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Q. Fair enough. Do you recall generally what your job duties were when you first got there?

A. I did plant management. I did engineering. I did engineering sales. I had a variety of hats that I wore when I first started there.

Q. Okay. And the duties that you just listed, those were things that you had when you first got the property -- when you first started at Masco?

A. When I started at Masco. I, was not located at 2930 Maria.

Q. Where was it located when you first started at Masco, approximately?

A. It was -- I think it is 141st Street or something like that.

Q. Okay.

A. I can't remember the exact address.

Q. Is that in Los Angeles?

A. Yes. South Los Angeles.

Q. Do you know when Masco first moved to 2930 East Maria Street?

A. It was either 1969 or 1970.

Q. Okay.

A. In that range.

Q. Do you know if Masco built the building that was located at 2930 in order to start their

operations there?

A. Yes, they did.

Q. Okay. So is it your understanding that they were the first company operating on that property?

A. They were.

Q. Okay. Do you know who owned the property at that time?

A. You mean before --

Q. Around the '69 to 1970 time frame?

A. It would have been the developer of the industrial park.

Q. Okay. But do you know if that developer was related to Masco or O.B. Distributors?

A. They weren't.

Q. They were not. Do you know if -- do you know the name of the developer?

A. I don't recall.

Q. Okay. Do you know if at any time the property was acquired by either Masco or O.B. Distributors or some other entity related to those companies?

A. I don't quite understand.

Q. Well, let me rephrase it. Do you know if at any time Louis Schnitz ever owned that property?

product was put on racks, if you can think of baking racks like in bakeries, and they actually -- the racks would go into the paint area, and they would paint the parts.

Q. Okay. Did any of the manufacturing process include creating items in molds where you would pour resin or something into a mold to create hardware?

A. You talking about injection molding or something?

Q. Yeah. Pre-formed that weren't made out of metal and weren't made out of wood, but maybe made out of some resin.

A. No.

Q. Okay. The processing that we have described today, was that consistent during your approximately 17 years at the property, with the exception of the miniblinds which we know was added at the end?

A. Yes.

Q. When you first started working at 2930, you were employed by O.B. Masco; correct?

A. Yes.

Q. Okay. At some point did your employment change such that you were no longer employed by O.B. Masco but instead a different company?

A. No.

Q. So throughout the 17 years at the property, you were always receiving a paycheck from O.B. Masco; correct?

A. Correct.

Q. At some point in that process, were you aware of a change in the ownership of O.B. Masco?

A. Yes.

Q. What change were you aware of, and when did it take place?

A. The dates I can't, with any certainty, say. We were purchased by a larger corporate entity. Was called Instrument Systems Corporation.

Q. Do you know approximately when that took place?

A. It was soon after we moved there. Maybe '71, '72.

Q. Within a couple years?

A. Oh, yeah. Yes. I remember that. I can't pin it down.

Q. But the company remained O.B. Masco; is that correct?

A. We retained our identity as O.B. Masco.

Q. Do you know the corporate structure, if it stayed the same? Did you have any knowledge of the

corporate structure of O.B. Masco?

A. Of our entity?

Q. Yeah.

A. Our individual -- when you say corporate structure, explain that to me.

Q. Do you know if O.B. Masco was a wholly owned subsidiary of Instrument Systems or a different company or if it was just -- became part of Instrument Systems?

A. I believe we were a wholly owned subsidiary. I am not fluent in exactly how the corporate structure was set up. I know we were -- even though we were owned by Instrument Systems, we were like a division or a wholly owned subsidiary of Lightron that was -- Instrument Systems had several divisions.

Q. Okay. Did you ever have any ownership interest in O.B. Masco or Masco or O.B. Distributing?

A. No.

Q. Okay. When you came to work at O.B. Masco, who was running the company? Was who running the show out there?

A. For the time I spent at Masco, and, again, remember O.B. is the distributing arm, it's

fuzzy for me.

Q. Sure.

A. Because Joe was there before Rob. And he also had the tenure. He was continuously with us. But Rob was more or less either equal to Joe or somewhat reporting to Joe at that time. When he came back, he became where Joe was reporting to him. It was just a question of particular responsibilities and so on.

Q. Okay.

A. So the whole year, identifying what years this happened and so on, is very hazy for me.

Q. Do you recall any other titles that Joe Lopez held?

A. Could have been like production manager or something like that.

Q. When was the last time you spoke with Joe Lopez?

A. Probably a year ago.

Q. Do you know where he was living at the time?

A. He's living in Orange County. He is -- gosh. It's like Anaheim Hills.

Q. Do you know if he's currently employed?

A. I don't know what his current employment

is. I know that he eventually ended up running the remnants of -- I believe O.B. Masco was bought by, like, Clopay at sometime after I left, and then, in turn, became part of Kirsch, which is a very large drapery -- they're the largest manufacturer of drapery in the country. And he ended up being the plant manager out in Orange County for Kirsch. And he ran the whole operation out there, and it was mainly miniblinds. They didn't do drapery hardware and vertical blinds and window coverings, generally.

Q. Do you have Joe's telephone number? Not with you, but at home?

A. I can get it, if it's still current. Like I said, I haven't talked to him in a while.

Q. We will leave a blank in the transcript, and when you get a chance to review it, just fill it in if you have it. If you don't, draw a line through it.

(Information requested:_____

_____

_____.)

THE WITNESS: It's at home.

Q. BY MR. HUGHES: You will get the transcript a week or two weeks after this.

A. Okay. Great.

and Lou Schnitz. That's where they came up with the JoL.

Q. BY MR. MAZGANI: Those were the three partners of JoL?

A. Yeah. To the best of my recollection that's what that stands for. It sounded familiar, but until I saw this...

Q. And if I could ask you to turn to the fifth page, do you recognize those signatures under JoL Enterprises?

A. Joe Greenstadt, the middle one is Otto Breman, and the third one is Louis Schnitz.

Q. And the signatures under Masco, do you recognize them?

A. I see Louis Schnitz, but I don't recognize this -- it's not clear enough for me to see who that signature is there, unless we have a clearer copy.

Q. That's fine. Thank you. Those are all I was looking for.

We'll mark the next exhibit in order. Exhibit 8.

(Defendants' Exhibit 8 was marked for identification and is attached hereto.)

Q. BY MR. MAZGANI: Assignment of Lease dated September 16, 1971 between O.B. Masco and Instrument

Systems. Does this help at all with your recollection of when O.B. Masco was bought by Instrument Systems?

A. I think I had previously stated about that -- seems about the right time frame.

Q. And after the time period -- and just for the record, after the time period Instrument Systems assumed the lease -- O.B. Masco continued to occupy the property?

A. Yes.

Q. Do you have an understanding as to why Instrument Systems assumed the lease, if you know?

A. It would only be speculation.

Q. Okay. And turning to the second page again, do you recognize that signature under Instrument Systems?

A. No.

Q. And prior to today, had you seen this document?

A. No.

Q. We can go through these fairly quickly. Here is another document I would like you to take a look at, Amendment to Lease dated August 14th, 1979.

(Defendants' Exhibit 9 was marked for

identification and is attached hereto.)

Q. BY MR. MAZGANI: Prior to today, had you ever seen this document, Exhibit 9?

A. No.

Q. Okay. You can see in the third recital, it says, "Said lease was thereafter assigned by Instrument Systems Corporation to Lightron..." What is the relationship between Instrument Systems Corporation and Lightron, if you know?

A. Lightron was a subsidiary of Instrument Systems.

Q. And after the assignment from Instrument Systems to Lightron, O.B. Masco continued to occupy the premises; correct?

A. Yes.

Q. And if you could turn to the last page, do you recognize the signature on behalf of Lightron Corporation?

A. Myron Levy, yes, I do.

Q. Who was Myron Levy?

A. He was the president of Lightron Corporation.

Q. Did you have any direct dealings with Mr. Levy?

A. Yes, I did.

Q. And how often would you interact with Mr. Levy?

A. Probably bimonthly.

Q. Okay. What was the purpose of those contacts?

A. It would be probably some fiscal matters, budgetary matters. He would possibly be talking to me about inventory, size of inventory, sales figures, you know, cost of goods manufactured, any number of things.

Q. Do you know Mr. Levy's title or position with Lightron?

A. I thought it was president of Lightron.

Q. And I'll ask you to look at one more document in this series.

A. Certainly.

(Defendants' Exhibit 10 was marked for identification and is attached hereto.)

Q. BY MR. MAZGANI: This looks to be an Assignment in October of 1987 from Lightron Corporation to Clopay. Were you still at the property as of 1987, you personally?

A. Yes. I'm trying to figure out when -- I'm trying to remember 1987 when I left. I can't remember whether it was the end of the year or the

beginning of the year. I know that just prior to my leaving that there was some kind of shake-up in the corporation, and they had -- they let Lou Schnitz go and they let Arnold Schnitz go right at -- I had given my notice, and then they had come in and let them go.

Q. Do you have a recollection as to why Lou and/or Arnold Schnitz were let go?

A. Specifics, again, it would only be speculation.

Q. To your knowledge, did Lightron -- excuse me. Did O.B. Masco continue to operate on the property after the lease was assigned to Clopay?

A. Yes.

Q. Do you know which company took over operations of the property after O.B. Masco?

A. Again, this is hearsay. But I believe they were bought by Kirsch Drapery Hardware Manufacturing Company.

Q. I think you mentioned that before. Can you spell that name?

A. K-i-r-s-c-h. They're someplace in the Midwest.

Q. But you have no knowledge of any of the post O.B. Masco operations on the property?

EXHIBIT 8

COPY

SOIL GAS SURVEY

American Racing Equipment
19200 South Reyes Avenue
Rancho Dominguez, CA 90221
(RWQCB SLIC NO. 1203)

Prepared for:
AMERICAN RACING EQUIPMENT
19200 South Reyes Avenue
Ranch Dominguez, CA 90211

EAI Project No. 2406

December 18, 2006

Prepared by:

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1.0 INTRODUCTION

This report constitutes a Soil Gas Survey for the real property identified as 19200 South Reyes Avenue, Rancho Dominguez, Los Angeles County, California 90221 (Site) (see Figure 1). The Site is currently occupied by American Racing Equipment (ARE), a manufacturer of aluminum alloy rims/wheels. Environmental Audit, Inc. (EAI) was retained by ARE to conduct a soil gas survey of the ARE Site.

1.1 BACKGROUND INFORMATION

In July 2006, ARE entered into a Spills, Leaks, Investigations and Cleanup (SLIC) oversight agreement with the RWQCB for the ARE Site. The RWQCB identifies the ARE Site as SLIC No. 1203. The RWQCB staff person assigned to the ARE Site is Mr. G. Jeffrey Hu.

On August 24, 2006, the RWQCB forwarded a letter to ARE requesting submittal of a comprehensive work plan for a complete assessment of the ARE Site. The letter states that the work plan shall focus on the investigation of historical sources and usage of volatile organic compounds (VOCs), metals, petroleum hydrocarbons and other contaminants in the vicinity of the following identified areas of concern:

- Hazardous materials storage areas throughout the site.
- Clarifier and sumps.
- Sewer line from process areas.
- Aboveground storage tanks (ASTs).
- All other locations on-site where hazardous materials have been or probably were stored, used, processed or generated.

The work plan shall include sampling protocol for collection, analysis and reporting of soil gas, soil and ground water samples, and construction of ground water gradient and contour map.

On October 6, 2006, EAI on behalf of ARE submitted a report for the ARE Site to the RWQCB entitled "*Site Assessment Work Plan*," dated October 6, 2006. The Work Plan outlined sampling locations for soil gas, soil and ground water with the understanding that additional soil and ground water sampling locations may be required based on the results of the soil gas survey.

On November 13, 2006, the RWQCB issued a conditional letter approving the Work Plan and requesting a report documenting the results of the soil gas survey by December 18, 2006.

1.2 SCOPE OF WORK

The scope of work included the collection of soil gas samples from the ARE Site at 5 and 15 feet below grade surface (bgs), analytical testing of soil gas samples for VOCs by EPA Methods 8260B and TO-15, and preparation of this report.

2.0 SAMPLING ACTIVITIES AND RESULTS

Soil gas sampling activities were conducted on November 16, 17 and 20, 2006, by H&P Mobile GeoChemistry (H&P) under the direct supervision of EAI staff (Mr. Brent Mecham). All fieldwork was completed in accordance with the EAI Health and Safety Plan for the ARE Site which is included as Appendix B of the Work Plan (see EAI, 2006).

2.1 APPROVALS AND PERMITS

The RWQCB issued an approval on November 13, 2006 to complete a soil gas survey of the ARE Site. No permits were required from any agency to complete the soil gas survey.

2.2 UTILITY CLEARANCE

Prior to initiating any fieldwork at the ARE Site, sampling locations were reviewed with ARE staff to determine if any locations had the potential to impact underground or overhead utilities, sampling locations were marked on the ground surface and Underground Service Alert (USA) was contacted. USA issued Ticket #A3121299 for this project.

2.3 RATIONALE FOR SOIL GAS SAMPLING STRATEGY

The soil gas sampling strategy was developed to address the presence or absence of VOCs beneath the ARE Site at depths of 5 and 15 feet bgs. As outlined in the Work Plan, the ARE Site was divided into 100' by 100' grid segments and soil gas samples collected and analyzed from the approximate center of each grid segment. For certain grid segments, more than one sample was collected to assess specific target areas requested by the RWQCB, e.g., hazardous materials storage areas, clarifiers, and sewer line from process areas, and for other areas less than one sample per segment was collected; i.e., areas used only for parking. Figure 2 depicts the grid segments and soil gas sampling locations. Twenty-four of the 30 grid segments are 100' by 100', and the six located along the eastern property line are smaller.

Soil gas sampling and analysis were conducted in accordance with the guidelines contained in the RWQCB and Department of Toxic Substances Control (DTSC) document titled "*Advisory - Active Soil Gas Investigations*," dated January 28, 2003, supplemented by the DTSC document titled "*Interim Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*," dated December 15, 2004, revised February 7, 2005. Soil gas samples were analyzed on-site by a mobile laboratory operated by H&P for VOCs by EPA Method 8260B, and two samples collected in Summa Canisters were analyzed by H&P at its fix-based laboratory for VOCs by EPA Method TO-15.

2.4 SOIL GAS SAMPLING METHODS AND PROCEDURES

A general description of the soil gas sampling collection procedures is provided below. Appendix A contains H&P's detailed field sampling procedures.

2.0 SAMPLING ACTIVITIES AND RESULTS

Thirty soil gas sample point locations were installed on the ARE Site as approximately depicted on Figure 2. Probes to 5 feet bgs were installed at all 30 locations, and probes to 15 feet bgs were installed at 15 of the 30 soil gas sampling locations, i.e., A1-1, A1-2, A3, A5, B1, B2, C1, C2, C3, D1, D2, E1, E2, E4 and E6 (see Figure 2). Due to access restrictions that precluded the use of a limited access rig and failure of manual methods to reach 15 feet bgs, it was not possible to install probes to 15 feet bgs at the other 15 sampling locations.

Probes were installed using both manual and hydraulic methods. Once the probe was driven to the desired sampling depth, the hollow probe drive-rods were withdrawn. A small diameter inert nylaflow tubing and filter were then inserted in the borehole to the desired depth. An on-off valve was placed on the tip of the tubing at the ground surface. Clean graded No. 3 kiln dried sand was poured around the tubing and filter to allow for diffusion of soil gas vapors. Each boring was then backfilled with granular hydrated bentonite to the surface.

The probes were allowed to equilibrate for at least 20 minutes, prior to collecting soil gas samples for analytical testing. Soil gas samples for on-site VOC analysis were collected from the inert tubing using a 20 to 60 cubic centimeter syringe connected via the on-off valve located at the surface tip of each probe. Each probe was then purged based on a pre-determined purge volume established by the purge volume test (see Section 2.4.1). A sample of the in-situ soil gas was then withdrawn and immediately transferred to the on-site H&P mobile laboratory for analytical testing within minutes of sample collection.

Soil gas samples were also collected from sample locations B1@5' and E1@15' using Summa Canisters. The Summa Canisters contained a choke that evacuated the canister at a rate of about 150 milliliters per minute. The Summa Canister samples were analyzed off-site for VOCs.

2.4.1 Purge Volume Test

A purge volume test was conducted at the beginning of the soil gas survey to purge ambient air from the sampling system to ascertain the purge volume with the highest concentration. Gas from sample location A5@5' was purged of one, three and seven volumes and each sample was analyzed on-site for VOCs. No VOCs were detected in the one, three or seven purge volume samples (see Table 1). Three purge volumes were used for all remaining soil gas samples.

2.4.2 Use of Tracer Compound to Ensure Probe Seal Integrity

A tracer compound, 1,1-difluoroethane, was used to test for leaks around the probe at the ground surface and in the sampling system. The tracer was placed around the base of the probe barrel and at the top of the probe barrel during sample collection. Each soil gas sample was analyzed for 1,1-difluoroethane, the presence of which confirms a leak. No 1,1-difluoroethane was detected (see Appendix B).

2.0 SAMPLING ACTIVITIES AND RESULTS

2.5 SAMPLE CONTAINERS

H&P provided the syringes and Summa Canisters used to collect the soil gas samples.

2.6 SAMPLE IDENTIFICATION, DOCUMENTATION, PACKAGING AND SHIPPING

To identify and manage the samples collected in the field, a sample label was affixed to each sample container. Each sample label included at a minimum, a sample identification number, purge volume, date, and time of sample collection. All samples were logged on chain of custody records forms (see Appendix B).

2.7 ANALYTICAL PROGRAM AND RESULTS

Soil gas samples were analyzed by H&P using a mobile and its fixed-base laboratory. Fifty-four soil gas samples were collected for analysis, i.e., 47 field samples, five duplicate samples, and two confirmation samples in Summa Canisters. Thirty-seven soil gas samples were collected from depths of 5 feet bgs, and 17 from depths of 15 feet bgs.

The field and duplicate samples were analyzed on-site for VOCs by EPA Method 8260B, and the Summa Canister samples for VOCs by EPA Method TO-15. The results of the on-site testing are summarized on Table 1 and the Summa Canister results on Table 2. Appendix B contains the chain of custody records and laboratory reports.

The following chemicals were detected in soil gas beneath the Site:

- 1,1-Dichloroethene (1,1-DCE)
- Freon 113 (a.k.a., 1,1,2-Trichloro-1,2,2-trifluoroethane)
- 1,1-Dichloroethane (1,1-DCA)
- cis-1,2-Dichloroethene (cis-1,2-DCE)
- 1,1,1-Trichloroethane (1,1,1-TCA)
- Trichloroethene (TCE)
- Benzene
- Toluene
- Tetrachloroethene (PCE)
- Xylenes
- Ethylbenzene
- Trichlorofluoromethane
- Acetone
- 2-Butanone
- n-Hexane
- Cyclohexane
- Styrene

- 4-Ethyltoluene
- 1,3,5-Trimethylbenzene (1,3,5-TMB)
- 1,2,4-Trimethylbenzene (1,2,4-TMB)

Listed below are the frequency of detection and the maximum concentration of each chemical detected at 5 and 15 feet bgs (see Table 3 and Table 4, respectively).

Chemical	Maximum Concentration 5 feet bgs (ug/l)	Detection Frequency 5 feet bgs	Maximum Concentration 15 feet bgs (ug/l)	Detection Frequency 15 feet bgs
1,1-DCE	0.1	2/37 (5%)	1.5	3/17 (18%)
Freon 113	0.7	3/37 (8%)	1.4	3/17 (18%)
1,1-DCA	0.1	1/37 (3%)	0.2	1/17 (6%)
cis-1,2-DCE	ND	0/37	0.3	1/17 (6%)
1,1,1-TCA	0.5	8/37 (22%)	2.6	7/17 (41%)
TCE	0.5	3/37 (8%)	6.9	4/17 (24%)
Benzene	0.2	3/37 (8%)	0.088	1/17 (6%)
Toluene	0.5	7/37 (19%)	0.27	1/17 (6%)
PCE	8.9	16/37 (43%)	150	14/17 (82%)
T. Xylenes	0.5	10/37 (27%)	0.31	1/17 (6%)
Ethylbenzene	0.043	1/37 (3%)	0.078	1/17 (6%)
Trichlorofluoromethane	ND	0/37	0.005	1/17 (6%)
Acetone	0.1	1/1 (100%)	ND	0/1
2-Butanone	ND	0/1	0.11	1/1 (100%)
n-Hexane	ND	0/1	0.0051	1/1 (100%)
Cyclohexane	ND	0/1	0.19	1/1 (100%)
Styrene	ND	0/1	0.0061	1/1 (100%)
4-Ethyltoluene	0.02	1/1 (100%)	0.034	1/1 (100%)
1,3,5-TMB	0.018	1/1 (100%)	0.033	1/1 (100%)
1,2,4-TMB	0.089	1/1 (100%)	0.15	1/1 (100%)

3.0 HUMAN HEALTH SCREENING EVALUATION

3.1 TIER 1

In order to determine if the VOC concentrations detected in soil gas beneath the ARE Site require further evaluation from a human health exposure perspective, EAI compared the highest VOC concentrations detected in soil gas at 5 feet bgs to California Human Health Screening Levels (CHHSLs) developed for residential and industrial/commercial land use (see Cal-EPA, 2005). Note CHHSLs have not been developed for soil gas concentrations at depths greater than 5 feet bgs.

Table 3 compares the VOC concentrations detected at 5 feet bgs with residential and industrial CHHSLs. Benzene and PCE were the only chemicals detected above CHHSLs established for industrial/commercial land use.

Benzene was detected in 3 of the 37 soil gas samples collected from 5 feet bgs, i.e., 8% of the samples. However, benzene was detected at only one location (B4-2@5') where the concentration detected (0.2 ug/l) exceeds the 0.122 ug/l CHHSL established for industrial/commercial land use. Sample location B4-2 is located inside the Main Building near the existing Clarifier and California Regulated Unit (see Figure 3).

PCE was detected in 16 of the 37 soil gas samples collected from 5 feet bgs, i.e., 43% of the samples. Of the 16 sampling locations where PCE was detected, only four of the locations had PCE concentrations equal to or above the 0.603 ug/l CHHSL established for industrial/commercial land use. The highest PCE concentrations detected, i.e., 1.1 ug/l at sample location B1 and 8.9 ug/l at sample location C1 are not beneath any of the structures located on the ARE Site, but are located along the main sewer line located northwest of the Foundry Building (see Figure 3). The other two sample locations, i.e., A2 and D4-2, had PCE concentrations of 0.6 ug/l. Sample location A2 is located beneath the Foundry Building and sample location D4-2 beneath the Main Building in an area identified to formerly contain a parts washer (see Figure 3).

Based on the above and the fact that there are no CHHSL standards for soil gas concentrations at 15 feet bgs, EAI proceeded with a Tier 2 human health screening evaluation. Figure 4 depicts the TCE and PCE concentrations detected in soil gas at 15 feet.

3.2 TEIR 2

A human health screening evaluation was completed to determine if the VOCs detected in soil gas beneath the ARE Site are problematic. This screening evaluation for human health effects involves identifying chemicals of concern, evaluating exposure pathways and media of concern, assessing chemical toxicity, and subsequently, characterizing risks. Estimated health risks are based on a calculated dose (i.e., the amount of chemical intake), which integrates exposure parameters for the receptors of concern (e.g., contact rates, exposure frequency and duration), with chemical-specific toxicity criteria (e.g., reference doses and slope factors) and exposure concentrations for the media of concern. The calculated risks are then compared to

health-based guidelines developed by DTSC. For the purpose of this screening evaluation, the potential risks are calculated based on an industrial/commercial land-use scenario.

Exposure to chemicals can only occur if there is a complete pathway by which chemicals in site soil, water, or air can be contacted by humans. Therefore, the evaluation of exposure pathways and media of concern is the first step in the human health screening evaluation. The results of the human health screening evaluation for indoor air soil gas intrusion are summarized in the risk characterization section.

3.2.1 Chemicals of Concern

The chemicals detected in soil gas samples collected from beneath the Site at 5 and/or 15 feet are (see Table 3 and Table 4, respectively):

- 1,1-DCE
- Freon 113
- 1,1-DCA
- cis-1,2-DCE
- 1,1,1-TCA
- TCE
- Benzene
- Toluene
- PCE
- Xylenes
- Ethylbenzene
- Trichlorofluoromethane
- Acetone
- 2-Butanone
- n-Hexane
- Cyclohexane
- Styrene
- 4-Ethyltoluene
- 1,3,5-TMB
- 1,2,4-TMB

3.2.2 Exposure Pathways

In this screening risk assessment, exposure to vapors intruded into indoor air was evaluated for the VOCs detected in soil vapor at 5 and 15 feet bgs. In accordance with the Preliminary Endangerment Assessment Guidance Manual (see DTSC, 1999), exposures to chemicals at the ARE Site were evaluated assuming industrial/commercial exposures, i.e., a continuous 25-year exposure.

3.2.2.1 Air Exposure Pathway

VOC's were detected in soil gas beneath the Site. Exposure to human receptors may occur through infiltration of soil gas into the indoor space. To evaluate the health risk, the upper 95 percent confidence level of the concentrations for all of the VOCs detected in soil gas were input in the DTSC version of SG-Screen Model (see DTSC, 2005).

Since the ARE Site is almost entirely covered with asphalt pavement, concrete pavement or buildings, i.e., no potential for direct contact with soil, no other exposure pathways were considered.

3.2.3 Exposure Concentrations and Chemicals

Table 3 and Table 4 summarize the VOCs detected in soil gas at 5 and 15 feet, respectively. The upper 95 percent confidence level of each chemical detected was used as the exposure point concentration.

3.2.4 Toxicity Values

The toxicity assessment characterizes the relationship between the magnitude of exposure to chemicals of concern, and the nature and magnitude of adverse health effects that may result from such exposure. For purposes of calculating exposure criteria to be used in risk assessments, adverse health effects are classified into two broad categories, non-carcinogens and carcinogens. Toxicity values/exposure criteria are generally developed based on the threshold approach for non-carcinogenic effects and the non-threshold approach for carcinogenic effects. Toxicity values may be based on epidemiological studies, short-term human studies, and subchronic or chronic animal data.

3.2.4.1 Carcinogenic Health Effects

Certain chemicals are regulated as carcinogens based on the likelihood that exposure could cause cancer in humans. Numerical estimates of cancer potency for these chemicals are presented as cancer slope or potency factors. The cancer potency factor defines the cancer risk due to constant lifetime exposure to one unit of a carcinogen (units of risk per $ug/m^3)^{-1}$. Cancer potency factors are derived by calculating the upper 95 percent confidence level on the slope of the linearized portion of the dose-response curve using the multistage cancer model on study data. Use of the upper 95 percent confidence level of the slope means that there is only a 5 percent chance that the probability of a response could be greater than the estimated value for the experimental data used. This is a conservative approach and may overestimate the actual risk given that the actual risk is expected to be between zero and the calculated value. Carcinogenicity potency factors assume no threshold for effect, i.e., all exposures to a chemical are assumed to be associated with some risk, i.e., there is no threshold below which the risk is negligible or unlikely. If there are thresholds for

carcinogenicity, the true risks could be zero at sufficiently low doses. Table 5 presents the cancer potency factors used in this health risk assessment.

3.2.4.2 Non-Carcinogenic Health Effects

A range of exposures is assumed to exist from zero to some finite value (a threshold) that can be tolerated by the organism without appreciable risk of an adverse health effect occurring for the purposes of assessing risks associated with non-carcinogenic effects.

Non-carcinogenic health effects were evaluated using reference concentrations (RfCs) developed by the EPA. The RfC is a health-based criterion based on the assumption that thresholds exist for non-carcinogenic toxic effects (e.g., lung or liver damage). In general, the RfC is an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious health effects during a lifetime of exposure. RfCs are expressed as acceptable daily doses in mg/m^3. Table 5 presents the RfCs used in this health risk assessment.

3.2.5 Risk Characterization Summary

Risk characterization integrates the quantitative and qualitative results of data evaluation, exposure, and toxicity assessments. The purpose is to estimate the likelihood, incidence, and nature of potential human health effects to defined receptor populations that may occur as a result of exposure to the chemicals of concern at the project site.

A total of twenty VOCs were identified in soil gas samples collected from the ARE Site. Table 6 summarizes the chemical specific cancer and non-cancer risks for the VOCs detected in soil gas beneath the ARE Site at 5 feet, and Table 7 the risks for VOCs detected at 15 feet.

3.2.5.1 Carcinogenic Risks

Carcinogenic risks are expressed as the upper-bound, increased likelihood of an individual developing cancer as a result of exposure to a particular chemical. For example, a cancer risk of 1×10^{-6} (one per million) refers to an upper-bound increased chance of one person developing cancer assuming one million people are exposed. The potential increase in cancer risk from exposure to chemicals detected in soil gas is in addition to a background risk of developing cancer. The background cancer risk is about one in three (0.33) for every American female, and one in two (0.5) for every American male of eventually developing cancer (see ACS, 1997). A cancer risk of 10 per million or less is typically considered acceptable for an industrial/commercial land-use scenario.

The results of the cancer risk calculation for the air exposure pathway at 5 feet bgs derived from the DTSC SG-Screen Model (see Appendix C), are provided in Table 6, and for 15 feet

in Table 7 (see Appendix D). The cancer risks are 1.2×10^{-6} or about 1.2 per million for 5 feet, and 9.9×10^{-6} or about 10 per million for 15 feet.

3.2.5.2 Non-Carcinogenic Health Hazards

The potential for noncarcinogenic effects due to exposure to a particular chemical is expressed as the hazard quotient. A hazard quotient is the ratio of the estimated intake or average daily dose of a chemical to the corresponding chemical-specific toxicity value or RfC. The hazard quotients are then compared to an acceptable hazard level. Implicit in the hazard quotient is the assumption of a threshold level of exposure below which no adverse effects are expected to occur. If the hazard quotient exceeds 1.0 (i.e., site specific exposures would exceed the RfC), then the potential for non-carcinogenic adverse effects may exist. Hazard quotients less than 1.0 indicate that no adverse health effects are expected to occur from exposure to chemicals of concern at the project site.

The hazard index for the inhalation pathway was calculated using the DTSC SG-Screen Model (see Appendix C and Appendix D). The hazard indexes are 0.0177 for 5 feet and 0.116 for 15 feet.

3.2.6 Uncertainty Analysis

The purpose of a risk assessment is not to predict the actual risk of exposure to an individual. Risk assessments are a management tool for developing conservative estimates of health hazards that are unlikely to underestimate the true risk for potentially exposed populations. The numerical estimates in a risk assessment have associated uncertainties reflecting the limitations in available knowledge about site concentrations, exposure assumptions (e.g., exposure concentrations, intake rates) and chemical toxicity. Where information is incomplete, conservative assumptions (assumptions that err on being overprotective) are made. The greater the uncertainty, the more conservative are the assumptions, in an attempt to be protective of public health. In other words, although calculations of exposure often must be simplified to a few pathways or subgroups within a population, the simplifying assumptions should be more likely to overestimate than underestimate risk so that public health is protected regardless of the other unknown conditions. Even when actual characteristics of a population are known, assumptions on exposure are often biased toward producing over protective rather than under protective health risk estimates for most of the population.

Risk assessment procedures are thus designed to result in a conservative estimate of risk in order to be protective of the majority of the population and to compensate for uncertainties inherent in estimating exposure and toxicity.

Results of the Tier 2 screening evaluation indicate a cancer risk of about 1.2 per million for 5 feet and about 10 per million for 15 feet, both of which are acceptable for an industrial/commercial land-use scenario.

3.0 HUMAN HEALTH SCREENING EVALUATION

Both the carcinogenic and hazard risks were based upon use of the upper 95 percent confidence level of the concentrations for all of the VOCs detected in soil gas beneath the ARE Site. For example, PCE was detected at an elevated level in only one of the 17 soil gas samples collected from 15 feet, and about 92% of the cancer risk (9.6 per million) is based on PCE. If a site-wide average of the detected values for PCE were used in determining the carcinogenic and hazard risks, the results of the risk assessment would be considerably lower.

In summary, every aspect of the risk assessment contains multiple sources of uncertainty. Simplifying assumptions are made so that health risks can be estimated quantitatively. Because the exact amount of uncertainty cannot be quantified, the risk assessment is intended to overestimate rather than underestimate probable risk. The results of the assessment therefore, are likely to be protective of human health despite the inherent uncertainties in the process.

4.0 DISCUSSION

The primary reason why the RWQCB requested ARE enter into a SLIC oversight agreement was based on analytical data associated with ground water monitoring well MW-7 installed on the ARE Site in October 2005. Well MW-7 was installed as part of assessment work associated with the Clopay Site and ERC Site located immediately north of the ARE Site across the flood control channel (see Figure 5). Soil samples collected from well MW-7 indicated PCE in vadose zone soils between five and 35 feet bgs at concentrations ranging between 12 and 292 micrograms per kilogram (ug/kg) and no detectable concentrations of TCE in vadose zone soils. Ground water samples collected from well MW-7 in October 2005 and December 2005 indicated the following concentrations of PCE and TCE:

WELL	DATE	PCE (ug/l)	TCE (ug/l)
MW-7	10/21/05	5,770	137
	12/20/05	34,600	475

Data from ground water monitoring reports associated with the Clopay Site and ERC Site had indicated that the ARE Site was down-gradient from these properties. After installation of ground water wells MW-6 and MW-7 the gradient has been interpreted differently.

If ARE was the source of the PCE and/or TCE detected in ground water associated with any of the wells currently located on the ARE Site, the concentrations detected in soil gas beneath the ARE Site should have been many orders of magnitude higher than any concentration detected as part of this investigation. Data from this investigation supports ARE's position that it is not a source of ground water contamination in the area of or beneath the ARE Site.

5.0 PROPOSED MEDIA SAMPLING AND TESTING

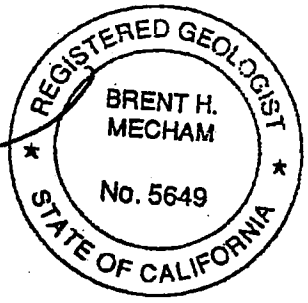
As outlined in the Work Plan (see EAI, 2006), data from the soil gas survey will be reviewed and evaluated to determine if locations proposed for borings and/or ground water wells should be modified. Based on the results of the soil gas survey, we have moved one of the proposed wells to south of the Foundry and reduced the number of borings around the Hazardous Waste/Drum Storage Area from five to three (see Figure 6). Otherwise, the soil and ground water sampling and testing will be completed as outlined in the Work Plan.

6.0 LIMITATION

Our professional services have been performed using that degree of knowledge, diligence, care and skill ordinarily exercised, under similar circumstances, by reputable environmental consultants practicing in this or similar localities at this time. EAI assumes that information provided by third parties is true, accurate and reliable. This report has been prepared for American Racing Equipment. The conclusions and recommendations contained in this report are based on information contained and/or referenced herein, and our best judgment. No other warranty, expressed or implied, is made as to the professional advice contained in this report.

Respectfully submitted,

ENVIRONMENTAL AUDIT, INC.



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7.0 REFERENCES

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Department of Toxic Substances Control, "Interim Final, Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air," dated December 15, 2004, Revised February 7, 2005 (DTSC, 2005).

Environmental Audit, Inc., "Site Assessment Work Plan American Racing Equipment, 19200 South Reyes Avenue, Ranch Dominguez, CA 90221 (RWQCB SLIC No. 1203)," dated October 6, 2006 (EAI, 2006).

TABLES

TABLE 1
SUMMARY OF 8260B SOIL GAS TESTING RESULTS
American Racing Equipment
19200 South Reyes Avenue, Rancho Dominguez, CA 90221
(concentrations in micrograms per liter - ug/l)

Sample ID	Date	1,1-DCE	Freon 113	1,1-DCA	cis-1,2-DCE	1,1,1-TCA	1,2-DCA	TCE	Benzene	Toluene	PCE	Total Xylenes
A1-1@5'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.3	ND<0.1	ND<0.1
A1-1@15'	11/20/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.5	ND<0.1
A1-2@5'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.3	0.1	ND<0.1
A1-2@15'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.3	0.6	ND<0.1
A2@5'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	0.4	ND<0.1	0.3	ND<0.1	0.5	0.6	0.1
A3@5'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.3	ND<0.1	ND<0.1
A3@15'	11/20/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	0.3	ND<0.1	0.5	ND<0.1	ND<0.1	0.4	ND<0.1
A5@5' (1)	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.3	ND<0.1	ND<0.1
A5@5' (3)	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.3	ND<0.1	ND<0.1
A5@5' (7)	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.3	ND<0.1	ND<0.1
A5@15'	11/20/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1
A5@15' D	11/20/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1
B1@5'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.3	1.1	ND<0.1
B1@15'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	0.3	ND<0.1	1.9	ND<0.1	ND<0.1	37	ND<0.1
B2@5'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1
B2@15'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.4	ND<0.1
B3@5'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.2	ND<0.1
B3@5' D	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.2	ND<0.1
B4-1@5'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1
B4-2@5'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.2	0.4	ND<0.1	ND<0.1
B4-2@5' D	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.2	0.4	ND<0.1	ND<0.1

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American Racing Equipment
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Sample ID	Date	1,1-DCE	Freon 113	1,1-DCA	cis-1,2-DCE	1,1,1-TCA	1,2-DCA	TCE	Benzene	Toluene	PCE	Total Xylenes
B5-1@5'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1
B5-2@5'	11/20/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.4	ND<0.1	0.5
C1@5'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	0.1	ND<0.1	0.2	ND<0.1	ND<0.1	3.1	ND<0.1
C1@5' D	11/16/06	0.1	ND<0.5	ND<0.1	ND<0.1	0.2	ND<0.1	0.5	ND<0.1	ND<0.1	8.9	ND<0.1
C1@15'	11/16/06	1.5	ND<0.5	ND<0.1	0.3	2.6	ND<0.1	6.9	ND<0.1	ND<0.1	150	0.1
C2@5'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.5	ND<0.1
C2@15'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	1.9	ND<0.1
C3-1@5'[a]	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.1
C3-1@15'[a]	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.6	ND<0.1
C3-2@5'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1
C4@5'	11/20/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.1	ND<0.1
C5@5'	11/20/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.4
C6@5'	11/20/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.2
D1@5'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.3	0.2	0.1
D1@15'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	4.8	ND<0.1
D2@5'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.1	ND<0.1
D2@15'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.2	ND<0.1
D3@5'	11/17/06	ND<0.1	0.5	ND<0.1	ND<0.1	0.2	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1

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Sample ID	Date	1,1-DCE	Freon 113	1,1-DCA	cis-1,2-DCE	1,1,1-TCA	1,2-DCA	TCE	Benzene	Toluene	PCE	Total Xylenes
D4-1@5'	11/20/06	ND<0.1	0.7	ND<0.1	ND<0.1	0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.2	0.4
D4-2@5'	11/20/06	ND<0.1	0.5	ND<0.1	ND<0.1	0.4	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.6	0.4
D5@5'	11/20/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.2	0.2
D6@5'	11/20/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1
E1@5'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.3	0.1	ND<0.1
E1@15'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.3	ND<0.1
E2@5'	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.3	ND<0.1
E2@15'	11/17/06	0.3	1.4	ND<0.1	ND<0.1	0.3	ND<0.1	0.2	ND<0.1	ND<0.1	0.3	ND<0.1
E4@5'	11/16/06	0.1	ND<0.5	0.1	ND<0.1	0.2	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1
E4@5' D	11/16/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	0.2	ND<0.1	ND<0.1	ND<0.1	0.3	ND<0.1	ND<0.1
E4@15'	11/117/06	1	0.6	0.2	ND<0.1	0.7	ND<0.1	ND<0.1	ND<0.1	ND<0.1	0.1	ND<0.1
E6@5'	11/17/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1
E6@15'	11/20/06	ND<0.1	ND<0.5	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1	ND<0.1

Unless indicated otherwise, all samples were collected after three purge volumes

(1) = One purge volume
(3) = Three purge volumes
(7) = Seven purge volumes
(a) = Identified in laboratory report as sample C3
D = Duplicate sample
ND< = Not detected at reporting limit listed

1,1-DCE = 1,1-Dichloroethene
1,1-DCA = 1,1-Dichloroethane
cis-1,2-DCE = cis-1,2-Dichloroethene
1,1,1-TCA = 1,1,1-Trichloroethane
1,2-DCA = 1,2-Dichloroethane
TCE = Trichloroethene
PCE = Tetrachloroethene

TABLE 2
SUMMARY OF SUMMA CANISTER SOIL GAS TESTING RESULTS
American Racing Equipment
19200 South Reyes Avenue, Rancho Dominguez, CA 90221

Chemical	B1@5'		E1@15'	
	(ug/m^3)	(ug/l)	(ug/m^3)	(ug/l)
Trichlorofluoromethane	ND<10	ND<0.01	5	0.005
Acetone	100	0.1	ND<20	ND<0.02
1,1,2-Trichlorotrifluoroethane	ND<20	ND<0.02	140	0.14
2-Butanone	ND<10	ND<0.01	110	0.11
n-Hexane	ND<10	ND<0.01	5.1	0.0051
1,1,1-Trichloroethane	ND<10	ND<0.01	54	0.054
Benzene	12	0.012	88	0.088
Cyclohexane	ND<10	ND<0.01	190	0.19
Toluene	240	0.24	270	0.27
Tetrachloroethene	ND<10	ND<0.01	630	0.63
Ethylbenzene	43	0.043	78	0.078
Total Xylenes	178	0.178	310	0.31
Styrene	ND<10	ND<0.01	6.1	0.0061
4-Ethyltoluene	20	0.02	34	0.034
1,3,5-Trimethylbenzene	18	0.018	33	0.033
1,2,4-Trimethylbenzene	89	0.089	150	0.15

For consistency with on-site soil gas testing results (see Table 1), Summa Canister results provided in ug/m^3 were converted to ug/l by dividing the ug/m^3 concentrations by 1,000

ND< = Not detected at reporting limit listed

TABLE 3
STATISTICAL SUMMARY OF VOCs DETECTED IN SOIL GAS AT 5 FEET
American Racing Equipment
19200 South Reyes Avenue, Rancho Dominguez, CA 90221
(concentrations in micrograms per liter - ug/l)

Sample ID	Date	1,1-DCE	Freon 113	1,1-DCA	1,1,1-TCA	TCE	Benzene	Toluene	PCE	Total Xylenes	Ethyl-Benzene	4-Ethyl-Toluene	1,3,5-TMB	1,2,4-TMB	Acetone
A1-1@5'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
A1-2@5'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.1	*0.05*	NA	NA	NA	NA	NA
A2@5'	11/17/06	*0.05*	*0.25*	*0.05*	0.4	0.3	*0.05*	0.5	[redacted]	0.1	NA	NA	NA	NA	NA
A3@5'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
A5@5' (1)	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
A5@5' (3)	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
A5@5' (7)	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
B1@5'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	[redacted]	*0.05*	NA	NA	NA	NA	NA
B1@5' S	11/16/06	*0.005*	*0.01*	*0.01*	*0.005*	*0.005*	0.012	0.24	0.005	0.178	0.043	0.02	0.018	0.089	0.1
B2@5'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
B3@5'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.2	*0.05*	NA	NA	NA	NA	NA
B3@5' D	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.2	*0.05*	NA	NA	NA	NA	NA
B4-1@5'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
B4-2@5'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	[redacted]	0.4	*0.05*	*0.05*	NA	NA	NA	NA	NA
B4-2@5' D	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	[redacted]	0.4	*0.05*	*0.05*	NA	NA	NA	NA	NA
B5-1@5'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
B5-2@5'	11/20/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	0.4	*0.05*	0.5	NA	NA	NA	NA	NA
C1@5'	11/16/06	*0.05*	*0.25*	*0.05*	0.1	0.2	*0.05*	*0.05*	[redacted]	*0.05*	NA	NA	NA	NA	NA
C1@5' D	11/16/06	0.1	*0.25*	*0.05*	0.2	0.5	*0.05*	*0.05*	[redacted]	*0.05*	NA	NA	NA	NA	NA
C2@5'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.5	*0.05*	NA	NA	NA	NA	NA
C3@5'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.1	NA	NA	NA	NA	NA
C3-2@5'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
C4@5'	11/20/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.1	*0.05*	NA	NA	NA	NA	NA
C5@5'	11/20/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.4	NA	NA	NA	NA	NA
C6@5'	11/20/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.2	NA	NA	NA	NA	NA
D1@5'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	0.3	0.2	0.1	NA	NA	NA	NA	NA
D2@5'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.1	*0.05*	NA	NA	NA	NA	NA
D3@5'	11/17/06	*0.05*	0.5	*0.05*	0.2	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
D4-1@5'	11/20/06	*0.05*	0.7	*0.05*	0.5	*0.05*	*0.05*	*0.05*	0.2	0.4	NA	NA	NA	NA	NA
D4-2@5'	11/20/06	*0.05*	0.5	*0.05*	0.4	*0.05*	*0.05*	*0.05*	[redacted]	0.4	NA	NA	NA	NA	NA
D5@5'	11/20/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.2	0.2	NA	NA	NA	NA	NA
D6@5'	11/20/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA

TABLE 3
STATISTICAL SUMMARY OF VOCs DETECTED IN SOIL GAS AT 5 FEET
American Racing Equipment
19200 South Reyes Avenue, Rancho Dominguez, CA 90221
(concentrations in micrograms per liter - ug/l)

Sample ID	Date	1,1-DCE	Freon 113	1,1-DCA	1,1,1-TCA	TCE	Benzene	Toluene	PCE	Total Xylenes	Ethyl-Benzene	4-Ethyl-Toluene	1,3,5-TMB	1,2,4-TMB	Acetone
E1@5'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.1	*0.05*	NA	NA	NA	NA	NA
E2@5'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	0.3	*0.05*	NA	NA	NA	NA	NA
E4@5'	11/16/06	0.1	*0.25*	0.1	0.2	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
E4@5' D	11/16/06	*0.05*	*0.25*	*0.05*	0.2	*0.05*	*0.05*	0.3	*0.05*	*0.05*	NA	NA	NA	NA	NA
E6@5'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA
Number of Samples		37	37	37	37	37	37	37	37	37	1	1	1	1	1
MAXIMUM		0.1	0.7	0.1	0.5	0.5	0.2	0.5	8.9	0.5	0.043	0.020	0.018	0.089	0.1
MEAN		0.051	0.269	0.050	0.097	0.072	0.057	0.109	0.473	0.106	–	–	–	–	–
Standard Deviation		0.014	0.102	0.011	0.113	0.087	0.035	0.129	1.519	0.120	–	–	–	–	–
95% UCL [1]		0.056	0.303	0.054	0.135	0.101	0.069	0.152	0.980	0.146	–	–	–	–	–
CHHSL -R		NE	NE	NE	991	0.528	0.0362	135	0.18	315	NE	NE	NE	NE	NE
CHHSL - I		NE	NE	NE	2,790	1.77	0.122	378	0.603	879	NE	NE	NE	NE	NE

For those samples reported as non-detected one-half of the detection limit was used for purposes of calculating the mean concentration. Concentrations reported in *italic* are the locations reported as non-detected.

NA = Not analyzed for this chemical

D = Duplicate sample

S = Sample collected in Summa Canister

(1) = Using Student 's Distribution Coefficient of 2.029

[redacted] Concentration detected meets or exceeds commercial/industrial CHHSL

CHHSL - R = California Human Health Screening Level for shallow soil gas - residential land use

CHHSL - I = California Human Health Screening Level for shallow soil gas - commercial/industrial land use

NE = CHHSLs not established

TABLE 4
STATISTICAL SUMMARY OF VOCs DETECTED IN SOIL GAS AT 15 FEET
American Racing Equipment
19200 South Reyes Avenue, Rancho Dominguez, CA 90221
(concentrations in micrograms per liter - ug/l)

Sample ID	Date	1,1-DCE	Freon 113	1,1-DCA	cis-1,2-DCE	1,1,1-TCA	TCE	PCE	Total Xylenes	Benzene	Toluene	Ethyl-Benzene	Hexane	Cyclohexane	Styrene	4-Ethyl-Toluene	2-Butanone	1,3,5-TMB	1,2,4-TMB	TCFM
A1-1@15'	11/20/06	*0.05*	*0.25*	*0.05*	*0.05*	0.1	*0.05*	0.5	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A1-2@15'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	0.6	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A3@15'	11/20/06	*0.05*	*0.25*	*0.05*	*0.05*	0.3	0.5	0.4	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A5@15'	11/20/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
A5@15' D	11/20/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B1@15'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	0.3	1.9	37	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B2@15'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	0.4	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C1@15'	11/16/06	1.5	*0.25*	*0.05*	0.3	2.6	6.9	150	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C2@15'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	1.9	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C3@15'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	0.6	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D1@15'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	4.8	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D2@15'	11/17/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	0.2	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E1@15'	11/16/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	0.3	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E1@15' S	11/16/06	*0.005*	0.14	*0.005*	*0.005*	0.054	*0.005*	0.63	0.31	0.088	0.27	0.078	0.0051	0.19	0.0061	0.034	0.11	0.033	0.15	0.005
E2@15'	11/17/06	0.3	1.4	*0.05*	*0.05*	0.3	0.2	0.3	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E4@15'	11/17/06	1.0	0.6	0.2	*0.05*	0.7	*0.05*	0.1	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E6@15'	11/20/06	*0.05*	*0.25*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Number of Samples		17	17	17	17	17	17	17	17	1	1	1	1	1	1	1	1	1	1	1
MAXIMUM		1.5	1.4	0.2	0.3	2.6	6.9	150	0.31	0.088	0.27	0.078	0.0051	0.19	0.0061	0.034	0.11	0.033	0.15	0.005
MEAN		0.203	0.332	0.056	0.062	0.286	0.594	11.64	0.068	--	--	--	--	--	--	--	--	--	--	--
Standard Deviation		0.409	0.290	0.039	0.062	0.621	1.687	36.74	0.063	--	--	--	--	--	--	--	--	--	--	--
95% UCL [1]		0.413	0.481	0.076	0.094	0.605	1.462	30.53	0.101	--	--	--	--	--	--	--	--	--	--	--

For those samples reported as non-detected one-half of the detection limit was used for purposes of calculating the mean concentration. Concentrations reported in *Italic* are the locations reported as non-detected.

NA = Not analyzed for this chemical

D = Duplicate sample

S = Sample collected in Summa Canister

(1) = Using Student's Distribution Coefficient of 2.12

TABLE 5
TOXICITY CRITERIA - HUMAN HEALTH SCREENING EVALUATION
American Racing Equipment
19200 South Reyes Avenue, Rancho Dominguez, CA 90221

Chemicals of Concern	Unit Risk Factor (URF) $(ug/m^3)^{-1}$	Reference Concentration (RfC) (mg/m^3)
Acetone	NC	3.5E-01
Benzene	2.9E-05	3.0E-02
2-Butanone	NC	5.0E+00
Cyclohehane	NC	6.0E+00(1)
1,1-Dichloroethane (1,1-DCA)	1.6E-06	5.0E-01
1,1-Dichloroethene (1,1-DCE)	NC	7.0E-02
cis-1,2-Dichloroethene (1,2-DCE)	NC	3.5E-02
Ethylbenzene	NC	1.0E+00
4-Ethyltoluene	NC	2.0E-01(2)
n-Hexane	NC	2.0E-01
Styrene	NC	9.0E-01
Tetrachloroethene (PCE)	5.9E-06	3.5E-02
1,1,2-Trichloro-1,2,2-Triflouroethane (Freon113)	NC	3.0E+01
Trichlofluoromethane	NC	7.0E-01
1,1,1-Trichlorethane (1,1,-TCA)	NC	1.0E+00
Trichloroethene (TCE)	2.0E-06	6.0E-01
Toluene	NC	3.0E-01
1,2,4-Trimethylbenzene (1,2,4-TMB)	NC	5.95E-03
1,3,54-Trimethylbenzene (1,3,5-TMB)	NC	5.95E-03
Xylenes	NC	2.12E-01

Toxicity data are from DTSC Johson - Ettinger Model Database
(1) = EPA IRIS
(2) = No data available; therefore, used data for 1,2,4 TMB

TABLE 6
RISK CALCULATIONS FOR INDOOR VAPOR INTRUSION AT 5 FEET
American Racing Equipment
19200 South Reyes Avenue, Rancho Dominguez, CA 90221

Chemical	95% UCL[(1)] (ug/L)	URFi $(ug/m^3)^{-1}$	RfCi (mg/m^3)	Cancer Risk	Hazard Quotient
Acetone	0.1	NC	3.5E-01	NA	1.4E-04
Benzene	0.069	2.9E-05	3.0E-02	3.3E-07	8.9E-04
1,1-Dichloroethane (1,1-DCA)	0.054	1.6E-06	5.0E-01	1.3E-08	3.7E-05
1,1-Dichloroethene (1,1-DCE)	0.056	NC	7.0E-02	NA	3.1E-04
Ethylbenzene	0.043	NC	1.0E+00	NA	1.5E-05
Tetrachloroethene (PCE)	0.98	5.9E-06	3.5E-02	8.3E-07	9.3E-03
1,1,2-Trichloro-1,2,2-Triflouroethane (Freon113)	0.303	NC	3.0E+01	NA	3.6E-06
1,1,1-Trichloroethane (1,1,1-TCA)	0.135	NC	1.0E+00	NA	4.8E-05
Trichloroethene (TCE)	0.101	2.0E-06	6.0E-01	3.1E-08	6.0E-05
Toluene	0.152	NC	3.0E-01	NA	1.9E-04
1,2,4-Trimethylbenzene (1,2,4-TMB)[(2)]	0.109	NC	5.95E-03	NA	5.3E-03
1,3,5-Trimethylbenzene (1,3,5-TMB)	0.018	NC	5.95E-03	NA	8.8E-04
Xylenes	0.146	NC	2.1E-01	NA	4.8E-04
			TOTAL	**1.20E-06**	**1.77E-02**

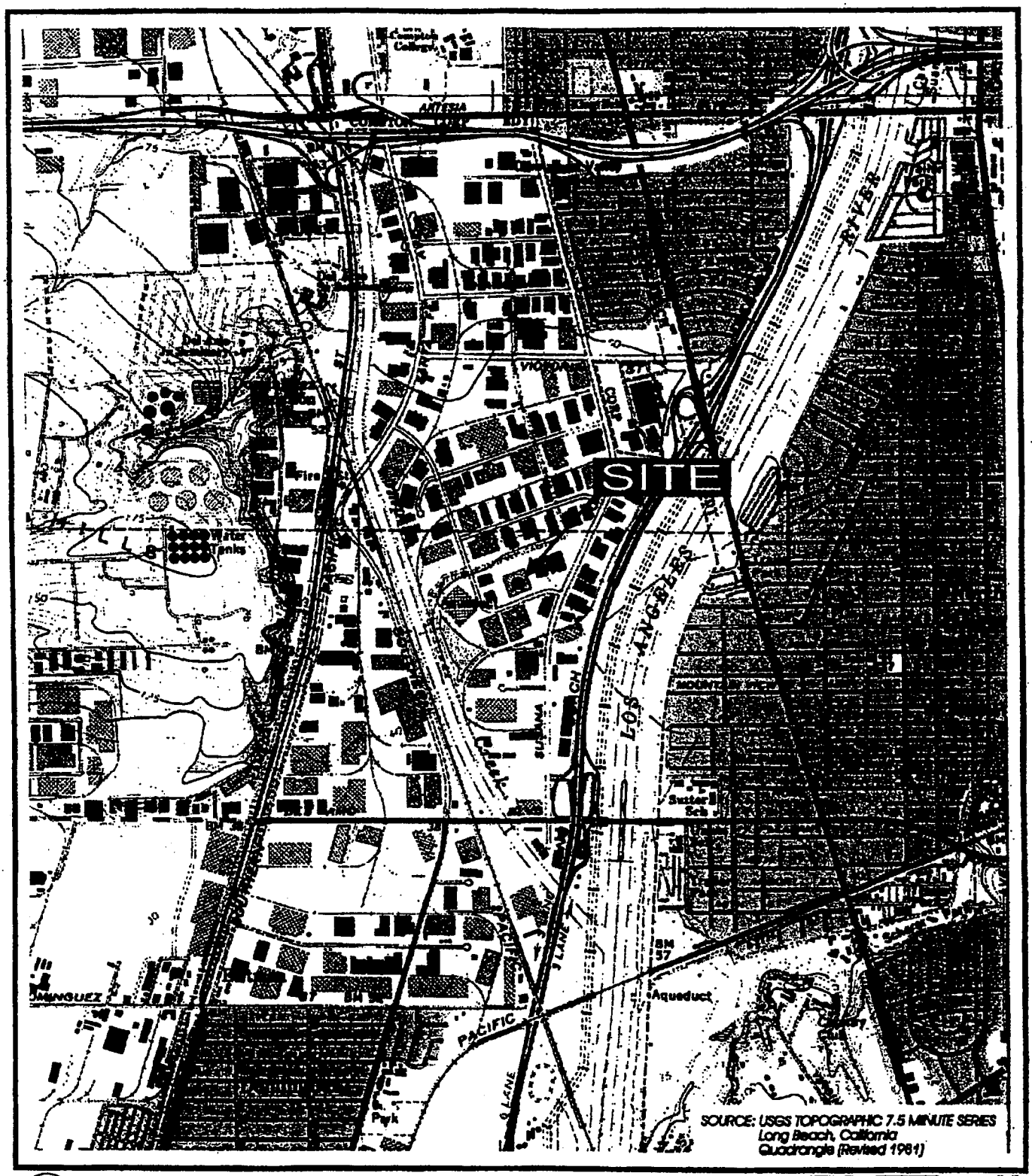
Risk was calculated using DTSC SG-Screen Model
NA = Not Applicable
NC = Noncancerous
(1) = See Table 3
(2) = 1,2,4-TMB concentration includes detected 4-Ethylbenzene concentration - see Table 5
URFi = Unit Risk Factor - see Table 5
RfCi = Reference Concentration - see Table 5

TABLE 7
RISK CALCULATIONS FOR INDOOR VAPOR INTRUSION AT 15 FEET
American Racing Equipment
19200 South Reyes Avenue, Raucho Dominguez, CA 90221

Chemical	95% UCL[(1)] (ug/L)	URFi $(ug/m^3)^{-1}$	RfCi (mg/m^3)	Cancer Risk	Hazard Quotient
Benzene	0.088	2.9E-05	3.0E-02	1.6E-07	4.4E-04
2-Butanone	0.11	NC	5.0E+00	NA	3.1E-06
Cyclohehane	0.19	NC	6.0E+00	NA	8.0E-06
1,1-Dichloroethane (1,1-DCA)	0.076	1.6E-06	5.0E-01	6.7E-09	1.9E-05
1,1-Dichloroethene (1,1-DCE)	0.413	NC	7.0E-02	NA	9.4E-04
cis-1,2-Dichloroethene (1,2-DCE)	0.094	NC	3.5E-02	NA	3.4E-04
Ethylbenzene	0.078	NC	1.0E+00	NA	1.0E-05
4-Ethyltoluene	0.034	NC	2.0E-01	see Note 2	
n-Hexane	0.0051	NC	2.0E-01	NA	7.6E-06
Styrene	0.0061	NC	9.0E-01	NA	8.3E-07
Tetrachloroethene (PCE)	30.53	5.9E-06	3.5E-02	9.6E-06	1.1E-01
1,1,2-Trichloro-1,2,2-Triflouroethane (Freon113)	0.481	NC	3.0E+01	NA	2.1E-06
Trichloflourometane	0.005	NC	7.0E-01	NA	1.1E-06
1,1,1-Trichlorethane (1,1,1-TCA)	0.605	NC	1.0E+00	NA	8.1E-05
Trichloroethene (TCE)	1.47	2.0E-06	6.0E-01	1.7E-07	3.3E-04
Toluene	0.27	NC	3.0E-01	NA	1.3E-04
1,2,4-Trimethylbenzene (1,2,4-TMB)	0.184	NC	5.95E-03	NA	3.3E-03
1,3,5-Trimethylbenzene (1,3,5-TMB)	0.033	NC	5.95E-03	NA	5.9E-04
Xylenes	0.101	NC	2.12E-01	NA	1.2E-04
			TOTAL	9.94E-06	1.16E-01

Risk was calculated using DTSC SG-Screen Model
NA = Not Applicable
NC = Noncancerous
(1) = See Table 4
(2) = 1,2,4-TMB concentration includes detected 4-Ethylbenzene concentration - see Table 5
URFi = Unit Risk Factor - see Table 5
RfCi = Reference Concentration - see Table 5

FIGURES



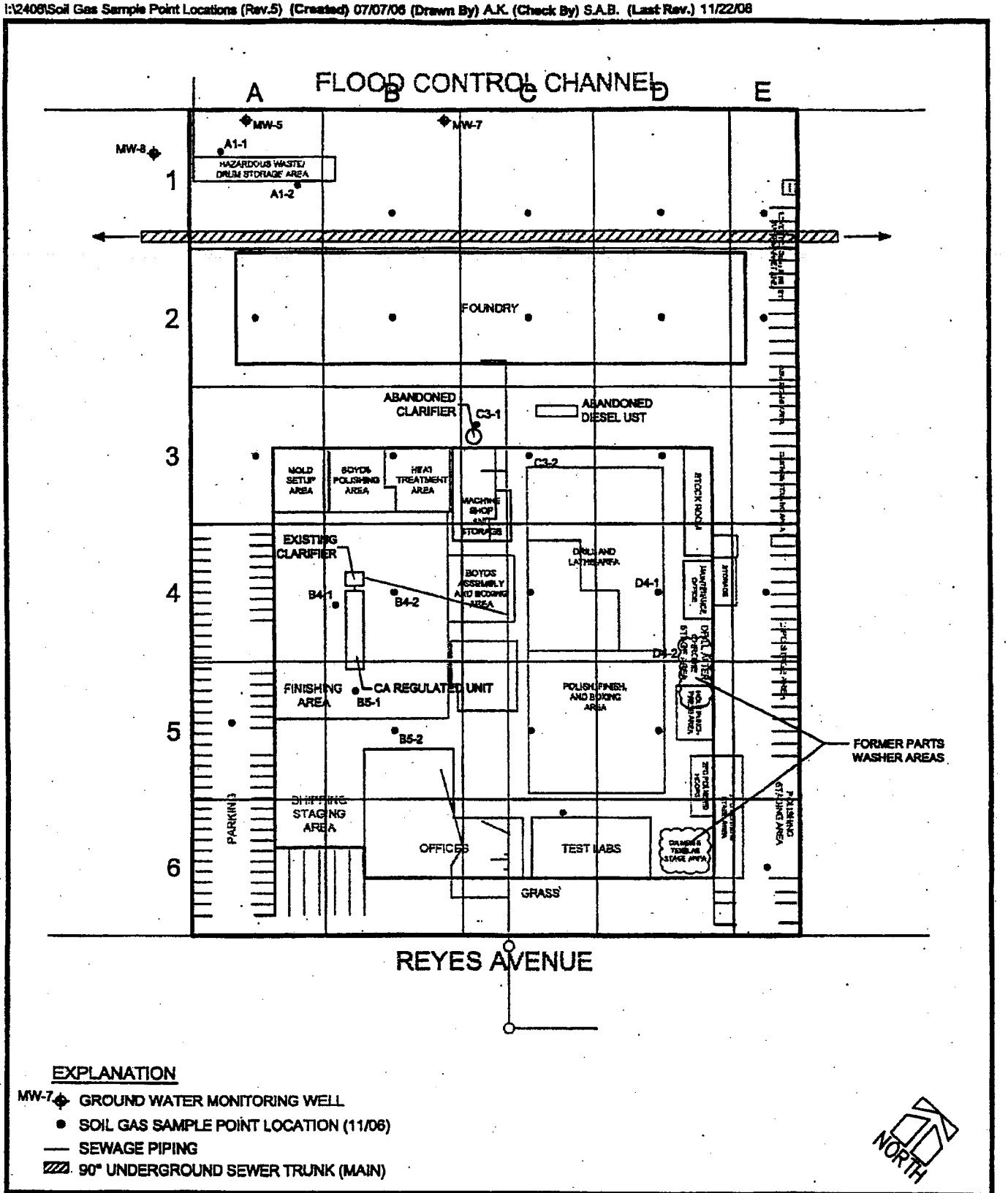
SITE LOCATION MAP
19200 South Reyes Avenue
Rancho Dominguez, CA 90221

Project No. 2406

Figure 1

Original In Color

I:\2406\Soil Gas Sample Point Locations (Rev.5) (Created) 07/07/06 (Drawn By) A.K. (Check By) S.A.B. (Last Rev.) 11/22/08



Environmental Audit, Inc.

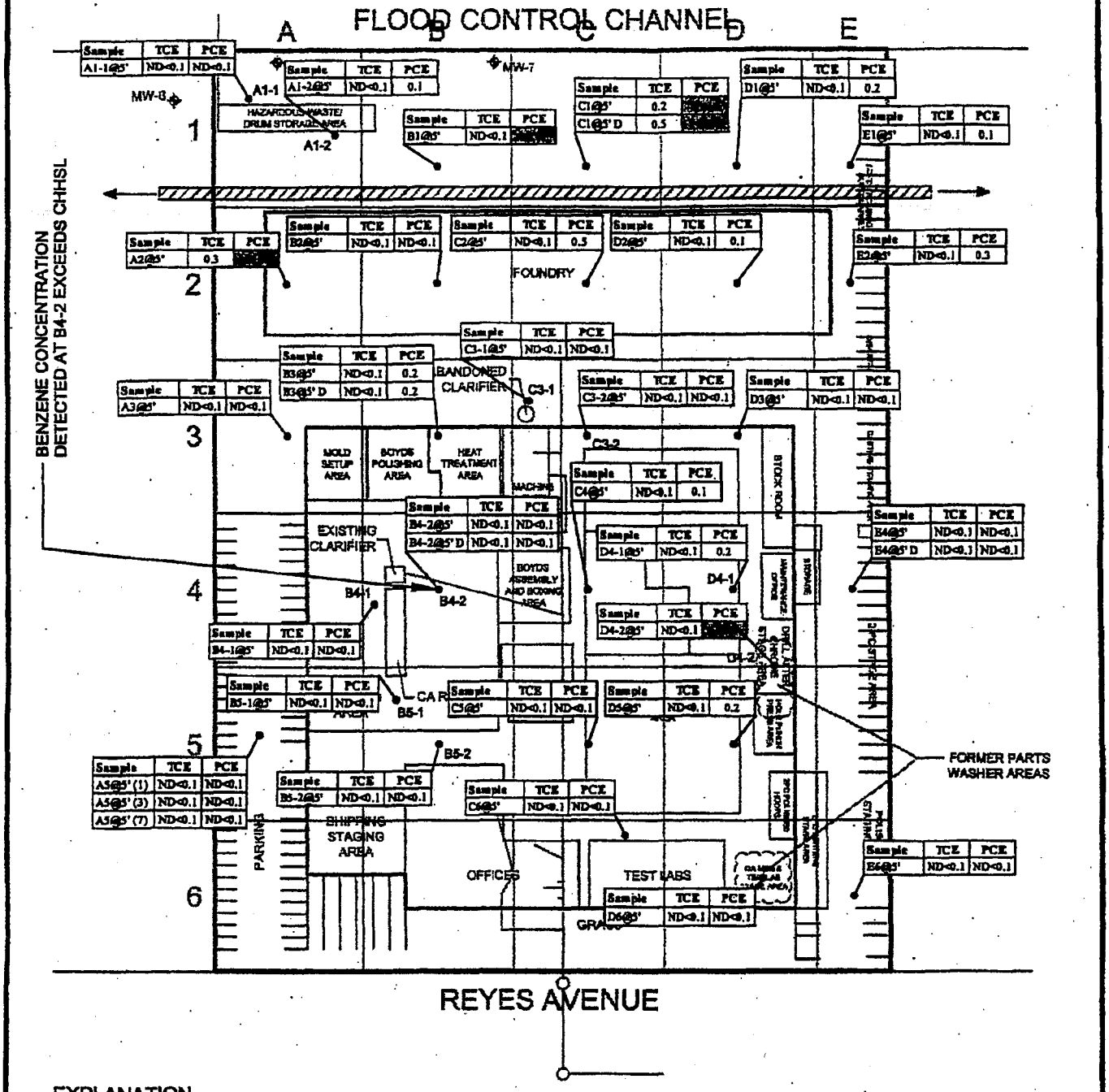
SOIL GAS SAMPLING POINT LOCATIONS
19200 South Reyes Avenue
Rancho Dominguez, CA 90221

Project No. 2406

Figure 2

I:\2406\TCE and PCE Conc at 5 Feet (rev.1) (Created) 07/07/06 (Drawn By) A.K. (Check By) S.A.B. (Last Rev.) 12/05/06

(concentrations in micrograms per liter ug/l)



EXPLANATION

MW-7 ⊕ GROUND WATER MONITORING WELL

• SOIL GAS SAMPLE POINT LOCATION (11/06)

— SEWAGE PIPING

90" UNDERGROUND SEWER TRUNK (MAIN)

CONCENTRATION DETECTED MEETS OR EXCEEDS CHHSL FOR COMMERCIAL/INDUSTRIAL PROPERTY

NORTH

0 100'

Environmental Audit, Inc.

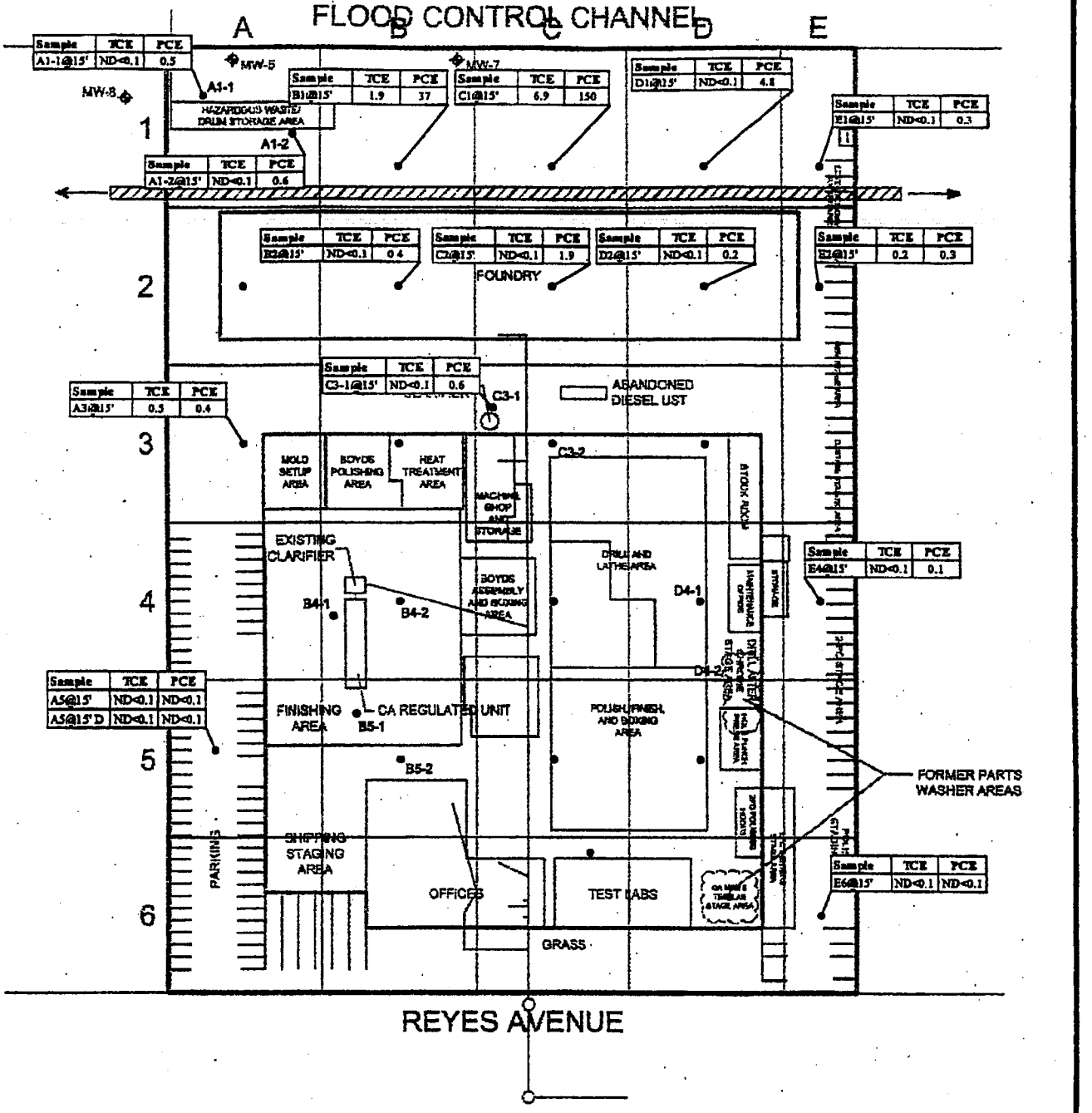
TCE AND PCE CONCENTRATIONS IN SOIL GAS AT 5 FEET
19200 South Reyes Avenue
Rancho Dominguez, CA 90221

Project No. 2406

Figure 3

I:\2406\TCE and PCE Conc at 15 Feet (rev.1) (Created) 07/07/06 (Drawn By) A.K. (Check By) S.A.B. (Last Rev.) 12/04/06

(concentrations in micrograms per liter ug/l)



EXPLANATION

MW-7 ◆ GROUND WATER MONITORING WELL

● SOIL GAS SAMPLE POINT LOCATION (11/06)

— SEWAGE PIPING

▨ 90" UNDERGROUND SEWER TRUNK (MAIN)

NORTH

Environmental Audit, Inc.

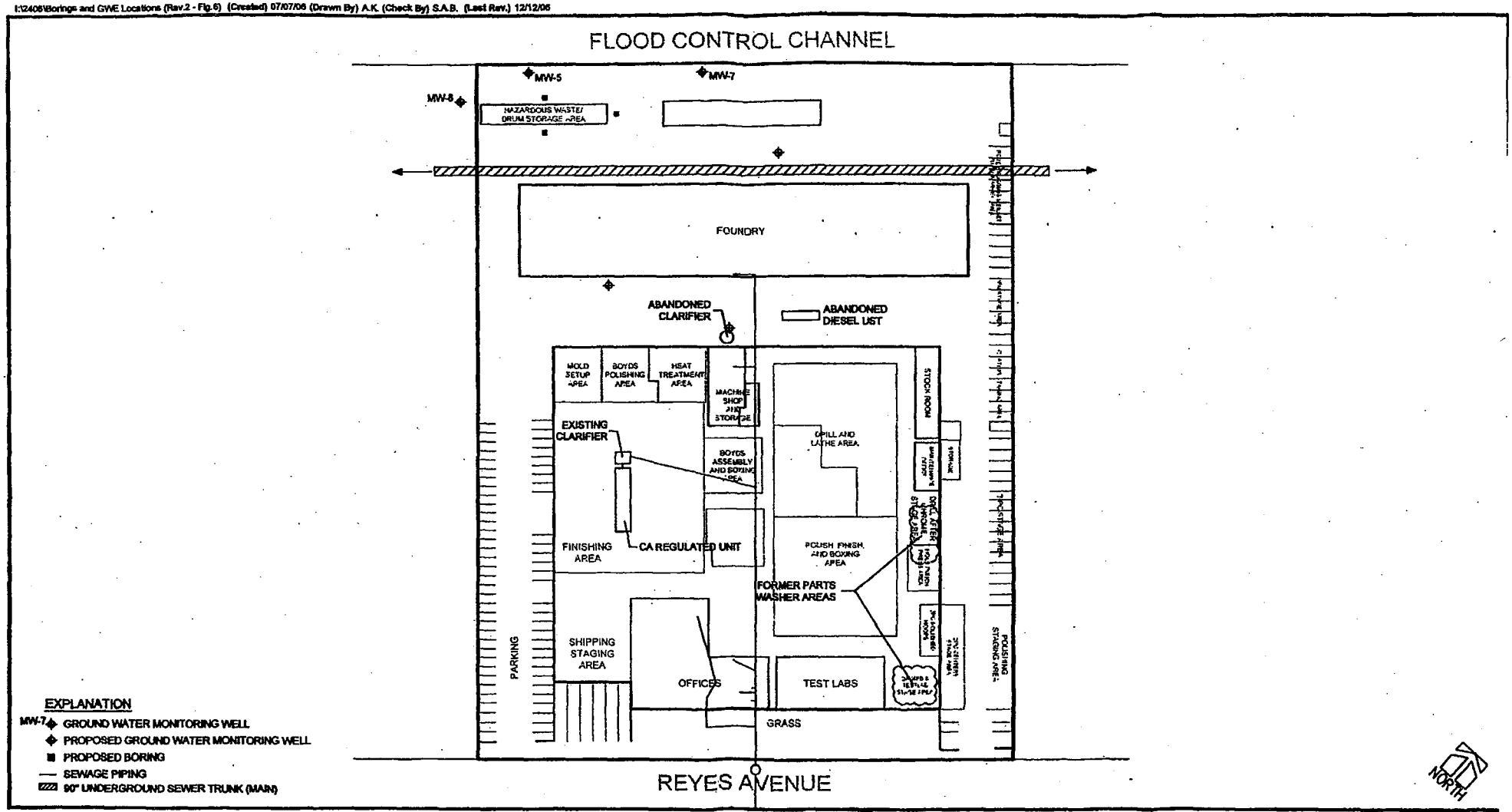
0 100'

TCE AND PCE CONCENTRATIONS IN SOIL GAS AT 15 FEET
19200 South Reyes Avenue
Rancho Dominguez, CA 90221

Project No. 2406

Figure 4

I:\2406\Borings and GWE Locations (Rev.2 - Fig.6) (Created) 07/07/06 (Drawn By) A.K. (Check By) S.A.B. (Last Rev.) 12/12/06



Environmental Audit, Inc.

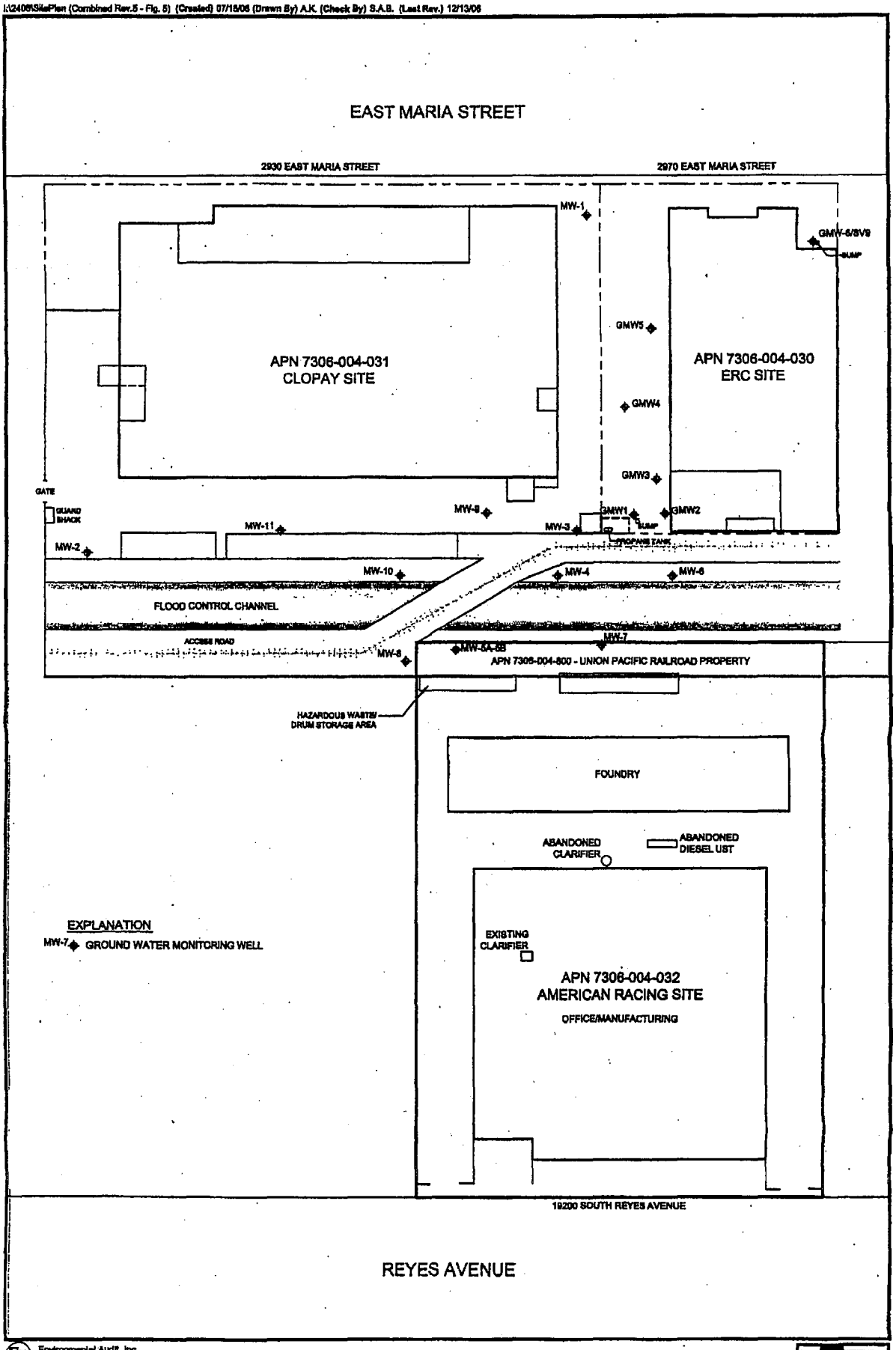
0 8

PROPOSED SOIL BORINGS AND GROUND WATER WELL LOCATIONS
19200 South Reyes Avenue
Rancho Dominguez, CA 90221

Project No. 2406

Figure
Original in Col

I:\2406\SitePlan (Combined Rev.5 - Fig. 5) (Created) 07/18/06 (Drawn By) A.K. (Check By) S.A.B. (Last Rev.) 12/13/06



Environmental Audit, Inc.

COMBINED SITE PLAN
19200 South Reyes Avenue
Rancho Dominguez, CA 90221

0 100'

NORTH

Project No. 2406

Figure 5

APPENDIX A

H&P's Soil Vapor Standard Operating Procedures Fulfilling CA-EPA (DTSC) Soil Gas Advisory, Revision 3, June 2005

MOBILE GEOCHEMISTRY

H&P

Soil Vapor Standard Operating Procedures Fulfilling CA-EPA (DTSC) Soil Gas Advisory

Revision 3

June 2005

Prepared by:

H&P Mobile Geochemistry

Carlsbad, California

Soil Gas Sampling Procedures

Probe Construction and Insertion

Manually-Driven Probes

H&P's manually driven soil vapor probes are constructed of 0.625 inch outside diameter steel and equipped with a hardened steel tip. The probes are nominally 5 feet long and can be threaded together to reach a depth of 10 feet below ground surface. An inert 1/8 inch nylaflow tube is threaded down the center of the probe and connected to a sampling port just above the tip. This internal sample tubing design eliminates any contact between the sample port and the gas sample.

The probe is driven into the ground by an electric rotary hammer. Once inserted to the desired depth, the probe is rotated approximately 3 turns to open the tip and exposes the vapor sampling ports. This design prevents clogging of the sampling ports and cross-contamination from soils during insertion.

Hydraulically-Driven Probes

H&P's hydraulically-driven soil vapor probes are constructed of either 1.25 or 1.5 inch outside diameter steel and equipped with a hardened drop-off steel tip. The probes are nominally 4 feet long and threaded together to reach multiple depths. The probe is driven into the subsurface with H&P's *STRATAPROBE*™ direct-push system. Once inserted to the desired depth, the probe is retracted slightly to expose the vapor sampling port. A small diameter inert tubing is then inserted through the center of the rod and threaded into a gas tight fitting just above the tip. After a sample is obtained the tubing is removed and the probe rod advanced to the next sampling depth or removed. This design prevents clogging of the sampling port and cross-contamination from soils during insertion.

Surface Seals

The probe rod is sealed at the surface with granular and hydrated bentonite for a minimum of 20 minutes before sampling.

Soil Gas Sampling

Soil vapor is withdrawn from the end of the inert nylaflow tubing that runs from the sampling tip to the surface using a 20 to 60 cubic centimeter (cc) syringe or gas tight canister (Summa) connected via an on-off valve (see diagram). The probe tip and sampling tubing is nominally purged of three to five internal dead volumes, or based upon a pre-determined purge volume established by a purge volume test described below. A sample of in-situ soil vapor is then withdrawn and immediately transferred to the mobile lab for analysis within minutes of collection. The use of small calibrated syringes allowed for careful monitoring of purge and sample volumes. This procedure ensures adequate sample flow is obtained without excessive pumping of air or introduction of surface air into the sample.

Purge Volume Test

If required, a site specific purge volume test is conducted at the beginning of the soil gas survey to purge ambient air from the sampling system. Three different volumes are sampled (nominally 1, 3, 7 purge volumes) and analyzed immediately to determine the volume amount with the highest concentration. Therefore, the optimum purge volume is achieved and used during the entire site investigation.

Use of Tracer Compound to Ensure Probe Seal Integrity

A tracer compound, typically difluoroethane, iso-propanol, or butane, is used to test for leaks around the probe barrel at the ground surface and in the sampling system. The tracer is placed around the base of the probe barrel and at the top of the probe barrel during sample collection. If the tracer is detected per CA-EPA advisory specifications, another sample is collected.

Sample Flow Rate

Sample collection is timed so that the flow rate does not exceed 200 ml/per minute. This is accomplished by withdrawing the plunger on the 60 cc syringe at a constant rate for 20 seconds. The collector notes the collection time on a logsheet, and also records any resistance to sample flow that is felt on the syringe during collection.

Summa Canister

Summa canisters are connected to the end of the nylaflow tubing to the same three way valve used with the syringe. A choke is placed on the canister to ensure that the flow rate is no more than 200 ml/ per minute into the summa canister.

Field Records

The field technician maintains a logsheet summarizing:

- Sample identification
- Probe location
- Date and time of sample collection
- Sampling depth
- Identity of samplers
- Weather conditions
- Sampling methods and devices
- Soil gas purge volumes
- Volume of soil gas extracted
- Observation of soil or subsurface characteristics (any condition that affects sample integrity)
- Apparent moisture content (dry, moist or saturated etc.) of the sampling zone
- Chain of custody protocols and records used to track samples from sampling point to analysis.

Analytical Methodology

The following analytical protocols fulfills the both the CA-EPA advisory (2003) and LA-RWQCB soil gas analytical guidelines (1997).

Operating Conditions and Instrumentation

Volatile Organic Compounds (VOCs) by EPA 8260

Instrument: Hewlett-Packard 6890(6850)/5973 or 5890/5972 GCMS
Column: 25 meter HP-624, 0.20mm x 1.0u. capillary.
Carrier flow: Helium at 1.0 ml/min.
Detectors: Quadrupole MS, full scan mode
Concentrator: Tekmar 3000/Solatek 72

Volatile Organic Compounds (VOCs) by EPA TO-14 or TO-15

Instrument: Hewlett-Packard 6850/5973
Column: 60 meter HP-624, 0.32mm x 1.8u. capillary.
Carrier flow: Helium at 3.0 ml/min.
Detectors: Quadrupole MS, full scan mode
TO-14 Instrumentation: Entech 7100 Air Concentrator/Entech 7300 Autosampler

Fixed and Biogenic Gases (O2, CO2, & Methane)

Instrument: SRI 8610 or Carle AGC 311 Gas Chromatograph
Column: 6 foot CTR
Carrier flow: Helium at 15 ml/min.
Detectors: Thermoconductivity (TCD) for O2 & CO2.

Detectors: Flame ionization detector (FID) for methane.

Hydrogen Sulfide

Instrument: Jerome 631x
Detectors: Gold-film

Standard Preparation

Primary (stock) standards: Made from certified neat components or from traceable standards purchased from certified suppliers.

Secondary (working) Standards: Made by diluting primary standard. Typical concentrations are 1ug/ml, 10 ug/ml, and 50 ug/ml.

Laboratory Check Samples are prepared at the midpoint concentration from a standard purchased from a source different than the primary standards.

Lot numbers and preparations of all standards are recorded on a log sheet and kept in the mobile laboratory.

Gas Standards for TO-14A/15 analysis purchased from Spectra Gases, Branchburg, N.J. diluted from 1.0 ppmv to 10ppbv (for targets) and 1.0ppmv to 100ppbv (internal standards and surrogates)

Initial Multi-Point Calibration Curve

An initial calibration curve of a minimum of 3 points is performed either:

- At the start of the project.
- When the GC column or operating conditions have changed
- When the daily mid-point calibration check cannot meet the requirements as specified below.
- For TO-15 a five point calibration is used.

Calibration curves for each target component are prepared by analyzing low, mid, and high calibration standards covering the expected concentration range. The lowest standard concentration will not exceed 5 times the reporting limit for each compound.

A linearity check of the calibration curve for each compound is performed by computing a correlation coefficient and an average response factor. If a correlation coefficient of 0.990 or a percent relative standard deviation (%RSD) of ± 15% is obtained, an average response factor is used over the entire calibration range. If the linearity criteria are not obtained, quantitation for that analyte is performed using a calibration curve.

After each initial multi-point calibration, the validity of the curve is further verified with a laboratory control standards (LCS) prepared at the mid-point of the calibration range. The LCS includes all target compounds and the response factor (RF) must fall within ± 20% of the factor from the initial calibration curve.

Continuing Calibration (Daily Mid-point Calibration Check)

Continuing calibration standards prepared from a traceable source are analyzed at the beginning of each day. Acceptable continuing calibration agreement is set at ± 20% to the average response factor from the calibration curve, except for freon, chloroethane, and vinyl chloride when a 25% agreement is required. When calibration checks fall outside this acceptable range for analytes detected on the site, corrective action, consisting of verification of the standard and/or a new calibration curve for the analytes out of specifications is performed by the on-site chemist.

The continuing calibration includes all compounds expected or detected at the site in addition to any specific compounds designated in the project workplan.

Detection Limits

Reporting limits for this program are defined as 5 times lower than the lowest concentration standard of the calibration curve, as follows:

Compound	Detector	Report Limit
VOCs by TO-14A/15	Mass Spec	1.0 to 5 ppbv
VOCs	Mass Spec	0.1 to 1 ug/l-vapor
Methane	FID	10 ppmv
Fixed Gases	TCD	0.1% by vol
H2S	Gold Film	0.10 ppmv

Injection of Soil Gas Samples

Vapor samples are withdrawn from the probe sampling syringe with a 5 cc syringe and injected with surrogates into a purge & trap instrument for VOC analysis. Separate aliquots are directly injected into gas chromatographs for fixed gases and methane analysis. The injection syringe is flushed 2 times with the sample prior to injection. Injection syringes are flushed several times with clean air or discarded between injections.

TO-14A/15 samples are taken into Summa or similar passivated canisters. Holding time for these canisters is 30 days.

Laboratory Data Logs

The field chemist maintains injection and sample analysis records including date and time of analysis, sampler's name, chemist's name, sample ID number, concentrations of compounds detected, calibration data, and any unusual conditions.

Quality Control Procedures

Compliance With Standards

Sampling and analytical procedures complied with the American Society for Testing and Materials' *Standard Guide for Soil Gas Monitoring in the Vadose Zone* (ASTM D5314-93), the LA-RWQCB Soil Gas Guidelines (Feb 1997 version), and the San Diego County SAM Soil Gas Guidelines (October, 2001).

Sampling Quality Control

Method Blanks

Prior to sampling each day, all components of the sampling system are checked for contamination by drawing ambient air from above ground through the sampling equipment, and injecting a sample into a gas chromatograph. The analysis results are compared to that of the ambient air and recorded in the data tables as blanks.

Sample Quality Control

Each sample is given a unique identification number specifying location and depth. Purge and sample volumes are monitored closely using small calibrated syringes to assure a proper flow of soil gas. This ensures a representative sample is obtained from the sample zone without excessive pumping, which could result in sampling of surface air.

Decontamination Procedures

To minimize the potential for cross-contamination between sites, all external soil vapor probe parts are wiped or washed cleaned of excess dirt and moisture with solvents or de-ionized water as appropriate. The probe's internal nylaflow tubing is purged with clean air between sampling locations or replaced as necessary. Sampling syringes are flushed with clean air after each use or replaced.

Corrective Action

Corrective action is taken when unexpected contaminant levels are detected. First duplicate samples are taken to verify the initial detection of petroleum hydrocarbons. If contamination is suspected, then the sample probes are disassembled, wiped cleaned of excess dirt and moisture, rinsed with deionized water, washed with Alconox and water, and rinsed again with