Work Plan for Remediation of Arsenic-Affected Soils on the East and West Sides of Horton Street in the Vicinity of the Sherwin-Williams Facility Emeryville, California

April 14, 1997
3042.95-008

Prepared for
The Sherwin-Williams Company
101 Prospect Avenue
Cleveland, Ohio 44115

Levine·Fricke·Recon
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

April 14, 1997 3042.95-008

Mr. Ravi Arulanantham, Ph.D., CHMM
California Regional Water Quality Control Board
2101 Webster Street, Suite 500
Oakland, California 94612

Subject: Work Plan for Remediation of Arsenic-Affected Soils on the East and West Sides of Horton Street in the Vicinity of the Sherwin-Williams Facility, Emeryville, California

Dear Ravi:

On behalf of The Sherwin-Williams Company ("Sherwin-Williams"), Levine·Fricke·Recon Inc. (LFR) submits this work plan for the remediation of arsenic-affected soils on the east and west sides of Horton Street in the vicinity of the Sherwin-Williams Facility in Emeryville, California. This work plan has been prepared pursuant to Cleanup and Abatement Order No. 97-047 issued by the Regional Water Quality Control Board (RWQCB) on April 7, 1997.

We expect to proceed with the schedule of work presented in this work plan upon receipt of RWQCB approval.

If you have any comments or questions, please call Larry Mencin at (216) 566-1768 or the undersigned at (510) 652-4500.

Sincerely,

Mark D. Knox

Mark D. Knox, P.E.
Principal Engineer

cc: Sum Arigala, Regional Water Quality Control Board
Larry Mencin, Sherwin-Williams
Dave Gustafson, Sherwin-Williams
John Gerulis, Sherwin-Williams
Frank McHugh, Sherwin-Williams
Sue Free, Sherwin-Williams
Ed Sangster, McKenna and Cuneo
James Ritchie, Secor
Susan Hugo, Alameda County Health Agency
Barbara Cook, Department of Toxic Substances Control
Tom Dunkelman, U.S. Environmental Protection Agency
Michael Biddle, City of Emeryville
Claudio Cappio, City of Emeryville
Mara Feeney, Mara Feeney & Assoc.
Gary Kendall, Bay Area Air Quality Management District

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1.0 INTRODUCTION

On behalf of The Sherwin-Williams Company ("Sherwin-Williams"), Levine·Fricke·Recon Inc. (LFR) is submitting this work plan for the remediation of arsenic-affected soils on the east and west sides of Horton Street in the vicinity of the Sherwin-Williams facility in Emeryville, California ("the Site"). This work plan has been prepared pursuant to Cleanup and Abatement Order No. 97-047 issued by the Regional Water Quality Control Board (RWQCB) on April 7, 1997. We expect to proceed with the schedule of work presented in this work plan upon receipt of RWQCB approval. A health and safety plan is included as Appendix A.

Sherwin-Williams will identify a construction contractor to perform the scope of work. The contractor will be responsible for securing the appropriate permits and complete the scope of work as specified. LFR will provide environmental and health and safety confirmation monitoring, conduct air monitoring, monitor work, coordinate with appropriate transporters and landfill operators, and complete any necessary waste manifests.

2.0 SITE BACKGROUND AND RESULTS OF SOIL INVESTIGATION

At Sherwin-Williams' request, LFR conducted soil investigations on the east and west sides of Horton Street in the vicinity of the Site on March 28, April 4, April 7, and April 11, 1997. The March 28, April 4, and April 7 investigations were conducted as proposed in two previous work plans prepared by LFR: "Work Plan for a Soil Investigation on the Property Between the Western Side of Horton Street and the Eastern Side of the Sherwin-Williams Plant, Emeryville, California," dated March 27, 1997, and "Work Plan for Additional Soil Investigations to the East of Horton Street, Emeryville, California," dated April 2, 1997. The April 11, 1997 surface soil investigation in areas outlying Sherwin-Williams was conducted in accordance with input and direction from the RWQCB.

The work was conducted with the concurrence of several environmental agencies including RWQCB, California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), and U.S. Environmental Protection Agency (U.S. EPA) Region 9.

During the March 28, April 4, and April 7 investigations, 208 soil samples were collected at 81 locations ranging in depths from 0.25 feet below ground surface (bgs) to 7.0 feet bgs. Soil samples were analyzed by a state-certified laboratory for arsenic, lead, zinc, and cadmium. The sample locations, depths, and analytical results are presented in Figures 1 and 2. The April 11 data for outlying areas will be submitted at the RWQCB meeting on April 15 and distributed to those not present at the meeting. Arsenic is the primary chemical of concern and will be used as the indicator compound for identifying the extent of excavation.

3.0 SCOPE OF WORK AND GENERAL PROCEDURES

Upon the receipt of approval of this work plan by the RWQCB, LFR and Sherwin-Williams will:

- Work with the Bay Area Air Quality Management District (BAAQMD) to establish action levels for generation of dust from excavation work.
- Work with RWQCB to establish clean-up action levels for soil excavation. Based on the established action levels, a soil excavation plan will be developed.
- Evaluate the data generated during the soil investigation and identify the lateral and vertical extent of arsenic-affected soil for purposes of soil excavation. LFR and Sherwin-Williams will also identify which areas of soil are expected to be disposed of as Class I (hazardous) and Class II (nonhazardous) wastes. LFR will prepare figures to present this information.
- Work with BAAQMD to conduct baseline air monitoring to determine ambient levels of airborne arsenic and other metals of concern. It is expected that samples will be collected by high-volume air samplers as described in Section 7.0.
- Select and coordinate contractors to perform the field work for the soil remediation.
- Select and coordinate with landfills to transport and dispose of the waste generated by the soil remediation.
- Work with the City of Emeryville and other regulatory agencies to secure the appropriate permits as described in Section 9.0.

The contractor selected by Sherwin-Williams to perform the field work for the soil remediation will:

- Secure and comply with the appropriate permits as described in Section 9.0.
- Locate and identify all utilities and aboveground and subsurface structures that may be affected by the soil remediation.
- Obtain the appropriate clearances from affected utilities in the areas to be remediated.
- Mobilize its equipment and personnel.
- Develop site health and safety procedures for its personnel.
- Implement traffic control plan as described in Section 8.0.
- Prepare the work area by identifying an exclusion zone, decontamination area, bin loading area(s), and staging area. Excavation work will occur within the exclusion zone. Waste material bins will be loaded in the bin loading area(s) and decontaminated before leaving the bin loading area(s).

  Personnel will be required to wear Level C personal protective equipment (PPE) while in the exclusion zone. Personnel will be required to wear Level C PPE in the

bin loading area until the bin is loaded, covered, and decontaminated, then Level D PPE may be worn. The transporter may enter the bin loading area wearing Level D PPE after the bin has been decontaminated to pick up the bin and to deliver an empty bin. Personnel will be required to wear Level D PPE while in the staging area. All personnel and equipment will be decontaminated before entering the staging area from areas where Level C work was taking place. Personnel working under Level D conditions in the bin loading area will not have to pass through the exclusion zone or decontamination area to enter the staging area. Personnel wearing Level C and Level D PPE may not occupy the bin loading area at the same time.

- Designate and clearly differentiate between waste material bins that contain waste destined for disposal at Class I and Class II disposal facilities.
- Remove plants and trees from the planter areas alongside the sidewalk in areas of arsenic-affected soils identified for excavation by LFR and Sherwin-Williams. The contractor will make every possible attempt to save plants and trees for later replanting. Plants and trees that cannot be saved will be disposed of in a disposal bin at an appropriate facility to be determined by LFR.
- Develop excavation methods in order to minimize dust generation and the impact of the excavation work on utilities.
- Remove the areas of sidewalk above the arsenic-affected soils as identified by LFR and Sherwin-Williams. The waste concrete from the sidewalk will be kept separate from other waste generated during the excavation for disposal at the appropriate Class I or Class II disposal facility.
- Take all necessary measures to ensure existing utility lines are maintained and stable during excavation and placement work.
- Excavate the arsenic-affected soils to the extent identified by LFR and Sherwin-Williams, while maintaining the integrity of affected utilities and structures. Waste soils destined for Class I and Class II disposal facilities will be segregated.
- Backfill the excavation with clean soil after confirmation sampling and approval by LFR. The contractor will compact the backfilled soil to the specifications prepared by LFR.
- Replace the areas of sidewalk removed for the excavation, and return all areas of the sidewalk to original conditions. The contractor will wet broom the areas of the sidewalk in the work area that were not removed for the excavation.
- Revegetate areas damaged or excavated during the work. This task may require the replanting of plants and trees removed from planter areas.

LFR will:

- Evaluate excavation methods and the effects of the excavation on affected utilities and aboveground and subsurface structures. LFR will work with the contractor to establish methods to maintain the integrity of the affected utilities and structures.

- Prepare specifications for the soil backfill. LFR will collect samples of the soil backfill for laboratory analysis and monitor compaction testing.
- Provide environmental and health and safety confirmation monitoring as described in this work plan.
- Conduct confirmation soil sampling to verify that the extent of excavation is adequate or determine whether additional excavation is required.
- Monitor soil remediation work as described in this work plan.
- Coordinate with landfill facilities for the acceptance of the waste generated during soil remediation work. LFR or a landfill representative will collect representative samples of the waste generated for laboratory analysis.
- Complete any necessary waste manifests for approval and signature by qualified Sherwin-Williams personnel.
- Remove the existing temporary fencing and barricades put up by LFR from Horton Street.
- Prepare a completion report for submittal to RWQCB.

4.0 DISPOSAL PROCEDURES AND WASTE MANAGEMENT

The contractor will segregate Class I and Class II debris into waste material bins that will be designated for disposal at the appropriate landfill. The bins will be covered and decontaminated before leaving the loading area as described above. LFR will coordinate with landfill facilities for the acceptance of the waste generated during soil remediation work. LFR or a landfill representative will collect representative samples of the waste generated for laboratory analysis. LFR will complete any necessary waste manifests for approval and signature by qualified Sherwin-Williams personnel. All bins will be removed from the work area within 96 hours after completion of the work by the contractor.

Excavated soil will be loaded directly into waste bins. During the excavation, the soil will be kept moist to prevent fugitive dust from migrating off site, but should not be overly wet. The bins will be covered with visqueen (or approved equal) during all times that soil is not being placed in the bins to prevent the soil from generating fugitive dust or becoming overly wet. The visqueen will be secured to prevent uncovering of the soil stockpile by wind.

A portable toilet and hand wash facility will be installed in the staging area to minimize the need for personnel to leave the work area. While in the exclusion zone, personnel will wear two tyvek suits. The outer suit will be removed from the person before leaving the exclusion zone. Vehicles and equipment working within the exclusion zone will be decontaminated within a bermed area of visqueen (or approved equal) using a high-pressure hose or other method approved by LFR. The contractor will collect any water generated during decontamination work by a wet vacuum or other method

approved by LFR and disposed of in the Sherwin-Williams groundwater treatment system.

The contractor will be responsible for the health and safety of its workers and will comply, at a minimum, with health and safety procedures presented in the site health and safety plan (Attachment A). All site visitors will also be expected to comply, at a minimum, with health and safety procedures presented in the site health and safety plan.

5.0 DUST CONTROL

The project-specific dust control plan follows the recommendations in Chapter Five of the "Handbook - Dust Control at Hazardous Waste Sites" published by the U.S. EPA (U.S. EPA/540/2-85/003, November 1985).

Dust control is important to reducing the potentially hazardous airborne dust particles which may be generated during soil remediation work. During soil remediation work, potentially hazardous dust will be generated during concrete breaking, excavation, stockpiling, and loading of waste material bins.

5.1 Dust Monitoring

Dust levels will be measured periodically by LFR as described in Section 7.0.

5.2 Identification of Applied Dust Control Methods

Control method alternatives for dust sources will follow the recommendations in Table 5.1 of the U.S. EPA handbook cited above. These include:

- Apply a water mist or fog to the Site to adequately meet U.S. EPA specifications.
- Use area water spray before any waste material is moved.
- Adequately cover all vehicles transporting waste from the Site to prevent dust discharge while in transit.

5.3 Inspection and Recordkeeping

A dust control manager for the Site will be designated by the contractor. During operations he/she will be responsible for dust control work and inspections as follows.

- Daily inspections of the work areas and waste material bins will determine the projected requirements for the day.

- Daily reports will be generated, discussing all soil remediation work on the Site. Dust control methods and inspections will be addressed in the daily reports.

6.0 WATER CONTROL

The contractor will provide and maintain ample means and devices to remove and promptly dispose of all water entering the exclusion zone, bin loading area, and decontamination area. The water may be generated due to dust control measures, wet brooming, or rainfall events. Berming using sand bags and wet vacuuming (or approved equal) will be used to contain excess water. The contractor will store water in 55-gallon drums. The contractor will dispose of any water collected during demolition work in the groundwater treatment system located on the Sherwin-Williams property.

7.0 AIR MONITORING

Air and dust monitoring will be implemented before and during work conducted for remediation of arsenic- and lead-affected soils on the east and west sides of Horton Street. The objectives of air and dust monitoring are to evaluate the potential for worker exposure to contaminants, to determine appropriate levels of respiratory protection, to verify protection of off-site public and nearby residents and workers, and to evaluate the effectiveness of dust control measures implemented at the Site. LFR will work with BAAQMD during development and performance of this air monitoring program.

Baseline ambient air monitoring, perimeter ambient air monitoring, personal air monitoring, and site dust monitoring will be conducted using high-volume air samplers, personal air monitors (PAMs), and an MIE miniature real-time aerosol monitor (mini-RAM) dust monitoring device equipped with a data logger. All air quality monitoring and sampling, personal sampling, and related recordkeeping will be performed by LFR.

7.1 Baseline Ambient Air Monitoring

LFR will install and operate baseline ambient air monitoring equipment for three 10-hour days before the beginning of earth-moving work. This equipment will be used to determine baseline levels of dust and target metals in the atmosphere in and around the proposed work area. Four Graceby/GMW model GMWL-2000 high-volume air samplers with Whatman EPM-2000 glass microfiber filters (complies with Code of Federal Regulations [CFR] 40 Part 50 Appendix B) will be operated during the three-day period. Two air sampling stations will be located downwind of the proposed area of operations (on the Artists' Cooperative property); one air sampling station will be placed at the property line at Sherwin-Williams adjacent to Horton Street; and a fourth sampler will be placed upwind (east) of the Sherwin-Williams property.

A weather station with windspeed- and direction-recording capabilities will also be installed and operated during the three days of baseline monitoring. The data recorded by the weather station will be used to verify the correct placement of upwind and downwind monitoring stations. Wind direction and speed at the Site will be measured and recorded periodically.

Flow-measurement recordings of the high-volume air samples will also be made at the beginning and end of each of these three days, and will be checked periodically throughout each day. Should any anomalies be detected, the high-volume air sampler will be recalibrated. All air monitoring records will be kept on site for the duration of the field work.

These samples will be analyzed for arsenic, lead, cadmium, and zinc using EPA Methods 7060 and 7421.

7.2 Perimeter Ambient Air Monitoring

LFR will use the previously described baseline ambient air monitoring equipment (four Graceby/GMW model GMWL-2000 high-volume air samplers with Whatman EPM-2000 glass microfiber filters) as perimeter ambient air monitoring equipment during any dust-generating work conducted at the Site as described in Section 3.0. This equipment will be used to confirm the effectiveness of dust control measures taken by the remediation contractor. Additional air monitoring stations may be installed based on field conditions and recommendations from BAAQMD.

The weather station installed for baseline ambient air monitoring will also be operated during the dust-generating work. The data recorded by a weather station will be used to verify the correct placement of upwind and downwind monitoring stations. Wind direction and speed at the Site will be measured and recorded periodically.

Flow-measurement recordings of the high-volume air samples will also be made at the beginning and end of each work day, and will be checked periodically throughout the day. Should any anomalies be detected, the high-volume air sampler will be recalibrated.

Perimeter air monitoring samples (using the high-volume air samplers) will be collected during dust-generating earth-moving work. All samples will be analyzed for arsenic, lead, cadmium, and zinc using EPA Methods 7060 and 7421. The initial samples will be analyzed on an expedited 24-hour turnaround. If the initial analytical concentration results for target compounds are below action levels (see Tables 1 and 2 in Section 7.5), subsequent samples will be analyzed on a 72-hour turnaround. If the initial analytical concentration results for target compounds are above action levels, work will be modified to suppress dust emissions, and subsequent samples will be analyzed on a 24-hour turnaround until analytical results are below action levels. Off-site public exposure will be evaluated by comparing upwind high-volume-sampler arsenic, lead,

and zinc concentrations to downwind and baseline high-volume-sampler arsenic, lead, and cadmium concentrations. Proper Proposition 65 warning signs will be posted during the work.

7.3 Personal Air Monitoring

PAM devices will be used to assess the potential for worker exposure to contaminants that could become airborne during demolition work at the Site. One PAM will be fastened to the worker operating the heavy equipment used to excavate soil, and one PAM will be fastened to a worker who is doing manual labor near the excavation work.

The PAMs will consist of a sampling pump manufactured by SKC West, model 224PCXR7, and a filter cassette that is attached to the pump. Each pump will be set for a flow rate of 1.5 liters per minute and will generally run for a period of between 7 and 8 hours during the work day. Pre- and post-use calibration of the pumps will be performed by LFR in accordance with the manufacturer's specifications.

Samples will be collected periodically during dust-generating work. All samples will be analyzed for arsenic, lead, cadmium, and zinc using National Institute for Occupational Safety and Health (NIOSH) methods 7300 by a laboratory accredited by the American Industrial Hygiene Association (AIHA). The initial samples will be analyzed on an expedited 24-hour turnaround. If the initial analytical concentration results for target compounds are below action levels (see Tables 1 and 2 in Section 7.5), subsequent samples will be analyzed on a 72-hour turnaround. If the initial analytical concentration results for target compounds are above action levels, the work will be modified to better suppress dust emissions, and subsequent samples will be analyzed on a 24-hour turnaround until analytical results are below action levels.

7.4 Mini-RAM Dust Monitoring

Dust monitoring will be performed to monitor dust (potentially affected by the target inorganics) generated by the remediation work. The dust will be monitored using a mini-RAM equipped with a data logger, which is a passive-collection dust-monitoring instrument capable of monitoring total dust to 0.01 milligrams per cubic meter (mg/m^3). LFR personnel will perform routine monitoring during site operations to evaluate concentrations of total dusts in employee breathing zones. Work can be stopped or modified if total dust action levels are exceeded.

7.5 Action Levels

Workers will commence work in Level C PPE, in accordance with the HSP developed for this project (Appendix A). Action levels established for worker protection are indicated in Section 10.0 of the HSP.

Action levels for the surrounding community will be established by LFR using a risk-based approach, in conjunction with the BAAQMD. The community action levels will be based on real-time air monitoring devices for total dust (mini-RAM or data-RAM) and analytical results of perimeter air monitoring with high volume air sampling equipment.

8.0 TRAFFIC CONTROL

The contractor will conduct soil remediation operations and debris removal in a manner to ensure minimum interference with roads, streets, walks and other adjacent occupied or used facilities. Roads, streets, walks, or other occupied or used facilities will not be blocked or obstructed without written permission from authorities having jurisdiction.

The transport of debris, material, or equipment on- or off-site will meet with the City of Emeryville traffic regulations as well as U.S. Department of Transportation regulations.

To safely and effectively perform the work, traffic on Horton Street may have to be detoured around the work area. Traffic may be stopped on Horton Street between 45th Street to the south and the Sherwin-Williams/Former Rifkin Property boundary to the north. Traffic would be routed down 45th Street and 53rd Street to Hollis Street. This detour will only be implemented if alternative access driveways and doors can be found for Chiron, the Artists' Cooperative and all other affected parties. The traffic control plan will be coordinated with the City of Emeryville.

9.0 PERMITTING AND UTILITY CLEARANCE

Before starting soil remediation work, LFR and Sherwin-Williams will obtain an encroachment permit from the City of Emeryville.

Before starting soil remediation work, the contractor will obtain the following permits:

- traffic permit from the City of Emeryville
- excavation permit from the City of Emeryville

In addition, USA will be contacted for utility location notification and a private utility locator will be used to identify the location of utilities.

10.0 PUBLIC NOTIFICATION

Sherwin-Williams will work with the City of Emeryville to notify the public of the soil remediation work. Listed below are the Sherwin-Williams and LFR personnel to be contacted in case of questions or emergency.

Larry Mencin, Sherwin-Williams, (216) 566-1768
Sue Free, Sherwin-Williams, (510) 420-7206
Mark Knox, LFR, (510) 596-9512

11.0 CLOSURE REPORT

LFR will prepare a closure report including air monitoring results, copies of hazardous waste manifests and confirmation sampling results. The closure report will be submitted to RWQCB as lead agency with copies to other interested agencies.

12.0 SCHEDULE

Figure 3 presents the estimated project schedule. The actual start date as shown on the project schedule (Week 2) will be the first Monday after RWQCB approval of this work plan is received by Sherwin-Williams.

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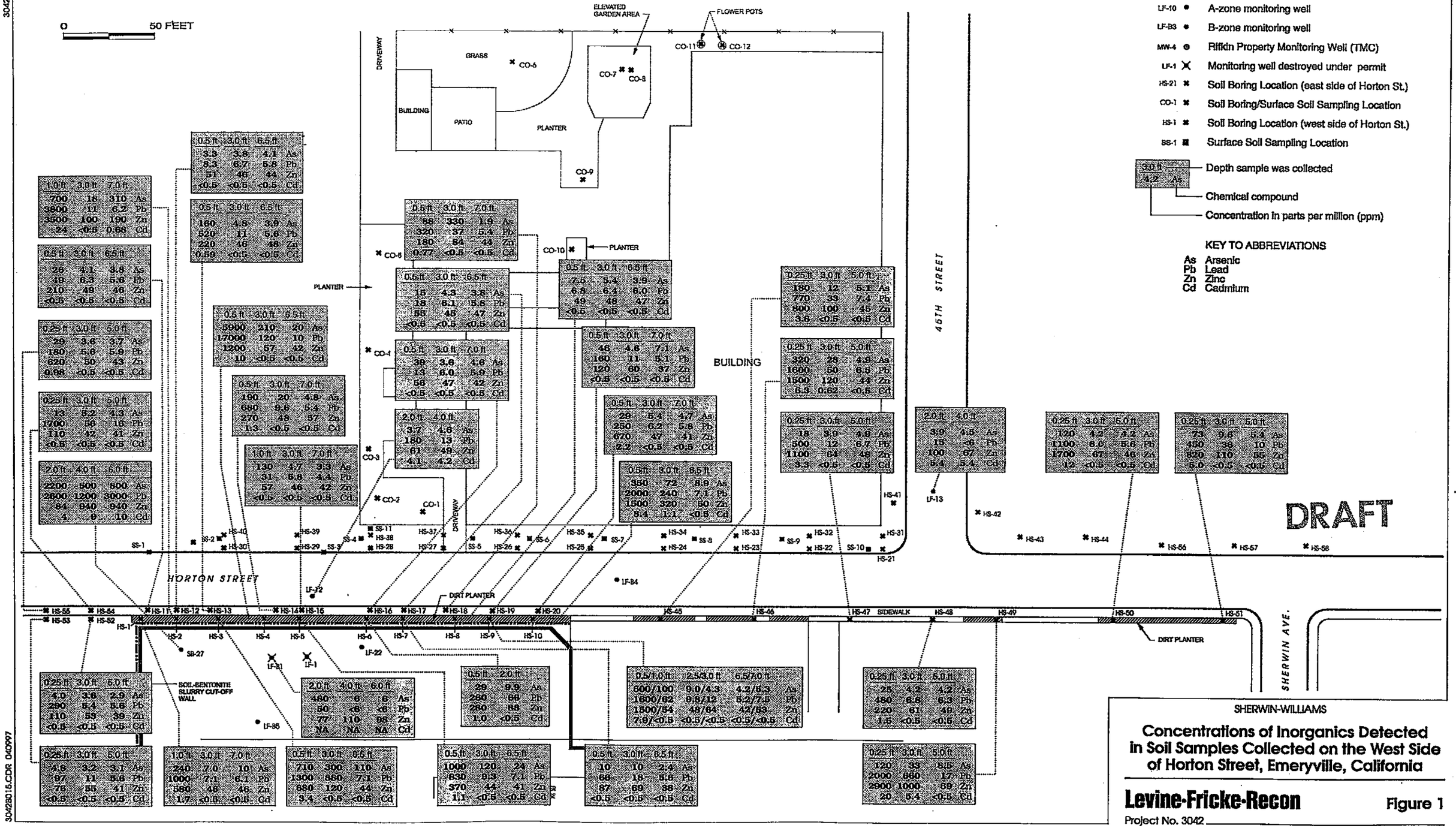

EXPLANATION

- Property boundary
- LF-10 ● A-zone monitoring well
- LF-B3 ● B-zone monitoring well
- MW-4 ⊕ Riffkin Property Monitoring Well (TMC)
- LF-1 ✕ Monitoring well destroyed under permit
- HS-21 ✖ Soil Boring Location (east side of Horton St.)
- CO-1 ✖ Soil Boring/Surface Soil Sampling Location
- HS-1 ✖ Soil Boring Location (west side of Horton St.)
- SS-1 ■ Surface Soil Sampling Location

3.0 ft / 4.2 As — Depth sample was collected; Chemical compound; Concentration in parts per million (ppm)

KEY TO ABBREVIATIONS

As Arsenic
Pb Lead
Zn Zinc
Cd Cadmium

SHERWIN-WILLIAMS

Concentrations of Inorganics Detected in Soil Samples Collected on the West Side of Horton Street, Emeryville, California

Levine-Fricke-Recon Figure 1

Project No. 3042

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0 50 FEET

0.25 ft	2.5 ft	
5.9	4.4	As
52	730	Pb
96	99	Zn
<0.5	<0.5	Cd

0.25 ft	2.5 ft	
7.9	4.7	As
34	32	Pb
100	96	Zn
<0.5	<0.5	Cd

0.25 ft	2 ft	
6	5.6	As
71	16	Pb
120	61	Zn
<0.5	<0.5	Cd

0.25 ft	
1	As
14	Pb
70	Zn
<0.5	Cd

0.25 ft	
<1	As
3.7	Pb
40	Zn
<0.5	Cd

0.25 ft	
4.2	As
31	Pb
140	Zn
1.3	Cd

0.25 ft	
5	As
22	Pb
100	Zn
0.57	Cd

0.25 ft	2.5 ft	
2.9	4.1	As
44	28	Pb
160	74	Zn
0.52	<0.5	Cd

0.25 ft	3 ft	
5.6	4.9	As
50	41	Pb
180	99	Zn
<0.5	<0.5	Cd

0.25 ft	1.5 ft	
7.4	9.9	As
140	88	Pb
160	180	Zn
1.3	0.54	Cd

0.25 ft	3 ft	
21	5.6	As
130	11	Pb
320	59	Zn
1.2	<0.5	Cd

0.25 ft	3 ft	
11	2.9	As
60	6.6	Pb
280	45	Zn
0.67	<0.5	Cd

0.5 ft	3 ft	5 ft	
150	8.6	7.8	As
1000	15	13	Pb
130	50	44	Zn
<0.5	<0.5	<0.5	Cd

1 ft	3 ft	5 ft	
86000	410	100	As
49000	270	10	Pb
390	48	37	Zn
17	<0.5	<0.5	Cd

1.5 ft	3.5 ft	
<1	<1	As
3.9	2.2	Pb
20	16	Zn
<0.5	<0.5	Cd

0.25 ft	3 ft	5 ft	
40	4.4	4.2	As
180	6.2	6.2	Pb
230	46	45	Zn
0.77	<0.5	<0.5	Cd

0.5 ft	3 ft	5 ft	
<1	4	2.4	As
<1	17	6	Pb
<1	480	43	Zn
<0.5	0.65	<0.5	Cd

0.25 ft	3 ft	5 ft	
280	4.4	4.3	As
1600	7	6.6	Pb
2200	47	50	Zn
7.6	<0.5	<0.5	Cd

0.5 ft	
11	As
66	Pb
220	Zn
0.82	Cd

0.5 ft	
12	As
120	Pb
190	Zn
0.59	Cd

0.5 ft	
17	As
80	Pb
190	Zn
0.79	Cd

0.5 ft	
920	As
3600	Pb
920	Zn
3.3	Cd

0.25 ft	3 ft	5 ft	
550	52	6.5	As
2200	19	6.4	Pb
260	48	40	Zn
1.1	<0.5	<0.8	Cd

0.25 ft	3 ft	5 ft	
330	6.6	3.9	As
<1	12	5.7	Pb
680	48	42	Zn
<0.5	<0.5	<0.5	Cd

0.25 ft	3 ft	5 ft	
96	5.8	5.5	As
470	6.8	6.3	Pb
600	46	43	Zn
2.7	<0.5	<0.5	Cd

0.5 ft	
78	As
470	Pb
620	Zn
3.0	Cd

0.5 ft	
110	As
570	Pb
810	Zn
9.9	Cd

0.25 ft	3 ft	5 ft	
36	6.4	7.3	As
320	17	13	Pb
600	64	46	Zn
2.7	<0.5	<0.5	Cd

1 ft	3 ft	5 ft	
12	4.7	4.8	As
32	6.5	6	Pb
64	56	42	Zn
<0.5	<0.5	<0.5	Cd

1 ft	3 ft	5 ft	
180	4.5	4.9	As
260	6.5	6.9	Pb
350	52	50	Zn
2.1	<0.5	<0.5	Cd

0.25 ft	3 ft	5 ft	
89	As		
360	Pb		
190	Zn		
0.56	Cd		

0.5 ft	
44	As
640	Pb
998	Zn
4.2	Cd

0.5 ft	
100	As
780	Pb
970	Zn
4.6	Cd

0.5 ft	
140	As
1200	Pb
1600	Zn
7.4	Cd

0.25 ft	3 ft	5 ft	
92	27	6.6	As
610	12	6.2	Pb
960	65	40	Zn
4.1	<0.5	<0.5	Cd

0.25 ft	3 ft (A)	3 ft (B)	5 ft	
82	4.6	26	4	As
620	9.5	47	7	Pb
710	63	56	44	Zn
4.2	<0.5	<0.5	<0.5	Cd

0.25 ft	3 ft	5 ft	
130	5.3	6.8	As
1400	9.2	7.6	Pb
1700	64	50	Zn
7.2	<0.5	<0.5	Cd

0.25 ft	3 ft	5 ft	
180	5.4	4.1	As
1200	16	6.7	Pb
1400	78	43	Zn
9.2	<0.5	<0.5	Cd

0.5 ft	3 ft	5 ft	
210	20	6.6	As
640	15	6.9	Pb
860	65	43	Zn
3.2	<0.5	<0.5	Cd

3 ft	5.5 ft	
52	8	As
120	65	Pb
160	86	Zn
<0.5	<0.5	Cd

0.25 ft	2 ft	3 ft	
37	4.9	1.5	As
890	38	6.9	Pb
830	73	41	Zn
4.2	<0.5	<0.5	Cd

0.25 ft	3 ft	5 ft	
<1	20	3.8	As
6.8	38	6.9	Pb
37	350	48	Zn
<0.5	<0.5	<0.5	Cd

0.25 ft	2.5 ft	5 ft	
5.6	1.9	3.5	As
83	7.4	6.0	Pb
230	73	53	Zn
1.1	<0.5	<0.5	Cd

0.25 ft	2.5 ft	5 ft	
50	3.2	3.0	As
400	6.8	5.2	Pb
660	60	41	Zn
5.2	<0.5	<0.5	Cd

0.25 ft	3 ft	5 ft	
6.2	5.5	2.4	As
180	50	5.2	Pb
310	54	43	Zn
1.3	<0.5	<0.5	Cd

0.25 ft	3 ft	5 ft	
8.5	7.6	5.4	As
8.7	11	48	Pb
66	86	1500	Zn
<0.5	<0.5	4.2	Cd

0.25 ft	3 ft	5 ft	
91	5.6	4.6	As
610	11	6.1	Pb
870	67	44	Zn
7.5	<0.5	<0.5	Cd

1.5 ft	3 ft	5 ft	
190	5.5	5.5	As
380	32	6.4	Pb
820	84	42	Zn
3.1	<0.5	<0.5	Cd

0.5 ft	
18	As
140	Pb
320	Zn
1.3	Cd

1.5 ft	3 ft	5 ft	
77	7.6	6.2	As
490	19	6.8	Pb
460	66	47	Zn
3.6	<0.5	<0.5	Cd

CO-1 CO-2 CO-3 CO-4 CO-5 CO-6 CO-7 CO-8 CO-9 CO-10 CO-11 CO-12

HS-1 HS-2 HS-3 HS-4 HS-5 HS-6 HS-7 HS-8 HS-9 HS-10 HS-11 HS-12 HS-13 HS-14 HS-15 HS-16 HS-17 HS-18 HS-19 HS-20 HS-21 HS-22 HS-23 HS-24 HS-25 HS-26 HS-27 HS-28 HS-29 HS-30 HS-31 HS-32 HS-33 HS-34 HS-35 HS-36 HS-37 HS-38 HS-39 HS-40 HS-41 HS-42 HS-43 HS-44 HS-45 HS-46 HS-47 HS-48 HS-49 HS-51 HS-52 HS-53 HS-54 HS-55 HS-56 HS-57 HS-58 HS-61

SS-1 SS-2 SS-3 SS-4 SS-5 SS-6 SS-7 SS-8 SS-9 SS-10 SS-11

SB-27

LF-1 LF-5 LF-12 LF-13 LF-22 LF-84 LF-85

MW-4

GRASS
ELEVATED GARDEN AREA
FLOWER POTS
BUILDING
PATIO
PLANTER
CONCRETE
DRIVEWAY
ASPHALT
HORTON STREET
45TH STREET
SHERWIN AVE.
DIRT PLANTER
SIDEWALK
SOIL-BENTONITE SLURRY CUT-OFF WALL
HOUSE

EXPLANATION

- Property boundary
- LF-10 — A-zone monitoring well
- LF-B3 — B-zone monitoring well
- MW-4 — Rifkin Property Monitoring Well (TMC)
- LF-1 — Monitoring well destroyed under permit
- HS-21 — Soil Boring Location (east side of Horton St.)
- CO-1 — Soil Boring/Surface Soil Sampling Location
- HS-1 — Soil Boring Location (west side of Horton St.)
- SS-1 — Surface Soil Sampling Location

1.5 ft	
190	As

Depth sample was collected
Chemical compound
Concentration in parts per million (ppm)

KEY TO ABBREVIATIONS

As Arsenic
Pb Lead
Zn Zinc
Cd Cadmium

DRAFT

SHERWIN-WILLIAMS

Concentrations of Inorganics Detected in Soil Samples Collected on the East Side of Horton Street, Emeryville, California

Levine-Fricke-Recon Figure 2

Project No. 3042

3042B012.CDR 040797

SHERWIN WILLIAMS
SOIL EXCAVATION ON HORTON STREET
FIELD ACTIVITIES SCHEDULE

ID	Task Name	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13
1	Submit Work Plan to RWQCB													
2	RWQCB Approval of Work Plan													
3	Develop & Evaluate Excavation Plan													
4	RWQCB Approval of Excavation Plan													
5	Background Air Monitoring													
6	Select & Coordinate Contractors (soil excavation, disposal, & transport)													
7	Secure Permits from City, Utility Clearance, & Traffic Control Plan													
8	Mobilize Contractor; Perform Soil Removal, Transportation, & Disposal													
9	Confirmation Sampling & Data Evaluation													
10	Additional Excavation (if necessary)													
11	Additional Confirmation Sampling & Data Evaluation (if necessary)													
12	Air Monitoring (during dust generating activities)													
13	Additional Air Monitoring (during dust generating activities, if necessary)													
14	Backfill, Repave Sidewalk, Replace Plants													
15	Demobilize Contractor													
16	Preparation of Completion Report													

Levine·Fricke·Recon
ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

FIGURE 3

Soil Excavation on Horton Street

DRAFT

L:\ARC\3042\3042SCHD.MPP

Mon 4/14/97

APPENDIX A

Health and Safety Plan

Health and Safety Plan
for Remediation of Arsenic-Affected Soils
on the East and West Sides of Horton Street
in the Vicinity of the Sherwin-Williams Facility
Emeryville, California

April 14, 1997
3042.95-008

Prepared for
The Sherwin-Williams Company
101 Prospect Avenue
Cleveland, Ohio 44115

CONTENTS

ATTACHMENTS

1.0 GENERAL

This Health and Safety Plan (HSP) has been developed for use by Levine·Fricke·Recon Inc. (LFR) during remediation of arsenic-affected soils on the east and west sides of Horton Street in the vicinity of The Sherwin-Williams Company's ("Sherwin-Williams'") facility in Emeryville, California ("the Site"). All activities conducted at the Site shall be in compliance with applicable Occupational Safety and Health Administration (OSHA) regulations, particularly those in Title 8 California Code of Regulations (CCR) Sections 5192, 5214, and 5216, and other applicable federal, state, and local laws, regulations, and statutes.

This HSP addresses the potential hazards associated with planned field activities at the Site. It presents the minimum health and safety requirements for establishing and maintaining a safe working environment and providing community protection during the course of work described in LFR's "Work Plan for Remediation of Arsenic-Affected Soils on the East and West Sides of Horton Street in the Vicinity of the Sherwin-Williams Facility, Emeryville, California," dated April 14, 1997 ("the Work Plan"). It is intended for use solely by employees of LFR and its subcontractors. Other entities conducting work at the Site are responsible for developing and abiding by their own health and safety programs and procedures. In the event of conflicting requirements, the procedures or practices that provide the highest degree of personnel protection shall be implemented. If work plan specifications change or if site conditions encountered during the course of the work are found to differ substantially from those anticipated, the Director of Health and Safety will be informed immediately, and appropriate changes will be made to this HSP.

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

2.0 SITE DESCRIPTION AND BACKGROUND

At Sherwin-Williams' request, LFR conducted soil investigations on the east and west sides of Horton Street in the vicinity of the Site on March 28, April 4, April 7, and April 11, 1997. The March 28, April 4, and April 7 investigations were conducted as proposed in two previous work plans prepared by LFR: "Work Plan for a Soil Investigation on the Property Between the Western Side of Horton Street and the Eastern Side of the Sherwin-Williams Plant, Emeryville, California," dated March 27, 1997, and "Work Plan for Additional Soil Investigations to the East of Horton Street, Emeryville, California," dated April 2, 1997. The April 11, 1997 surface soil investigation in areas outlying Sherwin-Williams was conducted in accordance with input and direction from the RWQCB.

The work was conducted with the concurrence of several environmental agencies including RWQCB, California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), and U.S. Environmental Protection Agency (U.S. EPA) Region 9.

During the March 28, April 4, and April 7 investigations, 208 soil samples were collected at 81 locations ranging in depths from 0.25 feet below ground surface (bgs) to 7.0 feet bgs. Soil samples were analyzed by a state-certified laboratory for arsenic, lead, zinc, and cadmium. The sample locations, depths, and analytical results are presented in Figures 1 and 2. The April 11 data for outlying areas will be submitted at the RWQCB meeting on April 15 and distributed to those not present at the meeting. Arsenic is the primary chemical of concern and will be used as the indicator compound for identifying the extent of excavation.

3.0 PLANNED SITE ACTIVITIES

Soil remediation at the Site will be conducted as described in the Work Plan. LFR will provide environmental and health and safety confirmation monitoring during remediation of the soil. Based on the analytical results of soil samples collected to date, LFR believes that a small portion of the excavated soil will be classified as hazardous and will be disposed of in a Class I landfill, and the remaining soil will be disposed at a Class II landfill.

4.0 KEY LFR PERSONNEL AND RESPONSIBILITIES

Project Manager ..... Mark D. Knox, P.E.

Site Safety Officer (SSO)..... Alex Jenkins

Director of Health and Safety ..... James Bucha, CIH

The responsibilities of these personnel are outlined below.

4.1 Project Manager

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

- ensuring that all project personnel have received a copy of, and have read and understand, this HSP
- keeping the Director of Health and Safety informed of project developments
- keeping on-site personnel, including subcontractors, informed of the expected hazards and appropriate protective measures at the Site

- ensuring that resources are available to provide a safe and healthy work environment for Levine·Fricke·Recon personnel

4.2 Director of Health and Safety

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

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

4.3 Site Safety Officer

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

- obtaining and distributing personal protective equipment (PPE) and air monitoring equipment necessary for this project
- reviewing air monitoring data
- limiting access at the Site to authorized personnel
- communicating any unusual or unforeseen site conditions to the Project Manager
- supervising and monitoring the safety performance of all site personnel to ensure that required health and safety procedures are followed, correcting any deficiencies
- conducting daily tailgate safety meetings before each day's activities begin

5.0 HAZARDS OF KNOWN OR EXPECTED CHEMICALS OF CONCERN

With the exception of one soil sample, concentrations of chemicals of concern at the Site ranged as shown in Table A-1. Concentrations in the sample collected underneath the sidewalk at 1 foot bgs at location HS-38 were 86,000 mg/kg of arsenic, 49,000 mg/kg of lead, 380 mg/kg of zinc, and 17 mg/kg of cadmium. The average detected concentrations (without sample HS-38) are shown in Table A-2.

Table A-1: Range of Detected Concentrations of Chemicals of Concern

Known Inorganic Compounds in Soil	Range of Detected Concentrations (mg/kg) (with the exception of the sample collected at 1 foot bgs at HS-38)	
	Lowest	Highest
Inorganic Arsenic	<1	5,900
Lead	<1	17,000
Zinc	<1	35,000
Cadmium	<0.5	20

Table A-2: Average Detected Concentrations

Known Inorganic Compounds of Concern	Average Detected Concentrations (mg/m^3) (with the exception of the sample collected at 1 foot bgs at HS-38)	
	Shallow Depth	Median Depth
Inorganic Arsenic	229	26
Inorganic Lead	888	49

Exposure pathways of concern for chemical compounds that may be present at the Site are inhalation of airborne contaminants and direct skin contact with contaminated materials. Dermal contact can be minimized by wearing protective equipment and following decontamination procedures listed in Section 9. Attention to personal hygiene is imperative whenever working with or near arsenic or lead. Workers will be instructed to decontaminate thoroughly on site and shower as soon as practical upon leaving the Site. Eating, drinking, smoking, chewing gum or tobacco products, or applying cosmetics is prohibited at the Site.

To minimize inhalation hazards, dust control will be implemented during all phases of the project and action levels will be observed during scheduled work. Additional cautionary dust control measures will be performed when working in the localized area of boring HS-38. Site-specific action levels are presented in Section 10. Attachment A presents descriptions, health effects, and exposure limits of chemicals of concern.

The Work Plan air monitoring plan, which describes methods for monitoring exposure to hazardous dusts, will be followed during work. On-site worker exposure to airborne contaminants will be monitored during all intrusive site activities. Personal air monitoring will consist of industrial hygiene air monitoring using personal air monitoring equipment as well as real-time air monitoring devices, which will be used to determine the appropriateness of personal protective equipment in the field.

A miniature real-time aerosol monitor (mini-RAM) equipped with a data logger will be used to monitor exposure to total dusts. Personnel will perform routine monitoring during site operations to evaluate concentrations of total dusts in employee breathing zones. If total dusts are detected above predetermined action levels specified in Section 10, the procedures found in Section 7 of this HSP will be followed.

Biological monitoring of LFR employees will be conducted before beginning field work and after field work is completed, to evaluate worker exposure to arsenic and lead during the project.

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

6.0 PHYSICAL HAZARDS

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

- slips, trips, and falls
- heavy equipment
- noise
- heat stress
- electric shock
- utilities and subsurface structures
- excavations
- container handling
- biological hazards

6.1 General Safe Work Practices

All personnel, including subcontractor personnel, shall bring to the attention of the SSO any unsafe condition or practice associated with site activities.

- Workers shall thoroughly clean their hands, faces, and all other potentially contaminated areas before smoking, eating, or leaving the Site.
- Respiratory devices may not be worn with beards or long sideburns, or under other conditions that prevent a proper seal.

- All accidents and/or injuries shall be immediately reported to the SSO. If necessary, a first report will be initiated by the SSO.
- Periodic safety briefings will be held to discuss current site conditions, field tasks being performed, planned modifications, and work concerns.
- Site conditions may include elevated, uneven, unstable, or slippery work surfaces. Substantial care and personal observation is required on the part of each employee to prevent injuries from slips, trips, and falls.
- Workers shall maintain good housekeeping practices to maintain a safe working environment. The site shall be kept free of debris, waste, and trash at all times.
- The "buddy system" shall be used whenever appropriate.

6.2 Heavy Equipment

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

Operation of heavy equipment during these activities poses potential physical hazards; the following precautions should be observed whenever heavy equipment is used:

- PPE, including steel-toed boots, safety glasses, and hard hats, must be worn.
- Personnel must be aware at all times of the location and operation of heavy equipment and take precautions to avoid getting in the way of its operation. Workers must never assume that the equipment operator sees them; eye contact and hand signals should be used to inform the operator of intent.
- Traffic safety vests are required for personnel working near mobile heavy equipment or near high traffic areas.
- Personnel should never walk directly in back of, or to the side of, heavy equipment without the operator's knowledge.
- Nonessential personnel shall be kept out of the work area.

6.3 Noise

Noise may result primarily from the operation of mechanical equipment. The use of heavy equipment may generate noise above the Cal/OSHA permissible exposure limit for noise of 90 dBA for an 8-hour time-weighted average. Workers shall wear appropriate hearing protection when operating or working near heavy equipment. If loud noise is present or normal conversation becomes difficult, hearing protection in the form of ear plugs, or equivalent, will be required.

6.4 Heat Stress

Adverse climate conditions, primarily heat, are important considerations in planning and conducting site operations. Heat-related illnesses range from heat fatigue to heat stroke, with heat stroke being the most serious condition. The effects of ambient temperature can cause physical discomfort, loss of efficiency, and personal injury, and can increase the probability of accidents. In particular, protective clothing that decreases the body's ventilation can be an important factor leading to heat-related illnesses. To reduce the possibility of heat-related illness, workers should drink plenty of fluids and establish a work schedule that will provide sufficient rest periods for cooling down. Workers should be aware of signs and symptoms of heat-related illnesses, as well as first aid for these conditions, as summarized in Table A-3.

Table A-3: Signs and Symptoms of Heat-Related Illnesses

CONDITION	SIGNS	SYMPTOMS	RESPONSE
Heat Rash or Prickly Heat	Red rash on skin	Intense itching and inflammation	Increase fluid intake and observe affected worker
Heat Cramps	Heavy sweating, lack of muscle coordination	Muscle spasms, and pain in hands, feet, or abdomen	Increase fluid uptake and rest periods. Closely observe affected worker for more serious symptoms.
Heat Exhaustion	Heavy sweating; pale, cool, moist skin; lack of coordination; fainting	Weakness, headache, dizziness, nausea	Remove worker to a cool, shady area. Administer fluids and allow worker to rest until fully recovered. Increase rest periods and closely observe worker for additional signs of heat exhaustion. If symptoms recur, treat as above and release worker from the day's activities after he/she has fully recovered.
Heat Stroke	Red, hot, dry skin; disorientation; unconsciousness	Lack of or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse.	Immediately contact emergency medical services by dialing 911. Remove the victim to a cool, shady location and observe for signs of shock. Attempt to comfort and cool the victim by administering small amounts of cool water (if conscious), loosening clothing, and placing cool compresses at locations where major arteries occur close to the body's surface (neck, underarms, and groin areas). Carefully follow instructions given by emergency medical services until help arrives.

6.5 Electric Shock

All electrical equipment to be used during field activities will be suitably grounded and insulated. Ground fault circuit interrupters (GFCI) will be used with all heavy electrical equipment to reduce the potential for electrical shock.

6.6 Utilities and Subsurface Structures

The locations of all pipes, electrical lines, gas lines, telephone lines, water and sewer lines, or any other subsurface utility or structure must be determined before excavation is performed.

6.7 Excavations

A competent person who is capable of identifying existing and predictable hazards in the surroundings, or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them, shall be present during excavation activities.

The atmosphere shall be tested in any excavation greater than 4 feet in depth where oxygen deficiency or flammable gases are likely to be present before employees are permitted to enter and begin work. The atmosphere should be ventilated and retested until flammable gas concentrations less than 20 percent of the lower flammable limit (LFL) are obtained. Worker entry shall not be allowed if the oxygen concentration is less than 19.5 percent.

Workers shall not enter excavations greater than 4 feet in depth without appropriate protective systems such as benching, sloping, or shoring. Side slopes shall not be steeper than 1:1 without a written report from a qualified civil or geotechnical engineer. All excavations shall be in accordance with the Cal/OSHA Excavation Safety Standard, 8 CCR 1541.

The competent person shall inspect excavations daily. If there is evidence that a cave-in or slide is possible, all work shall cease until the necessary safeguards have been taken. Excavated material shall be placed far enough from the edge of the excavation (a minimum of 2 feet) so that it does not fall back into the opening. At the end of each day's activities, all open excavations will be clearly marked and secured to prevent nearby workers or unauthorized personnel from entering them. Remote sampling techniques will be the preferred method of sample collection in excavations.

6.8 Container Handling and Moving Procedures

The movement and handling of containers and materials on the Site pose a risk to workers in the form of muscle strains and minor injuries. These injuries can be avoided

by using safe handling practices, proper lifting techniques, and proper personal safety equipment such as steel-toed boots and sturdy work gloves. Where practical, mechanical devices will be used to assist in the movement of containers and materials.

6.9 Biological Hazards

Biological hazards that may be encountered at the Site include possible exposure to:

- **Fur-bearing animals.** Animals may carry the rabies virus or ticks that may transmit lyme disease to humans; avoid contact, and don't attempt to feed or touch.
- **Poisonous reptiles.** Primarily snakes (rattlesnake, water moccasin, copperhead). Avoid contact and areas that may harbor snake populations including high grass, shrubs, and crevices.
- **Poisonous insects.** Common examples include bees and wasps. Avoid contact with insects and their hives.
- **Spiders.** The black widow and brown recluse spiders are the most venomous. Avoid contact with spiders and areas where they may hide.
- **Poisonous plants.** Common examples include poison ivy and poison oak. Avoid contact. Long-sleeved shirts and pants will allow some protection against inadvertent contact.

If any of the above biological hazards are identified at the Site, workers in the area will immediately notify the SSO and remaining Site personnel.

7.0 PERSONAL PROTECTIVE EQUIPMENT

All LFR personnel will be provided with appropriate personal safety equipment and protective clothing. The SSO is to inform each worker about necessary protection and must provide proper training in the use of the safety equipment. To minimize the generation of hazardous dusts, dust control methods will be implemented during all phases of this project.

7.1 Conditions Requiring Level D Protection

Support zone area work may be conducted in Level D PPE if the likelihood of exposure to contaminants at the Site is determined to be minimal. Level D protection includes:

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

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

- outer nitrile gloves at a minimum for all material handling (inner nitrile surgical gloves are recommended where practical)
- chemical-resistant clothing (e.g., Tyvek or polycoated Tyvek coveralls), when contact with chemically affected materials is anticipated
- hearing protection

7.2 Conditions Requiring Level C Protection

Work will begin in Level C PPE. During work, sustained mini-RAM readings within action levels specified in Section 10 will require Level C protection. Level C protection requires the following in addition to Level D protection:

- half-face air-purifying respirator (APR) equipped with high-efficiency particulate air (HEPA) filter cartridges
- chemical-resistant clothing (e.g., Tyvek, polycoated Tyvek, or Saranex coveralls) when contact with chemically affected materials is anticipated
- outer nitrile gloves and inner nitrile surgical gloves
- safety shoes/boots with protective overboots or knee-high PVC polyblend boots when direct contact with chemically affected materials is anticipated
- face shields or ventilated safety goggles in lieu of safety glasses may be required if action levels are exceeded or eye irritation is apparent

During work, sustained mini-RAM readings above action levels specified in Section 10 will require Level C protection with the addition of a full-face APR equipped with HEPA filter cartridges in lieu of half-face APR and safety glasses.

If sustained mini-RAM readings are above the action levels specified in Section 10, activities must cease, and personnel must evacuate the Exclusion Zone (see Section 9). If questions arise, they should be addressed to the SSO; the Project Manager and Director of Health and Safety will also be contacted immediately.

8.0 SAFETY PROCEDURES

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

Access inside the specified work area will be limited to authorized personnel. Only LFR employees and their designated subcontractors, the field construction contractor

(to be determined), designated employees of Sherwin-Williams, and designated personnel from the concerned regulatory agencies will be admitted to the work site. Only those workers possessing evidence of the required current 40-hour OSHA health and safety training (or current 8-hour refresher) and physician's authorization to conduct hazardous waste activities will be permitted in the designated Exclusion Zone. The SSO will be responsible for ensuring that workers wear proper personal protective clothing. All personnel entering the Site will sign the signature page in this HSP, indicating they have read and accepted the health and safety practices outlined herein.

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

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

All personnel entering the Site will exit at the same location. An alternate exit must be established for emergency situations. Worker safety will always take precedence over decontamination procedures. If decontamination of personnel is necessary, exiting the Site will include the decontamination procedures described below.

9.0 WORK ZONES AND DECONTAMINATION PROCEDURES

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

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

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

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

Workers should employ only applicable steps in accordance with the level of PPE worn and extent of contamination present. Workers are strongly encouraged to shower as soon as possible after leaving the Site. All disposable items will be disposed of in a dry container. Wash and rinse water generated from decontamination will be drummed on site and then discharged into the Sherwin-Williams on-site groundwater extraction and treatment system. Nondisposable items will be sanitized before reuse. The SSO is responsible for PPE maintenance, decontamination, and sanitizing.

Heavy equipment will be decontaminated as follows:

- An Alconox and water solution will be used to wash the equipment.
- The equipment will be rinsed with tap water.

Each person must follow these procedures to ensure that potential contamination is not transferred off site.

10.0 ACTION LEVELS

See Section 7 of this HSP for minimum required health and safety procedures. Table A-4 shows the action levels that have been established for air monitoring using a mini-RAM during excavation activities at the Site. Dust control measures will be implemented during all phases of this project to minimize the generation of airborne dusts.

Table A-4: Air Monitoring Action Levels for Total Dust and Required Respiratory Protection

Activity	Action Level	Level of Respiratory Protection
Excavation	0 to 5.0 mg/m^3	Level C: Half-face air-purifying respirator fitted with HEPA filter cartridges. Evaluate Engineering Controls.
	5.1 to 10 mg/m^3	Level C: Full-face air-purifying respirator fitted with HEPA filter cartridges. Re-evaluate Engineering Controls.
	> 10 mg/m^3	Cease operations and evacuate work area. Contact Director of Health and Safety and Project Manager immediately.

Results of personal industrial hygiene air monitoring and biological monitoring will be evaluated by the Director of Health and Safety to determine employee exposure to lead and inorganic arsenic.

11.0 CONTINGENCY PROCEDURES

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

It is the SSO's duty to evaluate the seriousness of the situation and to notify appropriate authorities. Section 12 of this HSP contains emergency telephone numbers and directions to the hospital (a hospital route map is presented in Attachment C). Nearby telephone access must be identified and available to communicate with local authorities. If a nearby telephone is not available, a cellular telephone will be maintained on site during work activities. Personnel should dial 911 in the event of an emergency.

11.1 Injury/Illness

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

In the event of an injury, the extent and nature of the victim's injuries will be assessed and first aid will be rendered as appropriate. If necessary, the individual may be transported to the nearest hospital (see Attachment C for a route map). The mode of transportation and the eventual destination will be based on the nature and extent of the injury. In the event of a life-threatening emergency, the injured person shall be given immediate first aid and emergency medical services will be contacted by dialing 911.

The individual rendering first aid shall follow directions given by emergency medical personnel via telephone. A person certified in first aid/CPR techniques will be present on site at all times during field activities.

11.2 Fire

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

11.3 Evacuation

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

11.4 Hazardous Material Spill

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

- Upright or rotate containers to stop the flow of liquids. This step may be accomplished as soon as the spill or leak occurs, providing it is safe to do so.
- Sorbent pads, booms, or adjacent soil may be used to dike or berm materials, subject to flow, and to solidify liquids.

12.0 EMERGENCY CONTACTS

Ambulance	911 or (510) 657-0777
Police	911 or (510) 596-3700
Fire Department	911 or (510) 596-3771
Hospital	911 or (510) 655-4000
National Response Center	(800) 424-8802
Poison Control Center	(800) 682-9211
TOXLINE	(301) 496-1131
CHEMTREC	(800) 424-9300
LFR Director of Health and Safety (Irvine, CA)	(714) 955-1390
LFR Offices (Emeryville, CA)	(510) 652-4500
Summit Hospital	(510) 655-4000

350 Hawthorne Avenue
Oakland, California

Directions to Hospital (see Attachment C for map): Take 45th Street to San Pablo Avenue and turn right; proceed to 27th Street and turn left; proceed to Broadway and turn left; proceed approximately 3 blocks to Hawthorne Avenue and turn left. The hospital is on the corner of Hawthorne and Webster Street.

13.0 LEVINE·FRICKE·RECON APPROVALS

This Health and Safety Plan (HSP) has been prepared for the following project:

The Sherwin-Williams Facility
1450 Sherwin Avenue
Emeryville, California

Levine·Fricke·Recon Project Number 3042.95-008

This Health and Safety Plan (HSP) has been approved by the following Levine·Fricke·Recon personnel:

Alex Jenkins — Date
Site Safety Officer

Mark D. Knox, P.E. — Date
Project Manager

James Bucha, CIH — Date
Director of Health and Safety

SIGNATURE PAGE

The following signatures indicate that this Health and Safety Plan has been read and accepted by Levine·Fricke·Recon personnel as well as all subcontractors and their personnel.

NAME	COMPANY	SIGNATURE	DATE

Important notice to subcontractor(s):

This Health and Safety Plan has been prepared solely for the use of LFR personnel. It is supplied to you for informational purposes only and may not be relied upon for protection of your employees. As stated in the subcontract, you are responsible for your own health and safety program.

ATTACHMENT A

Chemical Descriptions

CHEMICAL DESCRIPTIONS

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

ARSENIC

Metallic arsenic is most commonly a gray, brittle, crystalline solid. It can also be in a black or yellow amorphous form. Arsenic is also commonly found in its volatile white trioxide form. Arsenic is used in several insecticides, herbicides, defoliants, desiccants, and rodenticides and appears in a variety of forms. It is also used in tanning, pigment production, glass manufacturing, wood preservation, and anti-fouling coatings. Arsenic is classified as a known carcinogen.

Short-term exposure to arsenic can cause marked irritation of the stomach and intestines with nausea, vomiting, and diarrhea. In severe cases the vomiting and stools are bloody and the exposed individual goes into collapse and shock with weak, rapid pulse, cold sweats, coma, and death. Inorganic arsenicals are more toxic than organic arsenicals, and the trivalent form is more toxic than the pentavalent form. Acute arsenic poisoning usually results from ingestion exposures. Blood cell changes, blood vessel damage, and impaired nerve function can also result from chronic arsenic ingestion. Other effects include skin changes, irritation of the throat, increased risk of cancer of the liver, bladder, kidney, and lung.

- The OSHA PEL is listed as 0.01 mg/m^3 for inorganic forms of arsenic and 0.5 mg/m^3 for organic forms.
- The Cal/OSHA PEL is listed as 0.01 mg/m^3 for inorganic forms of arsenic and 0.2 mg/m^3 for organic forms.
- The TLV is listed as 0.01 mg/m^3 for inorganic forms of arsenic.

LEAD

Lead (inorganic) is a bluish-white, silver or gray odorless solid. Short-term exposure to lead can cause decreased appetite, insomnia, headache, muscle and joint pain, colic, and constipation. Considerable data exists on the effects of lead exposure in humans. It is a poison by ingestion and a suspected human carcinogen of the lungs and kidneys. There are data to suggest that lead is a mutagen and can cause reproductive effects.

Human systemic effects by ingestion and inhalation (the two routes of absorption) include loss of appetite, anemia, malaise, insomnia, headache, irritability, muscle and joint pains, tremors, flaccid paralysis without anesthesia, hallucinations and distorted perceptions, muscle weakness, gastritis, and liver changes. Recent experimental evidence suggests that blood levels of lead below 10 μg/dl (micrograms per deciliter) can have the effect of diminishing the IQ scores of children.

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

ZINC

Zinc is a bluish-white, lustrous metallic element, and zinc oxide is a white fume. Short-term exposure to zinc oxide fume can cause a flu-like illness called metal fume fever. Symptoms of metal fume fever include headache, fever, chills, muscle ache, nausea, vomiting, weakness, and tiredness. Pure zinc powder, dust, and fume is relatively non-toxic to humans by inhalation. However, the inhalation of zinc oxides may cause a sweet taste, throat dryness, cough, weakness, generalized aches, chills, nausea, and vomiting. It is flammable in the form of dust when exposed to heat or flame and may ignite spontaneously in air when dry. It is explosive in the form of dust when reacted with acids.

- The OSHA PEL is listed as 15 mg/m^3 for total zinc oxide dust, and 5 mg/m^3 for zinc oxide fume and the respirable fraction of dust.
- The Cal/OSHA PEL is listed as 10 mg/m^3 for total zinc oxide dust, and 5 mg/m^3 for zinc oxide fume and the respirable fraction of dust.
- The TLV is listed as 10 mg/m^3 for zinc oxide dust and 5 mg/m^3 for zinc oxide fume.

CADMIUM

Cadmium dust is an odorless gray powder. Short-term exposure to cadmium dust can cause irritation of the nose and throat, cough, chest pain, sweating, chills, shortness of breath, and weakness. Inhalation of cadmium compounds has been shown to cause lung cancer in humans. Fatal concentrations may be breathed without sufficient discomfort to warn a worker to leave the area. Ingestion of cadmium dust may cause nausea, vomiting, diarrhea, and abdominal cramps.

- The OSHA PEL is listed as 0.005 mg/m^3.
- The Cal/OSHA PEL is listed as 0.005 mg/m^3.
- The TLV is listed as 0.01 mg/m^3 for dust (total) and 0.002 mg/m^3 for the respirable dust fraction.

ATTACHMENT B

Levine·Fricke·Recon Forms

Levine·Fricke·Recon

DAILY TAILGATE SAFETY MEETING FORM

Date:_____ Time:_____ Project Number:_____

Project Name:_____

Specific Location:_____

Type of Work:_____

_____

Chemicals Present:_____

SAFETY TOPICS DISCUSSED

Protective Clothing/Equipment: _____

_____

Hazards of Chemicals Present: _____

_____

Physical Hazards: _____

_____

Special Hazards: _____

_____

Other Topics: _____

_____

ATTENDEES

Name (printed)	Signature

Levine·Fricke·Recon

Page ____ of ____

AIR MONITORING FORM

Date:_____ Project Name:_____ Project Number:_____

Type of Activities:_____

Type of PID/FID: _____ Serial Number:_____

Pre-Calibration Reading: _____ Post-Calibration Reading: _____

Calibration Standard/Concentration: _____

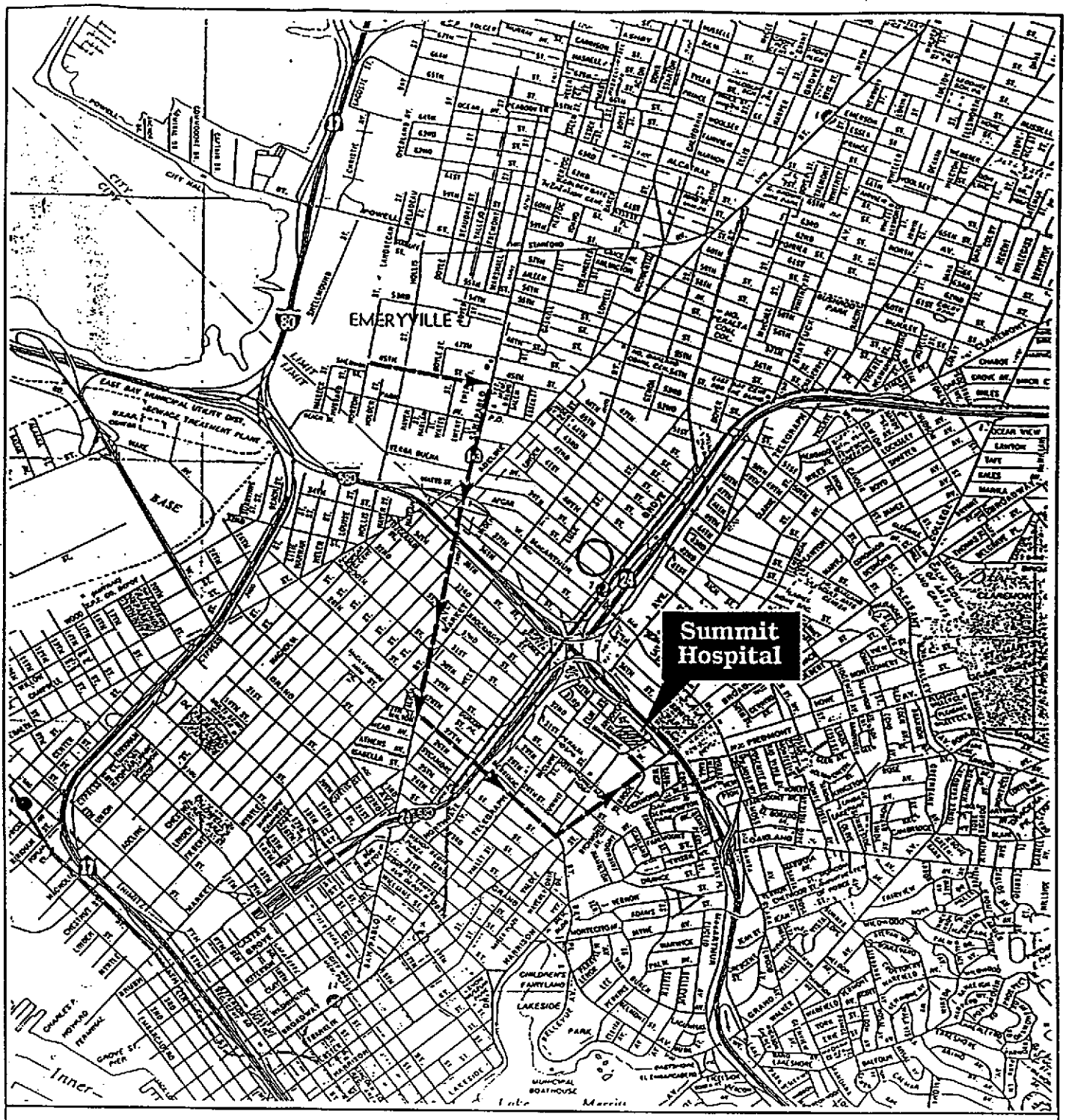
Mini-RAM Serial Number: _____ Zeroed in Z-Bag? Yes No

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

Name: _____ Signature: _____

ATTACHMENT C

Hospital Route Map



DIRECTION:
Summit Hospital: Take 45th Street to San Pablo Avenue and turn right; proceed to 27th Street and turn left; proceed to Broadway and turn left; proceed approximately 3 blocks to Hawthorne Avenue and turn left. The hospital is on the corner of Hawthorne and Webster Street. The telephone to the emergency room is 420-6116.

N

0 1/2 1 Mile

RIFKIN PROPERTY

Route to Summit Hospital

Levine·Fricke·Recon

Project No. 3042

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