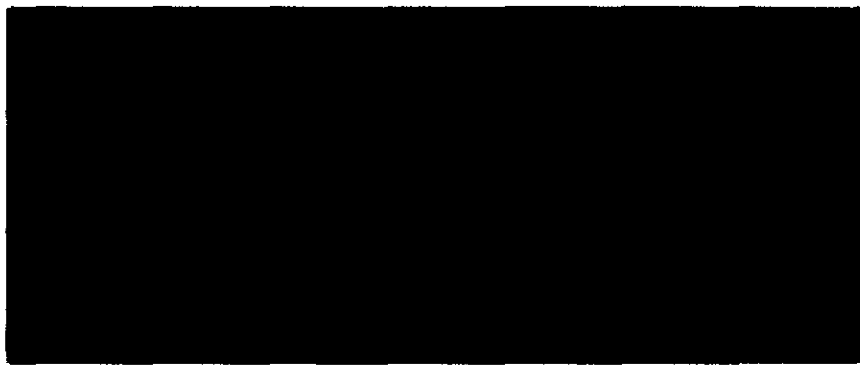


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10/22/92





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**WORKPLAN FOR
IN-PLACE CLOSURE
FORMER BOYSEN PAINT UNDERGROUND STORAGE TANK
41ST STREET
EMERYVILLE, CALIFORNIA**

**PREPARED FOR
CITY OF EMERYVILLE FIRE DEPARTMENT
2333 POWELL STREET
EMERYVILLE, CALIFORNIA 94608**

**PREPARED
BY
ENVIRONMENTAL STRATEGIES CORPORATION**

OCTOBER 22, 1992

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Introduction

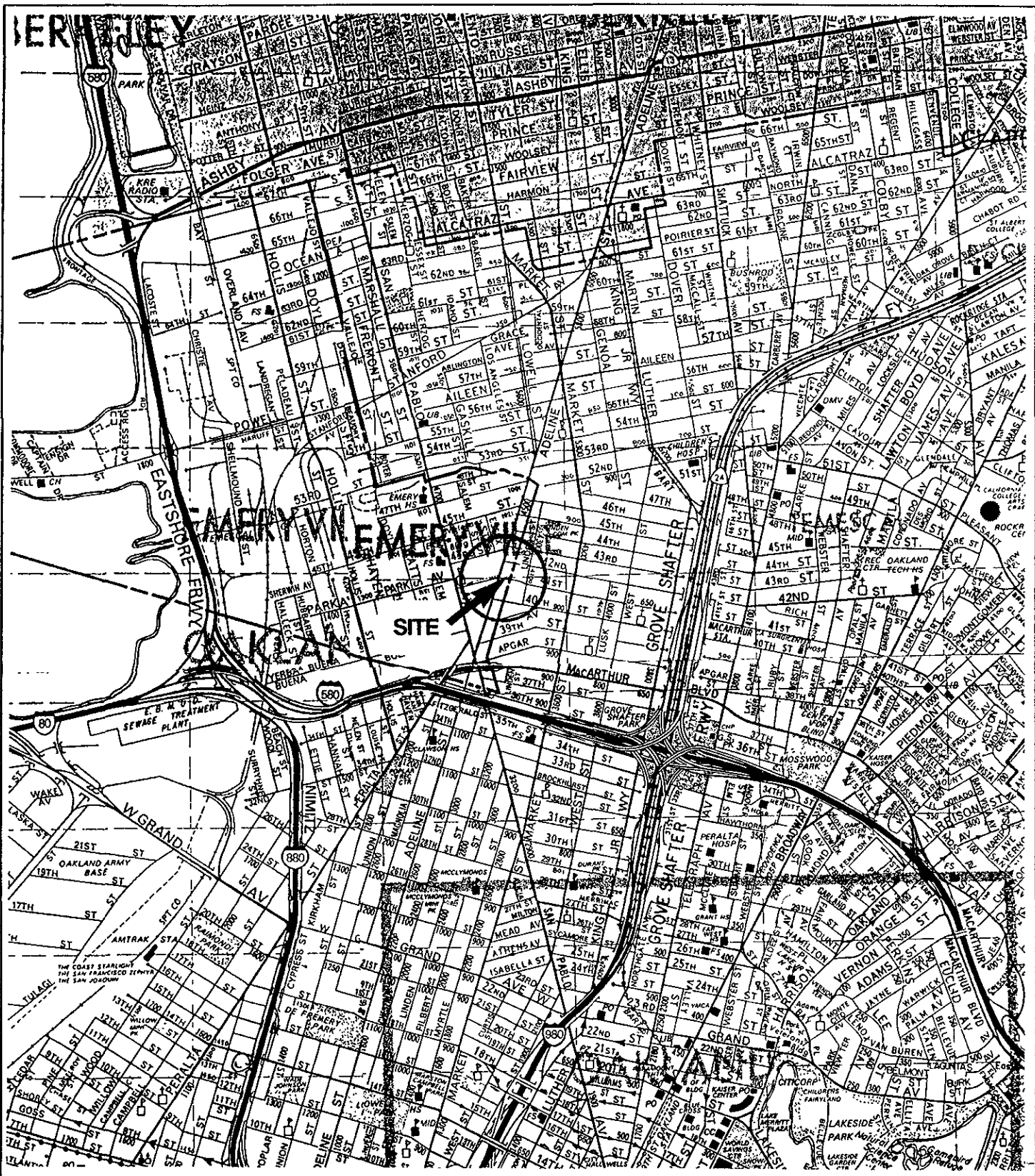
This workplan has been prepared by Environmental Strategies Corporation (ESC) on behalf of Grow Group, Inc. for submission to the Alameda County Department of Environmental Health (Alameda DEH) and the California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region. The workplan presents the rationale for permanent in-place closure of the former Boysen Paint underground storage tank located on 41st Street, between Adeline and Linden Streets in Emeryville, California. This workplan presents the information necessary to justify in-place closure and to render the tank inert per requirements outlined in Alameda DEH's letter of September 22, 1992 to Mr. David B. Russell of Grow Group, Inc.

In the September 22, 1992 letter, Alameda DEH requested that an underground storage tank (UST) at the former Boysen Paint site located on 41st Street be permanently closed. The Alameda DEH stated that the owner of the UST may elect to close the tank in-place, or by removal from the site and that the applicable provisions of Chapter 6.5 of Division 20 of the California Health and Safety Code must be complied with. Alameda DEH also stated that in-place closure of the tank will depend upon whether the "tank cannot be removed due to physical barriers (such as utility lines) and removal will affect the integrity of a building."

This workplan presents information on the existing conditions on the site, the reasons for selection of in-place closure of the tank, and the method to be used to render the underground storage tank inert. A separate submittal provides a workplan for a supplemental soil and groundwater investigation.

Site Description

The site was formerly owned by Boysen Paint Company, who was a predecessor of Ameritone Paint Corporation, a wholly-owned subsidiary of Grow Group, Inc. The site is now owned by Mr. and Mrs. Edward Kozel and operated by Oakland National Engravers (ONE) and also contains a furniture restoration shop. There is an underground storage tank that is located on the north side of 41st Street, approximately 125 feet east of its intersection with Adeline Street, in Emeryville, California (Figure 1). The 5000-gallon tank was installed under the sidewalk between the rear of the brick building occupied by ONE and the northern curb for 41st Street (Figures 2 and 3). Boysen used the tank for storing mineral spirits for manufacturing paint.



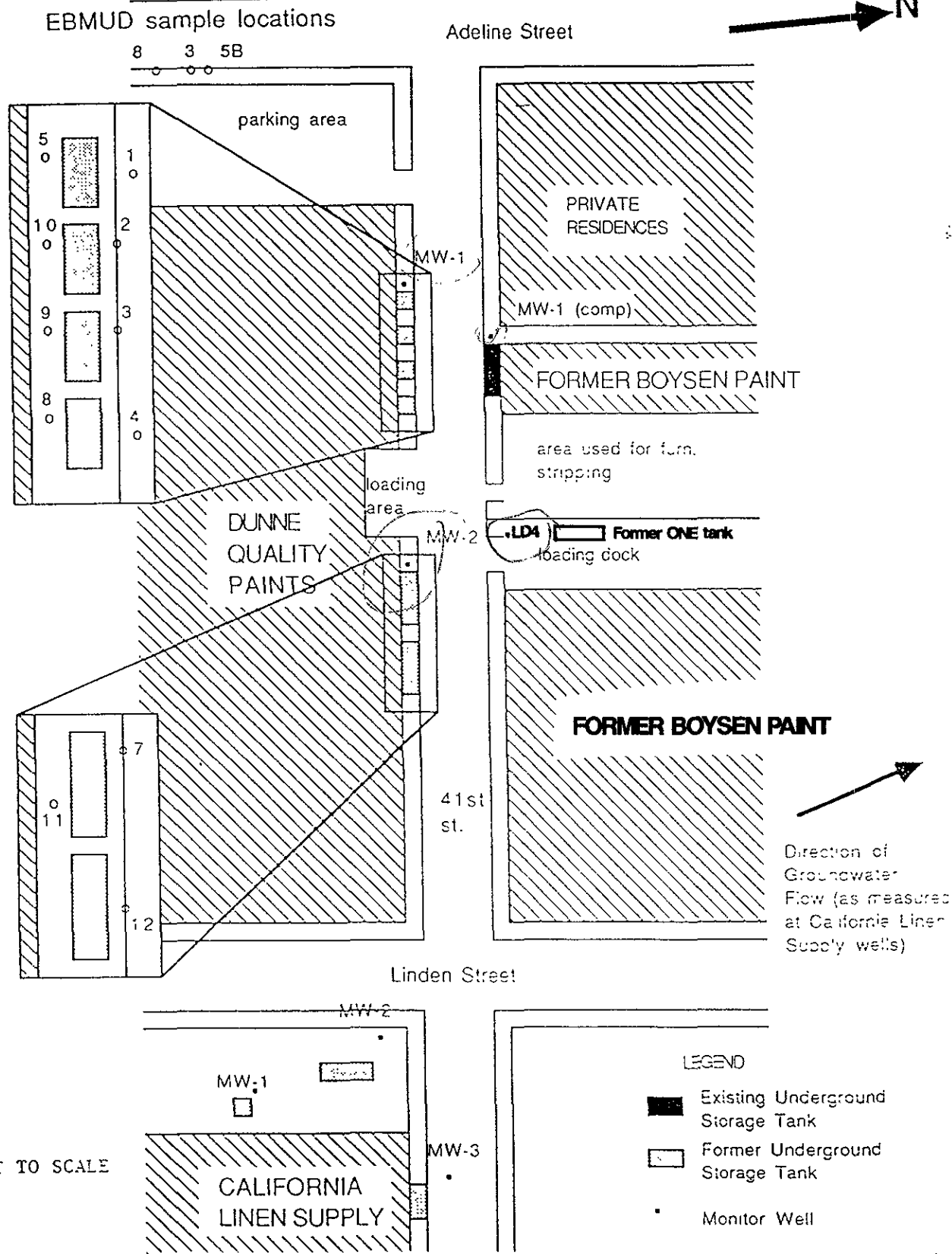
Source: The Thomas Guide, 1988, Alameda and Contra Costa Counties Street & Directory

Scale: 1 inch = 2,200 feet



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Figure 1
 Location Map,
 Former Boysen Paint Company,
 Emeryville, California



Source: UHM Remedial Services Corp., 1991.

Not to Scale



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Figure 2
Locations of Present and Former Underground Storage Tanks, Former Boysen Paint Company, Emeryville, California

Summary of Previous Site Investigations

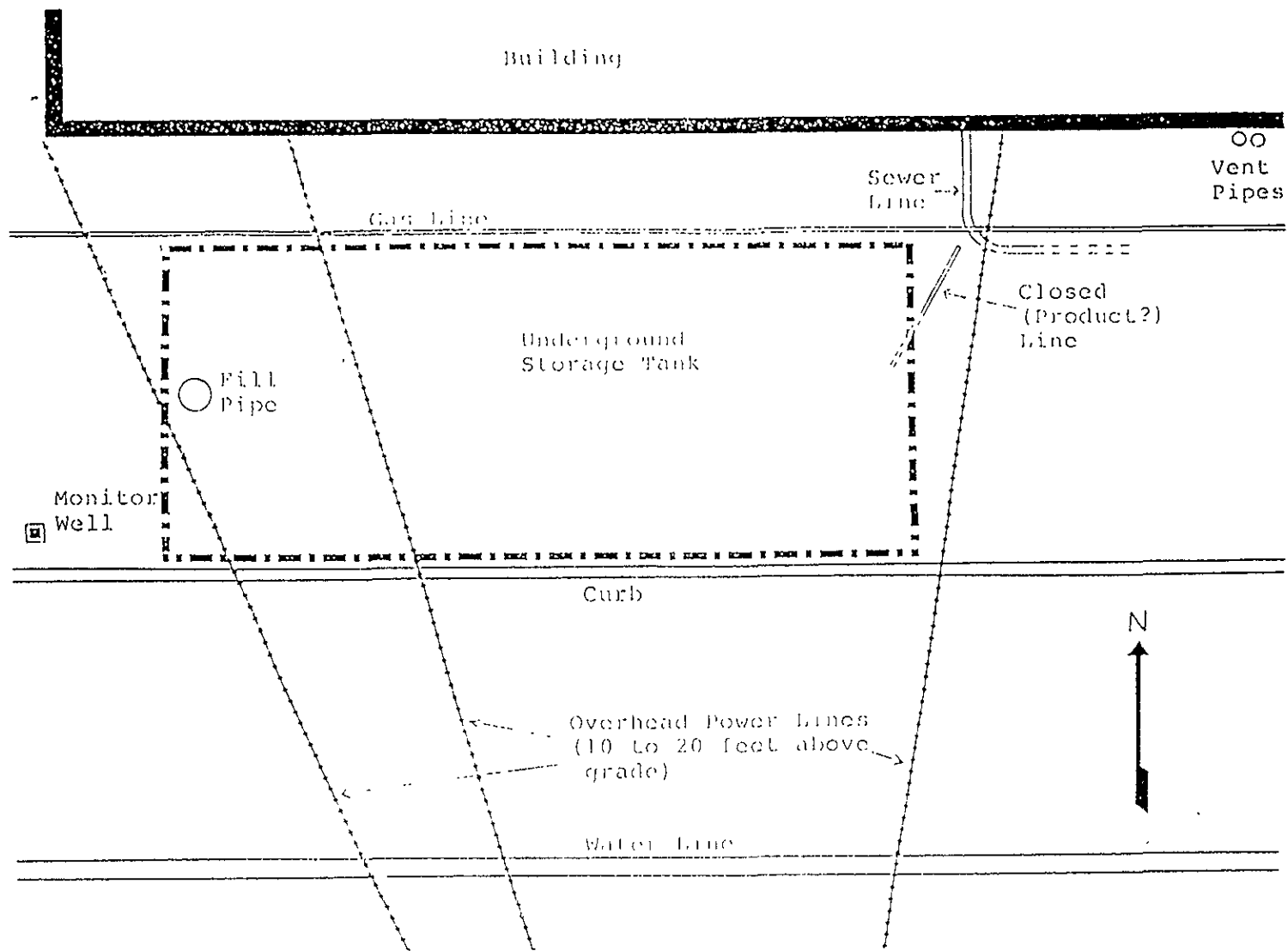
In May 1986, Mr. & Mrs. Edward Kozel purchased real property from the Boysen Paint Company located at 1001 42nd Street in Oakland, California. The property is currently operated by ONE. As part of the sale conditions, the Seller (Boysen Paint) agreed to remove all tanks located on the property except for tanks that were located in the truck loading area, as requested by the buyer. In December 1986, Grow Group, Inc., was informed that tanks in the truck loading area were scheduled to be removed in January of 1987 by ONE (Figure 2). After the tanks were removed, a monitoring well (LD4) was installed by ONE adjacent to the truck loading dock. Details of the removal of this tank and the date of well installation are unknown.

In May 1987, OHM, on behalf of Grow Group Inc. and Ameritone Paint Corporation, conducted a ground penetrating radar (GPR) survey of the site to identify buried structures that may affect proper closure of the former Boysen Paint underground tank located on 41st Street. The survey identified the limits of the tank and four underground utility lines: a natural gas line running parallel to the side walk and approximately 2 feet south of the building; a water pipeline running parallel to the sidewalk approximately 7 feet south of the curb; a sewer line, northeast of the tank; and, an unidentified structure at the eastern end of the tank (Figures 3 and 4).

On February 9, 1988, OHM, on behalf of Ameritone Paint Corporation, installed a temporary groundwater monitoring well adjacent to the former Boysen Paint tank and collected a groundwater sample for chemical analysis. Based on the presence of methylene chloride in the temporary well, OHM recommended that a permanent groundwater monitoring well be installed on the site, the inspection of associated piping at the east end of the tank, and the removal and disposal of the contents of the tank. The temporary well was abandoned.

On April 4, 1990, approximately 610 gallons of various materials, including solvents, petroleum hydrocarbons, sludge, and water, were pumped from the tank with a vacuum truck and transported to Solvent Services Inc., in San Jose for recycling or disposal at a licensed facility. OHM then removed a portion of the sidewalk to more accurately locate the utility lines and structures observed during the 1987 GPR survey. A 2-inch diameter natural gas line was located 2.75 feet south of and parallel to the building at a depth of 2.2 feet. In addition, at a depth of approximately 1.5 feet was a 1.5 inch diameter pipe traversing the sidewalk and dipping to the southwest toward the tank. Other utility lines located during the excavation are shown on Figures 3 and 4.

On May 15, 1990, OHM installed a 22 foot deep groundwater monitoring well at the western end of the underground storage tank (Figure 2). A composite soil sample of cuttings removed from the borehole contained total



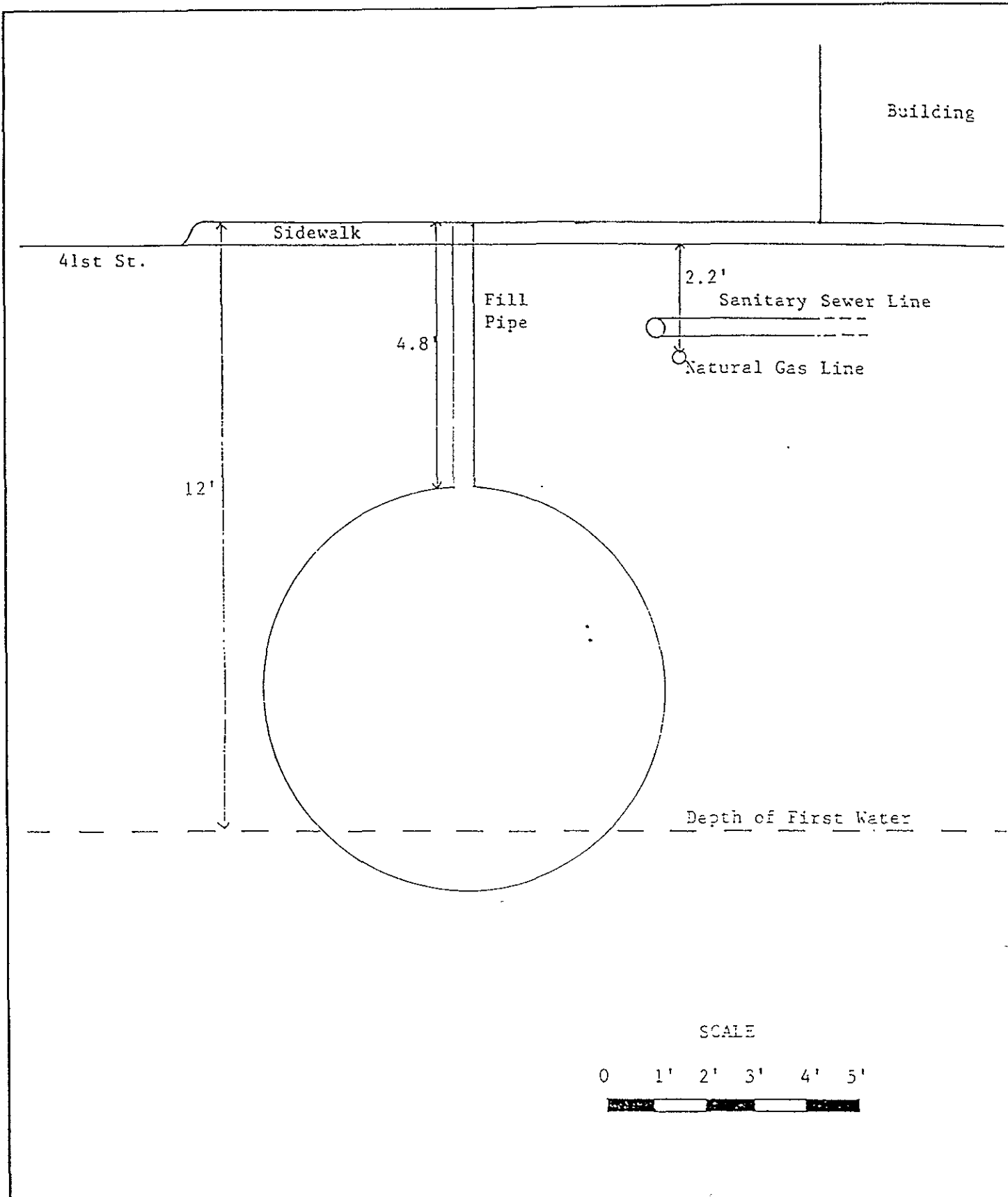
Source: UHM Remedial Services Corp., 1991.

Scale: 1 inch = 4 feet



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Figure 3
 Locations of Underground Storage Tank and
 Proximity to Utility Lines,
 Former Boysen Paint Company,
 Emeryville, California



Source: UHM Remedial Services Corp., 1991.

Scale: 1 inch = 2.75 feet



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Figure 4
 Cross-Section of Underground Storage Tank and
 Proximity to Utility Lines,
 Former Boysen Paint Company,
 Emeryville, California

petroleum hydrocarbons of 250 mg/kg near the formerly used tank. However, part of the soil sample was collected from below the water table and may have been affected by the migration of target constituents in groundwater (OHM, 1991). The soil sample was not analyzed for other constituents. After the well was installed and developed, a groundwater sample was collected and analyzed for total petroleum hydrocarbons (TPH, EPA Method 8015) and volatile organic compounds (VOC, EPA Method 624). Groundwater contaminants detected in the sample were total petroleum hydrocarbons (57,000 ug/l), methylene chloride (11.4 ug/l), and other VOCs totalling <2.5 ug/l per EPA method 624 (Table 1).

On September 30, 1991, Aqua Terra Technologies (ATT) collected groundwater samples from MW-1 (referenced to as "41st" in ATT's report, dated January 8, 1992) and LD4 on ONE's property. The groundwater samples collected from MW-1 were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPH-G, EPA Method 5030) and as diesel (TPH-D, EPA Method 3510), purgeable hydrocarbons (CLHC, EPA Method 601), and total dissolved solids (TDS, EPA Method 160.1). The groundwater sample in MW-1 contained TPH-G (18,000 mg/l), kerosene (29,000 mg/l), toluene (5.6 ug/l), ethylbenzene (250 ug/l), and total xylenes (980 mg/l). The TDS in MW-1 was reported at 526,000 ug/l. The groundwater sample collected from LD4 was analyzed for BTEX and TDS only. The groundwater sample from LD4 contained benzene (2.0 ug/l), toluene (3.1 ug/L), ethylbenzene (9.0 ug/l), and total xylenes (24 ug/l). The TDS from LD4 was reported at 695,000 ug/l.

In-Place Closure vs. Removal

As described in the previous section, the location of the tank is in close proximity to the adjacent building and underground and above ground utility lines. A very difficult excavation and elaborate protective measures for the utilities would be required if the tank is removed for closure. Several important issues are outlined below regarding any proposal involving removal of the tank.

- From an engineering standpoint, the excavation and removal of the former Boysen Paint mineral spirits storage tank presents several difficulties related to ensuring the integrity of underground utilities and adjacent permanent structures. The two structures that would require significant measures to ensure their integrity are the adjacent brick building currently used by Oakland National Engravers and the natural gas line. The outside edge of the building is approximately 3 feet from the northern edge of the tank footprint (Figures 3 and 4; Photo 1). The natural gas line lies approximately 2.2 feet below the surface and



Photo 1 - View of tank area looking east toward Adeline Street.
The edges of the tank are marked with the dashed line on the sidewalk
and the 2" diameter gas line is marked by the dashed line between building and tank.

almost directly above the northern edge of the subject tank (Figure 4). An elaborate shoring system will be required to protect both the gas line and building during implementation of an excavation and removal alternative. Typically, such structures would be shored by driving soldier piles at regular intervals between the tank and the existing structures. The base of the existing tank is approximately 15 feet below the surface. To ensure the integrity of the shoring, the piles would need to be driven to a depth of 20 to 25 feet. Wood or metal braces would then be installed to prevent the failure of excavation walls. However, the proximity of the gas line to the northern limit of the tank prohibits the vertical driving of such soldier piles between the tank and the gas line, or between the gas line and the building.

- The water table in the area has been measured at approximately 12 feet below the surface in MW-1, which is higher than the bottom of the tank. The soils surrounding the tank are likely to be saturated below the water table, thus diminishing their shear strength. When overburden is removed and as the soils are removed from around the tank, flotation of the tank may occur. It would be difficult, if not impossible, to constrain and control the upward movement of the "floating" tank to prevent it from impacting the gas line. In addition, an elaborate dewatering system would be required to handle potentially contaminated groundwater during excavation. The quantity of groundwater could be significant and control of its potential volume would not be possible.
- The overhead utilities (electricity and telephone) are between 10 and 20 feet above the ground. Service to residences and businesses in the area would have to be interrupted if a crane is used to lift the tank out of the ground.
- Street could be blocked for several days, impeding local access.

In support of the above analysis, ESC retained the services of Majors Engineering, Inc., to review this workplan and provide ESC with a professional opinion as to the feasibility of closure by removal. Majors Engineering states " The physical constraints of the site: proximity to building foundations, approximately 2 feet from the edge of the tank; proximity to 2" underground natural gas pipeline, approximately 6" from the edge of the tank; depth of UST, approximately 15' below grade; (and) depth of groundwater, approximately 12' feet below grade; proximity of overhead electric and telephone lines crossing over the tank; make the removal of the tank unreasonable, if not prohibitive." Majors Engineering further states that "Federal and state safety requirements (OSHA and

CALOSHA), prohibit use of the very equipment required to complete this job in situations where utility lines could be compromised (Appendix A)." After a careful review of the workplan and existing physical constraints at the site, Majors Engineering recommended "... that this underground storage tank be closed in place, cleaned and rendered inert to prevent unauthorized releases, filled to prevent movement and sealed to prevent any future problems."

Due to the reasons presented above, we recommend that permanent in-place closure of the subject tank be approved. The following section presents the method that will be used for rendering the tank inert.

In-Place Closure

Method of Rendering the Tank Inert

The remaining contents of the tank (if any) will be removed by using an explosion proof pump on a vacuum truck with a storage tank. Pump motors and suction hoses will be grounded to prevent electrostatic ignition hazards. If necessary, a hand pump will be used to remove the last few inches of residue from the bottom of the tank. The area surrounding the vacuum truck will be monitored with an explosimeter and a photoionization detector to insure that there are no hazardous vapors present during the vacuum operation. The vacuum truck will be located upwind from the tank and outside the path of probable vapor travel. The vacuum pump exhaust gases will be discharged through a hose of adequate size and length downwind of the truck and tank area.

The tank will be triple rinsed with water and the rinsate placed into drums. The drums will be hauled offsite to a waste disposal facility by a licensed hazardous waste hauler. A rinsate sample will be collected from the UST for laboratory analysis. The rinsate sample from the 5,000 gallon tank will be analyzed for TPH-G using EPA Method 5030, TPH-D using EPA Method 3510, and BTEX and VOCs using EPA Method 602, 624 or 8260.

After the tank rinsing process is complete, the soil overlying the tank will be excavated. All piping associated with the UST will be removed and disposed of unless removal might damage structures or other pipes in use. If such active lines are contained in a common trench with piping associated with the tank, tank piping to be closed will be emptied of its' contents and capped. The vent line will remain connected until the tank atmosphere has been brought to less than 20% of the lower flammable limit, as indicated by a combustible gas indicator. All other tank openings will be temporarily plugged. All vapors will be vented a minimum of 12 feet above grade and 3 feet above adjacent roof lines.

One or more holes may be cut in the tank top if existing tank openings are not adequate for introduction of the inert material to be used to fill the tank. An inert material (i.e., cement) that conforms with the Emeryville Fire Department's requirements will be introduced through openings in the top of the tank and the tank filled to the greatest extent possible.

no

In-Place Closure Report

A report on the in-place tank closure will be submitted to the Alameda DEH. This report will include a general description of the tank closure activities; description of the tank, fittings, and piping conditions; description of the tank excavation (as necessary), stratigraphy of units encountered during excavation, any evidence of contamination; description of sampling methods; description of remedial measures (as necessary); figures showing the excavation size and depth, nearby buildings, sample locations and depths, and tank and piping locations; chain-of-custody records; copies of signed laboratory reports; copies of "TSDF to Generator" Manifests for all hazardous wastes hauled offsite (sludge, rinsate, piping, contaminated soils, etc.); and tabulation of the volume and final destination of all non-manifested contaminated soil hauled offsite.

It is expected that in-place closure will begin within three weeks of approval of this plan by the Alameda DEH. Field work should last 5 to 7 working days. The tank closure report will be submitted to Alameda DEH five weeks after the field work is completed.

Appendix A - Letter from Major Engineering, Inc.



Majors Engineering

100 Park Place, Suite 220
San Ramon, CA 94583-1760
FAX (510) 820-3892
(510) 820-2423

October 20, 1992

Mr. Thomas Sparrowe
environmental Strategies Corporation
101 Metro Drive, Suite 650
San Jose, CA 95110

REFERENCE: PROPOSED IN-PLACE CLOSURE OF UNDERGROUND STORAGE TANK
FORMER BOYSEN PAINT FACILITY
EMERYVILLE, CA

Dear Thomas:

Per our telephone conversations of last week and your written request dated October 15, 1992, Majors Engineering, Inc. has reviewed your draft workplan and submits for your use the following observations and statements.

. It appears that your workplan includes key provisions of local and federal environmental laws applicable to the closure and/or removal, and testing, of underground storage tanks (UST), and these provisions appear to be standards in the industry. However, other testing or environmental safety measures may be required by local, state or federal agencies, above those specifically mentioned in the workplan.

. The physical constraints of this site:

Proximity to building foundations, approximately 2 feet from the edge of the tank;
Proximity to 2" underground natural gas pipeline, approximately 6 inches from the edge of the tank;
Depth of UST, approximately 15 feet below grade;
Depth of groundwater, approximately 12 feet below grade,
Proximity of overhead electric and telephone lines, crossing over the tank;

make the removal of the tank unreasonable, if not prohibitive.

. To properly and safely excavate and remove this tank, extraordinary steps would be required by the contractor. Because of the location of adjacent improvements, both public and private, open excavation is not possible. Any shoring system proposed would have to be installed virtually at the building face. No information is available about the building foundation or wall structure, and provisions for insuring the structural integrity of the building would necessitate a complete (semi-destructive) analysis of the structure. Closing the tank in place would not jeopardize the structural integrity of the building or unnecessarily encroach into or disturb any service easement or the public right-of-way.

An ESOP Company

... in San Ramon, Novato, Sacramento and Santa Rosa.

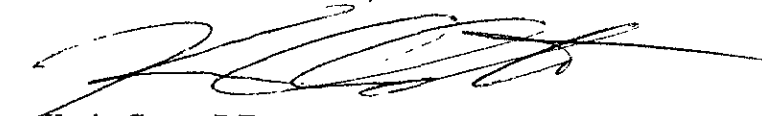
- . The utilities in close proximity to the tank, overhead electric and telephone lines and an underground natural gas pipeline, would require deactivation for the duration of the excavation, removal of the tank and backfilling operations, which may exceed a week. The disruption of utility services to adjacent neighbors and businesses can be avoided by closure in place.
- . Federal and state safety requirements, (OSHA and CALOSHA), prohibit use of the very equipment required to complete tank removals in situations where utilities could be compromised. Closing the tank in place would reduce the equipment required to those pieces of equipment that could be operated safely in such a tight location. The overall excavation would be less than half as deep as the excavation needed to pull the tank.
- . After the tank has been rendered inert and certified clean by the appropriate agencies, it can be stabilized against future movement caused by buoyancy or other potential problems. If the tank is not secured by straps and deadman anchors to prevent buoyancy, it should be filled. The workplan recommends concrete as a fill material. Majors Engineering, Inc. suggests consideration of alternate fill materials as the weight of the concrete may be excessive in relation to the bearing capacity of the soil. When calculating the buoyancy of the tank, the highest probable groundwater depth should be used, (i.e., high tide, non-drought conditions). When calculating the bearing capacity the lowest probable groundwater depth should be used.
- . In its review, Majors Engineering, did not address any of the issues related to investigation or remediation of environmental contamination at the site.

Majors Engineering, Inc. suggests that this underground storage tank be closed in place, cleaned and rendered inert to prevent unauthorized releases, filled to prevent movement and sealed to prevent any future problems. By following approved safety procedures of the local and state regulatory agencies, this work can be accomplished in a cost effective and non-threatening manner. Due consideration of this alternative is warranted and recommended.

Please contact us at your convenience if we may be of further assistance in this or other matters.

Sincerely,

MAJORS ENGINEERING, INC.



Kevin Carter, P.E.
R.C.E. No. 44665

KCC/cjs

