AUG 15 PM

Uriah Inc.

An Environmental Services Company

WORKPLAN FOR THE CHARACTERIZATION
AND REMEDIATION OF HYDROCARBON CONTAMINATED SOIL
AT:

3516 ADELINE STREET, OAKLAND, CA

JULY 31, 1991

464 Lindbergh Avenue • Livermore, California 94550 • (415) 455-4991

Uriah Inc.
An Environmental Services Company

91 AUG 16 P 2:

July 31, 1991

Mr. Dennis J. Byrne
Hazardous Materials Specialist
Alameda County Health Care Services Agency
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621

RE: Workplan for the Characterization and Remediation of Hydrocarbon Contaminated Soil at 3516 Adeline Street, Oakland, CA

Dear Mr. Byrne:

Uriah, Inc. has been authorized by Ms. Leah Champion, a representative of the estate which includes the former City of Paris Cleaners, 3516 Adeline Street, Oakland, CA, to prepare a workplan for the definition of the vertical and lateral extent of Stoddard Solvent contamination of soil, to excavate and bio-remediate soil found to be contaminated, and install one 2-inch diameter groundwater monitoring well at the site. This workplan is intended to respond to requirements for the specified tasks set forth by the Alameda County Health Care Services Agency (ACoHCSA) and meet guidelines promulgated by the San Francisco Bay Region Water Quality Control Board (RWQCB). The workplan includes a description of tasks to be performed, a Sampling and Analysis Plan (included as part of the text), and a Health and Safety Plan (attached as Appendix "A").

DEFINITION OF THE EXTENT OF SOIL CONTAMINATION

It is our intention to define the vertical and lateral extent of contamination previously detected in the area illustrated in Figure #2 as a result of certified analyses of soil samples acquired attendant to the excavation of one 750 gallon underground storage tank and two 1,000 gallon underground storage tanks, all of which, we understand, contained only Stoddard Solvent that was used in the dry cleaning plant formerly operated on site. It is proposed that the boundaries of the

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solvent plume(s), if any, be defined through the use of soil vapor analysis (SVA). As proposed for this site, the SVA procedure would involve the insertion of 7/8-inch diameter stainless steel probes fitted with a forged point and perforated with 3/16-inch holes along the lower twenty inches of the probe surface. Each probe would be inserted into the soil at a depth to be determined by lithologic conditions and accessibility to the subsurface. Samples of soil vapor (i.e. those gases that occupy the spaces between soil particles and may include vapor phase hydrocarbon contaminants) would be acquired at the site of each probe insertion by the aspiration of a volume of soil gas through a Photovac "Tip I" vapor analyzer which would be calibrated using a 50 parts per million (ppm) hexane standard. Subsequent to completing the on-site SVA study, a contour map would be prepared which would model vapor phase contaminant patterns in the subsurface. By comparing SVA contours with soil profile data also acquired, approximate liquid phase plume configurations would also be determined.

Upon completion of the SVA study and attendant data development, a backhoe or other appropriate mechanical excavator will be used to excavate the area of contamination. During the excavation process, contamination would be tracked organo-leptically, with field instrumentation such as the Photovac "TIP I", a liquid to liquid extraction process known as the Hanby System, and/or thin layer chromatography.

At such time as the extent of contamination has been determined, or it becomes unfeasible to excavate further due to the presence of a significant subsurface obstruction such as a utility line, building, or roadway, samples would be acquired from the floor and sidewalls of the excavation. Each sample would be obtained from an undisturbed block of soil brought to grade within the excavator bucket. After removing the top 1"-2" of soil within the bucket, a clean brass sampling tube (1.9 inches in diameter by 6.0 inches in length) would be driven into the remaining soil until it was completely filled with a consolidated volume of material. Promptly upon removing the sampling tube from the soil, the ends of the tube would be covered with teflon pads, fitted with plastic caps, and wrapped with black electrical or duct tape. Each tube would be marked and placed on blue ice for transportation to a certified hazardous waste analytical laboratory under chain of custody. All soil samples would be analyzed for Total Petroleum Hydrocarbons as Stoddard Solvent (TPH-S) using EPA Methods 3550/8015.

INSTALLATION, DEVELOPMENT, AND SAMPLING OF ONE GROUNDWATER MONITORING WELL

In order to ascertain if groundwater has been impacted by TPH-

S, it is proposed that one 2-inch diameter groundwater monitoring well be installed within ten feet downgradient of the pit formerly occupied by the underground tanks, i.e. at approximately that point which is illustrated in Figure #2. This location was established with regard to a hydraulic gradient of N 70° W, which was determined to be appropriate for the subject site based on gradients calculated at contamination sites within a ½-mile radius of 3516 Adeline Street at which three or more groundwater monitoring wells have been installed.

The well boring would be advanced with a truck-mounted drill rig equipped with 8-inch outside diameter, continuous-flight, hollow-stem augers and logged using the Unified Soil Classification System. If the well is placed in an area previously excavated as described above, it is proposed that no soil samples be acquired for chemical analyses. If, however, this is not the case, it is proposed that soil samples be acquired at five foot intervals between five feet below ground surface and the top of the capillary fringe using a California Modified Split-Spoon Sampler driven through the hollow stem of the drilling augers. Immediately upon opening the sampler, the ends of the 1.9 inch x 6.0 inch clean brass sampling tubes contained within would be wrapped with teflon pads, fitted with plastic caps, sealed with black electrical or duct tape, labeled, and placed on blue ice for transportation to a state certified hazardous waste analytical laboratory under chain of custody. The samples would be analyzed for TPH-S using EPA Methods 3550/8015. The limit of detection for TPH-S in soil is expected to be 10 ppm.

One discrete soil sample would be acquired from the stockpile of excavated soil at a frequency of one sample for each 50 cubic yards of soil present. Each of these samples would be acquired, sealed, and transported as described above with subsequent analyses for TPH-S, corrosivity, ignitability, reactivity, and toxicity (fish bioassay).

The monitoring well will be constructed as illustrated in Figure #3, having been advanced to a depth of approximately 20 feet below ground surface (i.e. fifteen feet below the point at which groundwater is first encountered), and then developed and sampled in accordance with protocol set forth by the RWQCB in the document entitled "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks... Tri-Regional Recommendations". Fluids produced from the development process would be held on site in a secured container until laboratory results are received and appropriate disposal protocol developed. Cuttings would be placed on visqueen sheeting, covered, and stored on site- also pending receipt of laboratory data.

Samples from the developed well would be acquired within a

clean, disposable, polyethylene bailer lowered into the well to a point immediately below the water surface. Each water sample would be transferred into one (1) amber glass sample bottle and two (2) Volatile Organic Analysis (VOA) vials, promptly sealed with teflon-lined screw caps, labeled, placed on blue ice, and transported to the certified laboratory under chain of custody for analysis for TPH-S using EPA Methods 3810/8015. The detection limit for TPH-S in water is expected to be 50 parts per billion (ppb).

Sample blanks and/or duplicates of soil and water samples will be acquired as specified by the County of Alameda.

All drilling and sampling equipment will be steam cleaned or thoroughly scrubbed with Alconox solution followed by a distilled water rinse prior to being brought on site and between samplings.

REMEDIATION OF EXCAVATED SOIL

Excavated soil which contains levels of hydrocarbons above those acceptable to concerned regulatory agencies are expected to be classified as non-hazardous waste, and it is proposed, therefore, that it be detoxified on site through the application of bioremediation technology. Although a number of space-minimizing methods are available for biological treatment, it appears that the most appropriate technology for the Adeline Street site will be that of "Modified Windrowing". Here, contaminated soil would be placed atop a bermed, hydrocarbon-resistant liner to a height of approximately $3\frac{1}{2}$'. Once positioned, the soil would be mixed with compost or treated with a liquid inoculum in order to provide adequate bulking, add nutrients (primarily nitrogen, phosphorus, and potassium), enhance and maintain moisture, and increase populations of common, non-pathogenic, hydrocarbon utilizing soil bacteria capable of the thorough aerobic degradation of hydrocarbon compounds to form the non-toxic end products of carbon dioxide, minerals, and water. Although largely weather dependent, the treatment process is expected to take between eight and ten weeks. During this period, the treatment bed would be monitored for rates of degradation, formation of degradation intermediates, moisture content, soil chemistry, and biological activity. Confirmation of the success of the treatment process would be through the acquisition and certified analysis of composite soil samples (one composite from four points for each 50 cubic yards of soil treated) for TPH-S.

Subsequent to the completion of excavation and monitoring well installation and sampling, a report will be prepared which will describe the work performed. The report will include methodology, maps and graphs, and plume modeling (if appropriate)

as well as conclusions and recommendations. Subsequent reports will be prepared and submitted regarding the bioremediation process and compliance monitoring of the on-site well.

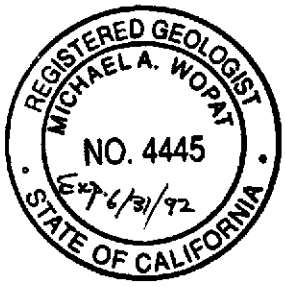
All tasks will be performed by, or under the direction of a Registered Geologist and/or Registered Civil Engineer.

If you have any questions regarding this workplan, or if we may otherwise be of assistance, please contact either of the undersigned at (415) 455-4991.

Sincerely,

Kevin McNamara

Kevin McNamara
Project Geologist
and



Michael A. Wopat, Ph.D.
Registered Geologist

KM/MAW:dr
enc. Appendix "A"...Health and Safety Plan

AREA LOCATION MAP

City of Paris Cleaners 3516 Adeline Street Oakland, California	Uriah, Inc. An Environmental Services Co. Date: June 21, 1991

Figure #1

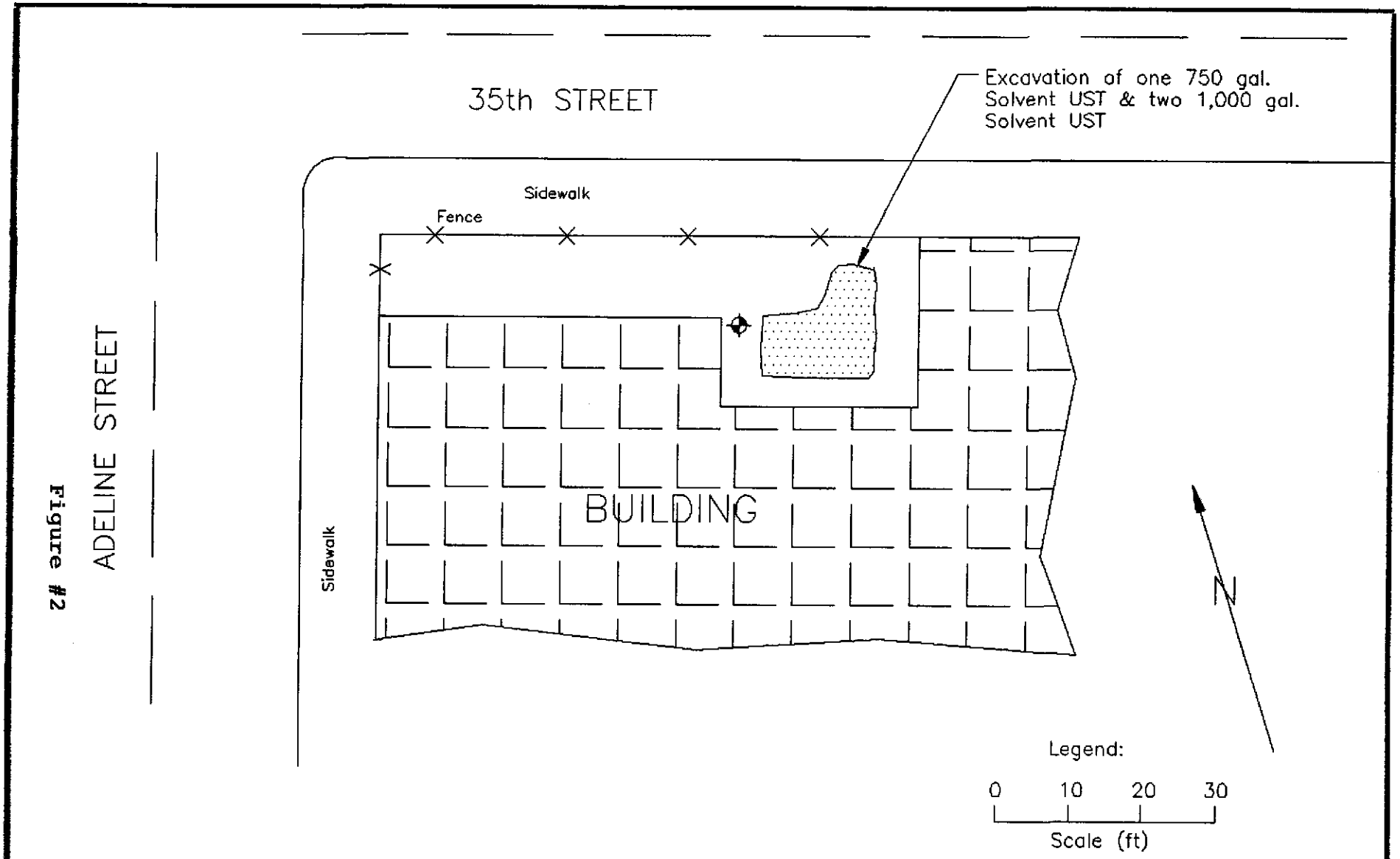


Figure #2

Site Map

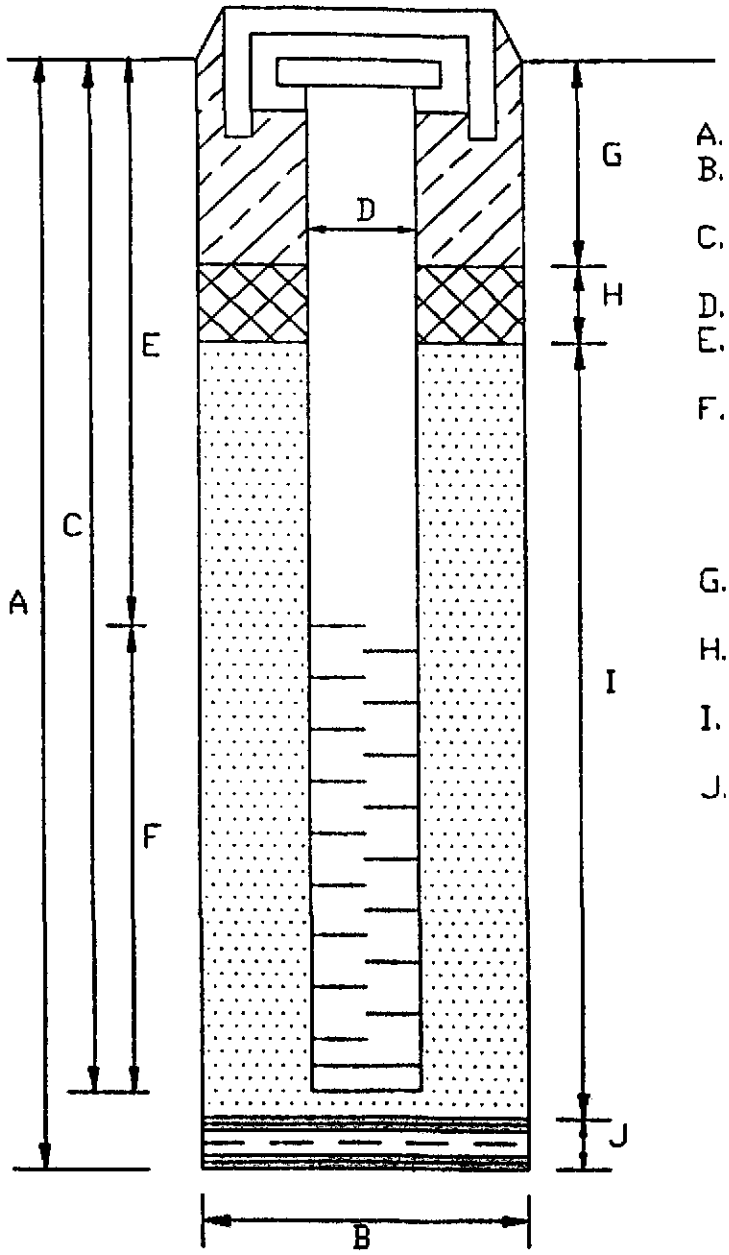
City of Paris Cleaners
3516 Adeline Street
Oakland, California

URIAH INC.
An Environmental Services Company

Date: June 21, 1991

WELL DETAILS

Project Name: 3516 Adeline St., Oakland
Well Number: MW-1



A. Total Depth: 30.0' bgs
B. Boring Diameter: 8.0"
Drilling Method: HSA
C. Casing Length: 30.0'
Material: Schedule 40 PVC
D. Casing Diameter: 2.0"
E. Depth to Perforations: 10.0' bgs
F. Perforated Length: 20.0'
Perforated Interval: 30.0'-10.0' bgs
Perforation Type: 0.02" slotted screen PVC
G. Surface Seal: 0.0'-8.0' bgs
Material: Portland Cement
H. Seal: 8.0'-9.0' bgs
Material: pelletized bentonite
I. Gravel Pack: 9.0'-30.0' bgs
Material: #3 grade silica sand
J. Bottom Seal: none

Figure #3

Appendix "A"
Health and Safety Plan

HEALTH AND SAFETY PROCEDURES FOR EXPLORATORY SOIL BORINGS/WELL INSTALLATIONS, AND EXCAVATIONS

The following protocol for personnel involved in the above referenced project is considered generally appropriate; however, modifications may be imposed by their consultants, and/or the County of Alameda in response to site specific conditions.

HEALTH AND SAFETY STAFF

Mr. John Rapp, REHS
Ms. Denise Rapp, R.N.

PUBLIC HEALTH/ENVIRONMENTAL HAZARD ASSESSMENT

Hazards associated with the performance of exploratory soil borings are those related to: 1). Exposure to the hydrocarbon contaminated soils being explored, 2). The potential for ignition of flammable/explosive vapors, and 3). The physical hazards associated with working with/near heavy equipment.

HAZARDS OF CHEMICAL EXPOSURE

A portion of the soils to be handled may be contaminated with gasoline and/or diesel fuel. The most toxic constituents present are believed to be the aromatic compounds within fuel hydrocarbons- benzene, toluene, xylenes, and ethylbenzene (BTX&E); with benzene the most toxic of these having been identified as a carcinogen and forming as much as 3.5% of gasoline by weight. Due to the volatile nature of the aromatics, the most significant route of potential exposure would appear to be via inhalation. Secondary routes of exposure would include dermal (by direct contact with contaminated soil) and by the incidental ingestion of contaminated dusts. The measures prescribed for the minimization of risks associated with the aforementioned routes of exposure are described below.

HAZARDS ASSOCIATED WITH FLAMMABLE VAPORS

Although by and large the levels of fuel hydrocarbons within soils encountered will not be very high, it is recognized that there is a potential for vapors to collect within the flammable range. The measures for early detection of these vapors is described below.

PHYSICAL HAZARDS

The physical hazards attendant to the performance of excavations and soil borings are those associated with working on/near mechanized equipment. Appropriate procedures attendant to the operation of equipment to be utilized on this project are already in force and are well known to our staff. Further, work-rest cycles will be established and adhered to so as to provide adequate rest periods; liquids will also be available to preclude problems associated with heat stress.

RISK FACTORS AND ASSOCIATED MITIGATION PROCEDURES

Type of Risk	Route of Exposure	Mitigating Factor(s)
Chemical	Inhalation	-Air purifying respirators with organic vapor and dust filters. -A hydrocarbon vapor survey meter will be used to determine exposure.
Chemical	Dermal/Ingestion	-Optimum use of equipment to minimize direct exposure to the soil. -Use of protective clothing. -The nature of the project does not involve the uncontrolled release of toxic materials.
Flammable Vapors	--	-A hydrocarbon vapor meter will be used to determine the percent of the lower explosive limit (LEL) present at the excavation.
Physical	--	-Physical hazards attendant to this project are no different from those associated with

drilling projects involving non-regulated materials.
-The use of trained and experienced staff; properly attired and using appropriate and well-maintained equipment.

WORK AREA

Only authorized personnel will be permitted within the work area. This area will be clearly marked and monitored.

DECONTAMINATION PROCEDURES

General procedures for handwashing and disposal of soiled clothing will be adhered to.

STANDARD WORK PRACTICES

All work will be planned in advance of its undertaking. No eating, smoking, or inappropriate consumption of liquids will be permitted. Proper procedures for the operation of equipment, and the instructions of the Safety Officer will be adhered to.

DOCUMENTATION

Monitoring, sampling, and analytical results will be carefully documented.