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W. A. CRAIG, INC.

Environmental Consulting and Contracting
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Contractor and Hazardous Substances License #455752
Cal/OSHA Statewide Annual Excavation Permit #559351
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July 5, 1995

Mr. Terry Knox
Pacific Electric Motor
1009 66th Avenue
Oakland, CA 94621-3535

Project No. 3471C

Subject: **WORKPLAN FOR ADDITIONAL REMEDIATION OF SOIL AND GROUNDWATER AT:**
1009 66th Street - Oakland, California

Dear Terry:

At your request, W. A. Craig, Inc. has developed a plan for cleanup of your site as required by the Alameda County Health Department and the State of California Regional Water Quality Control Board, San Francisco (SFRWQCB). W. A. Craig, Inc. understands that you will forward copies of this report to the Alameda County Health Department for their review. Please call W. A. Craig, Inc., if you have any questions at (707) 252-3353.

Sincerely,

W. A. Craig, Inc.

W. A. Craig, II
President, R.E.A. 01414

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WORKPLAN FOR ADDITIONAL REMEDIATION OF SOIL AND GROUNDWATER

AT

1009 66th Street - Oakland, California

by

W. A. Craig, Inc.
Napa, California

Submitted to:

Mr. Terry Knox
Pacific Electric Motor
1009 66th Avenue
Oakland, CA 94621-3535

REGISTERED ENVIRONMENTAL ASSESSOR
WILLIAM A. CRAIG, II
No. 01414
Expires 6-96
STATE OF CALIFORNIA

W. A. Craig II, R.E.A. 01414

REGISTERED GEOLOGIST
FRANKLIN JEROME GOLDMAN
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STATE OF CALIFORNIA

Frank Goldman, R.G. 5557

W.A. Craig, Inc.
Project No. 3471C
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1.0 EXECUTIVE SUMMARY

This report is a workplan for additional remediation of soil and groundwater already completed to date. The former 2,000 gallon underground storage tank (UST) which was apparently responsible for the discharge of gasoline to the subsurface onsite was investigated during two previous phases of investigation. These two reports produced by W. A. Craig, Inc. are listed as follows:

- **Subsurface Environmental Investigation, May 16, 1995**
- **Final Closure Plan for Underground Storage Tank Removal, March 14, 1995**

The closure plan report summarized the analytical results of contaminated soil samples obtained from the excavation during the removal of the former UST. The subsurface investigation report summarized the laboratory results of soil and groundwater samples collected from nine exploratory soil borings and eleven trench/excavation, pit sidewall and bottom soil samples as well as initial soil and groundwater remediation activities.

The results of laboratory testing identified gasoline contamination in soil and groundwater. The depth to groundwater at the site is approximately 13 to 15 feet below ground surface. The contamination appears to extend approximately five feet below the present water table due to a smear zone which was created when the water table was at a lower elevation. The vertical and lateral extent of contamination has been defined and the most highly contaminated soil is easily accessible to excavation by a backhoe/excavator. Contaminated groundwater is more easily accessible to pumping from the open pit than it would be if water was extracted through wells prior to treatment through carbon filtration drums. The fine grained nature of subsurface soils makes in-situ alternatives for remediation of soil and groundwater less effective than treatment of soil after excavation or treatment of water after pumping from the pit.

The goal of the proposed remediation work is to cost effectively remove the most contaminated soil and groundwater. After this remediation is completed, the existing open pit can be sealed up to eliminate this conduit for contaminant migratory pathways which may lead to human receptors onsite and may further threaten groundwater quality.

2.0 PROPOSED SOIL INVESTIGATION BY TRENCHING PERFORMED CONCURRENTLY WITH REMEDIATION

The vertical and lateral extent of contamination has been defined to the extent that it will enable an overexcavation of contaminated soil to commence in conjunction with post confirmation sampling to remove the most contaminated soil and groundwater. The most

contaminated soils in the vicinity of the former UST location can be removed by an excavator/backhoe. During this process, exploratory overexcavations of the pit sidewalls and bottom can be sampled and analyzed, for contaminated soil and groundwater, to guide the progress and effectiveness of the remediation activities until clean soil and groundwater are encountered. The overexcavation will extend to a depth of approximately 15 feet bgs. Contaminated groundwater which flows into the excavation and trenches will be pumped out into Baker tanks and run through a carbon filtration system before discharge to a nearby stormdrain or percolation onsite. (**See Drawing 1** for map of proposed limits of excavation.)

w/ appropriate reg approval

Sampling Protocol

An appropriate number of soil samples will be collected from each excavation associated with the former underground storage tank identified onsite according to the Tri-Regional guidelines. These samples will be obtained from along piping trenches and along pit sidewalls and pit bottoms.

specify

Soil samples will be collected using a backhoe bucket to scoop soil from the desired sampling points. Sampling tubes will then be driven into the soil in the backhoe buckets to obtain samples. Each sample will be screened for hydrocarbon contamination volatiles with a HNu and by olfactory odor to help guide the investigation. All sampling tubes will be 2"-diameter steel tubes. Care will be taken to ensure that these sampling tubes did not contain headspace.

All sampling equipment and tubes used for sampling will be pressure washed with water and inorganic detergent to help prevent cross-contamination. After the samples will be collected, the tube ends were covered with Teflon film, capped with polyethylene lids, and wrapped with duct tape. The sample tubes will then be sealed inside a ziploc bag with a sample identification label and placed inside the bag.

using a bailer?

Groundwater samples will be collected from the excavations and placed in 40 ml glass VOA vials, labeled, and placed in plastic bags.

All prepared soil samples will be immediately placed on ice inside a portable cooler, and stored under refrigeration for delivery using proper chain-of-custody documentation. Samples will then be delivered to McCampbell Analytical, a State-Certified laboratory for analysis.

3.0 CLEANUP LIMITS FOR GROUNDWATER AND EFFLUENT LIMITATIONS FOR TREATED WASTEWATER DISCHARGE

Effluent limitations limits for the treated wastewater discharge will be based on the

B appropriate for cleanup of although 21 ppb may be not appropriate for discharge conc which is dep. on reg agencies.

Human Health related criteria for Marine Water in the Shallow Water Effluent Limitations in the Basin Plan. Benzene will therefore be treated to less than 21 ppb. It is a safe assumption that if the benzene is treated to this level, Total Petroleum Hydrocarbons for gasoline ranged organics will also have been remediated to acceptable levels before discharge.

The goal of groundwater cleanup in the immediate vicinity of the site should be based on the Maximum Contaminant Levels (MCL's) for BTEX based on the San Francisco Regional Board Water Quality Control Board's beneficial use of groundwater. The groundwater in the vicinity has municipal and domestic supply beneficial uses.

4.0 CLEANUP LIMITS FOR SOIL REMOVAL

In absence of a generic soil cleanup criteria at the SFRWQCB, the soil cleanup levels proposed for gasoline are addressed in the Los Angeles Regional Water Quality Control Board's, "Interim Guidance for Remediation of Petroleum Impacted Sites, Soil Screening Levels, Table 1, Page 6."

The Level A criteria for any groundwater less than 40 vertical feet below the point source of contamination (i.e. shallow groundwater) specifies that the soil screening levels for the individual BTEX constituents are the MCL and gasoline ranged organics is 10 PPM.

Our proposed level for benzene (i.e. 50 ppb), however, is well above that suggested by the LARWQCB. The 50 ppb level is suggested based on the fine grained nature of the soils encountered at the site. Laboratory results for this site show that very high levels of benzene in the soil above the water table are significantly higher than the levels identified below the water table. The very low levels of benzene in soil below the water table indicates that the combination of fine grained soils and the water table provide an effective barrier to vertical migration of benzene below the water table. After removal of contaminated soil the remaining benzene will be less of a threat to water quality than at present. Leaving 50 ppb benzene in soil is therefore considered to be a minimal threat to groundwater quality and attainable by the proposed remediation system (i.e. Overexcavation and treatment by a vapor extraction piping network through stockpiles; ex-situ).

5.0 PROPOSED REMEDIATION PROCESS

The scope of work for the proposed remediation process is outlined in **Appendix 1**. This scope of work outlines the physical step-by-step process which W. A. Craig, Inc. will follow in the field in order to accomplish the removal of contaminated soil and groundwater onsite. Included is the analytical testing to be performed on samples collected and plans for waste disposal.

6.0 CONCLUSIONS & RECOMMENDATIONS

Soil removal and treatment will be performed in three or four phases to minimize exposure of gasoline vapors to neighboring properties and maximize space to allow ongoing business operations to continue without interruption. The exact configuration of the piping layout will be determined in the field after soil waste profiling is completed to determine the exact distribution of the waste soil piles.

Excavation of the most highly contaminated soils onsite is the most cost effective method at this time because the contamination exists at very shallow depths is easily accessible. Also, the resulting excavation will provide a conduit which will produce a temporary product recovery trench in the excavation which can yield more contaminated water for treatment than recovery wells. Recovery wells would be less effective due to the fine grained nature of the soils identified onsite.

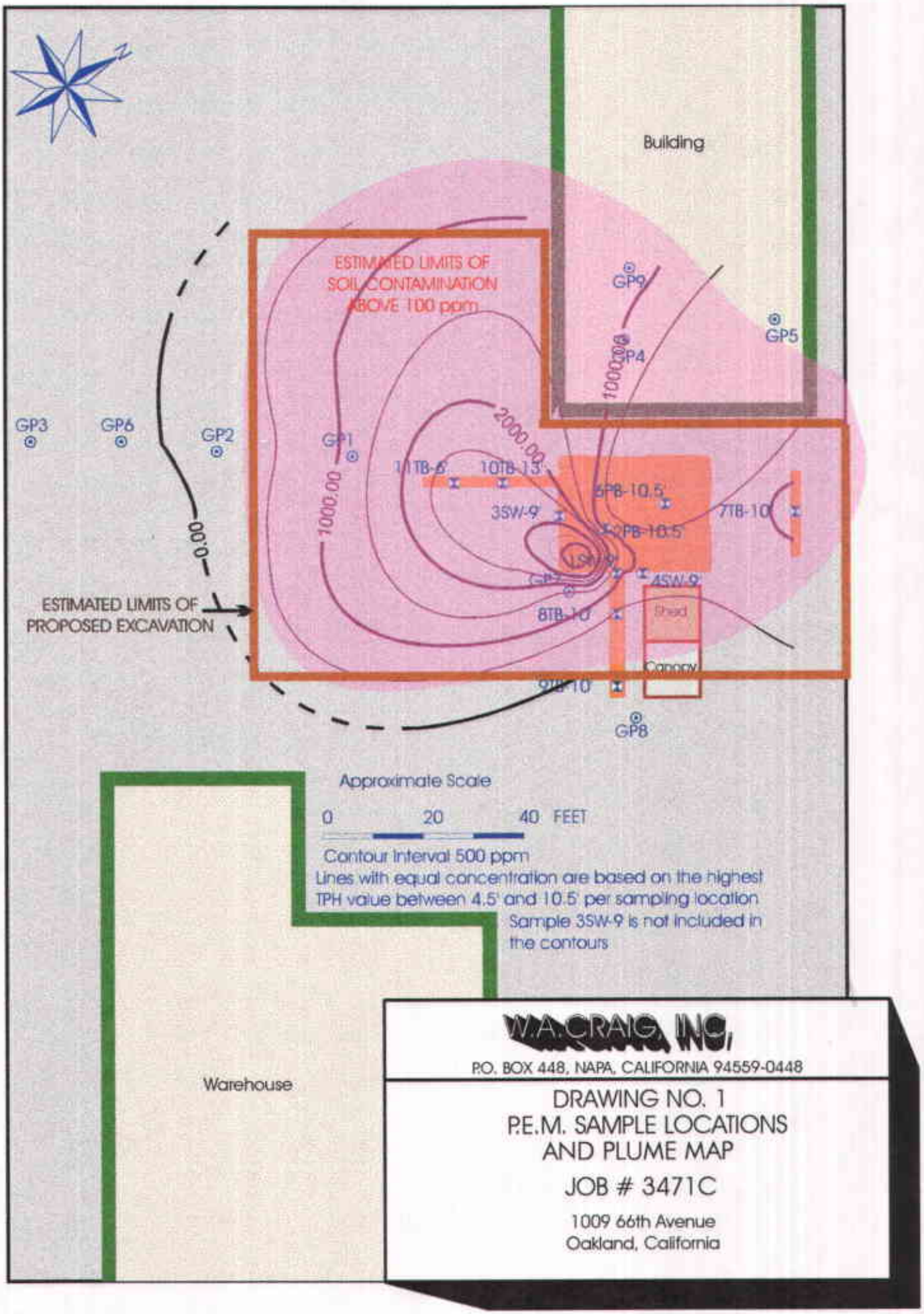
Contamination under the building is trapped within silty earthen materials and may be remediated by the use of vapor extraction wells. If not, the soil will have to be removed by horizontal well excavations or stabilized in-place to prevent future migration to groundwater.

Groundwater should not be removed and pumped with groundwater pumping wells because the yield is too low. Removal of water from tank pits during tank over-excavation would be the premier choice for remediating the groundwater onsite as a significantly greater amount of water can be recovered per unit of time, allowing for greater flexibility in treatment options. The water should be run through carbon drums to acceptable levels and a temporary NPDES or a WDR permit should be obtained from the Regional Water Board to discharge the treated water to a nearby storm drain or percolated onsite.

7.0 LIMITATIONS

This report has been prepared in accordance with generally accepted environmental, geological and engineering practices. No warranty, either expressed or implied, is made as to the professional advice presented herein. The analyses, conclusions and recommendations contained in this report are based upon site conditions as they existed at the time of the investigation and they are subject to change.

The conclusions presented in this report are professional opinions based solely upon visual observations of the site and vicinity, and interpretation of available information as described in this report. W. A. Craig, Inc., recognizes that the limited scope of services performed in execution of this investigation may not be appropriate to satisfy the needs, or requirements of other state agencies, or of other users. Any use or reuse of this document or its findings, conclusions or recommendations presented herein is at the sole risk of said user.



W.A. CRAIG, INC.

P.O. BOX 448, NAPA, CALIFORNIA 94559-0448

DRAWING NO. 1
P.E.M. SAMPLE LOCATIONS
AND PLUME MAP

JOB # 3471C

1009 66th Avenue
Oakland, California

PROPOSED SCOPE OF WORK FOR REMEDIATION

1. Provide proper Health and Safety Plan for projects Scope of Work.

2. Provide any permits that are required for work from appropriate agencies.

3. Figure on a one time mobilization and demobilization cost.

4. One small 10' x 12' wood frame and sheet metal sided 9' high storage structure must be removed and attached 8' attached roof overhang. Debris to be off hauled for disposal.

5. Concrete pad under structure listed above approximately 12' x 18' x 8" thick shall be broken up and hauled off site for proper disposal.

6. Asphalt shall be removed and hauled off site. Approximate square feet of asphalt 3" to 4" thick to be removed is 9,000.

7. Excavation shall be done in three (3) or four (4) phases with back filling and compacting being completed prior to the next phase. Excavation shall not encroach closer than three (3) feet from building or fence line. Excavation shall be cut vertical to five (5) feet below grade at building and fence line and then tapered at a 1 to 1 to bottom depth required to remove contamination. For bidding purposes depth of excavation shall not exceed twenty (20) feet below grade. Contractor will be required to finish either east side of building prior to work ing on south side or vice versa. Theses are the only two sides that owner can access building. One side must remain accessible at all times. Approximately 2000 cubic yards of contaminated soil and 1200 cubic yards of clean overburden will be removed and stockpiled onsite.

NOTE: Soil screening for contamination and soil sampling will be done by other under separate contract. Compaction testing and backfill shall also be done by others.

8. Dewatering of excavation - Contractor will be required to dewater excavation as needed with his or her own pumping apparatus. Owner has two (2) each 20,000 gallon backer tanks on site for water storage. Please review boring logs as to depth to ground water.

9. Stock piled soil - Contractor shall separate clean overburden from contaminated soil into respective stock piles on site. Soils Engineer will assist contractor in separating contaminated soil, soil shall be placed on 10 mil poly sheathing and covered with same at all times when not working on site.

10. Backfill - Contractor shall plan on no sand or gravel backfill. Backfill shall be clean compactable import soil. No debris, organic, concrete, asphalt, or stones/rocks larger than six (6) inches. Backfill material must meet 90% at five (5) feet below grade and 95% from five (5) feet to subgrade. Backfill shall be placed in lifts no greater than twelve (12) inches.

11. Contractor shall provide resurfacing with four (4) inches of AC on top of twelve (12) inches of Class II AB, owner has heavy truck traffic over area.

12. Contractor shall keep work area clean and neat, and fence excavation with six (6) feet of chain length portable panels as well as provide barricades during work hours.

13. Remediation options of stockpiled contaminated soil.

    a. Off haul for disposal at appropriate disposal facility.

    b. Aerate on site under BAAQ Permit.
       b1. Layout and mechanically aerate soil.
       b2. Stock pile with air venting through pipe gallery and vaccum pump.