LEVINE·FRICKE
CONSULTING ENGINEERS AND HYDROGEOLOGISTS

December 6, 1991

LF 1649.04

Mr. Dennis Byrne
Alameda County Health Agency
80 Swan Way, Suite 200
Oakland, California 94621

Subject: Sampling and Analysis Plan for
Quarterly Ground-Water Monitoring in
Area A, Yerba Buena Project Site,
Emeryville, California

Dear Dennis:

Enclosed is the Sampling and Analysis Plan (SAP) for quarterly monitoring in Area A of the Yerba Buena Project Site ("the Site") located in Emeryville and Oakland, California. The SAP has been prepared on behalf of Catellus Development Corporation (Catellus) in accordance with the "Site Remedial Plan, Yerba Buena Project Site," prepared by Levine•Fricke and dated February 11, 1991.

The SAP outlines the quarterly monitoring program to be implemented for monitoring wells located in or near Areas A and B of the Site. The objective of the quarterly sampling program is to monitor the effectiveness of the proposed ground-water trench to be located at the western portion of Area A, as well as to monitor the presence of volatile organic compounds (VOCs) in ground water in Area A and in the south-central portion of Area B. Following one year of quarterly monitoring, data for the Site will be re-evaluated to assess whether a semiannual monitoring program is appropriate for the Site.

If you have any questions or comments regarding this SAP, please call Jenifer Beatty or myself.

Sincerely,

Amanda Spencer
Senior Hydrogeologist

cc: Tom Gandesbury, RWQCB
Ric Notini, Catellus
Pat Cashman, Catellus
Don Marini, Catellus

1649/AREAAWO.SAP/jjb

1900 Powell Street, 12th Floor
Emeryville, California 94608
(415) 652-4500
FAX (415) 652-2246

Other offices in Irvine, CA, Sacramento/Roseville, CA, Tallahassee, FL

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SAMPLING AND ANALYSIS PLAN FOR QUARTERLY MONITORING OF AREA A AND THE SOUTH-CENTRAL PORTION OF AREA B OF THE YERBA BUENA PROJECT SITE EMERYVILLE AND OAKLAND, CALIFORNIA

1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) outlines activities to be conducted at the Yerba Buena Project Site located in Emeryville and Oakland, California (the "Site"; Figure 1). The SAP has been prepared on behalf of Catellus Development Corporation (Catellus) in accordance with the "Site Remedial Plan, Yerba Buena Project Site" prepared by Levine·Fricke and dated February 11, 1991.

The layout of the Site is presented in Figure 2. As illustrated in Figure 2, the Site was divided into four quadrants (Areas A, B, C, and D) to aid in the organization of the sampling and analysis program previously conducted for the Site. The Site excludes Area D, currently occupied by the Markstein Beverage Company and the Oakland Terminal Railway, and the former Ransome Company property in Area B.

The SAP outlines the quarterly monitoring program to be implemented for monitoring wells located in or near Areas A and B of the Site. On-site monitoring wells LF-4, LF-4D, LF-4Z, LF-5, LF-5D, LF-6, LF-17, LF-18, LF-19, LF-19D, LF-20, and LF-21 (Figure 3), and off-site monitoring wells LF-22 and LF-23 will be monitored quarterly for the presence of volatile organic compounds (VOCs) using EPA Method 8010 for a period of approximately one year. Following one year of quarterly monitoring, data for the Site will be re-evaluated to assess whether a semiannual monitoring program may be appropriate for the Site.

Additionally, to monitor ground-water quality in Area A in the vicinity of soils affected by total petroleum hydrocarbons (TPH) characterized as oil, wells LF-3, LF-4, LF-5, and LF-19 will be monitored semiannually for the presence of TPH as oil using modified EPA Method 8015.

2.0 BACKGROUND

The Yerba Buena Project Site covers an area of approximately 51 acres. The Site has been used since the early 1900s for a variety of industrial and commercial businesses. These businesses included warehouse storage of predominantly dry goods and limited quantities of hazardous materials (oxides and acids [a complete record of materials stored at the Site is not available]); metal foundries; truck maintenance and repair; an auto storage and wrecking yard; a construction yard; and several rail transit lines for transporting passengers and freight.

3.0 PREVIOUS SITE INVESTIGATIONS

Between September 1989 and December 1990, Levine·Fricke conducted three phases of environmental investigation at the Site on behalf of Catellus. Phase I consisted the following:

- a historical review of the Site and site usage
- development of a sampling and chemical analysis work plan
- sampling and chemical analysis of soil samples collected from areas identified during the historical review as areas of potential environmental concerns
- sampling and chemical analysis to characterize the general quality of shallow soil using soil samples from areas where potential environmental concerns would not be expected to be present, based on the historical review
- sampling and analysis of "grab" and monitoring well ground-water samples.

Phase II consisted of conducting a soil-gas and shallow ground-water reconnaissance survey in Area A; collecting and analyzing additional soil samples for lead, zinc, polychlorinated biphenyls (PCBs), and/or volatile organic compounds (VOCs); and conducting a shallow ground-water quality survey in the vicinity of Phase I monitoring well LF-9. The results of Phase I and II were presented in Levine·Fricke's report entitled "Phase I and II Environmental Investigation, Yerba Buena Project Site, Emeryville, California," dated August 15, 1990, and revised October 26, 1990.

Phase III consisted of conducting a shallow reconnaissance ground-water quality survey in Area A, and collecting and analyzing additional ground-water samples from monitoring wells for analyses of VOCs, herbicides, and/or total dissolved solids (TDS). Results of this investigation were presented in Levine·Fricke's report entitled "Phase III Environmental Investigation, Yerba Buena Project Site, Oakland and Emeryville, California," dated February 6, 1991.

Results of the Phase I through Phase III investigations indicated localized areas of soil had been impacted by lead and/or zinc, PCBs, or TPH at concentrations of possible environmental concern. Additionally, elevated concentrations of VOCs (up to 0.73 ppm 1,1-DCE) were detected in shallow ground water (less than 40 feet below ground surface) in Area A and the south-central portion of Area B. A Site Remedial Plan was prepared to address potential environmental concerns detected at the Site (Levine·Fricke, 1991b). The Site Remedial Plan (Levine·Fricke, 1991b) presented a summary of soil and ground-water quality at the Site and outlined the objectives and technical approach of remedial plans proposed for chemical-affected soil, perched water, and ground water.

Soil remediation activities were conducted at the Site from June 25, 1991 through July 3, 1991, in accordance with the Site Remedial Plan (Levine·Fricke, 1991b). The objective of the soil remediation activities was to clean up soils containing PCBs, lead, and/or zinc to concentrations equal to or less than the cleanup levels outlined in the Site Remedial Plan. To achieve this objective, soils containing elevated concentrations of PCBs, lead, and/or zinc were excavated and disposed of off site at an appropriate landfill facility. A detailed discussion of soil remediation activities, procedures, and analytical results will be included in a report entitled "Soil Remediation Activities, Yerba Buena Project Site," currently being prepared.

As part of remedial activities for the Site, a shallow ground-water collection trench (i.e., french drain) is planned for installation along the Hollis Street property boundary to intercept VOC-affected ground water from Area A, and mitigate off-site migration of VOC-affected ground water. Shallow ground water entering the trench will be pumped and treated on site using a conventional treatment technology, most likely air stripping, liquid-phase carbon adsorption, or photolysis with chemical oxidation. Two additional shallow monitoring wells (LF-22 and LF-23) were installed off site, downgradient from the proposed extraction trench. One additional intermediate-depth well (LF-19D) was installed adjacent to

shallow well LF-19 to assist in monitoring the effectiveness of the trench. Results of ground-water samples collected from these new wells and analyzed for the presence of VOCs (EPA Method 8010) are described in Levine•Fricke's September 6, 1991 report entitled "Additional Ground-Water Investigation, Yerba Buena Project Site, Emeryville and Oakland, California."

To monitor the effectiveness of the proposed extraction trench as well as to monitor the presence of VOCs in ground water in Area A and the south-central portion of Area B, periodic ground-water monitoring of wells located in Area A will be implemented in accordance with the Site Remedial Plan (Levine•Fricke, 1991b) and as described in this SAP.

4.0 GEOLOGY AND HYDROGEOLOGY OF AREA A AND THE SOUTH-CENTRAL PORTION OF AREA B

Subsurface materials encountered in Area A and the south-central portion of Area B at the Site consisted predominantly of gravelly, silty clays with occasional sandy and/or gravelly interbeds (alluvial deposits). Fill sediments more than 2 feet thick were generally not encountered at the Site, with the exception of a 4- to 5-foot elevated soil platform located in the western portion of Area A.

During Phase I through Phase III of the Investigation, ground-water levels were measured in shallow (less than 25 feet deep) and intermediate-depth (39 to 45 feet deep) wells at the Site.

The depth to shallow ground water beneath Areas A and B of the Site ranged between 11.18 feet (wells LF-19 and LF-20) and 13.71 feet (well LF-17) below ground surface during the most recent round of ground-water elevation measurements at the Site (April 23, 1990). Ground-water elevation data collected at the Site in both February and April 1990 indicated a westerly to southwesterly direction of ground-water flow, at an approximate gradient of 0.001 ft/ft to 0.003 ft/ft. Recent (August 7, 1991) ground-water elevation measurements collected in Area A indicated a westerly to northwesterly direction of ground-water flow in the western portion of Area A (Levine•Fricke, 1991c).

Ground-water levels measured in one of the three shallow (well LF-5/intermediate-depth well LF-5D) well pairs installed in Area A indicate a low to moderate upward vertical gradient (0.012 ft/ft) in the vicinity of these wells. Ground-water levels measured in well pairs LF-4/LF-4D and LF-19/LF-19D indicate an essentially equal vertical gradient in the area of

these wells. Ground-water levels measured in intermediate-depth well LF-4D (39 feet deep) and deeper well LF-4Z (62 feet deep) also indicated an essentially equal vertical gradient.

5.0 PERIODIC MONITORING

In accordance with the Site Remedial Plan (Levine·Fricke, 1991b), this SAP has been prepared to outline quarterly and semiannual ground-water monitoring and reporting activities to be conducted for the Site.

5.1 Quarterly Monitoring

A quarterly ground-water monitoring program will be initiated beginning in November 1991 (fourth quarter of 1991). The monitoring program will consist of collecting water-level measurements from all monitoring wells in Area A, from off-site wells LF-22 and LF-23, and from wells LF-20 and LF-21 located in Area B. In addition, ground-water samples will be collected quarterly for chemical analysis from wells LF-4, LF-4D, LF-4Z, LF-5, LF-5D, LF-6, LF-17, LF-18, LF-19, LF-19D, LF-20, LF-21, LF-22, and LF-23 (Figure 2).

Ground-water samples will be submitted to a State-certified laboratory for analysis of VOCs using EPA Method 8010. A schedule for sampling and analysis is presented in Table 1.

5.2 Semiannual Monitoring

Semiannual monitoring of selected wells will be initiated at the Site beginning with the first quarter of 1992. In addition to the quarterly sampling program discussed above, ground-water samples will be collected from wells LF-3, LF-4, LF-5, and LF-19 and submitted to a State-certified laboratory for analysis of TPH as oil using modified EPA Method 8015.

5.3 Ground-Water Sampling Methodology

Water-Level Measurements

The top of the well casings of each well at the Site has been surveyed relative to mean sea level by a State-licensed land surveyor. Before sampling, water-level measurements will be collected from all wells in Area A of the Site, from off-site wells LF-22 and LF-23, and from wells LF-20 and LF-21 located in Area B. Depth to water will be measured using an electric

water-level sounding probe to the nearest 0.01 foot, relative to the top of the PVC well casing. These data will be presented on tables and figures included in the quarterly reports, discussed below.

Sampling Procedures

Approximately three to five well casing volumes of water will be removed from each well before a water sample is collected. If a well cannot sustain a yield (i.e., pumps dry), it will be allowed to recover to 80 percent of the original, static water level. A ground-water sample will then be collected after the well has recovered to 80 percent of the original water level or within two hours of pumping the well dry.

The well(s) will be purged using a submersible or centrifugal pump. Specific conductance, pH, and temperature will be measured during this purging process to aid in evaluating overall ground-water quality. These parameters will be recorded in the field on water-quality sampling forms. Samples will be collected after these parameters have stabilized to within 15 percent of previous measurements.

Samples will be collected using a clean Teflon bailer. Samples collected for VOC or TPH analyses will be placed into laboratory-supplied, 40-milliliter glass vials and 1-liter amber bottles, respectively. The glass vials will be filled to capacity, capped, and checked for trapped air bubbles. If an air bubble is observed, the vial will be emptied and refilled with additional water from the well. Samples will be placed in an ice-chilled cooler immediately after collection for transportation to a state-certified laboratory for appropriate chemical analysis.

5.4 Reporting

Reports will be prepared and submitted quarterly to the Alameda County Health Care Services Agency (ACHA) in accordance with the Site Remedial Plan and following the schedule outlined in Table 1. These reports will include a summary of work completed since the previous quarterly report and work projected to be completed during the next quarter. These reports will include the following:

- a discussion of water-quality and ground-water elevation data collected at the Site during the quarterly period
- a site plan showing locations of all wells

- ground-water elevation maps and ground-water quality maps for data collected during the quarterly period
- tables presenting well construction and ground-water elevation data, and chemical analysis results
- tables summarizing historical ground-water quality data for the Site.

At the end of one year, hydrogeologic data for the Site will be re-evaluated to review the trend in water-quality data for the Site during the previous year and to assess whether a semiannual monitoring program may be appropriate for the Site.

6.0 SCHEDULE

It is anticipated that periodic monitoring will begin in November 1991 (fourth quarter of 1991) pending receipt of written approval of the SAP. An estimated schedule for quarterly monitoring and reporting in presented in Table 1.

REFERENCES

Levine•Fricke, Inc. 1990a. Phase I and phase II environmental investigation, Yerba Buena Project Site, Emeryville and Oakland, California. August 15 (REVISED October 26, 1990).

Levine•Fricke, Inc. 1990c. Conceptual remedial plan, Yerba Buena Project Site, Emeryville and Oakland, California. November 8.

Levine•Fricke, Inc. 1991a. Phase III environmental investigation, Yerba Buena Project Site, Emeryville and Oakland, California. February 6.

Levine•Fricke, Inc. 1991b. Site remedial plan, Yerba Buena Project Site, Emeryville and Oakland, California. February 11.

Levine•Fricke, Inc. 1991c. Additional ground-water investigation, Yerba Buena Project Site, Emeryville and Oakland, California. September 6.

TABLE 1

SAMPLING AND ANALYSIS PROGRAM FOR OCTOBER 1991-SEPTEMBER 1992

AREA A, YERBA BUENA PROJECT SITE

EMERYVILLE AND OAKLAND, CALIFORNIA

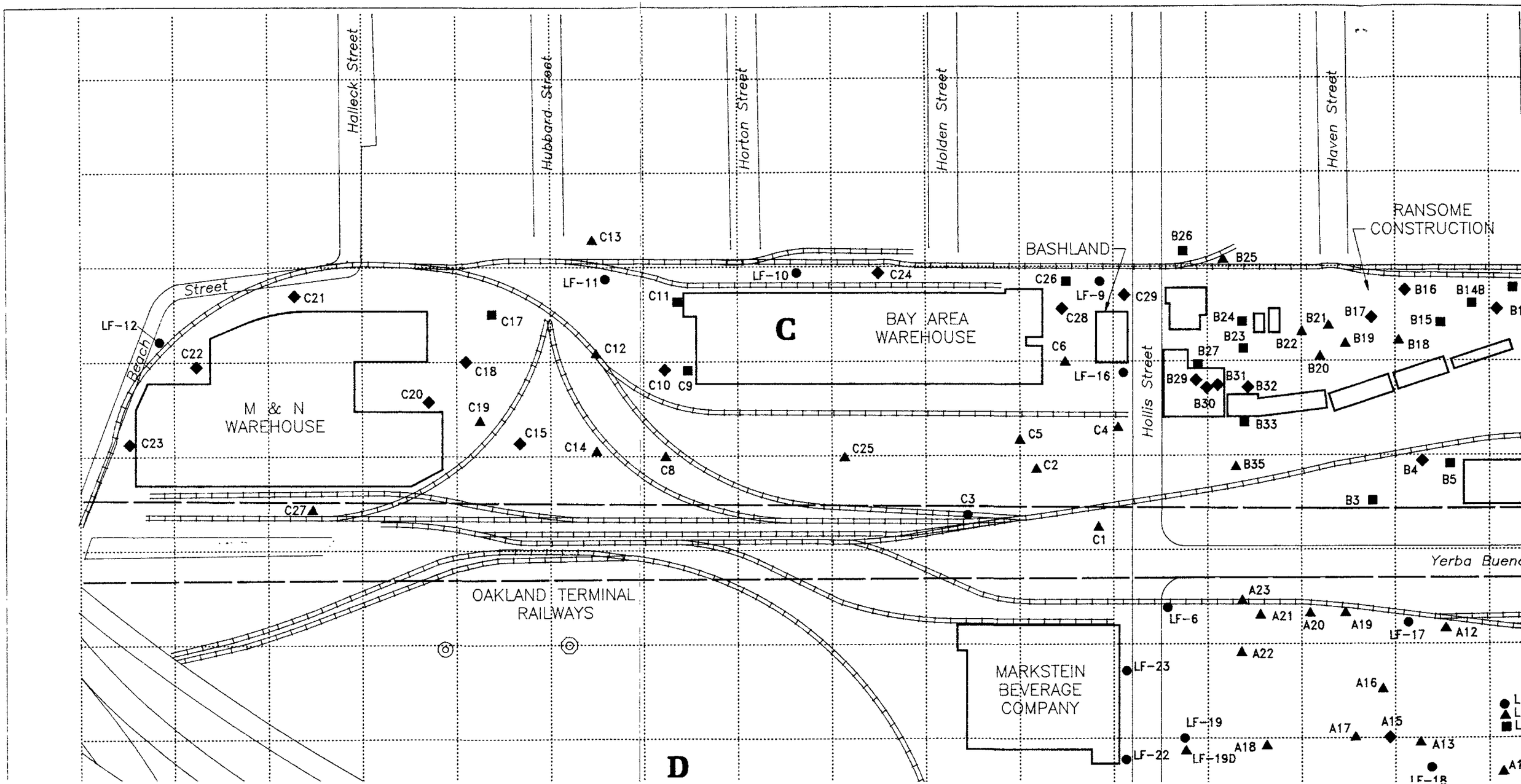
Quarter	Quarterly Period	Wells to be Sampled	Analysis	Quarterly Report Submittal Date
Fourth +	October - December 1991	LF-4, LF-4D, LF-4Z, LF-5, LF-5D, LF-6, LF-17, LF-18, LF-19, LF-19D, LF-20 LF-21, LF-22, LF-23	EPA Method 8010	January 15, 1992
First	January - March 1992	LF-3*, LF-4*, LF-4D, LF-4Z, LF-5*, LF-5D, LF-6, LF-17, LF-18, LF-19*, LF-19D, LF-20 LF-21, LF-22, LF-23	* EPA Method 8010 and/or EPA Methods 8015	April 15, 1992
Second	April - June 1992	LF-4, LF-4D, LF-4Z, LF-5, LF-5D, LF-6, LF-17, LF-18, LF-19, LF-19D, LF-20 LF-21, LF-22, LF-23	EPA Method 8010	July 15, 1992
Third	July - September 1992	LF-3*, LF-4*, LF-4D, LF-4Z, LF-5*, LF-5D, LF-6, LF-17, LF-18, LF-19*, LF-19D, LF-20 LF-21, LF-22, LF-23	* EPA Method 8010 and/or EPA Methods 8015	October 15, 1992

Notes:

** - Ground-water quality results will be reviewed at the end of one year to evaluate the appropriate future monitoring frequency.

+ - The quarterly sampling program will begin in the fourth quarter of 1991.

* - Samples to be analyzed using EPA Methods 8010 and 8015.


Halleck Street
Hubbard Street
Horton Street
Holden Street
Haven Street
RANSOME CONSTRUCTION
BASHLAND
Beach Street
Hollis Street
Yerba Buena
C
BAY AREA WAREHOUSE
M & N WAREHOUSE
OAKLAND TERMINAL RAILWAYS
MARKSTEIN BEVERAGE COMPANY
D
C1
C2
C3
C4
C5
C6
C8
C9
C10
C11
C12
C13
C14
C15
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
C28
C29
LF-6
LF-9
LF-10
LF-11
LF-12
LF-16
LF-17
LF-18
LF-19
LF-19D
LF-22
LF-23
A12
A13
A15
A16
A17
A18
A19
A20
A21
A22
A23
B3
B4
B5
B15
B16
B17
B18
B19
B20
B21
B22
B23
B24
B25
B26
B27
B29
B30
B31
B32
B33
B35

EXPLANATION

SHALLOW (LESS THAN 25 FEET) MONITORING WELL LOCATION

PHASE I INVESTIGATION SHALLOW SOIL SAMPLING LOCATION (LESS THAN 5 FEET)

PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (6 TO 18 FEET)

PHASE I INVESTIGATION DEEPER SOIL SAMPLING LOCATION (13 TO 18 FEET) AND GRAB GROUND-WATER SAMPLE LOCATION

SUBJECT AREA

N

RANSOME CONSTRUCTION

B

A

CLIPPER

LDS WAREHOUSE

Yerba Buena Avenue

Perata Street

San Pablo Avenue

B1 B2 B3 B4 B5 B6 B7 B8 B9 B10 B11 B12 B13 B14A B14B B15 B16 B17 B18 B19 B20 B21 B22 B32 B33 B34

A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15 A16 A17 A19 A20 A21 A22 A23 A24

LF-1 LF-2 LF-3 LF-4 LF-4D LF-4Z LF-5 LF-5D LF-7 LF-8 LF-17 LF-18 LF-20 LF-21

0 150 300 FEET

Figure 2 :

SITE PLAN SHOWING
CURRENT TENANTS OR FORMER TENANTS AND
PHASE I SAMPLING LOCATIONS
YERBA BUENA PROJECT SITE

Project No. 1649

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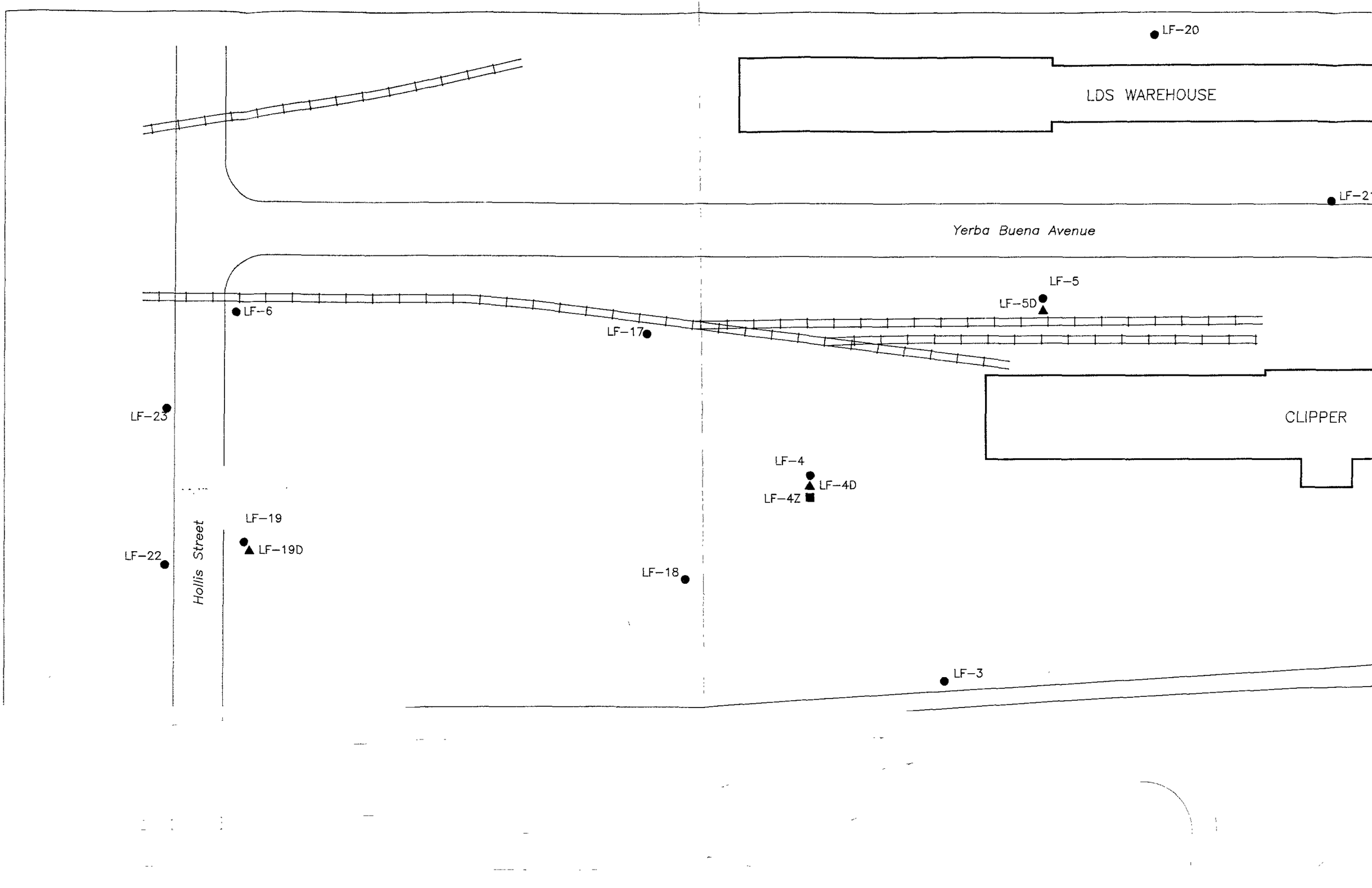
LF-20
LDS WAREHOUSE
LF-21
Yerba Buena Avenue
LF-5
LF-5D
LF-6
LF-17
LF-23
CLIPPER
LF-4
LF-4D
LF-4Z
LF-19
LF-19D
LF-22
Hollis Street
LF-18
LF-3

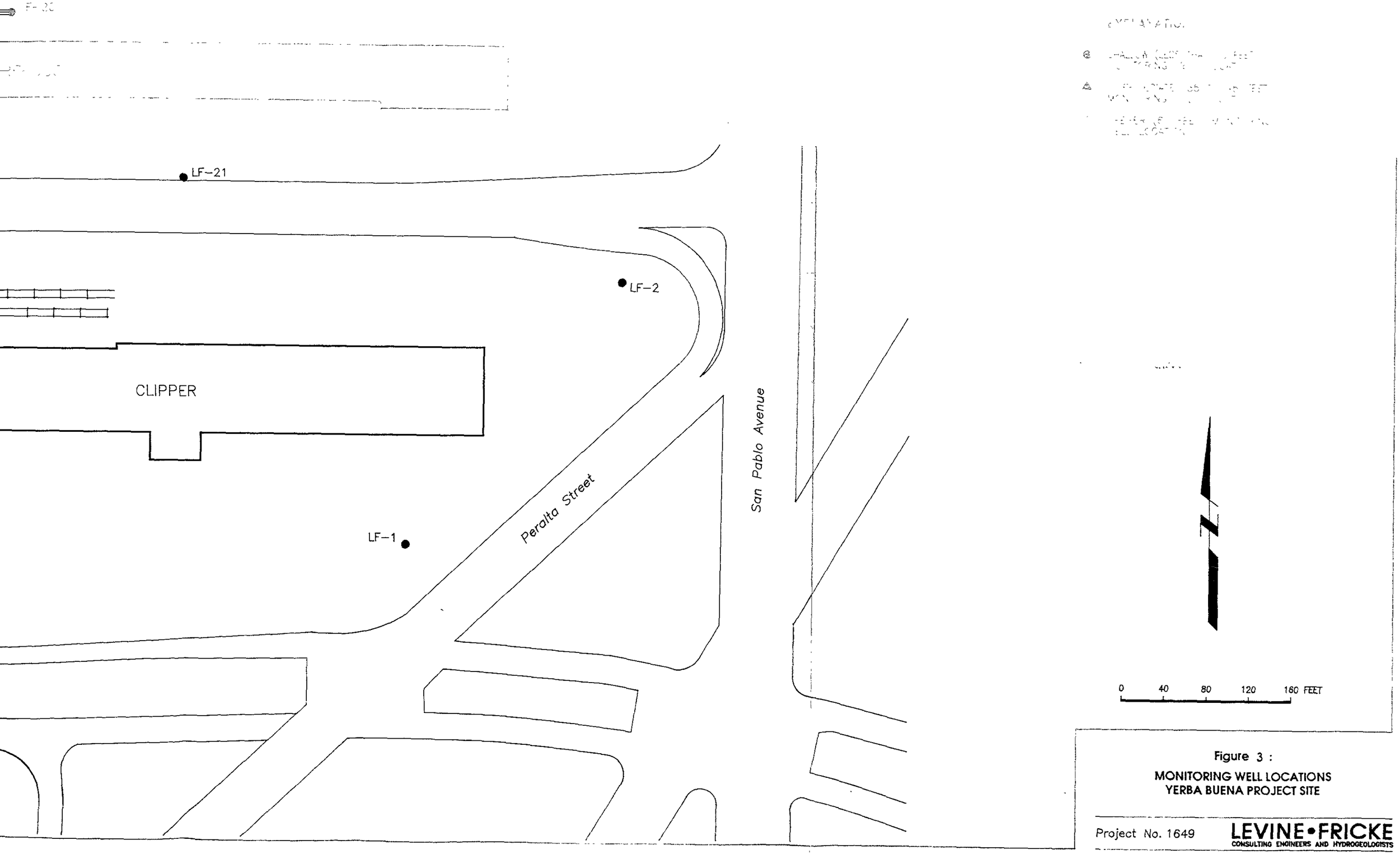

Figure 3 :

MONITORING WELL LOCATIONS
YERBA BUENA PROJECT SITE

Project No. 1649

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