TTLC: 2500 mg/kg STLC: 5.0 mg/l	Title 22 Title 22	19 2 (WET)	0 0	54 mg/kg 0.40 mg/l	33 mg/kg 0.38 mg/l
Chromium VI	TTLC: 500 mg/kg	Title 22	16	0	ND (<0.50 mg/kg)	---
Total Lead	TTLC: 1000 mg/kg STLC: 5.0 mg/l	Title 22/DTSC (3) Title 22	19 5 (WET)	0 0	120 mg/kg 4.2 mg/l	39 mg/kg 2.2 mg/l
Mercury	TTLC: 20 mg/kg	Title 22	19	0	0.82 mg/kg	0.14 mg/kg
Asbestos	TTLC: 1.0 percent	Title 22	5	0	ND (<1.0 percent)	---

TABLE 5

SUMMARY OF ANALYTICAL RESULTS FOR SOIL AND CONCRETE SAMPLES
COLLECTED FROM 0 TO 3 FEET BELOW GROUND SURFACE (1)
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

Notes:

PCBs	Polychlorinated biphenyls
TVPH	Total volatile petroleum hydrocarbons
TEPH	Total extractable petroleum hydrocarbons
BTEX	Benzene, toluene, ethyl benzene, total xylenes
mg/kg	Milligrams per kilogram
mg/l	Milligrams per liter
DTSC	California Department of Toxic Substances Control
Title 22	California Code of Regulations, Title 22
WET	Waste extraction test
ND	Compound not detected; value reported indicates the highest detection limit value reported for the analytical method
NA	Not applicable; compounds either not detected or the arithmetic average is less than the detection limit
NS	Not specified
TTLC	Total threshold limit concentration in Title 22, California Code of Regulations
STLC	Soluble threshold limit concentration in Title 22, California Code of Regulations
---	Data not obtained and/or not available or applicable.

(1) Does not include data obtained from the northern portion of the property that was previously excavated.

(2) The value of 1/2 the laboratory-reported limit of detection was used for calculating concentration averages where compounds were reported as not detected.

(3) DTSC acceptance criteria for relocation of soil and concrete to Shellmound properties based on information presented in letter from the City of Emeryville dated 9 March 1994. Confirmation of DTSC criteria regarding maximum concentrations allowed for the relocation of concrete debris and soil from the City of Emeryville/PG&E site was received at a meeting with DTSC on 17 March 1993 .

(4) Samples may have contained asphaltic material.

(5) Methylene chloride was the only compound detected (sample no. EE-15) and its presence is a suspected laboratory contaminant.

TABLE 6

ESTIMATED VOLUMES AND CHEMICAL CONCENTRATIONS
IN POSSIBLE RELOCATION MATERIALS (1)
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

MATERIALS PROPOSED FOR RELOCATION	ESTIMATED VOLUME (cubic yards)	SUMMARY OF ANALYTICAL DATA					
		COMPOUND	DTSC ACCEPTANCE CRITERIA FOR RELOCATION (2)	NUMBER OF ANALYSES CONDUCTED	NUMBER OF SAMPLES EXCEEDING CRITERIA	MAXIMUM CONCENTRATION DETECTED	ARITHMETIC AVERAGE OF CONCENTRATIONS DETECTED (3)
Soil Located Above Street Grade(Excluding Previously Excavated Area)	16,000	PCBs (EPA 8080)	1.0 mg/kg	31	2	2.1 mg/kg	0.29 mg/kg
		TEPH	100 mg/kg (5)	13	1 (4)	110 mg/kg	19 mg/kg
		ARSENIC	TTLC: 500 mg/kg	15	0	340 mg/kg	51 mg/kg
			STLC: 5.0 mg/l	3	2 (WET)	7.7 mg/l	6.0 mg/l
Concrete	3,000	PCBs (EPA 8080)	1.0 mg/kg	12	1	1.1 mg/kg	0.23 mg/kg
		TEPH	100 mg/kg (5)	4	3 (4)	260 mg/kg	130 mg/kg
		ARSENIC	TTLC: 500 mg/kg	4	0	<5.0 mg/kg	---
Soil Located Above Street Grade in Previously Excavated Area	1,200	PCBs (EPA 8080)	1.0 mg/kg	6	2	10.9 mg/kg	3.0 mg/kg

TABLE 6

ESTIMATED VOLUMES AND CHEMICAL CONCENTRATIONS
IN POSSIBLE RELOCATION MATERIALS (1)
City of Emeryville/PG&E Site
Emeryville, California
(EKI 930028.00)

Notes:

PCBs	Polychlorinated biphenyls
TEPH	Total extractable petroleum hydrocarbons
TTLC	Total threshold limit concentration in Title 22, California Code of Regulations
STLC	Soluble threshold limit concentration in Title 22, California Code of Regulations
mg/kg	Milligrams per kilogram
mg/l	Milligrams per liter
WET	Waste extraction test
<5.0	Compound not detected at or above indicated laboratory detection limit
---	Data not obtained and/or not applicable

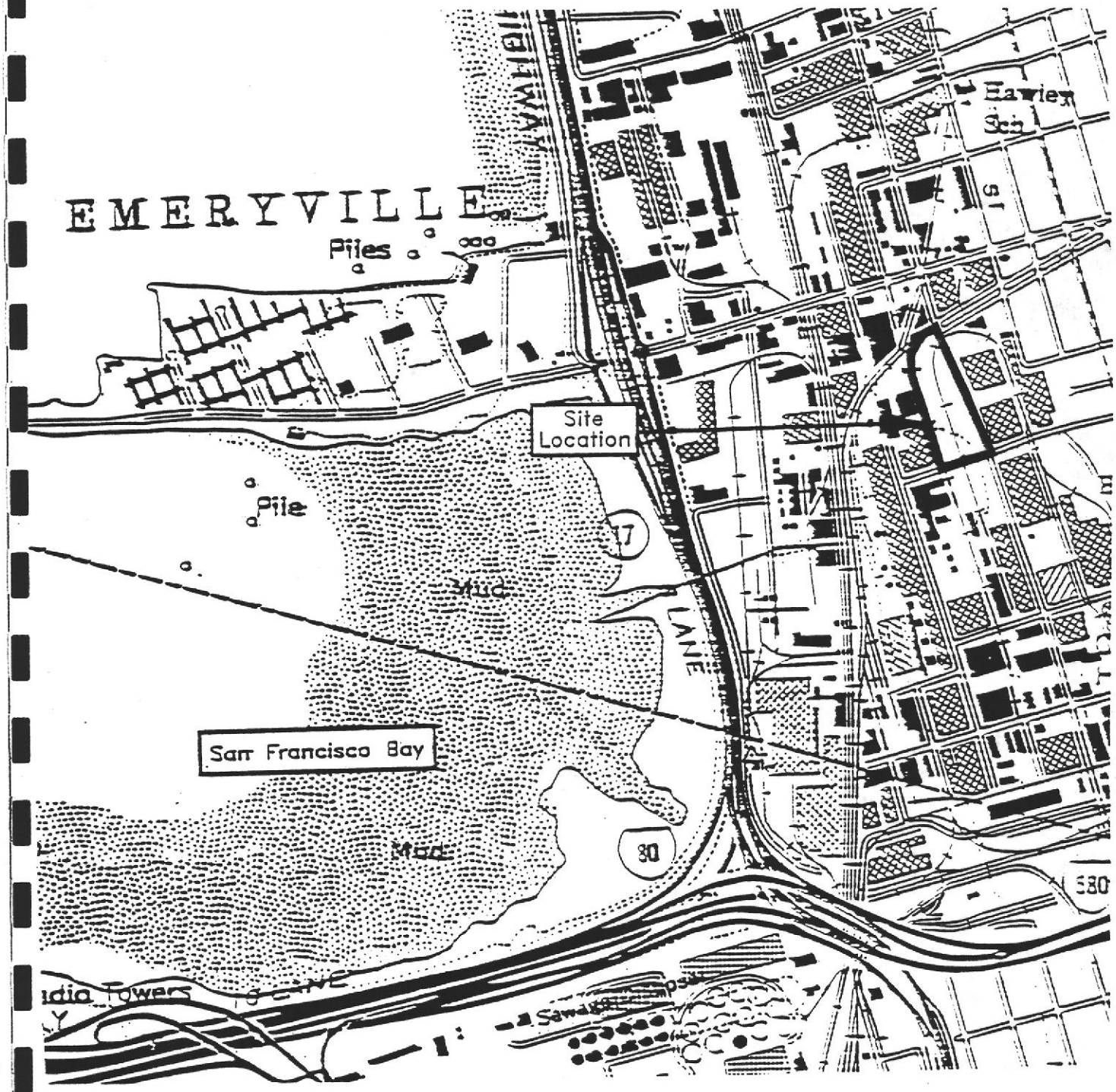
(1) Relocation materials include soil and concrete that are located on the PG&E site above surrounding street grade. These relocation materials range between approximately 2 to 3 feet in thickness.

(2) DTSC acceptance criteria for relocation of soil and concrete to Shellmound properties based on information presented in letter from the City of Emeryville dated 9 March 1994. Confirmation of DTSC criteria regarding maximum concentrations allowed for the relocation of concrete debris and soil from the City of Emeryville/PG&E site was received at a meeting with DTSC on 17 March 1993 .

(3) The value of 1/2 the laboratory-reported limit of detection was used for calculating concentration averages where compounds were reported as not detected.

(4) Samples may have contained asphaltic material.

(5) Recommended TEPH acceptance criteria is 400 mg/kg.



Basemap: Oakland West Quadrangle, 7.5 Minute Series Topographic Maps, U.S.G.S. Photo Revised 1980.

N

0 1000 2000

(Approximate Scale in Feet)

Erler & Kalinowski, Inc.

Site Location Map

Emeryville, CA
April 1994
EK 930029.00
Figure 1

Site Boundary
(Parcel No. 49-1041-28)

(Parcel No. 49-1041-29)

HOLLIS ST.

SPRR

53RD ST.

HORTON ST.

Former PG&E Excavation

Area A

Former PG&E Excavation

Stanford Avenue

Bldg. B

Bldg. F

Bldg. M

Bldg. G

CMF

Bldg.

Temescal Creek

MW-1 MW-2 MW-3 MW-4 MW-7 MW-10 MW-11 MW-12 MW-13

SB-1 SB-2 SB-3

C-1 C-2 C-3 C-4 C-5 C-6 C-7 C-9 C-10 C-11 C-12 C-13 C-14 C-15 C-16 C-17 C-18 C-19 C-20 C-21

TF-1 TF-2 TF-3 TF-4

15 16 17 18 22 23 28 30 35 36 37 39 40

74.70°

0 100 200

(Approximate Scale in Feet)

LEGEND

- Historic Monitoring Well Location
- Historic Soil Boring Location
- Recent Soil Boring Location by EKI
- Former Area of Excavation
- Existing Concrete Area
- Property Boundary; City of Emeryville/ PG&E Property
- Extent of Surface Materials to be Handled Separately from the Remainder of the Materials Located On-Site (Area A).

Notes:

1. All locations are approximate.

Erler & Kalinowski, Inc.

Site Plan
City of Emeryville/PG&E Site

Emeryville, CA
April 1994
EKI 930028.00
Figure 2

APPENDIX A

Field Methods and Procedures

Appendix A

Field Methods and Procedures

A.1 SAMPLING EQUIPMENT CLEANING

All equipment used for collecting materials samples will be cleaned before and after each use as follows:

- wash with non-phosphate detergent
- rinse with tap water
- rinse with methanol or hexane
- rinse with distilled water

A.2 SAMPLE CONTAINERS

Representative samples or subsamples of materials selected for relocation will be placed in 8 ounce wide mouth glass jars (e.g., item number 241-0250 from I-Chem) obtained and pre-cleaned at the laboratory.

A.3 SAMPLE PRESERVATION

Materials samples will be sealed and labeled as described in Section A.4. Each glass jar will be placed in a resealable plastic bag to prevent spillage in case of breakage. Ice will the be added to each ice chest to chill the samples to approximately 4°C.

A.4 SAMPLE DOCUMENTATION

This section describes standard operating procedures for sample custody during the relocation work at the Site. Sample custody procedures will be followed through sample collection, transfer, analysis, and ultimate disposal. The general procedures for all samples are described in the following subsections. The purpose of the general procedures is to assure that:

1. the integrity of samples is maintained during their collection, transportation, and storage prior to analysis; and

2. that post analysis sample material is properly disposed.

A.4.1 Field Sampling Operations

Each sample will be properly labeled and sealed immediately after collection. Sample tracking documents will be prepared so that identification and chain-of-custody records can be maintained and sample disposition can be controlled. Forms will be filled out with waterproof ink. The following are sample identification documents that will be utilized during the materials relocation work (examples of the forms are attached):

1. Sample Label;
2. Field Sample Log;
3. Daily Inspection Form; and
4. Chain-of-Custody Record.

A.4.1.1 Sample Labels

Sample labels are necessary to ensure proper sample identification. The following information will be specified on each label:

1. Name of collector;
2. Date and time of collection;
3. Place of collection;
4. Sample identification number (ID);
5. Depth of sample (if applicable); and
6. Preservative (if any)

A.4.1.2 Daily Inspection Form

Information pertinent to the contractor's activities on the Site will be recorded on the daily inspection form. The daily inspection form or consecutively numbered daily inspection forms will be maintained for each day of field activity. Entries on the daily inspection form will contain the following information if appropriate:

1. Name of contractor and supervisor of site activities, and physical/environmental conditions during field activities;

2. Delays or accidents that occurred during field activities;

3. Summary of work completed during field activities.

A.4.1.3 Field Log Book

Information pertinent to a field survey, measurements, and/or sampling will be recorded in a log book. The field log book or consecutively numbered field log books will be kept for all samples taken. Entries in the log book will contain the following information if appropriate:

1. Name and title of author, date and time of entry, and physical/environmental conditions during field activity;

2. Location of sampling or measurement activity;

3. Name(s) and title(s) of field crew;

4. Type of sample or measured media (e.g., soil, asphalt, or concrete);

5. Sample collection or measurement method(s);

6. Number and volume of sample(s) taken;

7. Description of sampling point(s);

8. Date and time of collection or measurement;

9. Sample Identification number(s);

10. Sample preservation;

11. Sample distribution (e.g., field laboratory or off-site laboratory); and

12. Field observation/comments.

A.4.1.4 Chain-of-Custody Form

Every sample will be listed on the Chain-of-Custody form. The form will accompany every sample and every shipment of samples to the field and off-site laboratories in order to establish the documentation necessary to trace sample possession. The form will contain the following information:

1. Sample ID;
2. Signature of collector;
3. Date of collection;
4. Place of collection;
5. Sample type;
6. Signatures of persons involved in chain of possession;
7. Inclusive dates of possession;
8. Name of person receiving the sample;
9. Date of sample receipt;
10. Analyses requested;
11. Special analytical procedures requested (including samples to be composited); and
12. Sample condition and temperature.

A.4.1.5 Sample Transfer and Shipment

Samples are always accompanied by a chain-of-custody record. When transferring samples, the individuals relinquishing and receiving the samples will sign, date, and note the time on the chain-of-custody record. Samples will be packaged properly for shipment and dispatched to the appropriate laboratory for analysis. A separate chain-of-custody record will accompany each shipment. The method of shipment and courier name(s) will be entered on the chain-of-custody record.

A.5 CORRECTIONS TO DOCUMENTATION

Original data recorded in field notebooks, daily inspection forms, chain-of-custody records, and other forms should be written in waterproof ink. None of these documents should be destroyed or discarded, even if they are illegible or contain inaccuracies that require a replacement document.

If an error is made on a document assigned to one individual, that individual should make corrections simply by drawing a line through the error, entering the correct information, and initialing and dating the change. If possible, any subsequent error(s) discovered on a document should be corrected by the person who made the entry.

A.6 SAMPLE STORAGE

The laboratory shall not dispose of any portion of a sample remaining after testing prior to thirty (30) days after the results of the analysis of the sample have been reported to EPA. After 30 days, unless notified by one of the project managers, all remaining portions of samples in which chemicals are detected will be disposed of in accordance with California Title 22 requirements.

Erler & Kalinowski, Inc.

Consulting Engineers and Scientists

(415) 578-1172

SOIL / WATER SAMPLE

Client / Source _____

Sample _____ Grab _____ Comp. _____

Date _____ Time _____ Coll. by. _____

Preserv: None H_2SO_4 HCl HNO_3 NaOH Other _____

Analytes: Vol. Exts. Metals Anions Other _____

Remarks _____

Erler &
Kalinowski, Inc.

FIELD SAMPLE LOG

Materials Relocation Project
City of Emeryville/PG&E Site
Emeryville, California

Sample ID	Date	Field Log Page Number

Daily Inspection Report No. _____

ERLER & KALINOWSKI, INC.
CONSULTING ENGINEERS AND SCIENTISTS

Contractor _____

Supt. on Job _____ Sheet _____ of _____

Weather _____ Date _____

_____ Temperature _____ °F Max _____ °F Min Project _____

Work Hours _____ to _____ Memos Issued _____ _____

Photos _____ EKI Job No. _____

Special Conditions, Delays, Changes _____ _____

Accidents Damage _____

Sampling, Testing _____

Visitors to Site _____

Work Report (Work done, Personnel/Equipment working) _____

Distribution Inspection File (orig)

Field File

By _____

CHAIN OF CUSTODY / SAMPLE ANALYSIS REQUEST

Erler & Kalinowski, Inc.

Analytical Laboratory:

Project Number:

Date Sampled:

Project Name:

Sampled By:

Source of Samples:

Report Results To:

Location:

Phone Number: 415) 578-1172

Lab Sample I D	Field Sample I D	Sample Type	Number and Type of Containers	Time Collected	Analyses Requested (EPA Method Number)	Results Required By (Date/Time)

Special Instructions:

Relinquished By: Name / Signature / Affiliation	Date	Time	Received By: Name / Signature / Affiliation
/EKI			