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**TIER I SCREENING LEVEL HUMAN
HEALTH RISK ASSESSMENT
2301 EAST 12TH STREET
OAKLAND, CA
DRAFT FINAL**

Alameda County
DEC 20 2005

**PREPARED BY:
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Table of Contents

1.0	INTRODUCTION	1
2.0	SITE DESCRIPTION AND BACKGROUND	2
3.0	SUMMARY OF PREVIOUSLY CONDUCTED SAMPLING ANALYSES.....	3
3.1	Groundwater	4
3.2	Subsurface Soil	5
4.0	TIER I SLHHRA METHODOLOGY	6
5.0	CURRENT USES OF THE SITE.....	7
6.0	CONCEPTUAL SITE MODEL	7
7.0	TIER I SLHHRA CRITERIA	8
7.1	RBSLs.....	8
7.2	PRGs	10
7.2.1	Tapwater	10
7.2.1	Soil	10
7.3	Tier I Screening Criteria Hierarchy	11
8.0	EVALUATING TPH-g, TPH-d, and TPH-o	11

9.0 RESULTS OF THE TIER I SLHHRA 12

 9.1 Groundwater 12

 9.2 Subsurface Soil 12

10.0 CONCLUSIONS AND RECOMMENDATIONS 12

11.0 REFERENCES 14

List of Figures

Figure 1 Site Map

List of Tables

Table 1 SUMMARY OF REPORTED CHEMICAL CONCENTRATIONS IN SOIL COLLECTED IN 1999

Table 2 SUMMARY OF REPORTED CHEMICAL CONCENTRATIONS IN GROUNDWATER FROM THE THREE MOST RECENT GROUNDWATER SAMPLING ACTIVITIES IN 1999, 2000, AND 2001

Table 3 GROUNDWATER RBSLs AND PRGs

Table 4 SOIL RBSLs AND PRGs

Table 5 RESULTS OF THE TIER I SLHHRA FOR GROUNDWATER

Table 6 RESULTS OF THE TIER I SLHHRA FOR SOIL

List of Appendices

Appendix A SUMMARY OF PREVIOUSLY CONDUCTED GROUNDWATER SAMPLING ACTIVITIES BETWEEN 1991 AND 2001.

Appendix B RESULTS OF RESIDENTIAL TIER 1 SLHHRA.

TIER I SCREENING HUMAN HEALTH LEVEL RISK ASSESSMENT

1.0 INTRODUCTION

A Tier I screening level human health risk assessment (Tier I SLHHRA) was conducted for the J.W. Silveira Company underground storage tank (UST) located at 2301 East 12th Street in Oakland, California (Site). A Tier I SLHHRA was conducted consistent with the methods outlined by the City of Oakland (City of Oakland, 2000) and the California Regional Water Quality Control Board (CRWQCB; 2001).

A Tier I SLHHRA is the initial step of a three-step human health risk assessment process as outlined in the Urban Land Redevelopment Program Guidance Document (City of Oakland 2000). A Tier I SLHHRA involves comparing detected chemical concentrations to generic risk-based screening concentrations (Tier I screening values). The Tier I SLHHRA is a conservative method of evaluating potential human health impacts at a site. If detected chemical concentrations exceed Tier I screening concentrations, then a Tier II or Tier III SLHHRA may be required. Tier II and Tier III SLHHRA involve refining Tier I screening values using site-specific data that account for the unique features of the Site. This assessment evaluates potential health impacts associated with current site conditions (e.g., no development, earthmoving activities, or re-zoning). An additional assessment may be required to evaluate any subsequent modifications to the Site.

This report summarizes the methodology and results of a Tier I SLHHRA conducted to evaluate potential human health risks associated with exposure to chemicals in soil and groundwater at the Site. The Tier I SLHHRA was based on analytical results for soil and

groundwater samples collected between April 1999 and August 2001 (most recent sampling event).

This report consists of the following sections:

- Section 2.0: Site Description and Background
- Section 3.0: Summary of Previously Conducted Sampling Events
- Section 4.0: Tier I SLHHRA Methodology
- Section 5.0: Land Use
- Section 6.0: Conceptual Site Model
- Section 7.0: Tier I SLHHRA Criteria
- Section 8.0: Results
- Section 9.0: Conclusions and Recommendations
- Section 10: References

2.0 SITE DESCRIPTION AND BACKGROUND

The Site is approximately ¼ acre in size. The Site was previously a gas station and vehicle repair facility and is currently a tire and brake repair facility (Figure 1). It is located in an industrially zoned area and bordered to the northeast by East 12th street, to the southeast by railroad property, to the northwest by 23rd Avenue and a public park, and to the southwest by a furniture restoration facility. Groundwater flows in a northwesterly direction. Presently, groundwater at the Site is not used for any domestic or industrial purposes. For this reason, groundwater was assumed to be nonpotable. You mentioned previously that you were working on it. Our TDS does not come in high enough. Here's what we put in the groundwater report. "TDS concentrations in the latest six groundwater well samples from the site ranged from 510 mg/L in the sample from MW-4 to 960 mg/L in the sample from MW-1. If the concentration of TDS in groundwater at a site is greater than 3,000 mg/L, then groundwater will be classified as

unsuitable for potential drinking water purposes. Previously, four USTs were located along the eastern edge of the Site. :

- One 6000 gallon gasoline UST
- Two 1,000 gallon waste oil USTs and
- One 1,000 gallon diesel UST.

All USTs were excavated between 1990 and 1991 (TtEMI, 2001). Groundwater flow at the site as of August 2001 is north 54 degrees west (N54W; TtEMI, 2001). Leaking underground storage tanks are assumed to be the source of all chemical impacts at the Site. Therefore, the only media of concern at the Site include subsurface soil and groundwater.

3.0 SUMMARY OF PREVIOUSLY CONDUCTED SAMPLING ANALYSES

This section briefly summarizes the sampling activities conducted at the Site. Both soil and groundwater were sampled at the Site. Either soil and/or groundwater were sampled during the following time intervals:

For Groundwater:

- March, June, and October 1994
- February, June, and October 1995
- February, June, and September 1996
- January, May, and December 1997
- March and July 1999
- May 2000 and
- August 2001

For Soil:

- December 1990
- January and February 1991
- July 1992
- March 1994 and
- June 1999

A summary of site characterization activities conducted at the Site is presented in Sections 3.1 (subsurface soil) and 3.2 (groundwater) below. A more detailed description is provided in the Groundwater Summary Report (TtEMI, 2001). Appendix A summarizes the results of all soil

and groundwater sampling data collected from 1991 through 2001. All samples were analyzed for the presence of:

- Total petroleum hydrocarbons (TPH) as gasoline (TPH-g), diesel (TPH-d) and motor oil (TPH-o)
- 1,2,4-trimethylbenzene (1,2,4-TMB)
- 1,3,5-trimethylbenzene (1,3,5-TMB)
- Benzene
- Chlorobenzene
- Ethylbenzene
- Isopropylbenzene
- m,p-Xylenes
- Vinyl Chloride
- N-Butylbenzene
- Naphthalene
- o-xylene
- Para-Isopropyl Toluene
- Propylbenzene
- sec-Butylbenzene
- tert-Butylbenzene
- Toluene
- Trans-1,2-Dichloroethene
- Trichloroethene

3.1 GROUNDWATER

Groundwater was present at the bottom of the diesel and gasoline UST excavations; approximately 1 foot of water was present in the 9-foot-deep former diesel tank excavation, and approximately 0.5 foot of water was present in the 14-foot-deep former gasoline tank excavation. One groundwater sample was collected from each of the excavated locations.

Between December 23, 1991 and March 18, 1994, six monitoring wells were installed at the Site-- MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6. Monitoring wells were sampled between one and four times annually since August 2001. MW-1, MW-2, and MW-3 have been sampled 23 times since 1992 and wells MW-4, MW-5, and MW-6 were sampled 17 times since 1994.

On June 28, 1999, as part of an additional site characterization, six soil borings (SB-1 through SB-6) were completed to determine the lateral extent of petroleum contamination at the site. Soil boring depths re-drilled to depths ranging from 16 to 24 feet bgs.

Finally, on August 30, 2001, samples were collected from MW-1 through MW-6. Appendix A summarizes the analytical results for the soil and groundwater data collected between 1992 and 2001. A more detailed summary of previously conducted site characterization activities is presented in the Groundwater Report (TtEMI, 2001). Groundwater data used to conduct the Tier I SLHHRA are presented in Table 1.

3.2 SUBSURFACE SOIL

On December 21, 1990 soil samples were collected from the initial diesel and gasoline UST excavation bottoms, at about 9 and 14 feet below the ground surface (bgs), respectively. Presumably (although this activity is not well documented), additional soil removal took place in the diesel and gasoline UST excavations. Following this soil removal, two additional soil samples were collected on December 26, 1990 from the diesel and gasoline UST excavations at 17 and 20 feet bgs, respectively.

Six additional samples were collected on January 10, 11, and 16, 1991 from the side-walls of the side-by-side gasoline and diesel tank excavations. During January 1991, the side-by-side gasoline and diesel tank excavations were lined with double layers of 6-millimeter-thick plastic sheeting. It is reported that the stockpiled soils on site were combined with imported fill material and used to backfill the side-by-side excavation pits (Epigene, 1995).

On February 11, 1991 the two side-by-side 1,000 waste oil tanks were removed and soil excavated down to 8 feet bgs (TtEMI, 2001). During removal, a hole was observed at the bottom of the tanks and contamination was discovered at both ends of the waste oil tanks. Based on this information, four soil samples were collected from the ends of the USTs at the

bottom of the excavation at approximately 8 feet bgs. One soil sample was also collected from the single stockpile of soil that had been removed from the excavation.

On February 27, 1991 the area of excavation for the waste oil tanks with the highest concentration of diesel contamination was excavated to a depth of 13 feet bgs. Three additional soil samples were collected from the bottom of this excavated area along the western edge of the excavations at approximately 13 feet bgs. The excavated area was then backfilled with some stockpiled soil that had been previously removed from the excavation including imported fill material. In addition, approximately 18 cubic yards of stockpiled soil was transported to a disposal facility due to elevated concentrations of TPH-g and TPH-d.

In December 1991, MW-1 was installed and four soil samples were collected from the well borings at depth of 6, 11, 16 and 21 feet bgs. During the construction of MW-2 and MW-3, soil samples were collected from the borings at depths of 9 and 8 feet bgs, respectively. In March 1994 three additional monitoring wells - MW-4, MW-5, and MW-6 - were constructed and one soil sample from each well was collected at 10, 5 and 10 feet bgs, respectively. Soil samples were last collected in June 1999 as part of an "additional site characterization" study. Six soil borings (SB-1 through SB-6) were collected to establish the lateral extent chemical impacts at the site (TtEMI, 2001). Soil depths ranged from 16 to 24 feet bgs. As indicated earlier in Section 2.0, shallow/surface soil samples were not collected because chemical impacts were assumed to be limited to subsurface soils, as a result of subsurface leakage from underground storage tanks. Subsurface soil data used to conduct the Tier I SLHHRA are summarized in Table 2.

4.0 TIER I SLHHRA METHODOLOGY

As indicated in Section 3.0 and summarized in Appendix A, subsurface soil and groundwater data have been collected at the Site since 1991. However, data collected over ten years ago do not reflect current site conditions due to attenuation (e.g., degradation) or migration (in

groundwater). For this reason, only data collected during the three most recent sampling activities – (April 1999, May 2000, and August 2001) were used to conduct the SLHHRA.

Detected chemical concentrations in groundwater and subsurface soil were compared to Tier I screening levels identified from one of three sources, as described in Section 7.3 below. Tier I screening levels for commercial/industrial receptors exposed to chemicals in groundwater and subsurface soil through inhalation of indoor air vapors were used in this assessment, with exceptions as noted in Section 7.2. The rationale for receptor and exposure pathway selection is presented in Sections 5 and 6 below.

5.0 CURRENT USES OF THE SITE

The Site is currently and expected to remain industrial. For this reason, this Tier I SLHHRA was evaluated as an industrial site. However, consistent with CRWQCB (2001a) recommendations, potential residential exposures were also evaluated and the results presented in Appendix B.

6.0 CONCEPTUAL SITE MODEL

As noted in Section 3.0, potential site-related chemical impacts are assumed to exist in groundwater and subsurface soils (greater than 1 foot bgs) only. Chemical impacts at the Site are assumed to be directly related to leaking underground storage tanks. Therefore, surface soil exposures were not evaluated. The only complete exposure pathways at the Site are inhalation of chemical vapors indoors working inside an office building. Although some exposure may also occur while outdoors, indoor exposures (to vapors) represents the most significant exposure pathway for an industrial/commercial worker. Chemical vapors readily accumulate inside buildings (indoors). Alternatively, chemical vapors emanating to outdoor air dissipate or degrade rapidly resulting in lower chemical concentrations and exposure while outdoors.

7.0 TIER 1 SLHHRA CRITERIA

The SLHHRA was conducted using one of the following three local, state, or federal agency developed health-based screening criteria in order of priority:

- Subsurface soil and nonpotable groundwater Residential Risk-Based Screening Levels (RBSLs) developed by the City of Oakland (City of Oakland, 2000).
- Subsurface soil and nonpotable groundwater Residential Risk-Based Screening Levels developed by the California Regional Water Quality Control Board (CRWQCB, 2001))
- Surface soil and tapwater Residential Preliminary Remediation Goals (PRGs) developed by EPA Region 9 (EPA, 2002).

Each of these health based screening criteria is discussed in detail below followed by a discussion regarding the basis for this hierarchy. RBLs and PRGs are addressed in Section 7.1 and 7.2, respectively.

7.1 RBSLs

RBSLs developed by both the City of Oakland and the CRWQCB are based on different assumptions (discussed in detail in *“Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater”* (CRWQCB, 2001a)). Both the City of Oakland and CRWQCB RBSLs evaluate potential residential and commercial/industrial worker exposure scenarios and address exposure to:

- City of Oakland RBSLs
 - Surficial soil which accounts for ingestion, dermal contact, and inhalation of vapors and soil particulates while outdoors.
 - Subsurface soil which accounts separately for

- Inhaling indoor air vapors
- Inhaling outdoor air vapors
- Ingesting groundwater impacted by leachate
- For Groundwater:
 - Inhaling indoor air vapors
 - Inhaling outdoor air vapors
 - Ingesting groundwater
- Water used for recreation – ingestion and dermal contact (residential only).
- CRWQCB:
 - Surface soil and groundwater as a current or a potential source of drinking water
 - Surface soil and groundwater not a current or a potential source of drinking water
 - Subsurface soil and groundwater as a current or a potential source of drinking water
 - Subsurface soil and groundwater not a current or a potential source of drinking water.
 - Elevated threat to surface water.

Subsurface soil is defined as soil either 1 meter or greater than 3 meters below ground surface (bgs) by the City of Oakland (2000) and the CRWQCB (2001a), respectively.

7.2 PRGs

Similar to RBSLs, PRGs are available for residential and commercial/industrial workers exposed to ambient (outdoor) air, tapwater, and soil. Soil and tapwater PRGs account for direct contact exposures (i.e., ingestion and dermal contact) in addition to inhalation of chemical vapors or soil particles. PRGs for tapwater and soil are discussed in more detail below. Ambient air PRGs are not relevant to this assessment and are not discussed further in this report.

7.2.1 Tapwater

As indicated in Section 2.0, groundwater at the site is considered nonpotable. For this reason, RBSLs for nonpotable groundwater were used in this evaluation. However, in the absence of nonpotable groundwater RBSLs (City of Oakland or CRWQCB), nonpotable groundwater PRGs developed by EPA Region IX were used in this assessment. Tapwater PRGs incorporate vapor inhalation, ingestion, and dermal contact exposures.

7.2.1 Soil

Soil PRGs account for direct exposure (dermal and ingestion) as well as inhalation of vapors or particulates. In case of VOCs, subsurface RBSLs are considered more conservative (i.e., lower) than PRGs because RBSLs account for the inhalation of vapors while indoors (where vapors can accumulate). PRGs also account for vapor inhalation but only while outdoors (where vapors dissipate or degrade more rapidly). As noted earlier, PRGs were only used in the absence of an available and appropriate RBSL.

7.3 TIER I SCREENING CRITERIA HIERARCHY

RBSLs developed by the City of Oakland “reflect Oakland-specific geologic, hydrogeologic and climatic conditions.” As acknowledged by the CRWQCB (CRWQCB, 2001b) because the Site is located within the Oakland city limits whenever available Oakland RBSLs were used to conduct the Tier 1 SLHRA. In the absence of Oakland RBSLs, more generic RBSLs developed by the CRWQCB (2001a) were used. The more conservative PRGs were used only when RBSLs were not available for a detected chemical.

The Site is industrial groundwater is not used for recreational activities nor is there a threat to nearby surface water bodies. Potential impacts are associated solely with the inhalation of VOCs emanating from either nonpotable groundwater or subsurface soils. For this reason nonpotable groundwater and subsurface commercial/industrial RBSLs were used in this assessment. As noted earlier, in some cases RBSLs may not be available for all chemicals detected at the Site. In the absence of RBSLs, PRGs developed by EPA Region IX were selected as Tier I screening level criteria.

8.0 EVALUATING TPH-g, TPH-d, and TPH-o

Benzene, toluene, ethylbenzene, and xylenes (BTEX) account for the most toxic components of TPH-g. BTEX was sampled for in both soil and groundwater. In addition to BTEX, semivolatile organic compounds (SVOCs) are indicator chemicals for TPH-d and TPH-o. However, because SVOCs do not readily volatilize exposure to these class of compounds is not expected at the Site. Sampling for the presence of BTEX at the Site is assumed to account for the most relevant components of TPH-g, TPH-d and TPH-o. For this reason TPH-g, TPH-d, and TPH-o were not evaluated separately in this assessment. In addition, the results of the TPH sampling events are summarized in Tables 1 and 2 for the reader’s review.

9.0 RESULTS OF THE TIER I SLHHRA

The results of the Tier I SLHHRA for groundwater and subsurface soil are presented in Sections 9.1 and 9.2, respectively.

9.1 GROUNDWATER

No VOCs detected in MW-1, MW-3, MW-4, MW-5, or MW-6 exceeded Tier I screening levels. 1,2,4-TMB and 1,3,5-TMB were the only VOCs that exceeded Tier I screening levels ($12 \mu\text{g}/\text{L}$) at MW-2 consistently in the three most recent sampling events. 1,2,4-TMB concentrations were 200, 110, and $240 \mu\text{g}/\text{L}$ and 1,3,5-TMB concentrations were 120, 100, and $190 \mu\text{g}/\text{L}$ over the last three sampling rounds. Table 5 presents chemicals detected in groundwater and corresponding Tier I screening levels

9.2 SUBSURFACE SOIL

The following chemicals detected at SB-5 (13 to 13.5 feet bgs) exceeded Tier I screening levels for soil: Isopropylbenzene (600 mg/kg), propylbenzene (920 mg/kg), n-butylbenzene (510 mg/kg), and sec-butylbenzene (410 mg/kg). The Tier I screening levels for these chemicals are 540, 240, 240, and 220 mg/kg, respectively. Table 6 presents chemicals detected in subsurface soil and corresponding Tier I screening levels.

10.0 CONCLUSIONS AND RECOMMENDATIONS

1,2,4-TMB and 1,3,5-TMB were the only two VOCs detected in groundwater that exceeded Tier I screening levels in MW-2. However, as indicated in Table 3, a domestic tapwater PRG was used in the absence of industrial/commercial worker RBSL for either 1,2,4- or 1,3,5-TMB. The tapwater PRG is overly conservative. Development of an industrial/commercial worker RBSL may indicate that 1,2,4-TMB and 1,3,5-TMB are present below health-based

levels of concern. In subsurface soils, exceedances of detected chemicals (isopropylbenzene, propylbenzene, n-butylbenzene, and sec-butylbenzene) are limited to SB-5. Soil excavation along with the collection of confirmation samples may adequately address soil levels exceeding Tier I screening levels.

Based on the results of the Tier I SLHHRA – in the absence of a site soil and groundwater remediation or soil excavation activities, a Tier II or Tier III SLHHRA may be required to establish more site-specific health-based remediation criteria. As noted in Section 4.0 the Tier I RBSLs and PRGs are not site-specific and are considered conservative to allow use across a number of different types of sites. Implementation of a Tier II or Tier III SLHHRA will allow for the development of screening levels that more closely reflect and account for expected industrial uses of the Site as well as site-specific physical/chemical properties such as soil type, soil moisture, soil porosity, and soil pH. These factors can significantly influence development of site-specific screening levels.

11.0 REFERENCES

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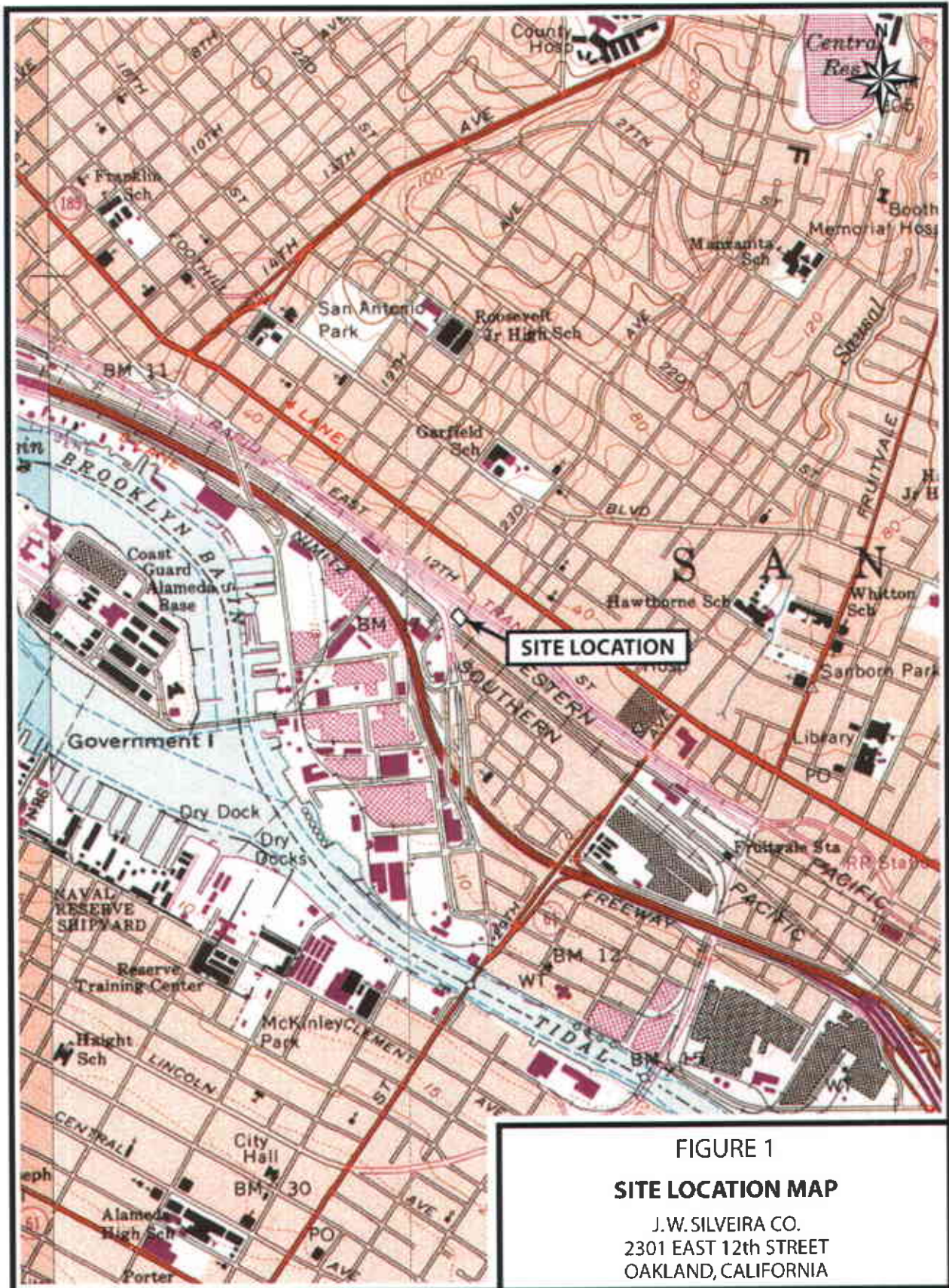


Table 1
SUMMARY OF REPORTED CHEMICAL CONCENTRATIONS IN GROUNDWATER
FROM THE THREE MOST RECENT GROUNDWATER SAMPLING ACTIVITIES IN 1999, 2000, AND 2001
2301 EAST 12TH STREET

Chemical	MW-1			MW-2			MW-3			MW-4			MW-5			MW-6		
	4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01
VOC (ug/L)																		
1,2,4-Trimethylbenzene	ND	5.4	ND	200	110	240	ND	0.5	ND	ND	ND	ND	ND	0.8	ND	ND	ND	ND
1,3,5-Trimethylbenzene	ND	6.4	ND	120	100	190	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1,300	1,300	1,000	1,100	970	630	73	0.5	59	ND	ND	ND	73	53	44	280	320	240
Chlorobenzene	ND	ND	ND	5.2	4.6	ND	ND	ND	ND	ND	ND	ND	ND	1.1	1.4	ND	ND	ND
cis-1,2-Dichloroethene	ND	1	ND	ND	ND	ND	ND	3.4	ND	ND	ND	ND	ND	3.6	3.1	72	44	43
Ethylbenzene	93	98	92	540	560	340	29	18	13	0.8	ND	ND	13	5.6	5.2	66	61	34
Isopropylbenzene	ND	17	20	50	63	64	41	41	41	18	10	10	55	43	44	17	20	15
m,p-Xylenes	36	24	20	370	230	260	6.3	5.4	4.6	ND	ND	ND	13	8.1	7.3	6.4	1.9	ND
n-Butylbenzene	ND	10	10	39	43	88	17	20	21	11	4.6	5.9	14	11	12	ND	5.8	6.7
Naphthalene	ND	16	17	570	600	910	3.4	3.9	3	ND	ND	ND	42	26	23	ND	ND	ND
o-Xylene	ND	1.9	ND	38	27	31	ND	0.6	ND	ND	ND	ND	ND	1.5	1.3	ND	ND	ND
para-Isopropyl Toluene	ND	9.6	12	22	21	42	18	21	22	7.9	2.8	3.6	9.9	6.3	6.3	ND	3.9	2.8
Propylbenzene	ND	17	19	86	120	110	45	48	47	18	9.4	9.1	80	61	63	15	17	14
sec-Butylbenzene	ND	7.2	7.6	ND	13	21	12	13	14	13	7	8.2	8.3	6.8	7.7	ND	4	3.9
tert-Butylbenzene	ND	ND	ND	ND	ND	ND	3.3	1.3	1.3	ND	1	1.2	ND	ND	ND	ND	ND	ND
Toluene	30	30	19	100	84	49	7	6.3	5.8	ND	ND	ND	5	3.4	3.1	4.4	3.8	2.5
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	3.3	2.6	ND	ND	ND	ND	2.7	3.6	5.3	21	18	15
Trichloroethene	20	ND	ND	ND	ND	ND	6.7	3.9	4.4	ND	ND	ND	ND	ND	ND	75	46	33
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13	ND	ND	13
TPH (ug/L)																		
Diesel (TPH-d)	4,300	3,300	8,800	5,800	6,900	28,000	3,200	9,700	9,800	2,500	580	28,000	1,500	1,000	2,100	3,400	730	1,400
Motor Oil (TPH-o)	850	720	2,600	750	840	3,800	280	390	750	300	ND	3,000	290	ND	340	280	ND	300

Notes:

ug/L micrograms per liter
 ND Not detected
 TPH Total petroleum hydrocarbons
 VOC Volatile organic compound

TABLE 2
SUMMARY OF REPORTED CHEMICAL CONCENTRATIONS IN SUBSURFACE SOIL
COLLECTED IN 1999
2301 EAST 12TH STREET

Analyte	Location and Depth					
	SB-1 JW1-09 15.5-16 ft bgs	SB-2 JW1-13 15-15.5 ft bgs	SB-3 JW1-17 18-18.5 ft bgs	SB-4 JW1-12 18-18.5 ft bgs	SB-5 JW1-16 13-13.5 ft bgs	SB-6 JW1-20 19-19.5 ft bgs
Isopropylbenzene	ND	ND	ND	ND	600	ND
Propylbenzene (as n-Propylbenzene)	ND	ND	ND	ND	920	ND
cis-1,2-Dichloroethene	ND	ND	ND	4.2	ND	ND
n-Butylbenzene	ND	ND	ND	ND	510	ND
para-Isopropyl Toluene	ND	ND	ND	ND	360	ND
sec-Butylbenzene	ND	ND	ND	ND	410	ND
TPH (mg/kg)						
Diesel (TPH-d)	ND	ND	ND	ND	120	ND

Notes:

The analytical results of the soil samples were validated by a TtEMI chemist.

bgs below ground surface

ft feet

mg/kg milligrams per Kilogram

ND Not Detected

TPH Total Petroleum Hydrocarbons

VOC Volatile Organic Compound

**TABLE 3
GROUNDWATER RBSLs AND PRGs USED TO CONDUCT THE COMMERCIAL/INDUSTRIAL WORKER TIER I SLHHRA
2301 EAST 12TH STREET**

Chemical	City of Oakland Commercial/Industrial Worker RBSLs	CRWQCB Commercial/Industrial Worker RBSLs for Non Potable Groundwater	Region IX Residential Tapwater PRGs	Selected Tier I Screening Levels ^a	Residential or Industrial Tier I Screening Level ^b	Surrogate
VOC (ug/L)						
1,2,4-Trimethylbenzene	NA	NA	12	12	Residential	
1,3,5-Trimethylbenzene	NA	NA	12	12	Residential	
Benzene	1800	46	0.34	1800	Commercial/Industrial	
Chlorobenzene	69000	50	110	69000	Commercial/Industrial	
cis-1,2-Dichloroethene	1000000	590	61	1000000	Commercial/Industrial	
Ethylbenzene	>SOL	290	2.9	>SOL	Commercial/Industrial	
Isopropylbenzene	NA	NA	660	660	Commercial/Industrial	
m,p-Xylenes	>SOL	13 (as xylenes)	210	>SOL	Commercial/Industrial	
n-Butylbenzene	NA	NA	240	240	Commercial/Industrial	
Naphthalene	>SOL	24	6.2	>SOL	Commercial/Industrial	
o-Xylene	>SOL	13 (as xylenes)	210	>SOL	Commercial/Industrial	
para-Isopropyl Toluene	>SOL	130	720	>SOL	Commercial/Industrial	Toluene
Propylbenzene (as n-propylbenzene)	NA	NA	240	240	Residential	
sec-Butylbenzene	NA	NA	240	240	Residential	
tert-Butylbenzene	NA	NA	240	240	Residential	
Toluene	>SOL	130	720	>SOL	Commercial/Industrial	
trans-1,2-Dichloroethene	940000	590	120	940000	Commercial/Industrial	
Trichloroethene	11000	360	0.028	11000	Commercial/Industrial	
Vinyl Chloride	59.0	4.9	0.02	59.0	Commercial/Industrial	

Notes:

CRWQCB California Regional Water Quality Control Board

ug/L micrograms per liter
 NA Not available (applicable)
 TPH Total petroleum hydrocarbons
 VOC Volatile organic compound
 >SOL RBSL exceeds the solubility of the chemical in water.

Both City of Oakland and CRWQCB groundwater RBSLs assume exposure to chemical vapors emanating from groundwater, through soil into a residence.

Tapwater PRGs assume drinking water exposure and are therefore conservative for this evaluation because groundwater is considered nonpotable.

As indicated in the main text, in order of preference, the Tier I Screening Level are those developed by the City of Oakland, the CRWQCB, and EPA Region IX PRGs.

Notes

- a Hierarchy for selection of screening criteria is described in the main document.
- b Residential screening levels were used only in the absence of an appropriate commercial/industrial worker value.

Table 5
**RESULTS OF THE COMMERCIAL/INDUSTRIAL WORKER TIER 1 SLHRA for GROUNDWATER
 FROM THE THREE MOST RECENT GROUNDWATER SAMPLING ACTIVITIES IN 1999, 2000, AND 2001
 2301 EAST 12TH STREET**

Chemical	Selected Tier I Screening Levels ^a	MW-1			MW-2			MW-3			MW-4			MW-5			MW-6		
		4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01
VOC (ug/L)																			
1,2,4-Trimethylbenzene	12	ND	5.4	ND	200	110	240	ND	0.5	ND	ND	ND	ND	0.8	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	12	ND	6.4	ND	120	100	190	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	1800	1,300	1,300	1,000	1,100	970	630	73	0.5	59	ND	ND	ND	73	53	44	280	320	240
Chlorobenzene	69000	ND	ND	ND	5.2	4.6	ND	ND	ND	ND	ND	ND	ND	1.1	1.4	ND	ND	ND	ND
cis-1,2-Dichloroethene	1000000	ND	1	ND	ND	ND	ND	ND	3.4	ND	ND	ND	ND	3.6	3.1	72	44	43	43
Ethylbenzene	>SOL	93	98	92	540	560	340	29	18	13	0.8	ND	ND	13	5.6	5.2	66	61	34
Isopropylbenzene	660	ND	17	20	50	63	64	41	41	41	18	10	10	55	43	44	17	20	15
m,p-Xylenes	>SOL	36	24	20	370	230	260	6.3	5.4	4.6	ND	ND	ND	13	8.1	7.3	6.4	1.9	ND
n-Butylbenzene	240	ND	10	10	39	43	88	17	20	21	11	4.6	5.9	14	11	12	ND	5.8	6.7
Naphthalene	>SOL	ND	16	17	570	600	910	3.4	3.9	3	ND	ND	ND	42	26	23	ND	ND	ND
o-Xylene	>SOL	ND	1.9	ND	38	27	31	ND	0.6	ND	ND	ND	ND	ND	1.5	1.3	ND	ND	ND
para-Isopropyl Toluene	>SOL	ND	9.6	12	22	21	42	18	21	22	7.9	2.8	3.6	9.9	6.3	6.3	ND	3.9	2.8
Propylbenzene	240	ND	17	19	86	120	110	45	48	47	18	9.4	9.1	80	61	63	15	17	14
sec-Butylbenzene	240	ND	7.2	7.6	ND	13	21	12	13	14	13	7	8.2	8.3	6.8	7.7	ND	4	3.9
tert-Butylbenzene	240	ND	ND	ND	ND	ND	ND	3.3	1.3	1.3	ND	1	1.2	ND	ND	ND	ND	ND	ND
Toluene	>SOL	30	30	19	100	84	49	7	6.3	5.8	ND	ND	ND	5	3.4	3.1	4.4	3.8	2.5
trans-1,2-Dichloroethene	940000	ND	ND	ND	ND	ND	ND	3.3	2.6	ND	ND	ND	ND	2.7	3.6	5.3	21	18	15
Trichloroethene	11000	20	ND	ND	ND	ND	ND	6.7	3.9	4.4	ND	ND	ND	ND	ND	ND	75	46	33
Vinyl Chloride	59.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13	ND	ND	13

Notes:

ug/L micrograms per liter

ND Not detected

VOC Volatile organic compound

Bold/shaded numbers indicate concentration exceeds Tier I Screening Level.

>SOL RBSL exceeds solubility of the chemical in water

TABLE 6
RESULTS OF COMMERCIAL/INDUSTRIAL WORKER TIER I SLHHRA FOR SOIL
COLLECTED IN 1999
2301 EAST 12TH STREET

Analyte	Selected Tier I Screening Levels	Location and Depth					
		SB-1 JW1-09 15.5-16 ft bgs	SB-2 JW1-13 15-15.5 ft bgs	SB-3 JW1-17 18-18.5 ft bgs	SB-4 JW1-12 18-18.5 ft bgs	SB-5 JW1-16 13-13.5 ft bgs	SB-6 JW1-20 19-19.5 ft bgs
Isopropylbenzene	520	ND	ND	ND	ND	600	ND
Propylbenzene (as n-Propylbenzene)	240	ND	ND	ND	ND	920	ND
cis-1,2-Dichloroethene	410	ND	ND	ND	4.2	ND	ND
n-Butylbenzene	240	ND	ND	ND	ND	510	ND
para-Isopropyl Toluene	SAT	ND	ND	ND	ND	360	ND
sec-Butylbenzene	220	ND	ND	ND	ND	410	ND

Notes:

The analytical results of the soil samples were validated by a TrEMI chemist.

- bgs below ground surface
 - ft feet
 - mg/kg milligrams per kilogram
 - Not Analyzed
 - ND Not Detected
 - VOC Volatile Organic Compound
- Bold/shaded numbers indicate concentration exceeds Tier I Screening Level.

APPENDIX A
SUMMARY OF PREVIOUSLY CONDUCTED GROUNDWATER
SAMPLING CONDUCTED BETWEEN 1991 AND 2001

TABLE A-1
CHEMICAL CONCENTRATIONS IN GROUNDWATER
MONITORING WELL MW-1
FROM JULY 1992 TO AUGUST 2001
2301 EAST 12TH STREET

ANALYTE	SAMPLE DATE																						
	7/92	11/92	3/93	5/93	8/93	12/93	3/94	6/94	10/94	2/95	6/95	10/95	2/96	6/96	9/96	1/97	5/97	12/97	3/98	7/98	4/99	5/00	8/01
VOC (µg/L)																							
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	5.4	ND
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	6.4	ND
Benzene	600	2,400	3,800	3,400	2,300	29	2,400	2,300	2,100	3,200	2,600	2,200	1,400	2,500	1,200	1,500	2,200	2,000	2,600	2,100	1,300	1,300	1,000
Chlorobenzene	--	--	ND	ND	ND	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	--	--	--	ND	ND	ND	ND
cis-1,2-Dichloroethene	--	--	ND	ND	1.1	--	--	--	--	1.3	1.1	0.84	0.82	ND	ND	0.71	0.81	--	--	1.4	ND	1.0	ND
Ethylbenzene	13	41	120	140	180	5.8	310	260	250	460	450	220	130	190	86	190	170	81	280	220	93	98	92
Isopropylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	17	20
m,p-Xylenes	18	ND	ND	150	57	26	280	170	140	260	220	110	81	130	55	130	110	94	100	83	36	24	20
n-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	10	10
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	16	17
o-Xylene	a	ND	ND	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	ND	1.9	ND
para-Isopropyl Toluene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	9.6	12
Propylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	17	19
sec-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	7.2	7.6
tert-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Toluene	5.1	6.1	ND	44	35	16	84	44	35	110	87	63	25	72	29	47	56	46	74	57	30	30	19
trans-1,2-Dichloroethene	--	--	ND	ND	ND	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND
Trichloroethene	--	--	5.8	6.8	ND	--	--	--	--	ND	6.5	2.5	24	ND	11	13	2.7	--	--	3.4	20	ND	ND
Vinyl Chloride	--	--	ND	ND	ND	--	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND
TPH (µg/L)																							
Diesel (TPH-d)	360	670	1,100	1,170	1,200	ND	2,600	1,500	2,000	2,500	3,500	2,700	16,000	8,000	3,100	11,000	4,300	3,400	8,600	6,800	4,300	3,300	8,800
Motor Oil (TPH-o)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	850	720	2,600

Notes:

- a Laboratory analytical report only lists total xylenes
- µg/L Micrograms per liter
- Not analyzed
- ND Not detected
- TPH Total petroleum hydrocarbons
- VOC Volatile organic compound

TABLE A-2
CHEMICAL CONCENTRATIONS IN GROUNDWATER
MONITORING WELL MW-2
FROM JULY 1992 TO AUGUST 2001
2301 EAST 12TH STREET

ANALYTE	SAMPLE DATE																							
	7/92	11/92	3/93	5/93	8/93	12/93	3/94	6/94	10/94	2/95	6/95	10/95	2/96	6/96	9/96	1/97	5/97	12/97	3/98	7/98	4/99	5/00	8/01	
VOC (µg/L)																								
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	200	110	240	
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	120	100	190	
Benzene	110	2,800	3,800	5,200	1,700	87	2,100	2,000	1,500	2,000	1,300	1,500	1,700	1,400	1,600	1,800	1,300	1,200	1,200	890	1,100	970	630	
Chlorobenzene	--	--	ND	9.8	10	4.3	ND	6.5	5.7	12	7.9	5.1	4.8	5.6	8.2	ND	5.2	--	--	1.9	5.2	4.6	ND	
cis-1,2-Dichloroethene	--	--	ND	2.7	3.2	1.0	ND	ND	0.73	ND	1.0	ND	ND	ND	ND	0.69	ND	--	--	ND	ND	ND	ND	
Ethylbenzene	37	790	950	1,000	640	42	630	550	410	660	510	400	490	460	480	670	400	460	430	490	540	560	340	
Isopropylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50	63	64	
m,p-Xylenes	39	1,100	1,100	990	710	400	750	520	520	900	520	330	440	410	460	780	410	420	350	850	370	230	260	
n-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	39	43	88	
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	570	600	910	
o-Xylene	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	38	27	31	
para-isopropyl Toluene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	22	21	42	
Propylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	86	120	110	
sec-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	13	21	
tert-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND	
Toluene	6	120	110	140	120	79	100	72	81	120	85	92	93	75	66	150	96	76	74	160	100	84	49	
trans-1,2-Dichloroethene	--	--	ND	2.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND	
Trichloroethene	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	12	ND	ND	--	--	ND	ND	ND	ND	
Vinyl Chloride	--	--	ND	ND	2.2	1.5	ND	ND	1.0	ND	2.1	ND	ND	ND	ND	ND	ND	--	--	0.46	ND	ND	ND	
TPH (µg/L)																								
Diesel (TPH-d)	1,500	17,000	37,000	6,000	54,000	720	6,100	3,000	53,000	49,000	6,600	31,000	11,000	5,500	13,000	30,000	24,000	24,000	9,500	490,000	5,800	6,900	28,000	
Motor Oil (TPH-o)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	750	840	3,800	

Notes:

- a Laboratory analytical report only lists total xylenes
- µg/L Micrograms per liter
- Not analyzed
- ND Not detected
- TPH Total petroleum hydrocarbons
- VOC Volatile organic compound

TABLE A-3
CHEMICAL CONCENTRATIONS IN GROUNDWATER
MONITORING WELL MW-3
FROM JULY 1992 TO AUGUST 2001
2301 EAST 12TH STREET

ANALYTE	SAMPLE DATE																						
	7/92	11/92	3/93	5/93	8/93	12/93	3/94	6/94	10/94	2/95	6/95	10/95	2/96	6/96	9/96	1/97	5/97	12/97	3/98	7/98	4/99	5/00	8/01
VOC (µg/L)																							
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	0.5	ND
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Benzene	150	78	120	570	180	30	180	230	140	220	310	120	62	110	68	64	67	63	ND	87	73	0.5	59
Chlorobenzene	--	--	ND	--	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND
cis-1,2-Dichloroethene	--	--	ND	--	ND	--	ND	6.0	8.4	4.3	4.9	7.1	7.3	6.9	11	4.9	4.9	--	--	1.1	ND	3.4	ND
Ethylbenzene	88	830	240	640	110	12	100	93	68	110	160	32	50	130	61	38	51	68	53	44	29	18	13
Isopropylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	41	41	41
m,p-Xylenes	13	13	37	8.4	9.4	62	24	7.6	25	22	63	16	33	160	42	60	20	48	21	25	6.3	5.4	4.6
n-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17	20	21
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.4	3.9	3
o-Xylene	a	ND	ND	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	ND	0.6	ND
para-Isopropyl Toluene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18	21	22
Propylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	45	48	47
sec-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	12	13	14
tert-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.3	1.3	1.3
Toluene	8.6	3.1	ND	4.1	15	14	10	13	8.7	17	23	6.7	13	65	20	19	13	22	1.5	13	7.0	6.3	5.8
trans-1,2-Dichloroethene	--	--	ND	--	ND	--	ND	1.5	2.1	1.3	1.7	2.0	2.6	2.5	ND	2.0	2.4	--	--	0.81	3.3	2.6	ND
Trichloroethene	--	--	ND	--	16	--	6.0	ND	12	5.1	5.7	7.8	9.3	ND	13	3.9	ND	--	--	ND	6.7	3.9	4.4
Vinyl Chloride	--	--	ND	--	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND
TPH (µg/L)	7/92	11/92	3/93	5/93	8/93	12/93	3/94	6/94	10/94	2/95	6/95	10/95	2/96	6/96	9/96	1/97	5/97	12/97	3/98	7/98	4/99	5/00	8/01
Diesel (TPH-d)	4,000	21,000	9,300	4,400	8,200	230	4,300	1,500	2,700	1,600	13,000	1,900	9,400	5,000	15,000	57,000	30,000	16,000	10,000	17,000	3,200	9,700	9,800
Motor Oil (TPH-o)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	390	750

Notes:

- a Laboratory analytical report only lists total xylenes
- µg/L Micrograms per liter
- Not analyzed
- ND Not detected
- TPH Total petroleum hydrocarbons
- VOC Volatile organic compound

TABLE A-4
CHEMICAL CONCENTRATIONS IN GROUNDWATER
MONITORING WELL MW-4
FROM MARCH 1994 TO AUGUST 2001
2301 EAST 12TH STREET

ANALYTE	SAMPLE DATE																
	3/94	6/94	10/94	2/95	6/95	10/95	2/96	6/96	9/96	1/97	5/97	12/97	3/98	7/98	4/99	5/00	8/01
VOC (µg/L)																	
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Benzene	19	2.9	3.8	100	31	43	ND	12	ND	ND	ND	41	ND	2.2	ND	ND	ND
Chlorobenzene	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND
cis-1,2-Dichloroethene	--	--	0.71	ND	2.2	1.3	1.8	ND	ND	0.76	ND	--	--	ND	ND	ND	ND
Ethylbenzene	2.9	2.8	5.2	3.8	6.1	8.4	ND	3.4	78	3.0	3.4	14	3.7	2.0	0.8	ND	ND
Isopropylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18	10	10
m,p-Xylenes	12	4.6	24	7.1	12	6.9	ND	9.6	12	15	5.7	20	6.2	2.1	ND	ND	ND
n-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	11	4.6	5.9
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
o-Xylene	a	a	a	a	a	a	ND	a	a	a	a	a	a	a	ND	ND	ND
para-Isopropyl Toluene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.9	2.8	3.6
Propylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18	9.4	9.1
sec-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13	7.0	8.2
tert-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	1.0	1.2
Toluene	1.2	1.6	2.0	100	3.4	2.3	ND	5.7	15	7.0	5.1	13	5.0	1.5	ND	ND	ND
trans-1,2-Dichloroethene	--	--	ND	ND	1.0	ND	0.79	ND	ND	ND	ND	--	--	ND	ND	ND	ND
Trichloroethene	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND
Vinyl Chloride	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND
TPH (µg/L)																	
Diesel (TPH-d)	1,800	420	900	630	1,100	1,100	940	1,100	2,500	13,000	6,200	650	1,300	1,000	2,500	580	28,000
Motor Oil (TPH-o)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300	ND	3,000

Notes:

- a Laboratory analytical report only lists total xylenes
- µg/L Micrograms per liter
- Not analyzed
- ND Not detected
- TPH Total petroleum hydrocarbons
- VOC Volatile organic compound

TABLE A-5
CHEMICAL CONCENTRATIONS IN GROUNDWATER
MONITORING WELL MW-5
FROM MARCH 1994 TO AUGUST 2001
2301 EAST 12TH STREET

ANALYTE	SAMPLE DATE																
	3/94	6/94	10/94	2/95	6/95	10/95	2/96	6/96	9/96	1/97	5/97	12/97	3/98	7/98	4/99	5/00	8/01
VOC (µg/L)																	
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	0.8	ND
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Benzene	71	220	120	130	140	43	61	94	140	64	120	66	48	69	73	53	44
Chlorobenzene	--	0.53	0.66	ND	0.95	0.54	0.57	ND	0.83	0.71	ND	--	--	0.68	ND	1.1	1.4
cis-1,2-Dichloroethene	--	11	16	20	12	9.8	7.7	2.9	4.5	6.1	0.55	--	--	1.8	ND	3.6	3.1
Ethylbenzene	27	38	27	38	27	8.4	34	32	18	23	21	15	14	11	13	5.6	5.2
Isopropylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	55	43	44
m,p-Xylenes	15	24	13	29	29	6.9	ND	40	21	26	23	25	21	15	13	8.1	7.3
n-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14	11	12
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	42	26	23
o-Xylene	a	a	a	a	a	a	ND	a	a	a	a	a	a	a	ND	1.5	1.3
para-Isopropyl Toluene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	9.9	6.3	6.3
Propylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	80	61	63
sec-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	8.3	6.8	7.7
tert-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Toluene	ND	12	5.1	7.9	6.7	2.3	5.3	11	7.5	8.7	7.6	8.7	7.2	6.0	5.0	3.4	3.1
trans-1,2-Dichloroethene	--	3.1	4.2	5.1	4.1	2.9	ND	ND	2.7	3.8	ND	--	--	2.0	2.7	3.6	5.3
Trichloroethene	--	ND	ND	ND	ND	2.0	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND
Vinyl Chloride	--	7.5	9.6	8.4	10	7.6	5.3	ND	7.3	9.1	1.1	--	--	5.3	ND	ND	13
TPH (µg/L)																	
Diesel (TPH-d)	870	950	1,100	1,200	1,000	940	2,200	--	1,600	2,500	3,400	2,400	1,200	1,600	1,500	1,000	2,100
Motor Oil (TPH-o)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290	ND	340

Notes:

- a Laboratory analytical report only lists total xylenes
- µg/L Micrograms per liter
- Not analyzed
- ND Not detected
- TPH Total petroleum hydrocarbons
- VOC Volatile organic compound

TABLE A-6
CHEMICAL CONCENTRATIONS IN GROUNDWATER
MONITORING WELL MW-6
FROM MARCH 1994 TO AUGUST 2001
2301 EAST 12TH STREET

ANALYTE	SAMPLE DATE																
	3/94	6/94	10/94	2/95	6/95	10/95	2/96	6/96	9/96	1/97	5/97	12/97	3/98	7/98	4/99	5/00	8/01
VOC (µg/L)																	
1,2,4-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
1,3,5-Trimethylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Benzene	1,100	1,200	870	1,000	1,300	590	460	630	550	850	450	530	630	420	280	320	240
Chlorobenzene	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND	ND
cis-1,2-Dichloroethene	--	--	--	40	26	75	110	72	73	81	50	--	--	54	72	44	43
Ethylbenzene	180	210	140	210	240	84	110	140	120	190	38	130	120	60	66	61	34
Isopropylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17	20	15
m,p-Xylenes	41	54	49	55	79	24	23	37	38	43	35	38	25	14	6.4	1.9	ND
n-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	5.8	6.7
Naphthalene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
o-Xylene	a	a	a	a	a	a	a	a	a	a	a	a	a	a	ND	ND	ND
para-Isopropyl Toluene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	3.9	2.8
Propylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15	17	14
sec-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	4.0	3.9
tert-Butylbenzene	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	ND	ND
Toluene	17	21	14	17	24	8.8	11	14	14	17	9.1	13	11	7	4.4	3.8	2.5
trans-1,2-Dichloroethene	--	--	--	13	17	16	25	20	25	21	17	--	--	16	21	18	15
Trichloroethane	--	--	--	99	29	110	160	83	59	82	52	--	--	34	75	46	33
Vinyl Chloride	--	--	--	87	130	54	46	33	48	29	26	--	--	12	ND	ND	13
TPH (µg/L)																	
Diesel (TPH-d)	1,000	660	850	1,000	1,400	770	1,500	1,300	1,300	2,200	3,500	1,200	1,200	1,600	3,400	730	1,400
Motor Oil (TPH-o)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	ND	300

Notes:

- a Laboratory analytical report only lists total xylenes
- µg/L Micrograms per liter
- Not analyzed
- ND Not detected
- TPH Total petroleum hydrocarbons
- VOC Volatile organic compound

APPENDIX B
RESULTS OF RESIDENTIAL TIER I SLHRA

Table B-1
RESULTS OF THE RESIDENTIAL TIER I SLHRA FOR GROUNDWATER
FROM THE THREE MOST RECENT GROUNDWATER SAMPLING ACTIVITIES IN 1999, 2000, AND 2001
2301 EAST 12TH STREET

Chemical	Selected Tier I Screening Levels	MW-1			MW-2			MW-3			MW-4			MW-5			MW-6		
		4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01	4/99	5/00	8/01
VOC (ug/L)																			
1,2,4-Trimethylbenzene	12	ND	5.4	ND	200	110	240	ND	0.5	ND	ND	ND	ND	0.8	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	12	ND	6.4	ND	120	100	190	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	110	1,300	1,300	1,000	1,100	970	630	73	0.5	59	ND	ND	ND	73	53	44	280	320	240
Chlorobenzene	2400	ND	ND	ND	5.2	4.6	ND	ND	ND	ND	ND	ND	ND	1.1	1.4	ND	ND	ND	ND
cis-1,2-Dichloroethene	35000	ND	1	ND	ND	ND	ND	ND	3.4	ND	ND	ND	ND	3.6	3.1	72	44	43	43
Ethylbenzene	>SOL	93	98	92	540	560	340	29	18	13	0.8	ND	ND	13	5.6	5.2	66	61	34
Isopropylbenzene	660	ND	17	20	50	63	64	41	41	41	18	10	10	55	43	44	17	20	15
m,p-Xylenes	>SOL	36	24	20	370	230	260	6.3	5.4	4.6	ND	ND	ND	13	8.1	7.3	6.4	1.9	ND
n-Butylbenzene	240	ND	10	10	39	43	88	17	20	21	11	4.6	5.9	14	11	12	ND	5.8	6.7
Naphthalene	>SOL	ND	16	17	570	600	910	3.4	3.9	3	ND	ND	ND	42	26	23	ND	ND	ND
o-Xylene	>SOL	ND	1.9	ND	38	27	31	ND	0.6	ND	ND	ND	ND	1.5	1.3	ND	ND	ND	ND
para-Isopropyl Toluene	210000	ND	9.6	12	22	21	42	18	21	22	7.9	2.8	3.6	9.9	6.3	6.3	ND	3.9	2.8
Propylbenzene	240	ND	17	19	86	120	110	45	48	47	18	9.4	9.1	80	61	63	15	17	14
sec-Butylbenzene	240	ND	7.2	7.6	ND	13	21	12	13	14	13	7	8.2	8.3	6.8	7.7	ND	4	3.9
tert-Butylbenzene	240	ND	ND	ND	ND	ND	ND	3.3	1.3	1.3	ND	1	1.2	ND	ND	ND	ND	ND	ND
Toluene	210000	30	30	19	100	84	49	7	6.3	5.8	ND	ND	ND	5	3.4	3.1	4.4	3.8	2.5
trans-1,2-Dichloroethene	32000	ND	ND	ND	ND	ND	ND	3.3	2.6	ND	ND	ND	ND	2.7	3.6	5.3	21	18	15
Trichloroethene	690	20	ND	ND	ND	ND	ND	6.7	3.9	4.4	ND	ND	ND	ND	ND	ND	75	46	33
Vinyl Chloride	3.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	13	ND	ND	13

Notes:

ug/L micrograms per liter

ND Not detected

VOC Volatile organic compound

Bold/shaded numbers indicate concentration exceeds Tier I Screening Level.

>SOL RBSL exceeds the solubility of the chemical in water.

TABLE B-2
RESULTS OF RESIDENTIAL TIER I SLHHRA FOR SOIL
COLLECTED IN 1999
2301 EAST 12TH STREET

Analyte	Selected Tier I Screening Levels	Location and Depth					
		SB-1 JW1-09 15.5-16 ft bgs	SB-2 JW1-13 15-15.5 ft bgs	SB-3 JW1-17 18-18.5 ft bgs	SB-4 JW1-12 18-18.5 ft bgs	SB-5 JW1-16 13-13.5 ft bgs	SB-6 JW1-20 19-19.5 ft bgs
Isopropylbenzene	160	ND	ND	ND	ND	600	ND
Propylbenzene (as n-Propylbenzene)	240	ND	ND	ND	ND	920	ND
cis-1,2-Dichloroethene	14	ND	ND	ND	4.2	ND	ND
n-Butylbenzene	240	ND	ND	ND	ND	510	ND
para-Isopropyl Toluene	360	ND	ND	ND	ND	360	ND
sec-Butylbenzene	220	ND	ND	ND	ND	410	ND

Notes:

The analytical results of the soil samples were validated by a TtEMI chemist.

bgs below ground surface

ft feet

mg/kg milligrams per kilogram

-- Not Analyzed

ND Not Detected

VOC Volatile Organic Compound

Bold/shaded numbers indicate concentration exceeds Tier I Screening Level.