Preliminary Environmental Assessment Work Plan
Batarse Project Site
104th Avenue and East 14th Street
Oakland, California

May 25, 2001
7962.01-001

Prepared for
Oakland Unified School District
955 High Street
Oakland, California 94601

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DEPARTMENT OF TOXIC SUBSTANCES CONTROL
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May 25, 2001 7962.01-001

Ms. Janet Naito
California Environmental Protection Agency
Department of Toxic Substances Control
700 Heinz Avenue, Suite 200
Berkeley, California 94710

Subject: Preliminary Environmental Assessment Work Plan, Batarse Project Site, 104th Avenue and East 14th Street, Oakland, California

Dear Ms. Naito:

LFR Levine · Fricke (LFR) has prepared this Preliminary Environmental Assessment (PEA) work plan on behalf of the Oakland Unified School District for the Batarse Project Site in Oakland, California ("the Site").

LFR has reviewed background information obtained from the "Phase I Environmental Site Assessment Report, Batarse Project Site, Oakland, California," prepared by ENSR Consulting and Engineering, dated October 2000. On December 1, 2000, LFR personnel met with you and Dr. David Berry of the California Environmental Protection Agency Department of Toxic Substances Control (DTSC) to discuss the scope of the PEA work plan for the Site.

Our original work plan, dated January 30, 2001, has been revised to include the DTSC's comments as presented in documents issued by the DTSC on March 9, March 12, and March 19, 2001, and discussed during our teleconference on March 14, 2001. This work plan was prepared in general accordance with DTSC guidelines, as presented in the PEA Guidance Manual (January 1994, second printing June 1999).

If you have any questions or comments concerning the PEA work plan, please call either of the undersigned at (510) 652-4500.

Sincerely,

Lita D Freeman for
Alan D. Gibbs, R.G., R.E.A. II
Senior Associate Geologist

Charles H. Pardini, R.G.
Principal Geologist,
Assistant Operations Manager

cc: Ms. Ineda P. Adesanya, Oakland Unified School District
Mr. Jerry Suich, Oxbridge Development

LFR
LEVINE • FRICKE

May 25, 2001

7962.01-001

Ms. Ineda P. Adesanya
Director of Facilities
Oakland Unified School District
955 High Street
Oakland, California 94601

Subject: Preliminary Environmental Assessment Work Plan, Batarse Project Site, 104th Avenue and East 14th Street, Oakland, California

Dear Ms. Adesanya:

LFR Levine · Fricke (LFR) has prepared this Preliminary Environmental Assessment (PEA) work plan on behalf of the Oakland Unified School District for the Batarse Project Site in Oakland, California ("the Site"). The Site, which consists of numerous parcels, is located within an area bounded to the north by 104th Avenue, to the west by East 14th Street, to the east by Breed Avenue, and to the south by a maintenance facility owned by AC Transit.

LFR has reviewed background information obtained from the "Phase I Environmental Site Assessment Report, Batarse Project Site, Oakland, California," prepared by ENSR Consulting and Engineering, dated October 2000. On December 1, 2000, LFR personnel met with Ms. Janet Naito and Dr. David Berry of the California Environmental Protection Agency Department of Toxic Substances Control (DTSC) to discuss the scope of the PEA work plan for the Site.

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Senior Associate Geologist

Charles H. Pardini, R.G.
Principal Geologist,
Assistant Operations Manager

cc: Mr. Jerry Suich, Oxbridge Development

CONTENTS

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

This Preliminary Environmental Assessment (PEA) work plan for the Batarse Project site, located at the intersection of 104th Avenue and East 14th Street in Oakland, California ("the Site"; Figure 1), is being submitted by LFR Levine · Fricke (LFR) on behalf of the Oakland Unified School District (OUSD). The Site, which consists of numerous parcels, is located within an area bounded to the north by 104th Avenue, to the west by East 14th Street, to the east by Breed Avenue, and to the south by a bus maintenance facility owned by Alameda-Contra Costa Transit (AC Transit; Figures 1 and 2).

The site is being considered as a potential location for the construction of a new school. Information used in the preparation of this PEA work plan was obtained during LFR's drive-by visit of the Site on October 30, 2000, and from the following sources:

- "Underground Tank Technical Closure Report," prepared by Gen-Tech Environmental, dated March 26, 1993
- "Monitoring Well Installation and Sampling, Lloyd Wise Olds, 10440 East 14th Street, Oakland, California," prepared by Gen-Tech Environmental, dated May 6, 1993
- "Soil and Groundwater Investigation Site at 10440 and 10550 East 14th Street, Oakland, California," prepared by Gen-Tech Environmental, dated May 20, 1994
- "Overview of Environmental Conditions at 10550 East 14th Avenue Nissan/Honda Auto Dealership in Oakland, California," prepared by Gen-Tech Environmental, dated October 11, 1994
- "Monitoring Well Installation and Groundwater Sampling for Lloyd Wise Oldsmobile/Nissan, 10550 East 14th Street, Oakland, California," prepared by Piers Environmental Services, dated September 27, 1995
- "Limited Phase II Environmental Assessment and Groundwater Monitoring Report, 10500 East 14th Street, Oakland, California," prepared by Piers Environmental Services, dated March 13, 1997
- "Fuel Leak Site Case Closure for 10500 East 14th Street, Oakland," prepared by Alameda County Health Care Services Agency (ACHCSA), dated August 14, 1998
- "Phase I Environmental Assessment for 1500–1510 105th Avenue, Oakland, California," prepared by Piers Environmental Services, dated June 5, 1996

- "Phase I Environmental Assessment for 1520 105th Avenue, Oakland, California," prepared by Piers Environmental Services, dated August 27, 1998

- "Phase I Environmental Site Assessment Report, Batarse Project Site, East 14th Street and 105th Avenue, Oakland, California," prepared by ENSR Consulting and Engineering, dated October 2000 (ENSR 2000)

A summary of the reports prepared by previous consultants is included in Appendix A of this work plan. The reports for the properties known as 10440 through 10550 East 14th Street detail work performed off Site; however, information contained in these reports is summarized in this work plan to evaluate possible impacts to the Site.

LFR met with Ms. Janet Naito, Senior Hazardous Substances Scientist, and Dr. David Berry, Toxicologist, of the California Environmental Protection Agency Department of Toxic Substances Control (DTSC) on December 1, 2000, to discuss the scope of the PEA work plan for the Site. Our original work plan dated January 30, 2001, has been revised to include the DTSC's comments as presented in documents issued by the DTSC on March 9, March 12, and March 19, 2001, and discussed during our teleconference on March 14, 2001. This work plan was prepared in general accordance with DTSC guidelines, as presented in the PEA Guidance Manual (January 1994, second printing June 1999).

This work plan was prepared and will be implemented in general accordance with the guidelines of the DTSC, as detailed in the PEA Guidance Manual (January 1994, second printing June 1999). LFR has prepared a site-specific health and safety plan for the planned activities at the Site, and it is included with this work plan as Appendix B.

1.2 Summary of Background Information

At the request of the OUSD, LFR did not obtain access or observe the interior of all of the site buildings; however, access to most of the on-site buildings was gained by LFR to facilitate work at the Site.

For convenience, the Site has been divided into eight parcel groups, which are referred to as Lloyd Wise, Inc.; Bill & Bill's Auto Body; Management Storage; Ward's Custom Paint; Chevron Tow; Union Pacific Railroad (UPRR)/AC Transit; West Side of 105th Avenue Commercial, Industrial, and Residential; and East Side of 104th Avenue Residential. These parcels are located southeast of the intersection of 104th Avenue and East 14th Street (Figure 2). Information on the parcel groups, including the parcel group name, street address, and Assessor's Parcel Number (APN), is presented in the following table.

Parcel Group	Parcel Group Name	Street Address	Assessor's Parcel Number
I	Lloyd Wise, Inc.	10550 East 14th Street (eastern portion)	047-5519-005-02 (eastern portion)
		1424 105th Avenue (formerly part of East 14th Street)	047-5509-010-00
II	Bill & Bill's Auto Body	1500 105th Avenue	047-5509-009-01
III	Management Storage	1510, 1520, and 1528 105th Avenue	047-5509-007-00 and 047-5509-006-00
IV	Ward's Custom Paint	1536, 1538, 1544, and 1548 105th Avenue	047-5509-003-00, 047-5509-004-00, and 047-5509-005-00
V	Chevron Tow	1560 and 1570 105th Avenue	047-5509-001-01
VI	UPRR	Center of 105th Avenue (see Figure 2)	047-5519-004-10 and 047-5519-003
	Portion of AC Transit	No assigned address (see Figure 2)	047-5519-004-03
VII	West Side of 105th Avenue Commercial, Industrial, and Residential	1429/1433/1439 105th Avenue	047-5509-015-03
		1449 105th Avenue	047-5509-015-04
		1501 105th Avenue	047-5509-17
		1525 and 1545 105th Avenue	047-5509-021-01
		1557, 1559, and 1561 105th Avenue	047-5509-023-01
		105th Avenue Right of Way	NA
VIII	East Side of 104th Avenue Residential	10403 Walnut Street	047-5509-32-01
		1440 104th Avenue	047-5509-36-01
		1446 104th Avenue	047-5509-34-00
		1452 104th Avenue	047-5509-33-00
		1604 104th Avenue	047-5509-31-00
		1608 104th Avenue	047-5509-30-00
		1616 104th Avenue	047-5509-029-00
		1626 104th Avenue	047-5509-28-00
		1632 104th Avenue	047-5509-27-00
		1636 104th Avenue	047-5509-26-00
		1640 104th Avenue	047-5509-25-00
		1648 104th Avenue	047-5509-24-00

A summary of historical uses for each parcel group is presented below. This information was obtained from the Phase I Environmental Site Assessment (ESA) report prepared by ENSR (ENSR 2000). During their Phase I ESA, ENSR reviewed Sanborn fire insurance maps (Sanborn maps), aerial photographs and agency files for historical site usage information.

Lloyd Wise, Inc., Parcel Group – 10550 East 14th Street and 1424 105th Avenue

Sanborn maps indicate that the eastern portion of the parcel, known as 10550 East 14th Street, was vacant land from 1926 until the construction of a commercial building in 1981. This building appears to be the service building that is currently present on the parcel. During a reconnaissance visit on May 30, 2000, ENSR reported that two buildings exist on the eastern portion of the parcel, including the service building noted above and the maintenance shop that is currently known as 1424 East 14th Street (Figure 2). Both of these buildings were occupied by Lloyd Wise, Inc., during the site reconnaissance.

The western portions of 10500 and 10550 East 14th Street are occupied by the Lloyd Wise showroom and office buildings. These areas were not included in the study area.

According to information obtained by ENSR, a residence existed on the eastern portion of the parcel known as 1424 105th Avenue from 1926 to 1969. By the early 1980s, the residence had been replaced by a commercial building. This building appears to be the maintenance shop that is currently present on this parcel.

The history of the buildings on this parcel group are described briefly below:

- The service building (eastern portion of 10550 East 14th Street) was used for vehicle repairs until those operations were relocated in 1999. The first floor of the building is divided into eight maintenance bays, offices, a tool room, and an oil storage room. The second floor was used for offices and storage. The former aboveground hydraulic lifts have been removed (date unknown). According to information contained in ENSR's report, no underground hydraulic lifts were present in this building. ENSR noted that the floor drains in this building had been backfilled with concrete at the time of their visit.

  Four double-walled aboveground storage tanks (ASTs), ranging in capacity from 55 to 200 gallons and used for storage of motor oil, were formerly located in this building, according to ENSR's report. ENSR noted in their report that two oil stained areas, each measuring approximately 2 feet in diameter, were observed on the concrete floor of this room. No nearby floor drains or significant cracks were observed in the area of the former ASTs.

  ENSR representatives observed an approximately 300-gallon aboveground storage tank (AST) and an air compressor within a fenced enclosure outside the eastern end of the service building. Heavy oil staining was noted on the concrete pad of this enclosure.

- The maintenance shop (1424 East 14th Street) is divided into 10 vehicle maintenance bays. According to ENSR's report, one underground hydraulic lift was present at the southeastern end of the building at the time of their visit. ENSR reported that the remaining underground hydraulic lifts were removed in the early 1990s. At the time of ENSR's visit, one of the maintenance bays was being used for hand washing of automobiles; no maintenance work was being performed in the building.

  Six floor drains and a trench drain were formerly connected to a 600-gallon oil/water separator that remains in place near the northeastern corner of the maintenance building. Five of these floor drains have been backfilled with concrete. At the time of ENSR's site visit, the existing floor drain and the trench drain were still connected to the oil/water separator. ENSR representatives observed three ASTs ranging in capacity from 100 to 200 gallons along the northwestern wall of the shop. The ASTs were reportedly formerly used to store motor oil.

  A former underground sump and 550-gallon waste oil underground storage tank (UST) were reportedly located outside at the southeastern corner of the maintenance building at 1424 105th Avenue (formerly part of East 14th Street). The sump and waste oil UST were reportedly removed in 1993, according to previous consultants' reports cited by ENSR (ENSR 2000). Analytical results of soil samples collected in the vicinity of the former waste oil tank did not reveal significant levels of petroleum hydrocarbons, and the ACHCSA did not require further action in this area. The site owner and some of the reports and maps reviewed by LFR indicate that the location of this UST may have been misreported. The former UST may have been located across 105th Street, where two 1,000-gallon USTs containing product and waste oil were reportedly removed in 1993. Soil from the excavations of the two 1,000-gallon USTs was stockpiled across 105th Street (Gen-Tech Environmental 1993a).

Bill & Bill's Auto Body Parcel – 1500 105th Avenue

Sanborn maps and aerial photographs reviewed by ENSR showed this parcel to be a vacant lot from at least 1926 until 1951. A candy factory, constructed at 1500 105th Avenue between 1951 and 1952, was the first commercial building along 105th Avenue. The building was used as a roller rink in the early 1960s before being converted into a photographic laboratory in 1965. The building was subsequently used for automobile repairs and painting.

Bill and Bill's Auto Body (1500 105th Avenue) has occupied the building on this property since the mid-1990s. The body repair business is reportedly limited to spray painting and detailing. A paint spray booth is located in the building. This booth is operated under an air emissions permit issued by the Bay Area Air Quality Management District (BAAQMD). Approximately 250 one-pint and one-quart containers of paint were stored at the business during ENSR's site visit on May 30, 2000. The body shop reportedly uses approximately 85 gallons of paint thinner per

year. Waste paints and thinners are placed in 55-gallon drums while on the premises and removed approximately every 1.5 to 2 years.

According to information contained in ENSR's report, the only floor drain inside the building has been backfilled with concrete.

Management Storage Parcel Group – 1510, 1520, and 1528 105th Avenue

According to Sanborn maps and aerial photographs reviewed by ENSR, residences were located at 1520 and 1528 105th Avenue from at least 1926 until the late 1970s or early 1980s. The residence located at 1520 105th Avenue was demolished in 1979, according to information obtained by ENSR from the Oakland Building Department. The residence at 1528 105th Avenue was apparently demolished between 1975 and 1981. According to information from the Oakland Building Department, a warehouse used as a roller derby training facility was constructed at 1510 105th Avenue in 1951.

Bill Thompson, a former property owner, was interviewed during a previous Phase I ESA for this parcel. According to Mr. Thompson, a candy factory occupied the building at 1510 105th Avenue during the 1950s. Two approximately 1.5-foot-deep sumps located at the rear of this building were observed during the previous Phase I ESA. Mr. Thompson noted that these sumps were used by the candy factory for containment of wastewater from floor washing activities. Mr. Thompson stated that the sumps had not been used during his occupancy of the building.

Management Storage (1510 105th Avenue), a real estate owner and management business, currently occupies the building at this address, as well as the vacant lot located adjacent to the east of the building. The building is divided into offices and warehouse space used for storing furniture and files. According to ENSR's report, the only chemicals reportedly used in this building are janitorial supplies. One floor drain that discharges into the sanitary sewer was present in the building at the time of ENSR's visit.

A former water supply well is located in a metal-covered vault near one of the front entrances to the building.

An office trailer, fencing, and a gasoline dispenser (not connected to a tank) were located in the vacant lot at the time of ENSR's site visit on May 30, 2000. ENSR noted that this lot was enclosed by a chain-link fence.

Ward's Custom Paint Parcel Group – 1536, 1538, 1544, and 1548 105th Avenue

Sanborn maps and aerial photographs reviewed by ENSR showed that a house was located along the northwestern portion of the 1536 105th Avenue parcel from at least 1926. This house appeared in the aerial photographs through 1975 but had been demolished by the time of the 1981 photographs. Photographs from 1981 and later indicate that this parcel was used for vehicle storage.

According to ENSR's report, the parcel known as 1544 105th Avenue was a vacant lot in the 1926 through 1961 Sanborn maps and the 1947 through 1959 aerial photographs. By 1966, one commercial building had been constructed on this parcel. This building appeared unchanged in the later photographs.

According to ENSR's report, a 1926 Sanborn map and 1947 aerial photograph indicate that 1548 105th Avenue was a vacant lot. Sanborn maps and aerial photographs from the 1950s and 1960s indicate that a single-family residence was present at this location. By the time of the 1971 aerial photographs, two commercial buildings were present on the parcel. These building appear unchanged in later photographs. A furniture warehouse was reportedly constructed at 1548 105th Avenue. According to ENSR's report, the parcel's previous address included 1550 105th Avenue. A building department application dated 1959 for 1550 105th Avenue indicated that the building at this address was being used as a print shop with offices and a factory.

According to ENSR's report, the parcel currently known as 1544 105th Avenue was previously occupied by Milichichi Auto Body Fender. This business was included on the United States Environmental Protection Agency (EPA) database as a Resource Conservation and Recovery Act small quantity hazardous waste generator. This facility generated paint-related wastes. No release has been reported at this location.

Ward's Custom Paint shop currently occupies the properties that comprise this parcel group. A paved parking lot used by Ward's Custom Paint shop is located at 1536 and 1538 105th Avenue. Two buildings located at 1544 105th Avenue are used for spray painting and detailing of automobiles with a paint booth located in the southernmost building. Numerous spray cans and one-quart and five-gallon paint containers were stored in a locked room in the southernmost building at the time of ENSR's visit. Other chemical storage noted by ENSR consisted of car cleaners and waxes and five-gallon containers of paint thinner. The facility was identified as generating paint-related waste and maintaining permits from BAAQMD for air emissions from the paint booth. The facility was also identified as maintaining a permit with East Bay Municipal Utility District for water discharges.

Chevron Tow Parcel – 1560 and 1570 105th Avenue

Residential dwellings occupied the parcels at Chevron Tow from at least 1926 until the early 1980s, according to information contained in ENSR's report. According to an aerial photograph, by 1981, the residences had been demolished and the parcels were being used for vehicle storage. At the time of ENSR's visit, most of the property was being used for vehicle washing, maintenance, and storage. A small office building was noted at the northwestern corner of the parcel.

Union Pacific Railroad/AC Transit Parcel Group – 105th Avenue

Railroad tracks were noted along 105th Avenue and across the eastern end of the study area (remainder of UPRR parcel group and AC Transit parcel group) in all of the

Sanborn maps and aerial photographs reviewed by ENSR. These tracks, which are owned by UPRR, are currently present along the center of 105th Avenue and across the eastern end of the study area.

AC Transit (no assigned address) occupies two properties to the east of 105th Avenue. The northeastern portion of the AC Transit property at the eastern end of 105th Avenue is included in the study area for this work plan. This area appeared as vacant land in the 1947 through 1981 aerial photographs, according to ENSR's report. Aerial photographs indicate that by 1985 a commercial building that extended onto the AC Transit property adjacent to the south of the study area had been constructed on the parcel. This building was present in all of the remaining photographs reviewed by ENSR.

West Side of 105th Avenue Commercial, Industrial, and Residential Parcel Group – 1429 through 1561 105th Avenue

The parcel group lying west of 105th Avenue consists of commercial, light industrial, and residential properties, and a trailer park. A description of each of the properties within this parcel is provided below:

- The property known as 1429, 1433, and 1439 105th Avenue was occupied by a door manufacturer from 1926 to 1969, according to ENSR's report. Other companies that historically occupied the property include a construction company, Winca Chemical Company (a manufacturer of dry cleaning, laundry detergent, and pool chemicals), and Akana Designs (a carpentry company). At the time of ENSR's visit, the property was occupied by United Acoustics (1929 and 1433 105th Avenue) and Winca Chemicals (1439 105th Avenue).

  According to ENSR's report, a release was reported at 1433 105th Avenue in 1991. The responsible party was listed as United Acoustics. ENSR noted that the case was granted closure by the local regulatory agency. Further information on this release was not available as files had reportedly been misplaced during transfer from the ACHCSA to the City of Oakland Fire Department.

- The property known as 1449 105th Avenue was occupied by a single-family residence on Sanborn maps dated 1926, 1951, and 1952, according to ENSR's Phase I ESA (ENSR 2000). On 1959 and subsequent Sanborn maps, this property was being used by the door manufacturer for wood storage and a cabinet shop. In aerial photographs dating back to 1947, the building on this property appeared to be associated with the commercial building complex known as 1429, 1433, and 1439 105th Avenue, according to ENSR's report.
- The property known as 1501 105th Avenue has been residential since at least 1926.
- A trailer park has existed at 1525 and 1545 105th Avenue since at least 1941. Before the trailer park, the parcels were occupied by residences and a lumber storage yard. The manager of the trailer park reported that coal was unloaded from

railroad cars on this property in the late 1800s. Anecdotal information indicates that an underground or buried coal bin might have existed on this property.

- The property known as 1557, 1559, and 1561 105th Avenue has been occupied by a multi-tenant commercial building since 1951, according to Sanborn maps reviewed by ENSR (ENSR 2000). One occupant was an antique Volkswagen business during ENSR's May 30, 2000, site visit. Former uses of the building included a plumbing and carpentry business, venetian blind manufacturer, drapery facility, plastic bag facility, machine shop, and vending machine storage company. According to telephone listings dated 2000, Gomez Foods occupies 1559 105th Avenue.

  According to ENSR's report, 35 gallons of oil were spilled at 1561 105th Avenue in 1992. No information was available on the responsible party, location of the spill, or the response action.

East Side of 104th Avenue Residential Parcel – 10403 Walnut Street and 1440 through 1648 104th Avenue

The parcels lying along the eastern side of 104th Avenue have consisted of residential properties since at least 1926 (ENSR 2000). According to building department files reviewed by ENSR, permits to apply pest control chemicals were issued to occupants of 1604 and 1616 104th Avenue.

2.0 PEA OBJECTIVES

The California Department of Education (CDE) Board has recently adopted an environmental policy requiring that, if applicable, ambient air, subsurface soils, and shallow groundwater at all new school sites will be evaluated. A "No Further Action" designation from the DTSC must be obtained before the CDE can allocate funds to a school district for the acquisition and/or construction of a new school site. The PEA is intended to identify whether a release or threatened release of hazardous substances exists at the site and evaluate the potential risk to human health or the environment before the DTSC issues a "No Further Action" designation.

The following are the overall objectives of the PEA:

- evaluate historical information regarding the past use, storage, disposal, or release of hazardous wastes/substances at the Site
- conduct a field sampling and analysis program to further characterize the nature, concentration, and extent of hazardous wastes/substances present in ambient air, soil, and groundwater at the Site
- estimate the potential threat to public health and/or the environment posed by known hazardous constituents at the Site using a residential land use scenario

Based on information that will be developed during the PEA and the conservative human and ecological risk evaluation to be conducted using the DTSC's PEA Guidance Manual, the DTSC will make an informed decision regarding potential risks, if any, posed by the Site.

Possible outcomes of the PEA decision include the following:

- the requirement for further assessment through the Remedial Investigation/Feasibility Study process if the Site is found to be significantly affected by hazardous substances
- the need to perform a Removal Action for areas where localized impacts by hazardous substance releases are found
- issuance of a "No Further Action" finding if the Site is found not to be impacted or risks to human health and the environment are found to be within acceptable levels based on the conservative screening level risk assessment

3.0 SITE DESCRIPTION AND CONTACTS

3.1 Site Name and Address

The Site has been identified by the OUSD as the Batarse Project Site, located southeast of the intersection of 104th Avenue and East 14th Street in Oakland, California.

3.2 Designated Contact Person and Mailing Address

Ms. Ineda P. Adesanya
Director of Facilities
Oakland Unified School District
955 High Street
Oakland, California 94601

Phone No. (510) 879-8385
Fax No. (510) 879-1860

3.3 Property Use

The Site consists of eight parcel groups that occupy approximately 7.6 acres. The Site is currently occupied by Lloyd Wise, Inc.; Bill and Bill's Auto Body; Management Storage; Ward's Custom Paint; Chevron Tow; UPRR; United Acoustics; Winca Chemicals; and other commercial, light industrial, and residential properties.

The Site is being considered for acquisition and construction of a proposed new school. The layout of the proposed school has not been finalized.

3.4 Assessor's Parcel Numbers and Maps

The APNs for the Site as identified by the Alameda County Assessor's Office and the street addresses on record for each of these parcels are listed in the table in Section 1.2.

3.5 Township, Range, Section, and Meridian

Based on the United States Geological Survey (USGS) San Leandro Quadrangle, California 7.5-Minute Topographic Map, the Site is located in Subsection P of Section 23, Township 2 South, Range 3 West (ENSR 2000). The approximate geographic coordinates of the Site are Latitude North 37° 44'21" and Longitude West 122° 09'52".

3.6 Site Zoning

The City of Oakland Planning Department has zoned the Site for manufacturing (M-20) and residential (R-30). The planned future use of the Site is for general community commercial (LFR 2001).

3.7 Site Maps and Photographs

A site location map is included as Figure 1. A site sampling plan is included as Figure 2. Previous site photographs are presented in the Phase I ESA report included as Appendix C.

3.8 Physical Setting

The Site is located approximately 40 to 42 feet above mean sea level according to the USGS San Leandro Quadrangle, California, 7.5-minute topographic map. The nearest body of surface water is San Leandro Creek, located approximately 5,000 feet south of the Site. This creek drains into San Leandro Bay, which is part of San Francisco Bay.

The Site is located within the Coast Range geomorphic province and is underlain by Holocene alluvial fan and fluvial deposits. These deposits are brown or tan, medium-dense to dense, gravely sand or sandy gravel that generally grade upward, to sandy or silty clay (Helley and Graymer 1997). Boring logs for two monitoring wells installed during previous investigations at 10500 East 14th Street indicate that relatively fine-grained materials consisting of silty sand, sandy silt, and silty clay are encountered to depths of approximately 30 feet below ground surface (bgs) at the Site.

The soil at the Site is classified by the United States Department of Agriculture (USDA) Soil Survey of Alameda County, Western Part, as the Yolo silt loam in the southwestern portion of the Site, and as urban land-Danville complex in the

northeastern portion of the Site. These soils are used mainly for urban development. Runoff is slow and the erosion hazard is slight to none (USDA 1981).

The inferred direction of groundwater flow in the site vicinity is toward the west-southwest (Figure 2). The depth to groundwater reportedly ranged from approximately 8 to 28.3 feet bgs in 1993 (ACHCSA 1998a). Information regarding the depth to groundwater and direction of groundwater flow was obtained from the case closure summary prepared by the ACHCSA under the Leaking Underground Storage Tank Program for the former waste oil and gasoline USTs that were removed from 10500 East 14th Street in 1993.

3.9 Surrounding Property Land Use

Commercial businesses, light industry, a church, and residential areas comprise the surrounding property land use.

4.0 FIELD SAMPLING PLAN

4.1 Background

The Site consists of eight parcel groups totaling approximately 7.6 acres. The topography slopes slightly downward toward the north-northwest. The Site has been used for residential and commercial purposes. Building structures include several commercial and light industrial buildings, houses, and a trailer park.

A former water supply well reportedly exists at the Site. The well is reportedly located in an existing vault, and it is not currently in use. It is not known whether the well has been properly abandoned and sealed.

The potential environmental issues in the Site include former hydraulic lifts, sumps, an oil/water separator, a suspected former waste oil UST, floor drains, auto body painting operations, chemical use, a railroad spur, lead-based paint, and asbestos. Therefore, the chemicals of potential concern (COPCs) addressed in this investigation will include total petroleum hydrocarbons (TPH); benzene, toluene, ethylbenzene and xylenes (BTEX); and volatile organic compounds (VOCs) including methyl-tertiary butyl ether (MTBE), because of their historical association with industrial, automobile maintenance, and painting operations. Other COPCs include Title 22 metals (formerly known as California Assessment Manual 17 metals) because of their historical association with industrial operations and lead-based paint; and semivolatile organic compounds (SVOCs) including polychlorinated biphenyls (PCBs), which will be analyzed in selected samples collected along the UPRR right-of-way.

LFR has prepared a table outlining eight areas (designated as Areas I through VIII) of potential environmental concern, the sampling program, and the analyses that will be performed at each area. Because of the ages of the structures on the Site, asbestos

containing materials (ACMs) and lead-based paints may be present. A building materials survey for ACMs and lead-based paints will be conducted at the Site if OUSD decides to proceed with the project.

A soil-vapor survey will be conducted for potential fuel-related hydrocarbon impacts in the soil and groundwater if chemicals of concern are found at concentrations above EPA Region IX residential preliminary remediation goals (PRGs) in soils, or at 10 times the Maximum Contaminant Levels (MCLs) or detection limits (if no MCL is established for the COPC) in groundwater. If soil-vapor sampling is established to be necessary, vapor samples will be analyzed using EPA Test Method TO-14. A mobile laboratory will be used for analysis of the soil-vapor samples with four duplicate soil-vapor samples collected for off-site TO-14 analysis.

In the event that COPCs are detected, data regarding soil properties will be collected to model the fate and transport of chemicals in the environment. This data includes total organic carbon, grain size, bulk density, porosity, and moisture content. Total organic carbon will be analyzed by the Walkley-Black method; grain size will be analyzed by American Society for Testing and Materials (ASTM) D422M; and bulk density, porosity, and moisture content will be analyzed using American Petroleum Institute (API) RP40 method.

4.2 Sampling Locations and Analyses

The soil and groundwater sampling program presented herein was prepared by LFR with input provided by Ms. Janet Naito and Dr. Dave Berry of the DTSC during a scoping meeting on December 1, 2000. The sampling locations were selected based on information reported in the Phase I ESA and LFR's site visit on October 30, 2000. Proposed sampling locations are presented on Figure 2 and are summarized in Table 1. If analytical results indicate that there are chemicals present at the Site at levels of potential concern, they will be discussed with the OUSD and DTSC to establish whether additional sampling is necessary to complete the PEA.

Forty-nine soil borings are proposed, with total depths ranging from approximately 1 to 30 feet bgs. Groundwater samples will be collected from 46 of the soil borings. Additional borings may be warranted if visual, olfactory, or photoionization detector (PID) readings indicate a chemical release has likely occurred. Borings will be drilled to a depth of approximately 3 to 5 feet below the first groundwater encountered to allow collection of grab groundwater samples. An estimated 306 soil samples will be collected; additional samples may be collected if warranted by field observations. Soil samples collected from 20 feet bgs and deeper will be submitted to the laboratory but placed on hold pending our receipt and analysis of the shallower soil samples collected from the borings. The samples will be submitted to a laboratory certified by the State of California to perform the requested analyses (see Table 1).

During the PEA, LFR will attempt to locate published information on typical background concentrations for metals in the City of Oakland. LFR will also evaluate

the data from the soil samples collected from the proposed borings to ascertain if the concentrations of metals detected are appropriate for use as typical background levels. If published information is not available and data from on-site borings are not valid for background metals concentrations, four additional borings may be drilled to a depth of approximately 1 foot bgs in areas assumed clean of past or present operations. Soil samples will be collected from these borings and analyzed to evaluate the natural background levels of metals in the area.

For quality assurance/quality control (QA/QC), LFR will also collect an estimated 31 field split soil samples. The duplicate sampling program represents 10 percent of the total number of samples proposed for analysis. Five field split groundwater samples will be collected along with the 46 groundwater samples proposed for collection and analysis, representing 10 percent of the total number of proposed groundwater samples. Equipment rinsate blank samples and travel blank samples will be collected daily, and at least three of each of these blanks will be analyzed. The equipment rinsate blanks and travel blanks will be prepared from laboratory-supplied, organic-free, deionized water.

Based on the present and past land use at the different parcel groups at the Site, the proposed sampling program at each parcel group is as follows:

Lloyd Wise, Inc., Parcel Group – 10550 East 14th Street and 1424 105th Avenue

This parcel group has been used for residential dwellings, commercial facilities, vehicle repairs, and a maintenance shop. Underground and above ground hydraulic lifts, motor oil ASTs, floor and trench drains, a 600-gallon oil/water separator, an underground sump, and a concrete pad heavily stained with oil are or have been present in the area. In addition, a 550-gallon waste oil UST may have been present on this parcel in the past. Therefore, it is anticipated that petroleum hydrocarbons, heavy metals, and solvents have been used in the area.

Four soil borings are proposed at locations adjacent to and downgradient from the drains and reported sump (if present) in the maintenance shop and the oil/water separator and, depending on available information, at a depth consistent with the bottom of these features. A magnetic survey will be conducted to establish the presence of remaining underground structures.

Three soil borings are proposed at locations adjacent to the suspected former waste oil UST location and at a location adjacent to and upgradient from the two former 1,000-gallon product and waste oil USTs located on the northern side of 105th Street. The boring near the former product and waste oil USTs will be advanced upgradient from the former USTs because of access constraints in the downgradient direction. This boring will be advanced to assess the possible impact of the two 1,000-gallon USTs formerly present at that location. One of these soil borings will be advanced downgradient from the approximate location of the soil stockpile produced during the removal of two 1,000-gallon USTs.

Finally, two soil borings will be advanced at locations upgradient from the oil-stained pad. Borings cannot be advanced in the downgradient direction because of the presence of the service building. Five borings will be advanced within the service building to assess soil and groundwater conditions in the areas of hydraulic lifts (if present), ASTs, sumps, and floor drains. Five borings are also proposed inside the maintenance building at the locations of the hydraulic lifts and in the stained area near the motor oil ASTs to assess potential impacts to soil and groundwater in these areas.

Soil samples will be collected at the first native soil encountered, from approximately 5-, 10-, 15-, and 20-feet bgs, and from just above the first encountered groundwater. The sample from the approximately 20-foot depth will be placed on hold at the laboratory pending our receipt and review of analytical results for the shallower samples in the boring. Additional samples may be collected based upon visual observations and PID readings of the soil recovered from the sampler tip. Depending on available information, soil samples will be collected from borings located adjacent to the drains, oil/water separators, and sumps at depths consistent with the bottom of the features.

The soil samples collected in this area will be analyzed for Title 22 metals, total volatile hydrocarbons (TVH), and total extractable hydrocarbons (TEH). In addition, soil samples collected near the hydraulic lifts will also be analyzed for hydraulic oil and PCBs. Grab groundwater samples will be collected from each of the borings in which groundwater is encountered. Groundwater samples will be analyzed for Title 22 metals, TVH, TEH, and VOCs. Additionally, the soil and groundwater samples from the boring adjacent to the two former 1,000-gallon product and waste oil USTs located on the northern side of 105th Street will be analyzed for antifreeze (ethylene glycol).

Bill & Bill's Auto Body Parcel – 1500 105th Avenue

Residential and commercial buildings, a photographic laboratory, and automobile repair businesses have been located on this parcel. The only floor drain inside the building was previously abandoned with concrete. Waste paints and thinners were previously stored in the area. It is also anticipated that petroleum hydrocarbons, heavy metals, and solvents may have been used in the area.

Three soil borings are proposed in this area. One of the proposed borings will be located adjacent to and downgradient from the drain. Soil samples will be collected at the first native soil encountered, from approximately 5-, 10-, 15-, and 20-feet bgs, and from just above the first encountered groundwater. The sample from the approximately 20-foot depth will be placed on hold at the laboratory pending our receipt and review of analytical results for the shallower samples in the boring. Additional samples may be collected based upon visual observations and PID readings of the soil recovered from the sampler tip. Depending on available information, soil samples will be collected at a depth consistent with the bottom of the drain.

Soil samples will be analyzed for Title 22 metals, TVH, TEH, and VOCs. Grab groundwater samples will be collected from each of the borings in which groundwater is encountered. Groundwater samples from the borings will be analyzed for Title 22 metals, TVH, TEH, and VOCs.

Management Storage Parcel Group – 1510, 1520, and 1528 105th Avenue

One floor drain, two sumps, and a former water supply well are present in this area. The only chemicals reportedly used at this location are janitorial supplies. Three borings are proposed in the area of the drain and two sumps. Soil samples will be collected at the first native soil encountered, from approximately 5-, 10-, 15-, and 20-feet bgs, and from just above the first encountered groundwater. The sample from the approximately 20-foot depth will be placed on hold at the laboratory pending our receipt and review of analytical results for the shallower samples in the boring. Additional samples may be collected based upon visual observations and PID readings of soil recovered from the sampler tip. Depending on available information, soil samples will be collected at a depth consistent with the bottom of the drain and sumps.

Soil samples will be analyzed for Title 22 metals, TVH, and TEH. Grab groundwater samples will be collected from each of the borings in which groundwater is encountered, and, if possible, at the former water supply well. Grab groundwater samples from the borings will be analyzed for Title 22 metals, TVH, and TEH.

Groundwater samples will be collected from the water supply well, if possible, and analyzed for Title 22 metals, TVH, TEH, and VOCs. The well will be abandoned and sealed by a licensed drilling subcontractor in accordance with applicable regulatory requirements, if OUSD proceeds with the project.

Ward's Custom Paint Parcel Group – 1536, 1538, 1544, and 1548 105th Avenue

A paint booth and paved parking lot are present in this area. Paint and paint thinner, car cleaners, and waxes are used and stored at this location. It is also anticipated that petroleum hydrocarbons, heavy metals, and solvents may have been used in the past. Five soil borings are proposed in this area. Soil samples will be collected at the first native soil encountered, from approximately 5-, 10-, 15-, and 20-feet bgs, and from just above the first encountered groundwater. The sample from the approximately 20-foot depth will be placed on hold at the laboratory pending our receipt and review of analytical results for the shallower samples in the boring. Additional samples may be collected based upon visual observations and PID readings of the soil recovered from the sampler tip.

Soil samples will be analyzed for Title 22 metals, TVH, TEH, and VOCs (including paint thinner). Grab groundwater samples will be collected from each of the borings in which groundwater is encountered. Groundwater samples will be analyzed for Title 22 metals, TVH, TEH, and VOCs (solvents and thinners).

Chevron Tow Parcel Group – 1560 and 1570 105th Avenue

Most of this property is used for vehicle washing, maintenance and storage. Therefore, it is anticipated that petroleum hydrocarbons, heavy metals, and solvents are currently being used or have been used in the past. Four soil borings are proposed in the area. Two of these four borings will be advanced at the eastern boundary of the parcel, directly downgradient from the neighboring property. Soil samples will be collected at the first native soil encountered, from approximately 5-, 10-, 15-, and 20-feet bgs, and from just above the first encountered groundwater. The sample from the approximately 20-foot depth will be placed on hold at the laboratory pending our receipt and review of analytical results for the shallower samples in the boring. Additional samples may be collected based upon visual observations and PID readings of the soil recovered from the sampler tip.

Soil samples will be analyzed for Title 22 metals, TVH, and TEH. Grab groundwater samples will be collected from each of the borings in which groundwater is encountered. Groundwater samples from one of the borings at the eastern boundary of the parcel are proposed to detect possible migration onto the Site from off-site sources. Groundwater samples will be analyzed for Title 22 metals, TVH, TEH, and VOCs.

Union Pacific Railroad/AC Transit Parcel Group - 105th Avenue

Railroad tracks are currently present along the center of 105th Avenue. Therefore, it is anticipated that petroleum hydrocarbons and heavy metals may be present along the tracks. Four shallow soil borings (to a depth of approximately 3 feet) are proposed along the tracks on 105th Avenue. Samples will be collected at the first soil encountered beneath the railroad gravel ballast. Soil samples will be analyzed for Title 22 metals, TVH, TEH (including hydraulic oil), and SVOCs.

Three soil borings are proposed on the AC Transit parcel to establish a baseline of subsurface conditions. Soil samples will be collected at the first native soil encountered, from approximately 5-, 10-, 15-, and 20-feet bgs, and from just above the first encountered groundwater. The sample from the approximately 20-foot depth will be placed on hold at the laboratory pending our receipt and review of analytical results for the shallower samples in the boring. Additional samples may be collected based upon visual observations and PID readings of the soil recovered from the sampler tip.

Soil samples from these three borings will be analyzed for Title 22 metals, TVH, and TEH. Grab groundwater samples will be collected from each of the borings in which groundwater is encountered. Groundwater samples from each of the borings will be analyzed for Title 22 metals, TVH, TEH, and VOCs.

West Side of 105th Avenue Commercial, Industrial, and Residential Parcel Group – 1429 through 1561105th Avenue

This parcel group consists of commercial, light industrial, residential properties, and a trailer park. Former facilities in the area include a chemical company that manufactured dry cleaning, laundry detergent, and pool chemicals. Therefore, it is anticipated that petroleum hydrocarbons, heavy metals, and solvents may have been used in the area.

Heating oil USTs may have been installed at the residences in the past. A visual reconnaissance and interviews with residence owners is proposed to assess the presence of heating oil USTs. Also, coal was reportedly unloaded from railroad cars and an underground or buried coal bin may have existed on the trailer park property. A geophysical survey will be conducted at this location to assess whether a buried coal bin exists. If a heating oil UST or coal bin is suspected or confirmed based on our interviews and observations, the DTSC will be contacted to discuss the need for sampling in the areas of the suspected or confirmed USTs and/or coal bin.

Nine soil borings are proposed in the area, including three in the reported location of the buried coal bin. Soil samples will be collected at the first native soil encountered, from approximately 5-, 10-, 15-, and 20-feet bgs, and from just above the first encountered groundwater. The sample from the approximately 20-foot depth will be placed on hold at the laboratory pending our receipt and review of analytical results for the shallower samples in the boring. Additional samples may be collected based on visual observations and PID readings of the soil recovered from the sampler tip. Soil samples from these borings will be analyzed for Title 22 metals, TVH, TEH, and SVOCs. Grab groundwater samples will be collected from each of the borings in which groundwater is encountered. Groundwater samples will be analyzed for Title 22 metals, TVH, TEH, VOCs, and SVOCs. Additional locations, borings, or analyses may be required upon review of new information.

Additionally, one boring will be advanced in the area of the releases reported by United Acoustics at 1433 105th Avenue in 1991, and one boring will be advanced in the area of the oil spill reported at 1561 105th Avenue in 1992 if information on the locations of these releases is available. Soil samples will be collected at the first native soil encountered, from approximately 5-, 10-, 15-, and 20-feet bgs, and from just above the first encountered groundwater. The sample from the approximately 20-foot depth will be placed on hold at the laboratory pending our receipt and review of analytical results for the shallower samples in the boring. Additional samples may be collected based on visual observations and PID readings of the soil recovered from the sampler tip. Soil samples from these borings will be analyzed for Title 22 metals, TVH, TEH, and SVOCs. Grab groundwater samples will be collected from each of the borings in which groundwater is encountered. Groundwater samples will be analyzed for Title 22 metals, TVH, TEH, VOCs, and SVOCs. Additional locations, borings or analyses may be required upon review of new information.

East Side of 104th Avenue Residential Parcel – 10403 Walnut Street and 1440 through 1648 104th Avenue

Several residential properties have been present in this area since at least 1926.

Heating oil USTs may have been installed at the residences in the past. A visual reconnaissance and interviews with residence owners is proposed to assess the presence of heating oil USTs. If the location of a heating oil UST is suspected or confirmed based on our interviews and observations, the DTSC will be contacted to discuss the need for sampling in the areas of the suspected or confirmed USTs.

Six shallow (1 foot bgs) soil borings are proposed in this area to evaluate possible impacts by lead-based paints. Soil samples will be collected within the drip line adjacent to the exterior walls of the residences exhibiting the most visible signs of weathered paint. These samples will be analyzed for lead. DTSC is currently finalizing the sampling protocol for soils that have suspected lead-based paint and that are in close proximity to buildings constructed before 1980. Collection of additional soil samples for lead analysis may be completed after demolition of the residential facilities. These additional soil samples will be collected from the first soil encountered in residential areas (from the surface to approximately 0.5 foot bgs) and analyzed for lead. Asbestos surveys of the structures will be performed at a later date if OUSD decides to proceed with the project.

It has also been reported that pest control chemicals were used on some parcels in the past. Because of limited information, LFR may not be able to determine areas to which pesticides were applied. LFR proposes to analyze the soil samples collected from the six shallow borings noted above for TVH, TEH, and pesticides to evaluate pesticide impacts.

One deep soil boring is proposed at the eastern boundary of the parcel group. Soil samples will be collected at the first native soil encountered, from approximately 5-, 10-, 15-, and 20-feet bgs, and from just above the first encountered groundwater. The sample from the approximately 20-foot depth will be placed on hold at the laboratory pending our receipt and review of analytical results for the shallower samples in the boring. Additional samples may be collected based on visual observations and PID readings of the soil collected from the sampling tip. Soil samples from this boring will be analyzed for Title 22 metals, TVH, TEH, VOCs, and pesticides. One grab groundwater samples will be collected from the deep boring if groundwater is encountered. The groundwater sample is intended to assess if an off-site release has impacted the Site. The groundwater sample will be analyzed for Title 22 metals, TVH, TEH, and VOCs.

Surface soil samples from borings located in other portions of this parcel group will be analyzed for Title 22 metals and will be evaluated to assess background concentrations for lead.

4.3 Sample Collection

Sample containers will be sealed and labeled with the sampler's initials, time and date of collection, project number, project name, and a unique sample identification number, then placed on ice in a cooler for delivery to the laboratory under strict chain-of-custody (COC) protocol. Analytical methods, types of containers, preservation methods, and holding times are summarized in Table 2.

Shallow Soil Sampling

Twelve shallow soil samples will be collected from the railroad spur and residential areas (areas VI and VIII on Table 1) using a slide hammer manual sampling device. Along the railroad spur (area VI), shallow soil samples from below the gravel ballast will be collected at depths of up to approximately 3 feet. For these samples, a hand auger may be used to core to the desired depth and then a slide hammer with a brass or steel tube (2-inch by 6-inch) will be used for sample collection. In the residential area on the eastern side of 104th Street (area VIII), surface soil samples will be collected from the surface (after clearing of vegetation) to a depth of approximately 0.5 foot. Soil samples will be collected in standard 6-inch-long, 2-inch-diameter stainless-steel or brass sleeves. Alternatively, the sample may be placed in a glass jar if VOC analysis is not proposed. Both ends of the tubes will be capped with Teflon™ sheets and plastic caps, and properly labeled.

Subsurface Soil Sampling

LFR will collect soil samples from an estimated 49 deep soil borings, using a subcontracted Geoprobe™, or similar, direct-push method sampling rig. Soil samples will be collected in $1^{11}/_{16}$-inch-diameter, clear acetate sample tubes. Sample tubes will be advanced beneath the subsurface inside a stainless-steel sample probe in 3-foot sections. Upon recovery from the sample probe, soil samples will be cut to a desired length (6 to 8 inches), capped on both ends with Teflon™ sheets and plastic caps, and properly labeled.

After labeling, the soil samples will be sealed in plastic bags and placed in an ice-chilled cooler for transportation to the laboratory under strict COC protocol. Total sample recovery (3 feet) is not always achieved, particularly in loose, gravely, or dry soil types, or in very stiff or very soft clays. A sufficient sample to conduct the analytical methods proposed at each location will be collected during fieldwork.

Logging will be performed using continuous core samples for deep borings. Copies of the boring logs will be included in the PEA report. As requested, LFR will locate each borehole using global positioning system or by using a licensed surveyor to survey the lateral location to within the nearest foot. The coordinates will be presented in the PEA report.

Water Supply Well Sampling

If feasible, a groundwater sample will be collected from the water supply well located at 1510 105th Avenue. The method for collecting the groundwater sample will be established based on the accessibility and condition of the well, and with prior consultation with DTSC regarding the sampling methodology. If possible, the well will be purged of several volumes before sampling. Up to 100 gallons of water will be purged from the well and stored on-site in Department of Transportation–approved, 55-gallon drums pending our receipt and review of analytical data.

Groundwater Grab Sampling

Groundwater grab samples will be collected at an estimated 46 boring locations in areas I through V, VII and VIII as identified in Table 1. The samples will be collected using a Hydropunch™ sampler or factory-slotted polyvinyl chloride casing, advanced through a push-probe boring. It is expected that first groundwater will be encountered at an approximate depth of 15 feet bgs, as described in ENSR's report (ENSR 2000). The push-probe boring at the first groundwater sampling location will be continuously sampled to establish the approximate depth to groundwater.

Groundwater samples will be collected with new, disposable bailers. The groundwater samples will be decanted into pre-cleaned sample containers provided by the laboratory. To minimize volatilization of VOCs from groundwater during sampling, the following steps will be followed:

- the bailers will be extracted from the borings slowly and steadily to avoid creating air bubbles
- the water will be poured slowly into the containers to prevent agitating or mixing of water in the bailer
- bubbles will not be allowed to form in the volatile organic analysis (VOA) containers

Each groundwater sample collected for analysis of TEH will be decanted in two 1-liter, amber glass bottles preserved with hydrochloric acid (HCl). Each groundwater sample collected for analysis of TVH and VOCs will be decanted in three, HCl-preserved, 40-milliliter VOA vials. Each groundwater sample collected for analysis of dissolved Title 22 metals will be contained in one, unpreserved 300-milliliter poly bottle. Groundwater samples analyzed for metals will be filtered in the laboratory within 24 hours after sample collection. If the quantity of groundwater entering a borehole is insufficient for the proposed analyses (as listed in Table 1), then the VOC analysis will be the priority. Samples will be collected for TVH, TEH, and Title 22 metals analysis, in that order, depending on the quantity of groundwater.

Analytical methods, types of containers, preservation methods, and holding times are summarized in Table 2.

Ambient Air Sampling

Ambient air sampling will not be conducted for this PEA. Surrounding site conditions and activities described in Section 3.9 do not warrant air sampling.

4.3.1 Chain-of-Custody Records

COC records are used to document sample collection and shipment to laboratory for analysis. A COC record will be completed and sent with the samples for each laboratory and each shipment. If multiple coolers are sent to a single laboratory on a single day, individual COC forms will be completed and sent with each cooler.

The COC record will identify the contents of each shipment and maintain the custodial integrity of the samples. Information contained on the COC record includes the sampler's name, project number, sample number, date and time of sample collection, sample type, number of containers associated to each sample, analyses requested, and the names, dates, and times of custody.

Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel. Until receipt by the laboratory, the custody of the samples will be the responsibility of the sample collector.

4.3.2 Decontamination Procedures

Equipment that comes into contact with potentially contaminated soil or groundwater will be decontaminated and rinsed with distilled water before use at each sampling location and sampling event to assure the integrity of samples collected. Disposable equipment intended for one-time use will be packaged for appropriate disposal and will not be reused. Drilling and sampling devices used will be decontaminated using high-pressure hot water (steam-cleaned) or by the following procedures:

- laboratory-grade detergent and tap water wash, in a 5-gallon plastic bucket, using a brush
- initial tap water rinse, in a 5-gallon plastic bucket
- final distilled water rinse in a 5-gallon plastic bucket

Equipment will be decontaminated in a pre-designated area over plastic sheeting, and clean bulky equipment will be stored on plastic sheeting in uncontaminated areas. Cleaned small equipment will be stored in plastic bags. Materials to be stored for more than a few hours will be covered.

4.3.3 Soil and Wastewater Disposal

Soil and wastewater generated from sampling and decontamination activities will be stored temporarily on site in DOT-approved 5-gallon buckets with press-sealing lids or 55-gallon drums with ring-top sealed lids. The drums will be labeled as non-hazardous waste soil or nonpotable water and identified with the generator's name (Oakland Unified School District), the sampling locations from which the waste was produced, and the date the waste was produced and placed in the container.

LFR assumes that the analytical data from the investigations will be sufficient to meet waste acceptance criteria set by the disposal facility, and that additional profiling of the waste soils and wastewater will not be necessary. At OUSD's request, LFR will make recommendations for the cost-effective, off-site disposal of waste produced at the Site. However, OUSD shall make the final determination for such disposal and shall direct LFR to make such disposal accordingly. LFR is not and will not be interpreted to be the generator or arranger for disposal of hazardous waste or hazardous substances.

5.0 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

QA/QC procedures are to be employed in both the field and the laboratory. QA/QC protocols include the collection of equipment rinsate samples, field blank samples, field split samples, and travel blank samples. The laboratories used for this project will employ their own QA/QC procedures.

5.1 Field Quality Assurance/Quality Control Procedures

Field QA/QC procedures will be performed at the Site and will consist of the following measures:

- COC forms will be used for sample submittal to the laboratory.
- Daily information regarding soil sample collection will be recorded in field logbooks or field sampling information forms. Sample types, soil descriptions, sample identification numbers, and sample times will be collected and recorded on field sampling information forms and/or in the field logbooks. Pages will be numbered, dated, and signed by the person recording the field data.

Field QA/QC samples will be collected and submitted for analysis along with the discrete soil samples using the following sampling frequency:

- equipment blanks - one equipment rinsate blank per field day
- field blanks - one field blank sample per field day
- field split samples – one field split sample for every 10 discrete samples
- travel (trip) blank samples – one travel blank per field day

5.1.1 Equipment Rinsate Blanks

One equipment rinsate blank (equipment blank) will be collected from the final water rinsed over equipment after cleaning activities have been performed. The equipment blank will be collected from non-disposable (reusable) sampling equipment such as soil sampling tools and sampling equipment. The equipment blank will be analyzed for VOCs, TVH, and Title 22 metals using the same analytical method used on the unique soil or groundwater samples.

To collect an equipment blank sample, distilled water will be poured over or through the recently cleaned equipment, and carefully collected in an appropriate sample container held over a bucket. Equipment blank samples will be stored and processed in the same manner as other aqueous samples.

5.1.2 Field Blanks

Field blank samples consist of a sample of the distilled water that was used as a final rinse for sampling equipment during equipment cleaning activities. The purpose of the field blank sample is to evaluate the distilled water for the presence of chemicals for which environmental samples are being analyzed. A field blank sample will be collected by pouring distilled water into the appropriate sample container. The field blank samples will be stored and processed in the same manner as other aqueous samples.

5.1.3 Field Split Samples

Field split soil and groundwater samples will be collected to evaluate the analytical procedures and methods employed by the laboratory. The field split soil sample will be collected immediately below the depth interval where the original soil sample is collected. The field split groundwater sample will be collected in appropriate laboratory-supplied bottles using the same bailer from which the primary sample was collected. One field split sample will be collected for every 10 soil and groundwater samples collected.

5.1.4 Travel Blank Samples

Trip blanks are used to detect VOC contamination during sample shipping and handling. Trip blanks are 40-mililiter VOA vials of ASTM Type II water that are filled in the laboratory, transported to the sampling site, and returned to the laboratory with VOC samples. Trip blanks are not opened in the field. The planned frequency for trip blanks is one per cooler containing samples for VOC analysis.

5.2 Laboratory QA/QC Procedures

Laboratory QA/QC procedures include the following:

- Laboratory analyses will be performed within the required holding time for samples submitted for initial analysis and those which are being held for analysis based upon the results of the initial analyses. Groundwater samples that are being laboratory filtered will be filtered and preserved in the laboratory within 24 hours of sample collection.
- Appropriate minimum reporting limits will be used for each analysis. The reporting limits will be lower than the corresponding PRGs established by the EPA Region IX for residential land use. For water samples, the detection limits for Low Concentration Volatiles in Water by gas chromatograph/mass spectrometer system will be used.
- The analytical method proposed for arsenic analysis will provide a detection limit sufficient for residential risk evaluation purposes.
- A laboratory certified by the State of California for the requested analysis will be used for the analyses.
- The laboratory will report the following information for each sample delivery group as follows:
    - a discussion of how the QA/QC criteria were met by the laboratory
    - a discussion of hold times
    - matrix spike/matrix spike duplicate results
    - relative percent difference
    - method blank data
    - surrogate recovery, instrument tuning, and calibration data
    - signed laboratory reports including the sample designation, date of sample collection, date of sample analysis, laboratory analytical method employed, sample volume, and the minimum reporting limit (any discrepancies will be detailed in a letter provided by the laboratory)

LFR will use a state-certified environmental testing laboratory for the sample analyses. LFR will confirm the DTSC's minimum reporting limits with the selected laboratory before submitting samples for analysis. Proposed laboratory reporting limits are included as Appendix D.

6.0 HUMAN HEALTH AND ECOLOGICAL SCREENING EVALUATION

A human health and ecological screening evaluation will be performed in accordance with the protocols detailed in the DTSC PEA Guidance Manual. The human health screening evaluation will include a health risk assessment (HRA). The purpose of the HRA is to estimate adverse human health affects by qualitatively and quantitatively addressing possible routes of exposure associated with the Site. The scope of work will include the specific tasks listed below.

6.1 Data Evaluation and Selection of Chemicals of Potential Concern

The data for the Site will be evaluated and a list of COPCs originating at the Site will be compiled. These COPCs will be the focus of the HRA.

6.2 Exposure Assessment (including fate and transport modeling)

The exposure assessment will follow EPA and DTSC risk assessment guidelines and use the Reasonable Maximum Exposure (RME) methods recommended by the EPA. A conceptual site model will be included in the PEA report.

6.3 Toxicity Assessment

The toxicity assessment section provides a list of the potential adverse health effects attributable to each of the COPCs included in the HRA.

6.4 Risk Characterization

Quantitative estimates of the noncarcinogenic and carcinogenic risk to human populations will be presented for the COPCs at the Site. Risk estimates derived using this health-conservative methodology will be compared to the acceptable National Contingency Plan incremental lifetime cancer risk level range of 1×10^{-4} to 1×10^{-6}, and the Cal/EPA acceptable incremental lifetime cancer risk level of 1×10^{-6}.

Historical land use and the analytical results from previous soil and groundwater investigations conducted at the Site indicate that detectable concentrations of COPCs in soil and groundwater are known or suspected to exist adjacent and in close proximity to the Site. The known or suspected COPCs are presented below:

- VOCs, including MTBE; BTEX; cis-1,2-dichloroethene; and trichloroethene
- inorganic chemicals, including Title 22 metals
- petroleum hydrocarbons, including gasoline-, diesel-, and motor oil-range hydrocarbons, and oil and grease

If COPCs are detected, data regarding soil properties, including organic carbon, grain size, bulk density, porosity, and moisture content, will be collected to model the fate and transport of chemicals in the environment. Total organic carbon will be analyzed by the Walkley-Black method, grain size will be analyzed by ASTM D422M, and bulk density, porosity, and moisture content will be analyzed using the API RP40 method.

Inorganic compounds detected above background concentrations will be considered COPCs. In the event that lead is found to be a COPC in soil, it will be evaluated using the DTSC Lead-Spread version 7 with the homegrown produce pathway turned off. If VOCs are detected in the soil and/or groundwater, the indoor air pathway will be considered in the risk assessment by using the Johnson-Ettinger model.

If COPCs are detected in groundwater, LFR will evaluate potential exposure pathways associated with direct contact and vapor intrusion as well as the ingestion exposure pathway if information is obtained during the PEA indicating that groundwater beneath the Site is a potential drinking water source.

7.0 COMMUNITY INVOLVEMENT

The DTSC and the OUSD will prepare and implement a plan to establish the procedures and protocols for informing the community surrounding the Site of the PEA evaluation. This plan will be prepared according to the public participation requirements of the California Education Code.

8.0 PEA REPORT PREPARATION

A PEA report presenting the results of the overall investigation will be prepared and submitted to the DTSC. The PEA report will be prepared in accordance with the PEA Guidance Manual (January 1994, second printing June 1999). The report will include site background and environmental setting information, field procedures, presentation of field observations including boring logs, analytical results including laboratory report sheets and a summary table summarizing the analytes, detection limits, minimum concentrations, maximum concentrations, 95th upper confidence level (UCL) concentrations (if appropriate), and exposure point concentrations. Concentrations of metals detected at the Site will be compared to the EPA Region IX residential soil PRGs and/or natural background concentrations for the area. Metals detected at concentrations above the PRGs and the background concentrations will be considered COPCs.

The PEA report will also include a summary of the Human Health and Ecological Screening Evaluation and the public participation activities implemented during the PEA. Electronic files with the field data, laboratory data, and at least one geo-referenced figure will be submitted to DTSC at the time of submission of the PEA Report.

Based on the Human Health and Ecological Screening Evaluation, the Summary and Conclusions section of the PEA report will address the following four main questions:

- Have current or past practices resulted in a release or threat of a release at the site?
- If a release has occurred or a threatened release exists, does it pose a significant threat to public health or the environment and, if not, why not?
- Does a release pose an immediate potential hazard to health or the environment so as to necessitate an emergency removal action and, if so, why?
- What further specific information and/or removal/remediation actions are necessary in order to better assess or mitigate health/environmental threats posed by the site?

Recommendations will be made regarding the need for additional action to further assess conditions at the Site or for limited removal action(s), if appropriate, based on site investigative findings and the screening risk evaluation. If further action is recommended, the PEA report will identify additional investigations and/or remediation needs and strategies. The PEA report will also include recommendations for expedited response actions necessary to mitigate any immediate potential hazards to public health or the environment, if needed. No Further Action recommendations will be made if levels of detected COPCs are established to be below risk-based screening levels.

9.0 PROPOSED WORK SCHEDULE

Upon approval of this work plan, LFR anticipates submitting a results report within five to seven weeks after completion of field activities. If no unanticipated delays occur, LFR estimates that two weeks will be required to schedule the fieldwork; 8 to 10 days will be needed to complete the fieldwork; laboratory analytical analysis will require 10 working days after sample submittal; and final report preparation will require an estimated three to five weeks after analytical results are received from the laboratory.

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Table 1
Sampling Plan
Batarse Project Site, Oakland, California

	Parcels	Number of Boreholes	Depth (ft bgs)	Number of Soil Samples	Total Number of Soil Samples	Sample Intervals	Groundwater Samples	Comments: Laboratory Analysis
I.	Lloyd Wise, Inc. (10550 E. 14th St. and 1424 105th Ave.; includes hydraulic lifts area, sumps, oil/water separator, former waste oil UST, former oil ASTs and stained concrete slab)	19	30'	6 samples/boring	114	First native soil, 5', 10', 15', 20', and just above groundwater	19	Soil: Title 22 metals; TVH and TEH (including hydraulic oil at lifts) using EPA 8015 M; PCBs using EPA 8082 (soil samples at lifts); antifreeze (ethylene glycol) using GC-FID (for samples from boring adjacent to two former 1,000-gallon product and waste oil USTs located on the north side of 105th Street) 20' sample on hold Groundwater: Title 22 metals; TVH and TEH using EPA 8015 M; VOCs using EPA 8260;antifreeze (ethylene glycol) using GC-FID (for samples from boring adjacent to two former 1,000-gallon product and waste oil USTs located on the north side of 105th Street)
II.	Bill & Bill's Auto Body (1500 105th Ave.;floor drain)	3	30'	6 samples/boring	18	First native soil, 5', 10', 15', 20' and just above groundwater	3	Soil: Title 22 metals; TVH and TEH using EPA 8015 M; VOCs using EPA 8260 20' sample on hold Groundwater: Title 22 metals; TVH and TEH using EPA 8015 M; VOCs using EPA 8260
III.	Management Storage (1510 105th Ave.; two sumps, one floor drain area)	1 well aband.	100'	NA	NA	NA	1	Groundwater: Title 22 metals; TVH and TEH using EPA 8015 M; VOCs using EPA 8260
		3	30'	6 samples/boring	18	First native soil, 5', 10', 15', 20' and just above groundwater	3	Soil: Title 22 metals; TVH and TEH using EPA 8015 M 20' sample on hold Groundwater: Title 22 metals; TVH and TEH using EPA 8015 M; VOCs using EPA 8260
IV.	Ward's Custom Paint (1544 105th Ave.; chemical use and vehicle storage)	5	30'	6 samples/boring	30	First native soil, 5', 10', 15', 20' and just above groundwater	5	Soil: Title 22 metals; TVH and TEH using EPA 8015 M; VOCs using EPA 8260 20' sample on hold Groundwater: Title 22 metals; TVH and TEH using EPA 8015 M; VOCs using EPA 8260
V.	Chevron Tow (1560 and 1570 105th Ave.; vehicle storage)	4	30'	6 samples/boring	24	First native soil, 5', 10', 15', 20' and just above groundwater	1 at east border	Soil: Title 22 metals; TVH and TEH using EPA 8015 M 20' sample on hold Groundwater: Title 22 metals; TVH and TEH using EPA 8015 M; VOCs using EPA 8260
VI.	Union Pacific Railroad Spur/AC Transit (shallow borings along railroad tracks and deep borings on AC Transit parcel)	4 3	1-3' 30'	1 sample/boring 6 samples/borings	6 18	First "dirt" First native soil, 5', 10', 15', 20' and just above groundwater	0 3	Soil: shallow borings: Title 22 metals; TVH and TEH (including hydraulic oil) using EPA 8015 M; SVOCs using EPA 8270 Soil: deep boring: Title 22 metals; TVH and TEH using EPA 8015 20' sample on hold Groundwater: Title 22 metals; TVH and TEH using EPA 8015M; VOCs using EPA 8260
VII.	West Side 105th Ave. - (commercial/industrial and residential; possible buried coal bin; possible heating oil USTs and past releases)	11	30'	6 samples/borings	66	First native soil, 5', 10', 15', 20' and just above groundwater	11	Soil: Title 22 metals; TVH and TEH using EPA 8015; SVOCs using EPA 8270 20' sample on hold Groundwater: Title 22 metals; TVH and TEH using EPA 8015M; VOCs using EPA 8260; SVOCs using EPA 8270
VIII.	East Side 104th Ave. (residential; possible lead impacted soils)	6 1	1' 30'	1 sample/boring 6 samples/borings	4 6	0.0-0.5' First native soil, 5', 10', 15', 20' and just above groundwater	NA 1	Soil: shallow borings: lead; TVH and TEH using EPA 8015 M; pesticides using EPA 8081 Soil: deep boring: Title 22 metals; TVH and TEH using EPA 8015; VOCs using EPA 8260; pesticides using EPA 8081 20' sample on hold Groundwater: Title 22 metals; TVH and TEH using EPA 8015M; VOCs using EPA 8260
	Totals	**49 deep 12 shallow**	**1494' depth 100' abandonment**		**306 soil samples**		**46 groundwater samples 1 well sample**	

Notes:
The total number and depth of soil samples collected from each boring will depend on the actual depth of groundwater.
PAHs = polynuclear aromatic hydrocarbons
SVOCs = semivolatile organic compounds
TEH = total extractable hydrocarbons
TVH = total volatile hydrocarbons
VOCs = volatile organic compounds

Table 2
Sample Collection Information
Batarse Project Site, Oakland, California

Sample Matrix and Test Method	Container	Preservative
Soil		
All analyses	Stainless-steel, brass, or butyrate sample tubes and caps or glass jars	Ice (4P C)
Groundwater		
Polychlorinated Biphenyls and Organochlorine Pesticides (EPA 8080A/8081/8082)	Two, 1-liter amber glass bottles	Ice (4P C)
Total Petroleum Hydrocarbons (EPA 8015 modified)	(2) 1-liter amber bottles and (3) 40-milliliter glass VOAs	Ice (40 C)/HCI
Volatile Organic Compounds (EPA 8260A)	(3) 40-milliliter glass VOAs	Ice (40 C)/HCI
Title 22 Metals (EPA 6010/7000)	(1) 300-milliliter plastic bottle	Ice - No preservative - samples to be filtered at laboratory

Notes:

VOA = volatile organic analysis
HCI = hydrochloric acid

0 1320'

Scale in feet

SOURCE: Delorme Street Atlas USA Version 6.0

Site Location Map

BATARSE PROJECT SITE, OAKLAND, CA.

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Figure 1

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Area VIII
East Side 104th Avenue
- Residential
- Possible lead impacted soil
- 6 shallow (0-1 ft) and 1 deep boring
- Analyze soil from shallow borings for lead; TVH; TEH; and pesticides
- Analyze soil from deep borings for Title 22; TVH; TEH; VOCs; and pesticides
- Analyze groundwater samples for Title 22 metals; TVH; TEH; and VOCs

Area VI
UPRR & AC Transit
- Railroad tracks
- 4 shallow (1-3 ft) and 3 deep borings
- Analyze soil from shallow borings for Title 22
- metals; TVH; TEH (including hydraulic oil); SVOCs
- Analyze soil from deep borings for Title 22 metals; TVH; and TEH
- Analyze groundwater for Title 22 metals; TVH; TEH; and VOCs

Area V
Chevron Tow
- Vehicle storage
- 4 deep borings
- Analyze soil for Title 22 metals; TVH, and TEH
- Analyze groundwater for Title 22 metals; TVH; TEH; and VOCs

Area VII
West Side 105th Avenue
- Commercial/Industrial and Residential
- Possible buried coal bin; possible heating oil USTs, past releases
- 11 deep borings
- Analyze soil for Title 22 metals; TVH; TEH; and SVOCs
- Analyze groundwater for Title 22 metals; TVH; TEH; VOCs; and SVOCs

Area IV
Wards Custom Paint
- Chemical use and vehicle storage
- 5 deep borings
- Analyze soil sample for Title 22 metals; TVH; TEH; and VOCs
- Analyze groundwater samples for Title 22 metals; TVH; TEH; and VOCs

Area III
Management Storage
- Two sumps and floor drain
- 1 water supply well
- 3 deep borings
- Analyze water sample from well for Title 22 metals; TVH; TEH; and VOCs
- Analyze soil samples for Title 22 metals; TVH; and TEH
- Analyze groundwater samples for Title 22 metals; TVH; TEH; and VOCs

Area II
Bill & Bill's
- Floordrain
- 3 deep borings
- Analyze soil for Title 22 metals; TVH; TEH; and VOCs
- Analyze groundwater for Title 22 metals; TVH; TEH; and VOCs

Area I
Lloyd Wise, Inc.
- Hydraulic lifts, sumps, drains, oil/water separator, former waste oil & product USTs, former oil ASTs and stained concrete slab
- 19 deep borings
- Analyze soil for Title 22 metals; TVH; and TEH (including hydraulic oil at lifts); PCBs (at lifts); and antifreeze (at former waste oil/product USTs north of 105th Avenue)
- Analyze groundwater for Title 22 metals; TVH; TEH; VOCs; and antifreeze (at former waste oil/product USTs north of 105th Avenue)

RESIDENTIAL
RAILROAD
5508
STREET
1648
1640
1636
1632
1626
1616
1608
1604
STREET
10403
1452
1446
1440
104th Ave
COMMERCIAL & RESIDENTIAL
TRAILER PARK
RESIDENTIAL
LIGHT INDUSTRIAL
CHURCH
A/C TRANSIT VEHICLE WASH BUILDING
CHEVRON TOW (CAR STORAGE) 1560/1570
WARD'S BODY SHOP (1544)
LLOYD WISE CAR STORAGE
105TH AVENUE
WARDS LOT (1536)
TRAILER VACANT LOT
MGMT. STORAGE 1510 A/B
FORMER WASTE OIL UST 550 GAL.
BILL & BILLS AUTO BODY SHOP (1500)
STORAGE
OIL/WATER SEPARATOR
FORMER SUMP
LLOYD WISE SERVICE BUILDING
LLOYD WISE MAINTENANCE (1424)
LLOYD WISE SHOWROOM (10500 INTERNATIONAL BUILD)
LLOYD WISE OFFICES (1055)
INFERRED GROUNDWATER FLOW DIRECTION
FORMER WATER SUPPLY WELL
POSSIBLE FORMER 550 gal WASTE OIL UST
(2) 1,000 gal USTs FORMER PRODUCT AND WASTE OIL
APPROXIMATE FORMER SOIL STOCKPILE LOCATION FROM EXCAVATION OF OIL USTs
FORMER 2000 gal UST
FORMER DISPENSER
EAST 14TH STREET
COMMERCIAL
COMMERCIAL

0 150
APPROX. SCALE IN FEET

LEGEND

- SITE BORDER
- FORMER MONITORING WELL
- EXISTING BUILDING
- TVH TOTAL VOLATILE HYDROCARBONS
- TEH TOTAL EXTRACTABLE HYDROCARBONS
- VOCs VOLATILE ORGANIC COMPOUNDS
- SVOCs SEMI-VOLATILE ORGANIC COMPOUNDS

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Site Plan and Proposed Sampling Plan

BATARSE PROJECT SITE, OAKLAND, CA

LFR LEVINE • FRICKE

Figure 2

During the preparation of the Preliminary Environmental Assessment (PEA) work plan for the Oakland Unified School District Batarse Project Site ("the Site"), LFR Levine · Fricke (LFR) reviewed reports prepared for the Site by previous consultants. These reports included the following:

- "Underground Tank Technical Closure Report," prepared by Gen-Tech Environmental, dated March 26, 1993
- "Monitoring Well Installation and Sampling, Lloyd Wise Olds, 10440 East 14th Street, Oakland, California," prepared by Gen-Tech Environmental, dated May 6, 1993
- "Soil and Groundwater Investigation Site at 10440 and 10550 East 14th Street, Oakland, California," prepared by Gen-Tech Environmental, dated May 20, 1994
- "Overview of Environmental Conditions at 10550 East 14th Avenue Nissan/Honda Auto Dealership in Oakland, California," prepared by Gen-Tech Environmental, dated October 11, 1994
- "Monitoring Well Installation and Groundwater Sampling for Lloyd Wise Oldsmobile/Nissan, 10550 East 14th Street, Oakland, California," prepared by Piers Environmental Services, dated September 27, 1995
- "Limited Phase II Environmental Assessment and Groundwater Monitoring Report, 10500 East 14th Street, Oakland, California," prepared by Piers Environmental Services, dated March 13, 1997
- "Fuel Leak Site Case Closure for 10500 East 14th Street, Oakland," prepared by Alameda County Health Care Services Agency (ACHCSA), dated August 14, 1998
- "Phase I Environmental Assessment for 1500–1510 105th Avenue, Oakland, California," prepared by Piers Environmental Services, dated June 5, 1996
- "Phase I Environmental Assessment for 1520 105th Avenue, Oakland, California," prepared by Piers Environmental Services, dated August 27, 1998
- "Phase I Environmental Site Assessment Report, Batarse Project Site, East 14th Street and 105th Avenue, Oakland, California," prepared by ENSR Consulting and Engineering, dated October 2000 (ENSR 2000)

Information obtained from these reports is summarized below. The reports for the properties known as 10440 through 10550 East 14th Street detail work performed off Site; however, information contained in these reports is summarized in this work plan to evaluate possible impacts to the Site.

ON-SITE PROPERTIES

1500 through 1510 105th Avenue

Bill Thompson owned this property at the time of the environmental assessment by Piers Environmental. According to information contained in this report, the buildings

on this property were previously occupied by a photodeveloping laboratory (1500 105th Avenue) and a commercial printing business (1510 105th Avenue).

Piers Environmental representatives noted that a water supply well was present on the northern side of the 1510 105th Avenue building at the time of their site visit. According to Mr. Thompson, this well was present at the time he acquired the property in 1967. Mr. Thompson noted that he had not used the well but that he had been informed that the well was deepened to a depth of approximately 100 feet in 1974.

According to information contained in the report, a sink and a drain that appeared to be corroded were located in the southern corner of the 1500 105th Avenue building. In addition, two sumps that were approximately 1.5 feet deep were noted at the rear of the 1510 105th Avenue building by Piers Environmental representatives. These sumps were reportedly used to contain wastewater from floor washing activities.

1520 105th Avenue

Ida Rodrigues owned this property at the time of the environmental assessment by Piers Environmental. This property was occupied by a residence from at least 1926 until its demolition in 1979. From 1979 to Piers Environmental's 1998 site visit, the property was a vacant lot.

OFF-SITE PROPERTIES

10440 through 10550 East 14th Street

Two underground storage tanks (USTs) were formerly located at 10440 East 14th Street, according to information contained in previous reports reviewed by LFR. The tanks, including a 1,000-gallon product oil UST and a 1,000-gallon waste oil UST, were reportedly installed in the mid-1960s and were in use until 1992. The two USTs were removed in February 1993. At the time of the tank removals, 10 soil samples and two groundwater samples were collected for analysis, as follows:

- total petroleum hydrocarbons quantified as gasoline (TPH-g) and diesel (TPH-d) by United States Environmental Protection Agency (EPA) Test Method 8015 Modified
- benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA Test Method 8020
- volatile organic compounds (VOCs) by EPA Test Method 8240
- Semivolatile organic compounds (SVOCs) by EPA Test Method 8270
- oil and grease by Standard Method 5520 E&F
- five leaking underground fuel tank (LUFT) field manual metals
- ethylene glycol (antifreeze)

Analysis of the soil samples revealed the following maximum concentrations of selected compounds:

- TPH-g up to 20 milligrams per kilograms (mg/kg)
- TPH-d up to 660 mg/kg
- ethylene glycol up to 220 mg/kg
- toluene up to 140 micrograms per kilogram (μg/kg)
- ethylbenzene up to 93 μg/kg
- total xylenes up to 3,000 μg/kg
- oil and grease up to 1,400 μg/kg
- cis-1,2-dichloroethene up to 340 μg/kg
- tetrachoroethene up to 42 μg/kg

Analysis of the groundwater samples collected from the excavation revealed the following maximum concentrations of selected compounds:

- TPH-g at 27 milligrams per liter (mg/l);
- benzene at 780 micrograms per liter (μg/l);
- toluene at 8,700 μg/l
- ethylbenzene at 1,300 μg/l
- total xylenes at 6,300 μg/l

Cis-1,2-dichloroethene and tetrachloroethene were not detected in the groundwater samples at concentrations at or above the laboratory reporting limits.

Two additional USTs were removed in February 1993; the address given for the work site was listed as 10550 East 14th Street. According to information contained in previous reports reviewed by LFR, the two tanks were noted as a 2,000-gallon gasoline UST and a 550-gallon waste oil UST. According to the map provided, the gasoline UST was located on the southern side of 105th Avenue and adjacent to the western end of the Lloyd Wise auto dealership building while the waste oil UST was located on the northern side of 105th Avenue.

Soil samples collected at the time of the tank removals were analyzed for the following:

- TPH-g and TPH-d by EPA Test Method 8015 Modified
- BTEX by EPA Test Method 8020
- VOCs by EPA Test Method 8240
- SVOCs by EPA Test Method 8270
- oil and grease by Standard Method 5520 E&F
- five LUFT field manual metals

Analysis of the soil samples revealed the following maximum concentrations of selected compounds:

- TPH-g up to 1 mg/kg
- TPH-d up to 39 mg/kg
- total xylenes up to 7 μg/kg

Analysis of the groundwater sample collected from the excavation revealed the following maximum concentrations of selected compounds:

- TPH-g at 120 μg/l
- toluene at 1.2 μg/l
- ethylbenzene at 7.2 μg/l
- total xylenes at 26 μg/l

Three groundwater monitoring wells were installed on and near the 10550 East 14th Street property following removal of the USTs (see Figure 2 of Batarse Project Site PEA Work Plan). Analysis of groundwater samples collected from the wells in 1995 revealed TPH-g (up to 240,000 μg/l), benzene (up to 3,600 μg/l), toluene (up to 1,200 μg/l), ethylbenzene (up to 6,900 μg/l), and total xylenes (up to 35,000 μg/l).

The ACHCSA issued a case closure letter for the property known as 10500 East 14th Street. The case closure summary noted that a 550-gallon waste oil UST and a 2,000-gallon gasoline UST had been removed from this location. According to information presented in the case closure summary, the following chemicals of concern were present in the groundwater in February 1998: TPH-g (up to 18,000 μg/l), benzene (up to 270 μg/l), toluene (up to 120 μg/l), ethylbenzene (up to 1,800 μg/l), and total xylenes (up to 6,300 μg/l).

APPENDIX B

Site-Specific Health and Safety Plan

Health and Safety Plan
for Preliminary Environmental Assessment
Activities at the
Batarse Site
104th Avenue and East 14th Street
Oakland, California

May 25, 2001
7962.01-001

Prepared for
Oakland Unified School District
955 High Street
Oakland, California 94601

CONTENTS

1.0 GENERAL

LFR Levine · Fricke (LFR) has prepared this Health and Safety Plan (HSP) for use during the Preliminary Environmental Assessment (PEA) activities to be conducted at the Batarse Site located at 104th Avenue and East 14th Street (also called International Boulevard and Highway 185) in Oakland, California ("the Site"). This HSP is included as Appendix A in the work plan entitled "Draft Preliminary Endangerment Assessment Work Plan, Batarse Site, 104th Avenue and East 14th Street, Oakland, California," dated May 15, 2001 ("the Work Plan"). Activities conducted under LFR's direction at the Site will be in compliance with applicable Occupational Safety and Health Administration (OSHA) regulations, particularly those in Title 8 California Code of Regulations (CCR) 5192, and other applicable federal, state, and local laws, regulations, and statutes. A copy of this HSP will be kept on site during scheduled field activities.

This HSP addresses the potential hazards associated with planned field activities at the Site. It presents the minimum health and safety requirements for establishing and maintaining a safe working environment during the course of work. In the event of conflicting requirements, the procedures or practices that provide the highest degree of personnel protection will be implemented. If work plan specifications change or if site conditions encountered during the course of the work are found to differ substantially from those anticipated, the Corporate Director of Health and Safety must be informed immediately upon discovery, and appropriate changes will be made to this HSP.

It is the Project Manager's responsibility to ensure that health and safety procedures are enforced at the Site. Project personnel, including subcontractors, shall receive a copy of this HSP and sign the form to indicate acceptance before on-site project activities begin.

LFR's health and safety programs and procedures, including medical monitoring, respiratory protection, injury and illness prevention, hazard communication, and personal protective equipment (PPE), are documented in the LFR Corporate Health and Safety Manual. These health and safety procedures are incorporated herein by reference, and LFR employees will adhere to the procedures specified in the manual.

When specified in contract documents, this HSP may cover the activities of LFR subcontractors. However, this HSP may not address hazards associated with tasks and equipment that are specialties of the subcontractor (e.g., operation of a drill rig). Subcontractors are responsible for developing, maintaining, and implementing their own health and safety programs, policies, and procedures.

LFR is responsible for the safety of its employees and subcontractors under its control, but assumes no responsibility for the activities of other contractors or their subcontractors who may be working concurrently at the general project location. LFR will use a reasonable degree of care when marking potentially hazardous areas within its project work site and restricting access as appropriate. LFR will not be responsible

for others outside its control who disregard such marked hazards or restricted access. This HSP has been prepared specifically for this project and is intended to address health and safety issues solely with respect to LFR's work. All references, therefore, to the site, the work, activities, site personnel, workers, persons, or subcontractors in this HSP are with respect to LFR work only.

2.0 SITE DESCRIPTION AND BACKGROUND

The Site is located within a city block in Oakland bounded to the north by 104th Avenue, to the west by East 14th Street, and to the east by Breed Avenue (see Figure 1 of the Work Plan). For convenience, the Site has been divided into eight groups of parcels to facilitate describing the proposed assessment areas. The site is being considered for the construction of a new school. A list of the properties and their current occupants is provided below:

Parcel Group	Parcel Group Name	Street Address	Assessor's Parcel Number
I	Lloyd Wise Inc.	10550 East 14th Street (eastern portion)	047-5519-005-02 (eastern portion)
		1424 105th Avenue (formerly part of East 14th Street)	047-5509-010-00
II	Bill & Bill's Auto Body	1500 105th Avenue	047-5509-009-01
III	Management Storage	1510 105th Avenue	047-5509-007-00 and 047-5509-006-00
IV	Ward's Custom Paint	1536, 1538, and 1544 105th Avenue	047-5509-003-00, 047-5509-004-00, and 047-5509-005-00
V	Chevron Tow	1560 and 1570 105th Avenue	047-5509-001-01
VI	Union Pacific Railroad	Center of 105th Avenue (see Figure 2 of Work Plan)	047-5519-004-10 and 047-5519-003
	Alameda-Contra Costa Transit (A/C Transit)	No assigned address (see Figure 2 of Work Plan)	047-5519-004-03
VII	West Side of 105th Avenue Commercial, Industrial, and Residential Parcel	1429/1433/1439 105th Avenue	047-5509-015-03
		1449 105th Avenue	047-5509-015-04
		1501 105th Avenue	047-5509-17
		1525 and 1545 105th Avenue	047-5509-021-01
		1557, 1559, and 1561 105th Avenue	047-5509-023-01
		105th Avenue Right of Way	NA

Parcel Group	Parcel Group Name	Street Address	Assessor's Parcel Number
VIII	East side of 104th Avenue Residential Parcel	10403 Walnut Street	047-5509-32-01
		1440 104th Avenue	047-5509-36-01
		1446 104th Avenue	047-5509-34-00
		1452 104th Avenue	047-5509-33-00
		1604 104th Avenue	047-5509-31-00
		1608 104th Avenue	047-5509-30-00
		1616 104th Avenue	047-5509-029-00
		1626 104th Avenue	047-5509-28-00
		1632 104th Avenue	047-5509-27-00
		1636 104th Avenue	047-5509-26-00
		1640 104th Avenue	047-5509-25-00
		1648 104th Avenue	047-5509-24-00

The eight groups of parcels included within the area to be addressed by the PEA are referred to as Lloyd Wise, Inc.; Bill & Bill's Auto Body; Management Storage; Ward's Custom Paint; Chevron Tow; Union Pacific Railroad (UPRR)/AC Transit; West Side of 105th Avenue Commercial, Industrial, and Residential; and East Side of 104th Avenue Residential. Each of these parcel groups is described in the Work Plan.

3.0 PLANNED SITE ACTIVITIES

Scheduled work will consist of the following activities:

- A total of 46 to 54 soil borings are proposed, with total depths ranging from 1 to at least 30 feet bgs. (Borings might be drilled deeper and additional borings might be drilled if warranted based on field observations.) A Geoprobe™, or similar direct-push method sampling rig will be used to collect soil samples. An estimated 288 to 336 soil samples are proposed to be collected. Additional samples might be collected if warranted based on field observations.

- A total of 43 to 51 "grab" groundwater samples will be collected using a Hydropunch™ sampler or factory-slotted PVC casing, advanced through a push-probe boring. Additional samples might be collected if warranted based on field observations. It is expected that first groundwater will occur within 8 to 30 feet bgs. In addition, one water supply well will be sampled if accessible.

Work is anticipated to begin in approximately mid-February 2001, and may last approximately two weeks.

4.0 KEY PROJECT PERSONNEL AND RESPONSIBILITIES

Project Manager	Michael B. Marsden, R.G., C.HG., Senior Associate Hydrogeologist
Site Safety Officer	Michael B. Marsden, R.G., C.HG., Senior Associate Hydrogeologist
Corporate Director of Health and Safety	Joanne M. Jaeger, CIH

The responsibilities of key project personnel are outlined below.

4.1 Project Manager

The Project Manager has the ultimate responsibility for the health and safety of LFR personnel at the Site. The Project Manager is responsible for:

- ensuring that project personnel review and understand the requirements of this HSP
- keeping the Corporate Director of Health and Safety informed of project developments
- keeping on-site personnel, including subcontractors, informed of the expected hazards and appropriate protective measures at the Site
- providing resources necessary for maintaining a safe and healthy work environment for LFR personnel

4.2 Corporate Director of Health and Safety

The Corporate Director of Health and Safety is responsible for the review, interpretation, and modification of this HSP. Modifications to this HSP that may result in less stringent precautions cannot be undertaken by the Project Manager or Site Safety Officer (SSO) without the approval of the Corporate Director of Health and Safety. In addition, he has the following responsibilities:

- advising the Project Manager and SSO on matters relating to health and safety on this project
- recommending appropriate safeguards and procedures
- modifying this HSP, when necessary
- approving changes in health and safety procedures employed at the Site

4.3 Site Safety Officer

The SSO is responsible for enforcing the requirements of this HSP once site work begins. The SSO has the authority to immediately correct situations where noncompliance with this HSP is noted and to immediately stop work in cases where an immediate danger to site workers or the environment is perceived. Responsibilities of the SSO also include:

- obtaining and distributing personal protective equipment (PPE) and air monitoring equipment necessary for this project
- limiting access at the Site to authorized personnel
- communicating unusual or unforeseen conditions at the Site to the Project Manager
- supervising and monitoring the safety performance of site personnel to evaluate the effectiveness of health and safety procedures and correct deficiencies
- conducting daily tailgate safety meetings before each day's activities begin
- conducting a site safety inspection prior to the commencement of each day's field activities

4.4 Subcontractor Personnel

Subcontractor personnel are expected to comply with the minimum requirements specified in this HSP. Failure to do so may result in the removal of the subcontractor or any of the subcontractor's workers from the job site. Subcontractors may employ health and safety procedures that afford them a greater measure of personal protection than those specified in this plan so long as they do not pose additional hazards to themselves, the environment or others working in the area.

5.0 HAZARDS OF KNOWN OR EXPECTED CHEMICALS OF CONCERN

The potential environmental issues present among the eight areas listed in Table 1 of the Work Plan include former hydraulic lifts, sumps, oil/water separator, former waste oil and antifreeze USTs, floor drains, auto body painting operations, chemical use, a railroad spur, lead-based paint, and asbestos.

Therefore, the potential chemicals of concern addressed in this investigation will include total volatile and extractable hydrocarbons (TVH and TEH), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and volatile organic compounds (VOCs) because of their historical association with industrial, automobile maintenance, and painting operations; CAM 17/Title 22 metals because of their historical association with industrial operations and lead-based paint; and semivolatile organic compounds (SVOCs), including PCBs.

Information contained in ENSR's October 2000 Phase I Environmental Site Assessment Report was used to prepare the following table.

Known Compounds	Source (soil/water/drum, etc.)	Known Concentration Range (ppm, mg/kg, mg/l)	
		Lowest	Highest
Benzene	soil	ND	0.01
Toluene	soil	ND	0.21
Ethylbenzene	soil	ND	0.57
Total Xylenes	soil	ND	3.0
TVH (gasoline)	soil	ND	160
TEH (diesel)	soil	ND	660
Oil & Grease	soil	ND	1,400
VOCs	soil	NA	<10
Cadmium	soil	ND	NA
Chromium	soil	42	43
Lead	soil	15	16
Nickel	soil	45	50
Zinc	soil	42	45
Benzene	groundwater	<0.5	4.6
Toluene	groundwater	<0.5	8.7
Ethylbenzene	groundwater	<0.5	6.9
Total Xylenes	groundwater	<0.5	40
TVH (gasoline)	groundwater	<50	240
TEH (diesel)	groundwater	ND	NA
Oil & Grease	groundwater	ND	NA
Total Recoverable Petroleum Hydrocarbons (TRPH)	groundwater	<5,000	NA

Known Compounds	Source (soil/water/drum, etc.)	Known Concentration Range (ppm, mg/kg, mg/l)	
		Lowest	Highest
Methyl tertiary-butyl ether (MTBE)	groundwater	<5	23
VOCs	groundwater	ND	<0.01
Lead	groundwater	ND	0.01

ND – not detected

NA – not available

Exposure pathways of concern for chemical compounds that may be present at the Site are inhalation of airborne contaminants and direct skin contact with contaminated materials. Wearing protective equipment and following decontamination procedures listed in Section 9 can minimize dermal contact. To minimize inhalation hazards, dust control measures will be implemented, where necessary, and action levels will be observed during scheduled activities. Site-specific action levels are presented in Section 10. Chemical descriptions of chemicals of concern, including health effects and exposure limits, are located in Attachment A.

On-site worker exposure to airborne contaminants will be monitored during intrusive site activities. A calibrated photoionization detector (PID) or flame ionization detector (FID) will be used to monitor changes in exposure to volatile organic compounds (VOCs). Personnel will perform routine monitoring during site operations to evaluate concentrations of VOCs in employee breathing zones. If VOCs are detected above predetermined action levels specified in Section 10, the procedures found in Section 7 of this HSP will be followed.

In accordance with the Hazard Communication standard, material safety data sheets (MSDSs) will be maintained on site for chemical products used by LFR personnel at the Site. In addition, containers will be clearly labeled in English to indicate their contents and appropriate hazard warnings.

6.0 PHYSICAL HAZARDS

The following potential health and safety hazards may be encountered during scheduled activities at the Site:

- slips, trips, and falls
- heavy equipment
- cold stress

- noise
- electrical sources
- underground and overhead utilities
- materials and equipment handling
- fire/explosion
- traffic

6.1 General Safe Work Practices

- Workers will thoroughly clean their hands, faces, and other potentially contaminated areas before smoking, eating, or leaving the Site.
- Respiratory devices may not be worn with beards or long sideburns, or under other conditions that prevent a proper seal.
- Accidents and/or injuries associated with work at the Site will be immediately reported to the SSO. If necessary, an incident report will be initiated by the SSO.
- Periodic safety briefings will be held to discuss current site conditions, field tasks being performed, planned modifications, and work concerns.
- Site conditions may include uneven, unstable, or slippery work surfaces. Substantial care and personal observation is required on the part of each employee to prevent injuries from slips, trips, and falls.
- Workers will maintain good housekeeping practices during field activities to maintain a safe working environment. The work site will be kept free of debris, waste, and trash.
- The "buddy system" will be used whenever appropriate.
- To prevent head injury, ANSI-approved hard hats will be worn at all times while the worker is in an area where overhead obstructions or falling objects may be encountered.
- To prevent eye injuries, workers must wear ANSI-approved safety glasses during field activities.

6.2 Heavy Equipment

Equipment, including earth-moving equipment, drill rigs, or other heavy machinery, will be operated in compliance with the manufacturer's instructions, specifications, and limitations, as well as any applicable regulations. The operator is responsible for inspecting the equipment daily to verify that it is functioning properly and safely.

Operation of equipment at the Site for the activities outlined in Section 3 poses potential physical hazards. The following precautions should be observed whenever heavy equipment is in use:

- PPE, including steel-toed boots, safety glasses, and hard hats, must be worn.
- Personnel must be aware of the location and operation of heavy equipment and take precautions to avoid getting in the way of its operation. Workers must never assume that the equipment operator sees them; eye contact and hand signals should be used to inform the operator of intent.
- Traffic safety vests are required for personnel working near mobile heavy equipment or near high traffic areas.
- Personnel should not walk directly in back of, or to the side of, heavy equipment without the operator's knowledge.
- Nonessential personnel will be kept out of the work area.

6.3 Cold Stress

Workers performing activities during winter and spring months may encounter extremely cold temperatures, as well as conditions of snow and ice, making activities in the field difficult. Adequate cold weather gear, especially head and foot wear, is required under these conditions. Workers should be aware of signs and symptoms of hypothermia and frostbite, as well as first aid for these conditions. These are summarized in the table below.

Condition	Signs	Symptoms	Response
Hypothermia	Confusion, slurred speech, slow movement.	Sleepiness, confusion, warm feeling.	Remove subject to warm area, such as truck cab; give warm fluids; warm body core as rapidly as possible; remove outer clothing and wrap torso in blankets with hot water bottle or other heat source. Get medical attention immediately.
Frostbite	Reddish area on skin, frozen skin.	Numbness or lack of feeling on exposed skin.	Place affected extremity in warm, not hot, water, or wrap in warm towels. Get medical attention.

6.4 Noise

Noise may result primarily from the operation of drill rigs and mechanical equipment. The use of heavy equipment may generate noise above the Cal/OSHA permissible exposure limit for noise of 90 dBA for an 8-hour time-weighted average. Workers will wear appropriate hearing protection when operating or working near heavy equipment.

If loud noise is present or normal conversation becomes difficult, hearing protection in the form of ear plugs, or equivalent, will be required.

6.5 Electric Shock

Electrical equipment to be used during field activities will be suitably grounded and insulated. Ground fault circuit interrupters (GFCI), or equivalent, will be used with electrical equipment to reduce the potential for electrical shock.

Lockout/tagout procedures in accordance with 8 CCR 3314 will be conducted before activities begin on or near energized or mechanical equipment that may pose a hazard to site personnel. Workers conducting the operation will positively isolate the piece of equipment, lock/tag the energy source, and verify effectiveness of the isolation. Only employees who perform the lockout/tagout procedure may remove their own tags/locks. Employees will be thoroughly trained before initiating this procedure.

6.6 Underground and Overhead Utilities

The locations of underground pipes, electrical conductors, fuel lines, and water and sewer lines must be determined before soil intrusive work is performed. Lines must be de-energized, blocked out, or blinded where feasible. Equipment with articulated upright booms or masts shall not be permitted to pass within 20 feet of an overhead utility line while the boom is in the upright position.

6.7 Materials and Equipment Handling Procedures

The movement and handling of equipment and materials on the Site pose a risk to workers in the form of muscle strains and minor injuries. These injuries can be avoided by using safe handling practices, proper lifting techniques, and proper personal safety equipment such as steel-toed boots and sturdy work gloves. Where practical, mechanical devices will be utilized to assist in the movement of equipment and materials. Workers will not attempt to move heavy objects by themselves without using appropriate mechanical aids such as drum dollies or hydraulic lift gates.

6.8 Fire/Explosion

Site workers should have an increased awareness concerning fire and explosion hazards whenever working with or near flammable materials, especially when performing any activity that may generate sparks, flame, or other source of ignition. Intrinsically safe equipment is required when working in or near environments with the potential for an explosive atmosphere. The SSO will verify facility requirements for a "hot work" permit before activities that may serve as a source of ignition are conducted.

Flammable materials will be kept away from sources of ignition. In the event of fire, work will cease, the area will be evacuated, and the local fire response team will be

notified immediately. Only trained, experienced fire fighters should attempt to extinguish substantial fires at the Site. Site personnel should not attempt to fight fires, unless properly trained and equipped to do so. A fully charged ABC dry chemical fire extinguisher will be readily available for use during all scheduled activities at the Site.

6.9 Traffic

Vehicular traffic presents opportunities for serious injury to persons or property. Traffic may consist of street traffic or motor vehicles operated by facility employees or visitors to the Site. Workers and other pedestrians are clearly at risk during periods of heavy traffic. Risk from motor vehicle operations may be minimized by good operating practices and alertness, and care on the part of workers and pedestrians.

Site personnel will wear high-visibility safety vests whenever activities are conducted in areas of heavy traffic. Work vehicles will be arranged to be used as a barrier between site workers and nearby traffic.

7.0 PERSONAL PROTECTIVE EQUIPMENT

The purpose of PPE is to protect employees from hazards and potential hazards they are likely to encounter during site activities. The amount and type of PPE used will be based on the nature of the hazard encountered of anticipated. Respiratory protection will be utilized when an airborne hazard has been identified using real-time air monitoring devices, or as a precautionary measure in areas designated by the Corporate Director of Health and Safety or SSO.

Dermal protection, primarily in the form of chemical-resistant gloves and coveralls, will be worn whenever contact with chemically affected materials (e.g., soil, groundwater, sludge) is anticipated, without regard to the level of respiratory protection required.

LFR personnel will be provided with appropriate personal safety equipment and protective clothing. The SSO is to inform each worker about necessary protection and must provide proper training in the use of the safety equipment. The required PPE to be worn is described below.

7.1 Conditions Requiring Level D Protection

In general, site activities will commence in Level D PPE unless otherwise specified, or if the SSO determines on site that a higher level of PPE is required. Air monitoring will be routinely conducted using real-time air monitoring devices to determine if upgrading to Level C PPE is necessary. Level D PPE will be permitted as long as air monitoring data indicate that airborne concentrations of chemicals of concern are maintained below the site-specific action levels defined in Section 10.

It is important to note that dermal protection is required whenever contact with chemically affected soils or groundwater is anticipated. The following equipment is specified as the minimum PPE required to conduct activities at the Site:

- work shirt and long pants
- ANSI-approved steel-toed boots or safety shoes
- ANSI-approved safety glasses
- ANSI-approved hard hat

Other personal protection readily available for use, if necessary, includes the following:

- outer nitrile gloves and inner nitrile surgical gloves when direct contact with chemically affected soils or groundwater is anticipated (nitrile surgical gloves may be used for collecting or classifying samples as long as they are removed and disposed of immediately after each sampling event)
- chemical-resistant clothing (e.g., Tyvek or polycoated Tyvek coveralls) when contact with chemically affected soils or groundwater is anticipated
- safety shoes/boots with protective overboots or knee-high PVC polyblend boots when direct contact with chemically affected soils is anticipated
- hearing protection
- sturdy work gloves

7.2 Conditions Requiring Level C Protection

If air monitoring indicates that the site-specific action levels defined in Section 10 are exceeded, workers in the affected area(s) will upgrade PPE to Level C. In addition to the protective equipment specified for Level D, Level C also includes the following:

- NIOSH/MSHA-approved half-face air-purifying respirator (APR) equipped with filter cartridges as specified in Section 10.0.
- chemical-resistant clothing (e.g., Tyvek, polycoated Tyvek, or Saranex coveralls) when contact with chemically affected soils or groundwater is anticipated
- outer nitrile gloves and inner nitrile surgical gloves when direct contact with chemically affected soils or groundwater is anticipated (nitrile surgical gloves may be used for collecting or classifying samples as long as they are removed and disposed of immediately after each sampling event)
- safety shoes/boots with protective overboots or knee-high PVC polyblend boots when direct contact with chemically affected soils is anticipated

If air monitoring indicates that the site-specific action levels defined in Section 10 are exceeded, workers in the affected area(s) will upgrade to NIOSH/MSHA-approved full-face APRs in lieu of half-face APRs and safety glasses.

If air monitoring indicates that the site-specific action levels defined in Section 10 are exceeded, activities must cease, and personnel must evacuate the Exclusion Zone (see Section 9). The Project Manager and Corporate Director of Health and Safety will be contacted immediately.

8.0 SAFETY PROCEDURES

Procedures must be followed to maintain site control so that persons who may be unaware of site conditions are not exposed to hazards. The work area will be barricaded by tape, warning signs, or other appropriate means. Pertinent equipment or machinery will be secured and stored safely.

Access inside the specified work area will be limited to authorized personnel. Only LFR employees and designated LFR subcontracted personnel, as well as designated employees of the client, will be admitted to the work site. Only those workers possessing evidence of the required current 40-hour OSHA health and safety training (or current 8-hour refresher) and physician's authorization to conduct hazardous waste activities will be permitted in the work area designated as the Exclusion Zone. The SSO will be responsible for requiring that workers wear proper personal protective clothing. Personnel entering the work area will sign the signature page of this HSP, indicating they have read and accepted the health and safety practices outlined in this plan.

Real-time air monitoring devices will be used to analyze for airborne contaminant concentrations every 30 minutes in the workers' breathing zones while workers are in the Exclusion Zone. If elevated concentrations are indicated, the monitoring frequency will be increased, as appropriate. The equipment will be calibrated daily, and the results will be recorded on LFR's Air Monitoring form or project log book. The results of air monitoring will be recorded on a LFR Air Monitoring Form or project log book and will be retained in the project files following completion of field activities. A copy of the Air Monitoring Form is located in Attachment B.

A daily morning briefing to cover safety procedures and contingency plans in the event of an emergency is to be included with a discussion of the day's activities. These daily meetings will be recorded on LFR Daily Tailgate Safety Meeting Forms. A debriefing to cover the activities is to be held upon completion of the work. A copy of the Daily Tailgate Safety Meeting Form is included in Attachment B.

The SSO will conduct a safety inspection of the work site before each day's activities begin to verify compliance with the requirements of the HSP. Results of the first day's inspection will be documented on an LFR Site Safety Checklist. A copy of the checklist is included in Attachment B.

Minimum emergency equipment maintained on site will include a fully charged 20-pound ABC dry chemical fire extinguisher, an adequately stocked first aid kit, and an emergency eyewash station.

Personnel entering the designated Exclusion Zone should exit at the same location. There must be an alternate exit established for emergency situations. In all instances, worker safety will take precedence over decontamination procedures. If decontamination of personnel is necessary, exiting the Site will include the decontamination procedures described below.

9.0 WORK ZONES AND DECONTAMINATION PROCEDURES

In some instances it may be necessary to define established work zones: an Exclusion Zone, a Contamination Reduction Zone, and a Support Zone. Work zones may be established based on the extent of anticipated contamination, projected work activities, and the presence or absence of non-project personnel. The physical dimensions and applicability of work zones will be determined for each area based on the nature of job activity and hazards present. Within these zones, prescribed operations will occur using appropriate PPE. Movement between zones will be controlled at checkpoints.

Considerable judgment is needed to maintain a safe working area for each zone, balanced against practical work considerations. Physical and topographical barriers may constrain ideal locations. Field measurements combined with climatic conditions may, in part, determine the control zone distances. Even when work is performed in an area that does not require the use of chemical-resistant clothing, work zone procedures may still be necessary to limit the movement of personnel and retain adequate site control.

Despite protective procedures, personnel may come in contact with potentially hazardous compounds while performing work tasks. If so, decontamination needs to take place using an Alconox or TSP wash, followed by a rinse with clean water. Standard decontamination procedures for levels C and D are as follows:

- equipment drop
- boot cover and outer glove wash and rinse
- boot cover and outer glove removal
- suit wash and rinse
- suit removal
- safety boot wash and rinse
- inner glove wash and rinse
- respirator removal
- inner glove removal
- field wash of hands and face

Workers should employ only applicable steps in accordance with level of PPE worn and extent of contamination present. The SSO shall maintain adequate quantities of clean water to be used for personal decontamination (i.e., field wash of hands and face) whenever a suitable washing facility is not located in the immediate vicinity of the work area. Disposable items will be disposed of in an appropriate container. Wash and rinse water generated from decontamination activities will be handled and disposed of properly. Nondisposable items may need to be sanitized before reuse. Each Site worker is responsible for the maintenance, decontamination, and sanitizing of their own PPE.

Used equipment may be decontaminated as follows:

- An Alconox or TSP and water solution will be used to wash the equipment.
- The equipment will then be rinsed with clean water.

Each person must follow these procedures to reduce the potential for transferring chemically affected materials off site.

10.0 ACTION LEVELS

The following action levels were developed for exposure monitoring with real-time air monitoring instruments. The air monitoring data will determine required PPE levels at the Site during scheduled intrusive activities. The action levels are based on sustained readings indicated by the instrument(s). Air monitoring will be performed and recorded at up to 30-minute intervals. If elevated concentrations are indicated, the monitoring frequency will be increased, as appropriate. If during this time, sustained measurements are observed, the following actions will be instituted, and the Project Manager and Director of Health and Safety will be notified. For purposes of this HSP, sustained readings are defined as the average airborne concentration maintained for a period of 5 minutes.

Activity	Action Level	Level of Respiratory Protection
soil borings/sampling	0 to 5 ppm above background	Level D: No respiratory protection required.
	6 to 50 ppm	Level C: Half-face air-purifying respirator fitted with organic vapor filter cartridges.
	51 to 100 ppm	Level C: Full-face air-purifying respirator fitted with organic vapor filter cartridges.
	> 100 ppm	Cease operations and evacuate work area. Contact Corporate Director of Health and Safety and Project Manager immediately.

11.0 CONTINGENCY PROCEDURES

In the event of an emergency, site personnel will signal distress with three blasts of a horn (a vehicle horn will be sufficient). Communication signals, such as hand signals, must be established where communication equipment is not feasible or in areas of loud noise.

It is the SSO's duty to evaluate the seriousness of the situation and to notify appropriate authorities. Section 12 of this plan contains emergency telephone numbers as well as directions to the hospital. Nearby telephone access must be identified and available to communicate with local authorities. If a nearby telephone is not available, a cellular telephone will be maintained on site during work activities.

Personnel should dial 911 in the event of an emergency.

11.1 Injury/Illness

If an exposure or injury occurs, work will be temporarily halted until an assessment can be made of whether it is safe to continue work. The SSO, in consultation with the Corporate Director of Health and Safety, will make the decision regarding the safety of continuing work. The SSO will conduct an investigation to determine the cause of the incident and steps to be taken to prevent recurrence.

In the event of an injury, the extent and nature of the victim's injuries will be assessed and first aid will be rendered as appropriate. If necessary, the individual may be transported to the nearby medical center. The mode of transportation and the eventual destination will be based on the nature and extent of the injury. A hospital route map is presented in Attachment C. In the event of a life-threatening emergency, the injured person will be given immediate first aid and emergency medical services will be contacted by dialing 911. The individual rendering first aid will follow directions given by emergency medical personnel via telephone. A person certified in first aid/CPR techniques will be present during field activities.

11.2 Fire

In the event of fire, personnel should contact the local fire department immediately by dialing 911. When representatives of the fire department arrive, the SSO, or designated representative, will advise the commanding officer of the location, nature, and identification of hazardous materials on site. Only trained, experienced fire fighters should attempt to extinguish substantial fires at the Site. Site personnel should not attempt to fight fires, unless properly trained and equipped to do so.

11.3 Underground Utilities

In the event that an underground conduit is damaged during excavation or drilling, mechanized equipment will immediately be shut off until the nature of the piping can be determined. Depending on the nature of the broken conduit (e.g., natural gas, water, or electricity), the appropriate local utility will be contacted.

11.4 Evacuation

The SSO will designate evacuation routes and refuge areas to be used in the event of an emergency. Site personnel will stay upwind from vapors or smoke and upgradient from spills. If workers are in an Exclusion or Contamination Reduction Zone at the start of an emergency, they should exit through the established decontamination areas whenever possible. If evacuation cannot be done through an established decontamination area, site personnel will go to the nearest safe location and remove contaminated clothing there or, if possible, leave it near the Exclusion Zone. Personnel will assemble at the predetermined refuge following evacuation and decontamination. The SSO, or designated representative, will count and identify Site personnel to verify that all have been evacuated safely.

11.5 Hazardous Material Spill

If a hazardous material spill occurs, site personnel should locate the source of the spill and determine the hazard to the health and safety of site workers and the public. Attempt to stop or reduce the flow if it can be done without risk to personnel. Isolate the spill area and do not allow entry by unauthorized personnel. De-energize sources of ignition within 100 feet of the spill, including vehicle engines. Should a spill be of the nature or extent that it cannot be safely contained, or poses an imminent threat to human health or the environment, an emergency cleanup contractor will be called out as soon as possible. Spill containment measures listed below are examples of responses to spills.

- Upright or rotate containers to stop the flow of liquids. This step may be accomplished as soon as the spill or leak occurs, providing it is safe to do so.
- Sorbent pads, booms, or adjacent soil may be used to dike or berm materials, subject to flow, and to solidify liquids.
- Sorbent pads, soil, or booms, if used, shall be placed in appropriate containers after use, pending disposal.
- Contaminated tools and equipment shall be collected for subsequent cleaning or disposal.

12.0 EMERGENCY CONTACTS

Ambulance:	911
Police:	911
Fire Department:	911
Hospital:	911
National Response Center:	(800) 424-8802
Poison Control Center:	(800) 876-4766
TOXLINE:	(301) 496-1131
CHEMTREC:	(800) 424-9300
LFR Director of Health and Safety (Raritan, New Jersey):	(908) 526-1000
LFR Emeryville office	(510) 652-4500
Nearby Hospital:	(510) 357-6500

San Leandro Hospital
13855 East 14th Street
San Leandro, California

DIRECTIONS TO HOSPITAL:

From the Site, go to East 14th Street (also called International Boulevard and Highway 185). Turn left on East 14th Street and head south for approximately 2-1/4 miles. San Leandro Hospital will be on the right.

A hospital route map is presented in Attachment B.

13.0 LFR APPROVALS

This HSP has been prepared for the following project:

Batarse Project Site
104th Avenue and East 14th Street
Oakland, California

LFR Project Number: 7962.01-001

This HSP has been reviewed and approved by the following LFR personnel:

5-25-01
Michael B. Marsden, R.G., C.HG., Date
Senior Associate Hydrogeologist
Site Safety Officer

5-25-01
Michael B. Marsden, R.G., C.HG., Date
Senior Associate Hydrogeologist
Project Manager

Lita D Freeman for 5/25/01
Thomas Zakaria, for Date
Joanne M. Jaeger, CIH
Corporate Director of Health and Safety

SIGNATURE PAGE

The following signatures indicate that this Health and Safety Plan has been read and accepted by LFR personnel as well as subcontractors and their personnel.

NAME	COMPANY	SIGNATURE	DATE

Important notice to subcontractor(s):

This Health and Safety Plan has been prepared solely for the use of LFR personnel. It is supplied to you for informational purposes only and may not be relied upon for protection of your employees. The Subcontractor is responsible for providing, at its cost, all personal protective clothing and equipment required for its employees to perform their work in a safe manner and in compliance with all applicable state and federal OSHA regulations. Subcontractor is responsible for ensuring that such equipment is in good condition and is properly inspected and maintained. Subcontractor must, at a minimum, use the equipment and follow the procedures described in this HSP. Failure to do so may result in immediate termination of Subcontractor's services. This does not relieve Subcontractor of the responsibility to provide equipment and institute procedures affording a greater degree of protection than those specified in this HSP should Subcontractor determine such measures are necessary to protect the health and welfare of its employees, second-tier subcontractors, or others under its control or direction.

CHEMICAL DESCRIPTIONS

The following chemical descriptions are presented for chemicals that may be present at the Site. Each chemical description includes physical and odor recognition characteristics, health effects associated with exposure, and exposure limits expressed as an eight-hour time weighted average (TWA). Provided are federal OSHA ("OSHA") permissible exposure limits (PELs; located in 29 CFR 1910.1000); California OSHA ("Cal/OSHA") PELs (located in 8 CCR 5155); and American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs).

ASBESTOS

Asbestos may be solid, crystals or crystalline, or fibrous in appearance, and comprises hydrated, fibrous silicates. It is light or pale gray in color and odorless.

There are two groups of asbestos mineral. The first is the serpentine group, commonly referred to as chrysotile. Chrysotile, which comprises approximately 93% of all asbestos in use in the United States, is characterized by long, soft and flexible strands that can be woven into a cloth. The second category occurs as a group of minerals called amphiboles. Amphibole fibers are characterized as being strong, brittle, and needle-like. The common names of the forms of the minerals within this group are crocidolite, amosite, tremolite, anthophyllite, and actinolite. Asbestos was formerly very popular for use in building materials and industry.

Dust from this material can be hazardous when inhaled. Exposure to asbestos dust can cause irritation of eyes and mucous membranes, upper respiratory irritation, delayed and often serious breathing problems, and stomach upsets. Asbestos can produce a lung fibrosis called asbestosis. The onset of asbestosis is usually gradual, developing over a period of 10 to 30 years of exposure to significant concentrations of asbestos. It is characterized by development of a thickening of the lung pleura (lining).

Asbestos is also a cancer-producing agent (lung cancer and mesothelioma, among others). Heavy exposure to dust containing asbestos can also cause skin irritation. Epidemiological studies have shown that lung cancer appears to be related to the degree of exposure, the type of asbestos and whether or not the individuals smoke cigarettes. It is significant that cigarette smoking greatly increases the risk of lung cancer in those who are exposed to asbestos. However, mesothelioma (a rare tumor of the chest cavity lining) appears to develop without regard to the amount of asbestos inhaled.

- The OSHA PEL is listed as 0.1 fibers per cubic centimeter (f/cc).
- The Cal/OSHA PEL is listed as 0.1 f/cc.
- The TLV is listed as 0.1 f/cc.

WARNING: This chemical is known to the State of California to cause cancer.

BENZENE

Benzene is a clear, volatile liquid. It is colorless, highly flammable, and toxic, with a characteristic odor. It is a severe eye and moderate skin irritant. Human effects by inhalation and ingestion include euphoria, changes in sleep and motor activity, nausea and vomiting, other blood effects, dermatitis, and fever. In industry, inhalation is the primary route of chronic benzene poisoning. If the liquid is aspirated into the lung it may cause pulmonary edema. Poisoning by skin contact has also been reported. Exposure to high concentrations (3,000 ppm) may result in acute poisoning, which is characterized by the narcotic action of benzene on the central nervous system. Chronic poisoning occurs most commonly through inhalation and dermal absorption. Benzene is a known human carcinogen that can cause leukemia.

- The OSHA PEL is listed as 1 ppm.
- The Cal/OSHA PEL is listed as 1 ppm.
- The TLV is listed as 0.5 ppm.

Note: Published exposure limits designate a skin notation indicating that dermal contact can contribute to the overall exposure.

WARNING: This chemical is known to the State of California to cause cancer.

WARNING: This chemical is known to the State of California to cause birth defects or other reproductive harm.

1,2-DICHLOROBENZENE (1,2-DCB)

1,2-DCB (also known as o-dichlorobenzene) is a poison by ingestion and is moderately toxic by inhalation. It is an eye, skin, and mucous membrane irritant, and causes liver and kidney injury. It is an experimental teratogen and suspected carcinogen exhibiting experimental reproductive effects. It is flammable when exposed to heat or flame and can react vigorously with oxidizing materials.

- The OSHA PEL is listed as 50 ppm.
- The Cal/OSHA PEL is listed as 25 ppm.
- The TLV is listed as 25ppm.

Note: Published exposure limits designate a skin notation indicating that dermal contact can contribute to the overall exposure.

1,3-DICHLOROBENZENE (1,3-DCB)

Limited toxicological information is available for 1,3-DCB (also known as m-dichlorobenzene). It is identified as a poison and mutation data are reported. It is reported in the EPA TSCA Inventory and Community Right-To-Know List. When heated to decomposition, it emits toxic fumes of Cl^-.

- No OSHA PEL, Cal/OSHA PEL, or TLV is listed for 1,3-dichlorobenzene.

1,4-DICHLOROBENZENE (1,4-DCB)

1,4-DCB (also known as p-dichlorobenzene) is a confirmed carcinogen and an experimental teratogen. It is moderately toxic to humans by ingestion. Human systemic effects by ingestion include unspecified changes in the eyes, lungs, thorax, and respiration. It is also an eye irritant. It is flammable when exposed to heat or flame and can react vigorously with oxidizing materials.

- The OSHA PEL is listed as 75 ppm.
- The Cal/OSHA PEL is listed as 75 ppm.
- The TLV is listed as 10 ppm.

DIESEL FUEL

Diesel fuel is a gas oil fraction available in various grades as required by different engines. Composition of diesel varies in ratios of predominantly aliphatic, olefinic, cycloparaffinic, aromatic hydrocarbons, and additives.

It is a severe skin irritant and ingestion of diesel can lead to systemic effects such as gastrointestinal irritation, vomiting, diarrhea, and, in severe cases, drowsiness and central nervous system depression, progressing to coma and death. Absorption of diesel fuel can cause hemorrhaging and pulmonary edema, progressing to pneumonitis and renal involvement. It is combustible when exposed to heat or flame, and can react with strong oxidizing materials.

- No OSHA PEL or Cal/OSHA PEL is listed for diesel.
- The TLV is listed as 100 mg/m^3.

Note: Published exposure limits designate a skin notation indicating that dermal contact can contribute to the overall exposure.

WARNING: The exhaust from this chemical is known to the State of California to cause cancer.

ETHYLBENZENE

Ethylbenzene is a clear, colorless liquid. It is mildly toxic by inhalation and skin contact. Inhalation can cause eye, sleep, and pulmonary changes. It is an eye and skin irritant at levels as low as 0.1% (1,000 ppm) of the vapor in air. At higher concentrations, it is extremely irritating at first, then can cause dizziness, irritation of the nose and throat, and a sense of constriction in the chest. Exposure to high concentrations of ethylbenzene vapor may result in irritation of the skin and mucous membranes, dizziness, irritation of the nose and throat, and a sense of constriction of the chest.

- The OSHA PEL is listed as 100 ppm.
- The Cal/OSHA PEL is listed as 100 ppm.
- The TLV is listed as 100 ppm.

GASOLINE

Gasoline is produced from the light distillates during petroleum fractionation. Its major components include paraffins, olefins, naphthenes, aromatics, and recently ethanol. Gasoline also contains various functional additives as required for different uses, such as antiknock fluids, antioxidants, metal deactivators, corrosion inhibitors, anti-icing agents, preignition preventers, upper-cylinder lubricants, dyes, and decolorizers. Lead additives in particular were widely used in gasoline until the introduction of vehicle catalytic converters.

Mild cases of gasoline ingestion can cause inebriation, vomiting, vertigo, drowsiness, confusion, and fever. Aspiration into the lungs and secondary pneumonia may occur unless prevented. Gasoline can cause hyperemia of the conjunctiva and other eye disturbances. Gasoline is a skin irritant and a possible allergen. Repeated or chronic dermal contact can result in drying of the skin, lesions, and other dermatologic conditions.

- No OSHA PEL is listed for gasoline.
- The Cal/OSHA PEL is listed as 300 ppm.
- The TLV is listed as 300 ppm.

WARNING: The Exhaust from this chemical is known to the State of California to cause cancer.

HEAVY WASTE OILS

Heavy waste oils, including lubricants, grease, and used motor and hydraulic fluids, have been shown to cause skin cancer during prolonged dermal exposure in laboratory animals. Therefore, dermal protection must be provided when contact with used oil is suspected. Contaminated skin should be washed as soon as possible.

The above information is provided for a class of compounds. OSHA PELs, Cal/OSHA PELs, and TLVs (if listed) vary by specific compound.

LEAD

Lead (inorganic) is a bluish-white, silver or gray odorless solid. Short-term exposure to lead can cause decreased appetite, insomnia, headache, muscle and joint pain, colic, and constipation. Considerable data exist on the effects of lead exposure in humans. It is a poison by ingestion and a suspected human carcinogen of the lungs and kidneys. There are data to suggest that lead is a mutagen and can cause reproductive effects. Human systemic effects by ingestion and inhalation (the two routes of absorption) include loss of appetite, anemia, malaise, insomnia, headache, irritability, muscle and joint pains, tremors, flaccid paralysis without anesthesia, hallucinations and distorted perceptions, muscle weakness, gastritis, and liver changes. Recent experimental evidence suggests that blood levels of lead below 10 μg/dl (micrograms per deciliter) can have the effect of diminishing the IQ scores of children.

- The OSHA PEL is listed as 0.05 mg/m^3.
- The Cal/OSHA PEL is listed as 0.05 mg/m^3.
- The TLV is listed as 0.05 mg/m^3.

WARNING: This chemical is known to the State of California to cause cancer.

WARNING: This chemical is known to the State of California to cause birth defects or other reproductive harm.

MOTOR OIL

Motor oil is a dark viscous liquid. It is composed of aliphatic, olefinic, naphthenic (cycloparaffinic), and aromatic hydrocarbons, as well as additives depending on specific uses. Motor oil has a burning lubricating oil odor. Short-term exposure via dermal contact with motor oil can cause irritation to the skin and dermatitis. Inhalation of motor oil can cause aspiration. Target organs are the upper respiratory system and the skin.

- No OSHA PEL, Cal/OSHA PEL, or ACGIH TLV is listed for motor oil.

PETROLEUM HYDROCARBONS

Petroleum distillates (naphtha) are mildly toxic by inhalation. They can cause unconsciousness, dyspnea, and a bluish tint to the skin. Recovery follows after removal from exposure. In mild form, intoxication resembles drunkenness. On a chronic basis, no true poisoning occurs; however, effects may include headache, lack of appetite, dizziness, sleeplessness, indigestion, and nausea. It is combustible when exposed to heat or flame and can react with oxidizing materials.

- The OSHA PEL is listed as 500 ppm (as petroleum distillates).
- The Cal/OSHA PEL is listed as 300 ppm (as VM&P naphtha).
- The TLV is listed as 300 ppm (as VM&P naphtha).

POLYCHLORINATED BIPHENYLS (PCBS)

PCBs are a series of technical mixtures consisting of many isomers and compounds that vary from mobile oil liquids to white crystalline solids and hard non-crystalline resins. Technical products vary in composition, in the degree of chlorination, and possibly according to batch. Generally, they are moderately toxic by ingestion, and some are poisons by other routes. Most are suspect human carcinogens and experimental tumorigens, and exhibit experimental reproductive effects. They have two distinct actions on the body: a skin effect (chloracne) and a toxic action on the liver. The higher the chlorine content, the more toxic the PCBs tend to be.

- The OSHA PEL is listed as 0.5 mg/m^3 for 54% chlorine content (as a PCB) and 1.0 mg/m^3 for 42% chlorine content (as a PCB).
- The Cal/OSHA PEL is listed as 0.5 mg/m^3 for 54% chlorine content (as a PCB) and 1.0 mg/m^3 for 42% chlorine content (as a PCB).
- The TLV is listed as 0.5 mg/m^3 for 54% chlorine content (as a PCB) and 1.0 mg/m^3 for 42% chlorine content (as a PCB).

Note: Published exposure limits designate a skin notation indicating that dermal contact can contribute to the overall exposure.

WARNING: This chemical is known to the State of California to cause cancer.

WARNING: This chemical is known to the State of California to cause birth defects or other reproductive harm.

POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS)

PAHs constitute a class of materials of which benzo[a]pyrene (BaP) is one of the most common and also the most hazardous. In general, PAHs can be formed in any hydrocarbon combustion process. The less efficient the combustion process, the higher the PAH emission factor is likely to be. The major sources are stationary sources, such as heat and power generation, refuse burning, industrial activity, such as coke ovens, and coal refuse heaps. PAHs may also be released from oil spills. Because of the large number of sources, people are exposed to very low levels of PAHs every day.

Certain PAHs, such as the more common BaP, have been demonstrated to be carcinogenic at relatively high exposure levels in laboratory animals. BaP is a yellowish crystalline solid that consists of five benzene rings joined together. It is highly soluble in fat tissue and has been shown to produce tumors in the stomachs of laboratory mice. In addition, skin cancers have been induced in a variety of animals at very low levels and unspecified lengths of application.

It is important to recognize the PAHs' ability to adhere to soil and other particulates. Therefore, good particulate emission controls and the use of air purifying respirators with particulate filters are required for protection against airborne PAH hazards.

- The OSHA PEL is listed as 0.2 mg/m^3 (as coal tar pitch volatiles).
- The Cal/OSHA PEL is listed as 0.2 mg/m^3 (as coal tar pitch volatiles).
- The TLV is listed as 0.2 mg/m^3 (as coal tar pitch volatiles).

TETRACHLOROETHYLENE (PCE)

PCE (also known as perchloroethylene) is a colorless liquid with an ether-like odor. Short-term exposure to PCE may cause headaches, nausea, drowsiness, dizziness, incoordination, unconsciousness, irritation of the eyes, nose, and throat, and flushing of the face and neck. In addition, it may cause liver damage with such findings as yellow jaundice and dark urine. Liver damage may become evident several weeks after exposure. Skin contact may create a dry, scaly, itchy dermatitis. PCE is Classified by the U.S. Environmental Protection Agency as a Group B2 probable human carcinogen.

- The OSHA PEL is listed as 100 ppm.
- The Cal/OSHA PEL is listed as 25 ppm.
- The TLV is listed as 25 ppm.

WARNING: This chemical is known to the State of California to cause cancer.

ATTACHMENT B

LFR Levine·Fricke Forms

LFR
LEVINE•FRICKE

AIR MONITORING FORM

Date _____ *LFR Project No.* _____

Project Name _____ *Type of Activities* _____

Type of PID/FID _____ *Serial No.* _____

Initial Calibration Reading _____ *End-of-Use Calibration Check* _____

Calibration Standard/Concentration _____

Mini-RAM Serial No. _____ *Zeroed in Z-Bag?* ☐ Yes ☐ No

Time	Activity/Location	PID/FID (ppm)	Mini-RAM (mg/m^3)

Name (print) _____ *Signature* _____

LFR
LEVINE • FRICKE

SITE SAFETY CHECKLIST

Project Name _____ *LFR Project No.* _____

Project Activities _____

	YES	NO	N/A
Written Health and Safety Plan (HSP) is on site	☐	☐	☐
Addenda to the HSP are documented on site	☐	☐	☐
Information in the HSP matches conditions and activities at the site	☐	☐	☐
HSP has been read and signed by all site personnel, including visitors	☐	☐	☐
Daily tailgate safety meetings have been held and documented	☐	☐	☐
Site personnel have appropriate training and medical clearance	☐	☐	☐
Air monitoring is performed and documented as described in the HSP	☐	☐	☐
Air monitoring equipment has been calibrated daily	☐	☐	☐
Site zones are set up and observed where appropriate	☐	☐	☐
Access to the work area limited to authorized personnel	☐	☐	☐
Decontamination procedures are followed and match the requirements of the HSP	☐	☐	☐
Decontamination stations (including hand/face wash) are set up and used	☐	☐	☐
Personal protective equipment used matches HSP requirements	☐	☐	☐
Hearing protection used where appropriate	☐	☐	☐
Respirators are properly cleaned and stored	☐	☐	☐
Trenches and excavations are in compliance with federal, state, and local safety requirements before worker entry	☐	☐	☐
Spoils are placed no closer than 2 feet from the edge of an excavation	☐	☐	☐
Emergency and first aid equipment is on site as described in the HSP	☐	☐	☐
Drinking water is readily available	☐	☐	☐
Accessible phone is readily available for emergency use	☐	☐	☐
Proper drum and material handling techniques are used	☐	☐	☐
Drums and waste containers are labeled appropriately	☐	☐	☐
Extension cords are grounded and protected from water and vehicle traffic	☐	☐	☐
Ground-fault circuit interrupters (GFCI) are used with electrical equipment	☐	☐	☐
Tools and equipment are in good working order	☐	☐	☐
Lighting is adequate	☐	☐	☐
Compressed gas cylinders are upright and secured	☐	☐	☐

Notes (All "no" answers must be addressed and corrected immediately. Note additional health and safety observations here): _____

_____

_____

_____

_____

_____

_____

Conducted By: _____ *Signature:* _____ *Date:* _____

LFR
LEVINE • FRICKE

DAILY TAILGATE SAFETY MEETING FORM

Date _____ Time _____ LFR Project No. _____

Project Name _____ Specific Location _____

Type of Work _____

Chemicals Present _____

SAFETY TOPICS DISCUSSED

Protective Clothing/Equipment _____

_____

Hazards of Chemicals Present _____

_____

Physical Hazards _____

_____

Special Hazards _____

_____

Other Topics _____

_____

ATTENDEES

Name (please print) ***Signature***

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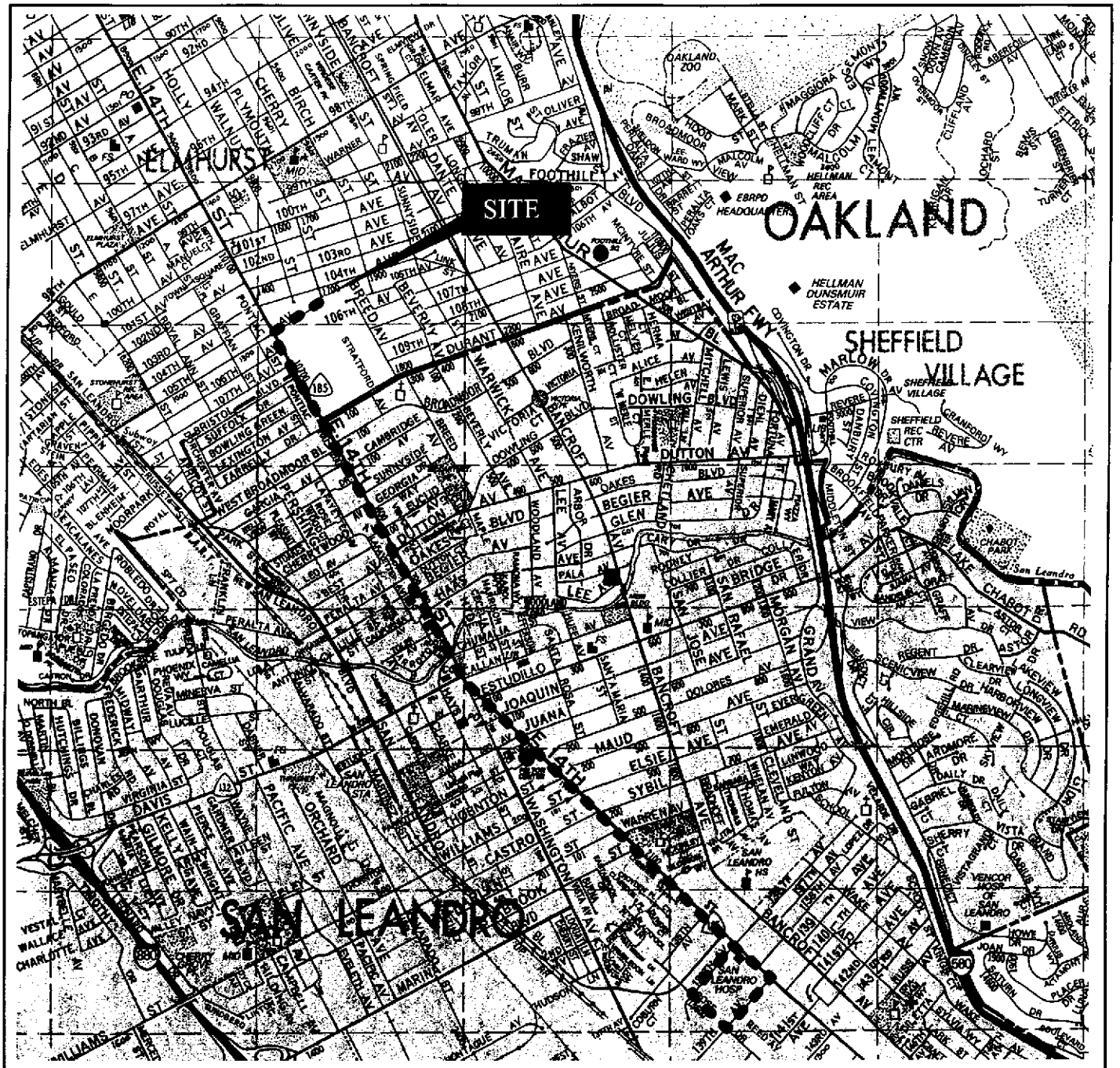

SOURCE: Thomas Brothers Guide

Hospital Route Map

BATARSE PROJECT SITE, OAKLAND, CA.

LFR LEVINE • FRICKE

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APPENDIX C

Phase I Environmental Site Assessment Report, Batarse Project Site, East 14th Street and 105th Avenue, Oakland, California

(To conserve paper, we have not included this document. It is available upon request.)

APPENDIX D

Proposed Laboratory Reporting Limits

Curtis & Tompkins, Ltd.

California Title 26 Metals

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7440-36-0	Sb	Antimony	60	3
7440-38-2	As	Arsenic	5	0.25
7440-39-3	Ba	Barium	10	0.5
7440-41-7	Be	Beryllium	2	0.1
7440-43-9	Cd	Cadmium	5	0.25
7440-47-3	Cr	Chromium	10	0.5
7440-48-4	Co	Cobalt	20	1
7440-50-8	Cu	Copper	10	0.5
7439-92-1	Pb	Lead	3	0.15
7439-97-6	Hg	Mercury	0.2	0.04
7439-98-7	Mo	Molybdenum	20	1
7440-02-0	Ni	Nickel	20	1
7782-49-2	Se	Selenium	5	0.25
7440-22-4	Ag	Silver	5	0.25
7440-28-0	Tl	Thallium	5	0.25
7440-62-2	V	Vanadium	10	0.5
7440-66-6	Zn	Zinc	20	1

Cations

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7429-90-5	Al	Aluminum	100	10
7440-70-2	Ca	Calcium	500	25
7439-89-6	Fe	Iron	100	5
7439-95-4	Mg	Magnesium	500	25
7439-96-5	Mn	Manganese	10	0.5
7440-09-7	K	Potassium	500	25
7440-23-5	Na	Sodium	500	25

Miscellaneous Metals

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7440-42-8	B	Boron	20	1
7723-14-0	P	Phosphorous	100	5
7440-21-3	Si	Silicon	200	10
7440-31-5	Sn	Tin	40	2
7440-32-6	Ti	Titanium	10	0.5

California LUFT Metals

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7440-43-9	Cd	Cadmium	5	0.25
7440-47-3	Cr	Chromium	10	0.5
7439-92-1	Pb	Lead	3	0.15
7440-02-0	Ni	Nickel	20	1
7440-66-6	Zn	Zinc	20	1

RCRA Metals

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7440-38-2	As	Arsenic	5	0.25
7440-39-3	Ba	Barium	10	0.5
7440-43-9	Cd	Cadmium	5	0.25
7440-47-3	Cr	Chromium	10	0.5
7439-92-1	Pb	Lead	3	0.15
7439-97-6	Hg	Mercury	0.2	0.04
7782-49-2	Se	Selenium	5	0.25
7440-22-4	Ag	Silver	5	0.25

Priority Pollutant Metals

CAS#		Element	Reporting Limit (ug/L)	Reporting Limit (mg/Kg)
7440-36-0	Sb	Antimony	60	3
7440-38-2	As	Arsenic	5	0.25
7440-41-7	Be	Beryllium	2	0.1
7440-43-9	Cd	Cadmium	5	0.25
7440-47-3	Cr	Chromium	10	0.5
7440-50-8	Cu	Copper	10	0.5
7439-92-1	Pb	Lead	3	0.15
7439-97-6	Hg	Mercury	0.2	0.04
7440-02-0	Ni	Nickel	20	1
7782-49-2	Se	Selenium	5	0.25
7440-22-4	Ag	Silver	5	0.25
7440-28-0	Tl	Thallium	5	0.25
7440-66-6	Zn	Zinc	20	1

Curtis & Tompkins, Ltd

Low Concentration Volatiles in Water by GCMS

CAS #	Target Compound	Reporting Limit (ug/L)
67-64-1	Acetone	10
71-43-2	Benzene	0.5
108-86-1	Bromobenzene	0.5
74-97-5	Bromochloromethane	0.5
75-27-4	Bromodichloromethane	0.5
75-25-2	Bromoform	1
74-83-9	Bromomethane	1
78-93-3	2-Butanone	10
104-51-8	n-Butylbenzene	0.5
135-98-8	sec-Butylbenzene	0.5
98-06-6	tert-Butylbenzene	0.5
75-15-0	Carbon disulfide	0.5
56-23-5	Carbon tetrachloride	0.5
108-90-7	Chlorobenzene	0.5
75-00-3	Chloroethane	1
67-66-3	Chloroform	0.5
74-87-3	Chloromethane	1
95-49-8	2-Chlorotoluene	0.5
106-43-4	4-Chlorotoluene	0.5
124-48-1	Dibromochloromethane	0.5
96-12-8	1,2-Dibromo-3-chloropropane	0.5
106-93-4	1,2-Dibromoethane (EDB)	0.5
74-95-3	Dibromomethane	0.5
95-50-1	1,2-Dichlorobenzene	0.5
541-73-1	1,3-Dichlorobenzene	0.5
106-46-7	1,4-Dichlorobenzene	0.5
75-34-3	1,1-Dichloroethane	0.5
107-06-2	1,2-Dichloroethane	0.5
75-35-4	1,1-Dichloroethene	0.5
156-59-2	cis-1,2-Dichloroethene	0.5
156-60-5	trans-1,2-Dichloroethene	0.5
78-87-5	1,2-Dichloropropane	0.5
142-28-9	1,3-Dichloropropane	0.5
594-20-7	2,2-Dichloropropane	0.5
563-58-6	1,1-Dichloropropene	0.5
10061-01-5	cis-1,3-Dichloropropene	0.5
10061-02-6	trans-1,3-Dichloropropene	0.5
100-41-4	Ethylbenzene	0.5
75-71-8	Freon 12	1
76-13-1	Freon 113	5
87-68-3	Hexachlorobutadiene	0.5
591-78-6	2-Hexanone	10
98-82-8	Isopropylbenzene	0.5
99-87-6	para-Isopropyl toluene	0.5
75-09-2	Methylene chloride	10
1634-04-4	Methyl t-butyl ether (MTBE)	0.5
108-10-1	4-Methyl-2-pentanone	10
91-20-3	Naphthalene	0.5
103-65-1	Propylbenzene	0.5
100-42-5	Styrene	0.5
630-20-6	1,1,1,2-Tetrachloroethane	0.5
79-34-5	1,1,2,2-Tetrachloroethane	0.5
127-18-4	Tetrachloroethene	0.5
108-88-3	Toluene	0.5
87-61-6	1,2,3-Trichlorobenzene	0.5
120-82-1	1,2,4-Trichlorobenzene	0.5
71-55-6	1,1,1-Trichloroethane	0.5
79-00-5	1,1,2-Trichloroethane	0.5
79-01-6	Trichloroethene	0.5
75-69-4	Trichlorofluoromethane	0.5
96-18-4	1,2,3-Trichloropropane	0.5
95-63-6	1,2,4-Trimethylbenzene	0.5
108-67-8	1,3,5-Trimethylbenzene	0.5
108-05-4	Vinyl acetate	10
75-01-4	Vinyl chloride	0.5
1330-20-7	m,p-Xylenes	0.5
95-47-6	o-Xylene	0.5

Additional Compounds (may be added to target list)

110-75-8	2-Chloro ethyl vinyl ether	10

Recommended Surrogates

460-00-4	Bromofluorobenzene
1868-53-7	Dibromofluoromethane
17060-07-0	1,2-Dichloroethane-d4
2037-26-5	Toluene-d8

NOTE: Standard reporting limits are listed; lower reporting limits may be achievable for specific compounds

Curtis & Tompkins, Ltd.

EPA 8260 - Volatile Organic Compounds

CAS #	Target Compound	Reporting Limit (ug/L) or (ug/Kg)
67-64-1	Acetone	20
71-43-2	Benzene	5
108-86-1	Bromobenzene	5
74-97-5	Bromochloromethane	10
75-27-4	Bromodichloromethane	5
75-25-2	Bromoform	5
74-83-9	Bromomethane	10
78-93-3	2-Butanone	10
104-51-8	n-Butylbenzene	5
135-98-8	sec-Butylbenzene	5
98-06-6	tert-Butylbenzene	5
75-15-0	Carbon disulfide	5
56-23-5	Carbon tetrachloride	5
108-90-7	Chlorobenzene	5
75-00-3	Chloroethane	10
67-66-3	Chloroform	5
74-87-3	Chloromethane	10
95-49-8	2-Chlorotoluene	5
106-43-4	4-Chlorotoluene	5
124-48-1	Dibromochloromethane	5
96-12-8	1,2-Dibromo-3-chloropropane	5
106-93-4	1,2-Dibromoethane (EDB)	5
74-95-3	Dibromomethane	5
95-50-1	1,2-Dichlorobenzene	5
541-73-1	1,3-Dichlorobenzene	5
106-46-7	1,4-Dichlorobenzene	5
75-34-3	1,1-Dichloroethane	5
107-06-2	1,2-Dichloroethane	5
75-35-4	1,1-Dichloroethene	5
156-59-2	cis-1,2-Dichloroethene	5
156-60-5	trans-1,2-Dichloroethene	5
78-87-5	1,2-Dichloropropane	5
142-28-9	1,3-Dichloropropane	5
594-20-7	2,2-Dichloropropane	5
563-58-6	1,1-Dichloropropene	5
10061-01-5	cis-1,3-Dichloropropene	5
10061-02-6	trans-1,3-Dichloropropene	5
100-41-4	Ethylbenzene	5
75-71-8	Freon 12	10
76-13-1	Freon 113	5
87-68-3	Hexachlorobutadiene	5
591-78-6	2-Hexanone	10
98-82-8	Isopropylbenzene	5
99-87-6	para-Isopropyl toluene	5
75-09-2	Methylene chloride	20
108-10-1	4-Methyl-2-pentanone	10
1634-04-4	Methyl t-butyl ether (MTBE)	5
91-20-3	Naphthalene	5
103-65-1	Propylbenzene	5
100-42-5	Styrene	5
630-20-6	1,1,1,2-Tetrachloroethane	5
79-34-5	1,1,2,2-Tetrachloroethane	5
127-18-4	Tetrachloroethene	5
108-88-3	Toluene	5
87-61-6	1,2,3-Trichlorobenzene	5
120-82-1	1,2,4-Trichlorobenzene	5
71-55-6	1,1,1-Trichloroethane	5
79-00-5	1,1,2-Trichloroethane	5
79-01-6	Trichloroethene	5
75-69-4	Trichlorofluoromethane	5
96-18-4	1,2,3-Trichloropropane	5
95-63-6	1,2,4-Trimethylbenzene	5
108-67-8	1,3,5-Trimethylbenzene	5
108-05-4	Vinyl acetate	50
75-01-4	Vinyl chloride	10
1330-20-7	m,p-Xylenes	5
95-47-6	o-Xylene	5

Additional Compounds (may be added to target list)

110-75-8	2-Chloro ethyl vinyl ether
108-94-1	Cyclohexanone
64-17-5	Ethanol
110-54-3	Hexane
67-63-0	2-Propanol (IPA)
109-99-9	Tetrahydrofuran (THF)

Recommended Surrogates

460-00-4	Bromofluorobenzene
1868-53-7	Dibromofluoromethane
17060-07-0	1,2-Dichloroethane-d4
2037-26-5	Toluene-d8

NOTE: Standard reporting limits are listed; lower reporting limits may be achievable for specific compounds.

Curtis & Tompkins, Ltd

EPA 8270 - Semivolatile Organic Compounds

CAS #	Target Compound	Reporting Limit (ug/L)	Reporting Limit (ug/Kg)
83-32-9	Acenaphthene	10	330
208-96-8	Acenaphthylene	10	330
120-12-7	Anthracene	10	330
103-33-3	Azobenzene	10	330
56-55-3	Benzo(a)anthracene	10	330
50-32-8	Benzo(a)pyrene	10	330
205-99-2	Benzo(b)fluoranthene	10	330
191-24-2	Benzo(g,h,i)perylene	10	330
65-85-0	Benzoic acid	50	1,700
100-51-6	Benzyl alcohol	10	330
111-91-1	bis(2-Chloroethoxy)methane	10	330
111-44-4	bis(2-Chloroethyl)ether	10	330
108-60-1	bis(2-Chloroisopropyl)ether	10	330
117-81-7	bis(2-Ethylhexyl)phthalate	10	330
101-55-3	4-Bromophenyl-phenylether	10	330
85-68-7	Butylbenzylphthalate	10	330
106-47-8	4-Chloroaniline	10	330
59-50-7	4-Chloro-3-methylphenol	10	330
91-58-7	2-Chloronaphthalene	10	330
95-57-8	2-Chlorophenol	10	330
7005-72-3	4-Chlorophenyl-phenylether	10	330
218-01-9	Chrysene	10	330
53-70-3	Dibenz(a,h)anthracene	10	330
132-64-9	Dibenzofuran	10	330
95-50-1	1,2-Dichlorobenzene	10	330
541-73-1	1,3-Dichlorobenzene	10	330
106-46-7	1,4-Dichlorobenzene	10	330
91-94-1	3,3'-Dichlorobenzidine	50	1,700
120-83-2	2,4-Dichlorophenol	10	330
84-66-2	Diethylphthalate	10	330
105-67-9	2,4-Dimethylphenol	10	330
131-11-3	Dimethylphthalate	10	330
84-74-2	Di-n-butylphthalate	10	330
534-52-1	4,6-Dinitro-2-methylphenol	50	1,700
51-28-5	2,4-Dinitrophenol	50	1,700
121-14-2	2,4-Dinitrotoluene	10	330
606-20-2	2,6-Dinitrotoluene	10	330
117-84-0	Di-n-octylphthalate	10	330
206-44-0	Fluoranthene	10	330
86-73-7	Fluorene	10	330
118-74-1	Hexachlorobenzene	10	330
87-68-3	Hexachlorobutadiene	10	330
77-47-4	Hexachlorocyclopentadiene	50	1,700
67-72-1	Hexachloroethane	10	330
193-39-5	Indeno(1,2,3-cd)pyrene	10	330
78-59-1	Isophorone	10	330
91-57-6	2-Methylnaphthalene	10	330
95-48-7	2-Methylphenol	10	330
1319-77-3	3-,4-Methylphenol	10	330
88-74-4	2-Nitroaniline	50	1,700
99-09-2	3-Nitroaniline	50	1,700
100-01-6	4-Nitroaniline	50	1,700
88-75-5	2-Nitrophenol	50	1,700
100-02-7	4-Nitrophenol	50	1,700
621-64-7	N-Nitroso-di-n-propylamine	10	330
62-75-9	N-Nitrosodimethylamine	10	330
86-30-6	N-Nitrosodiphenylamine	10	330
91-20-3	Naphthalene	10	330
98-95-3	Nitrobenzene	10	330
87-86-5	Pentachlorophenol	10	1,700
85-01-8	Phenanthrene	10	330
108-95-2	Phenol	10	330
129-00-0	Pyrene	10	330
120-82-1	1,2,4-Trichlorobenzene	10	330
95-95-4	2,4,5-Trichlorophenol	50	1,700
88-06-2	2,4,6-Trichlorophenol	10	330

Additional Compounds (may be added to target list):

62-53-3	Aniline	10	330
92-87-5	Benzidine	10	330
87-65-0	2,6-Dichlorophenol	10	330
110-86-1	Pyridine	100	1,700
58-90-2	2,3,4,6-Tetrachlorophenol	10	330

Recommended Surrogates:

321-60-8	2-Fluorobiphenyl
367-12-4	2-Fluorophenol
4165-60-0	Nitrobenzene-d5
13127-88-3	Phenol-d5
1718-51-0	Terphenyl-d14
118-79-6	2,4,6-Tribromophenol

NOTE: Standard reporting limits are listed. lower reporting limits may be achievable for specific compounds.

PETROLEUM HYDROCARBONS - Analytical Methods & Holding Times

LIMS Product	Analysis		Matrix	Prep Method[4]	Analytical Method	Reporting Limit	Holding Time[5]	Minimum Volume	Sample Container (water)	Preservative (water)[7]
BTXE	BTXE[1]		Water	EPA 5030	EPA 8020	0.5 ug/L	14 days	40 mL	2x40mL VOA	HCL[8]
			Soil	EPA 5030	EPA 8020	5 ug/Kg	14 days	5 g		
TVH	TPH/Gasoline[2]		Water	EPA 5030	EPA 8015 mod	50 ug/L	14 days	40 mL	2x40mL VOA	HCL[8]
			Soil	EPA 5030	EPA 8015 mod	1.0 mg/Kg	14 days	5 g		
TEH	TPH/Diesel[3]		Water	EPA 3520	EPA 8015 mod	50 ug/L	14/40[6]	500 mL	1L G	None
			Soil	CA LUFT[4]	EPA 8015 mod	1.0 mg/Kg	14/40[6]	50 g		
418.1	Oil & Grease, Petroleum (TRPH)	by IR	Water	METHOD[4]	EPA 418.1	1.0 mg/L	28 days	1 L	1L G	HCL
			Soil	METHOD[4]	EPA 418.1	25 mg/Kg	28 days	50 g		
5520BF	Oil & Grease, Petroleum,	gravimetric	Water	METHOD[4]	SM 5520BF	5.0 mg/L	28 days	1 L	1L G	HCL
5520EF			Soil	METHOD[4]	SM 5520EF	50 mg/Kg	28 days	50 g		
5520B	Oil & Grease, Total,	gravimetric	Water	METHOD[4]	SM 5520B	5.0 mg/L	28 days	1 L	1L G	HCL
5520E			Soil	METHOD[4]	SM 5520E	50 mg/Kg	28 days	50 g		
413.1	Oil & Grease, Total,	gravimetric	Water	METHOD[4]	EPA 413.1	5.0 mg/L	28 days	1 L	1L G	HCL
			Soil	METHOD[4]	EPA 413.1	50 mg/Kg	28 days	50 g		
413.2	Oil & Grease, Total,	by IR	Water	METHOD[4]	EPA 413.2	1.0 mg/L	28 days	1 L	1L G	HCL
			Soil	METHOD[4]	EPA 413.2	25 mg/Kg	28 days	50 g		

Footnotes:

1.) Benzene, toluene, ethylbenzene, and xylenes. MTBE (methyl tert-butyl ether) may be added upon request.

2.) Total Petroleum Hydrocarbons as Gasoline. JP-4, mineral spirits, or stoddard solvent may be added upon request. Reporting limits may be higher for fuels other than gasoline.

3.) Total Petroleum Hydrocarbons as Diesel: motor oil, commercial jet fuel, JP-5, hydraulic oil, transformer oil, or Bunker C may be added upon request. Reporting limits may be higher for fuels other than diesel.

4.) CA LUFT: California Department of Health Services Leaking Underground Fuel Tank Manual, May 1988. "Method" indicates that the prep method is an integral part of the analytical method.

5.) Holding times specified in 40CFR 136.3 Table 2 (Clean Water Act/ NPDES) and SW-846 Table 2-36 Revision 3, December 1996.

6.) 14/40: 14 days from sample collection to extraction, then 40 days from extraction to analysis.

7.) Samples should be kept at 4°C from time of collection until analysis. Preserved containers can be supplied by Curtis & Tompkins.
HCL: hydrochloric acid to pH<2 H_2SO_4: sulfuric acid to pH<2 NaOH: sodium hydroxide to pH > 12

8.) Free chlorine should be neutralized with 0.008% $Na_2S_2O_3$.

Legend:

ug/L: micrograms per liter (ppb)
mg/L: milligrams per liter (ppm)

ug/Kg: micrograms per kilogram (ppb)
mg/Kg: milligrams per kilogram (ppm)

VOA: amber VOA vial
G: amber Glass
P: Polyethylene

Curtis & Tompkins, Ltd.


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