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January 15, 1998

8G004-2

Jan 15, 98

Mr. Thomas F. Peacock
Hazardous Materials Division
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

RE: Transmittal, Groundwater Investigation Workplan
165 13th Street, Oakland, California

Dear Mr. Peacock:

As directed by the County of Alameda-General Services Agency, Professional Services Industries, Inc. (PSI) is transmitting two copies of the *Groundwater Investigation Workplan* for the Alcopark Fueling Facility located at 165 13th Street, Oakland, California.

If you have any questions on this report please call me at (510) 785-1111.

Sincerely,

Timothy R. O'Brien, RG/CEG/CHG
Senior Geologist

enclosure

cc: Rod Freitag, P.E., County of Alameda-General Services Agency

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GROUNDWATER INVESTIGATION WORKPLAN

ALCOPARK FUELING FACILITY
OAKLAND, CALIFORNIA

prepared for

ALAMEDA COUNTY GENERAL SERVICES AGENCY
1401 Lakeside Drive, 11th Floor
Oakland, California

prepared by

Professional Service Industries, Inc.
1320 West Winton Avenue
Hayward, California 94545
(510) 785-1111

January 15, 1998
575-8G004-2

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STATEMENT OF LIMITATIONS AND PROFESSIONAL CERTIFICATION

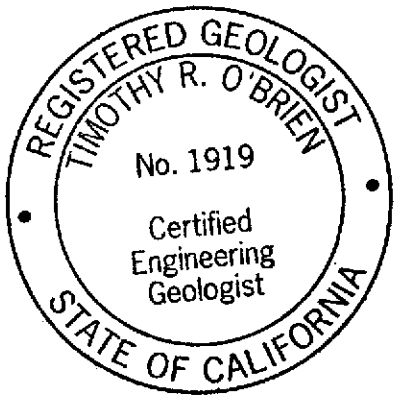
Information provided in this Workplan, for Professional Service Industries, Inc. (PSI), is intended exclusively for the use of County of Alameda, General Services Agency for the evaluation of subsurface conditions as it pertains to the subject site. The professional services provided have been performed in accordance with practices generally accepted by other geologists, hydrologists, hydrogeologists, engineers, and environmental scientists practicing in this field. No other warranty, either expressed or implied, is made. As with all subsurface investigations, there is no guarantee that the work conducted will identify any or all sources or locations of contamination.

PSI reserves the right to deviate from the proposed scope of services outlined in this Workplan as needed to obtain the required information. If such deviation is necessary, PSI will make every attempt to seek prior approval from the client and the regulatory agency overseeing this project.

This Workplan is issued with the understanding that GSA is responsible for ensuring that the information contained herein is brought to the attention of the appropriate regulatory agency. This Workplan has been reviewed by a geologist who is registered in the State of California and whose signature and license number appear below.

Frank R. Poss
Senior Hydrogeologist

Timothy R. O'Brien, RG/CEG/CHG
Senior Geologist



1. INTRODUCTION

Professional Service Industries, Inc. (PSI) has been retained by the County of Alameda, General Services Agency (GSA) to prepare a detailed Workplan to further assess soil and groundwater conditions at Alcopark fueling station located at 165 13th Street, Oakland, California. The site location is presented on Figure 1.

Presently, three groundwater monitoring wells exist on-site. Alameda County Health Care Services Agency (HCSA) has requested additional information on the extent of petroleum hydrocarbon impacted ground water (HCSA,1997a).

1.1 SCOPE OF WORK

The proposed scope of work consists of the following tasks:

- Prepare a site specific Health and Safety Plan.
- Mark the boring locations and notify Underground Service Alert 72 hours prior to performing drilling activities.
- Obtain groundwater levels in the existing wells to verify the groundwater gradient prior to drilling.
- Drill three soil borings to collect soil and groundwater samples. Soil samples and soil cuttings will be field screened for total organic vapor concentration using a photoionization detector (PID).
- Construct a 1-inch inside diameter well casing groundwater monitoring well in one of the soil borings. Develop and sample the well for chemical analysis.
- Obtain groundwater samples from the three existing monitoring wells.
- Transport soil and groundwater samples to McCampbell Analytical Laboratories, a California State certified laboratory, for analysis of Total Petroleum Hydrocarbons as Gasoline (TPH-G) by EPA Method 8015M; Benzene, Toluene, Ethylbenzene, total Xylenes (BTEX) and Methyl Tertiary Butyl Ether (MTBE) by EPA Method 8020;
- Prepare a report summarizing the findings of the investigation and evaluate the groundwater plume stability.

1.2 SITE BACKGROUND

Three groundwater monitoring wells were installed at the Alcopark fueling station in March, 1989 to assess environmental conditions subsequent to the repair of a line leak at Dispenser No.1. Initial sample results indicated the presence of BTEX in the groundwater. Subsequent sample results indicated the presence of TPH-G. Based on the analytical data, it was surmised that contaminants detected on-site were emanating from a source area located upgradient of the site. Sampling activities were halted in 1992 pending investigation of upgradient source (GSA, 1997).

By letter dated May 30, 1997 the Alameda County Health Care Services Agency (HCSA) instructed GSA to resume groundwater monitoring at Alcopark (HCSA, 1997b). Sampling resumed in July, 1997. Analytical data from that sampling event indicated elevated TPH-G and BTEX concentrations in the downgradient well. MTBE was also detected. Additional samples collected in October, 1997 provided similar results (GSA, 1997).

The extent of the groundwater plume is not defined. Groundwater at the site is approximately 20 feet below the ground surface. By letter dated September 11, 1997, the HCSA directed GSA to investigate the extent and stability of the plume.

1.2.1 Storage Tank System Upgrades

In September of 1992, overfill protection, spill containment, and automatic tank gauging were installed on the two underground tanks. In July and August of 1996, additional upgrade work was done to comply with Title 23 of the California Code of Regulations. This included replacement of underground single-walled steel piping with double-wall fiberglass piping, and installation of dispenser sumps, piping sumps, and sump leak sensors (GSA, 1997).

1.3 PROJECT OBJECTIVES

The objectives of the project are to define the extent of the groundwater plume and attempt to determine the source of the observed contamination.

2. PRE-FIELD ACTIVITIES

This section describes the tasks required prior to implementing the drilling program. The tasks include:

- Submit a Well Construction Permit to the Alameda County Public Works Department.
- Prepare a site specific health and safety plan.
- Mark the borehole locations on-site and inform Underground Service Alert of the planned drilling activities.
- Collect depth to groundwater measurements to verify the groundwater gradient.

2.1.1 Well Construction Permit Application

In accordance with well construction requirements in Alameda County, a well construction permit will be submitted to the Alameda County Public Works Department. The Public Works department will also be scheduled to be on-site to inspect the annular seal or boring grout placement.

2.1.2 Preparation of Site Specific Health and Safety Plan

Prior to the commencement of field activities at the site, a site-specific Health and Safety Plan (HSP) will be developed in compliance with 29 CFR 1910.120. The HSP will address the potentially hazardous materials and physical hazards that may be encountered during field activities at the site.

2.1.3 Utility Clearance

Upon approval of this workplan, PSI will mark the drilling locations with white paint. At least 72 hours prior to drilling activities, PSI will contact Underground Service Alert (USA) to identify subsurface utilities that may exist in the areas of investigation. In addition, the boring locations will be cleared by a private underground utility locating service.

2.1.4 Verify Groundwater Flow Direction

To verify the groundwater flow direction, depth to water measurements will be collected using an electric water level sounder. The depth to groundwater measurements will be converted to groundwater elevation and the groundwater gradient will be calculated.

3. SUBSURFACE INVESTIGATION

This section describes the soil and groundwater investigation at the site. The objectives of the investigation are to collect samples representative of site conditions and install a groundwater monitoring well to allow interpretation of soil and groundwater conditions.

3.1 SOIL BORINGS

Up to three soil borings will be drilled to further investigate the soil and groundwater conditions at the site. The borings will be advanced far enough to allow collection of grab groundwater samples. Boring B2 is planned to be converted to a groundwater monitoring well. If contaminants are observed while drilling Boring B2, a grab groundwater sample will be collected and the boring will be grouted. Boring B3 would then be drilled further downgradient of Boring B2 for the well installation. The soil boring locations are presented on Figure 2.

Fisch Environmental Exploration Services of Valley Springs, California will provide drilling services. Soil borings will be continuously logged by a PSI geologist using the Unified Soil Classification System (USCS). The work will be performed under the supervision of a State of California Registered Geologist. Samples will be collected in four-foot long plastic sample liners. Holes will be punched through the sample liners to allow collection of a soil gas VOC concentration measurement at one foot intervals. The PID measurements will be recorded on the boring logs.

3.1.1 Soil Sample Collection

One soil sample will be collected from each soil boring for the chemical analyses described in Section 4.0. Samples for chemical analysis will be selected based on field measured PID readings; the soil sample interval containing the highest concentration of total VOCs will be selected for submittal to the analytical laboratory. If no measurable concentration of VOCs is observed in the soil boring, a sample from the capillary fringe will be collected for chemical analysis.

Soil samples to be submitted to the analytical laboratory will be collected by cutting the interval for chemical analysis out of the plastic liners they were collected in and capping the ends with Teflon sheeting, plastic end caps, and duct tape. Samples will be labeled using a permanent marking pen identifying the sampler, boring name, sample collection depth, time, and date. Collected samples will be placed in a cooler containing ice and maintained under chain of custody protocol.

3.1.2 Grab Groundwater Sampling

Upon completion of the Borings B1 and B2, grab groundwater samples will be collected from the borings. The grab groundwater samples will be collected using disposable polyethylene tubing equipped with a check valve lowered through the drill stem to collect groundwater samples. Field work for groundwater sampling will be conducted in accordance with the procedures outlined in Appendix A. Samples will be stored in a cooler containing ice and maintained under chain of custody protocol.

Upon collection of the groundwater samples, the borings will be grouted with the exception of the boring that will be converted to a groundwater monitoring well.

3.1.3 Monitoring Well Construction

A one-inch, inside diameter, poly vinyl chloride well will be installed in Soil Boring B2 (or Boring B3 depending on site conditions). The screened interval of the well will be constructed to allow for the evaluation of the presence of floating product on the water table. The well construction will be determined based on the geologist's field log. A typical well construction detail is presented on Figure 3.

The screened interval of the well will consist of factory milled 0.020-inch slots. Sandpack will extend to approximately two-feet above the screen interval. A one-foot bentonite transition seal will exist above the sandpack, and neat cement grout will fill the annular space to the surface. A tamper resistant wellhead cover will be set in concrete slightly above grade to minimize surface water ponding.

3.1.4 Well Development

The well installed by PSI will be developed by surging and bailing. Groundwater parameters temperature and electrical conductivity will be monitored as development progresses to determine when equilibrium conditions are reached. Development water will be stored on-site in labeled DOT approved drums.

3.2 MONITORING WELL SAMPLING

The three existing monitoring wells (Wells MW-1, MW-4, and MW-5), and the new well installed by PSI (Well MW-6) will be sampled by PSI personnel and the samples chemically analyzed as described in Section 4.0.

3.2.1 Groundwater Elevation Measurements

Prior to groundwater sampling, depth to groundwater will be measured from the top of the well casings in each monitoring well. The monitoring wells will then be sampled without purging as requested in the ACHS letter dated September 11, 1997.

Groundwater samples will be collected with disposable polyethylene tubing equipped with a check valve. The groundwater samples will be collected according to PSI's standard protocol, included in Appendix A. The groundwater samples will be stored in an ice chest at 4 degrees Celsius and maintained under chain of custody protocol.

3.2.2 Decontamination Procedures

To minimize the possibility of contaminant cross-contamination between sampling locations most of the sampling equipment is disposable. To further minimize the possibility of cross-contamination, the following procedures will be implemented.

All re-usable sampling equipment will be cleaned with a non-phosphate detergent and rinsed twice with deionized water prior to use at a new sampling location. Sampling equipment includes:

- Stainless-steel sample barrel and tubes,
- Drilling equipment,
- Groundwater sampling equipment
- Sounders, and
- Development equipment.

3.2.3 Storage and Disposal of Generated Wastes

3.2.3.1 Solid Waste

All soil cuttings will be stored in DOT approved shipping containers. Drums will be labeled indicating the date of generation, the contents, and a PSI contact telephone number. The drums will be stored on-site in a location minimizing impact to site operations. The disposition of the cuttings will be determined upon receipt of laboratory analytical results.

3.2.3.2 Liquid Waste

Water from the drilling equipment cleaning will be stored in a individually labeled drum. Disposition of the water will be determined upon receipt of laboratory analytical results of the soil and water samples. PSI will arrange for the management and appropriate disposal of the investigation generated wastes at the request of GSA for additional costs.

4. LABORATORY ANALYSIS PROGRAM

The soil and groundwater samples collected during this investigation will be submitted to McCampbell Analytical, Inc. of Pacheco, California. McCampbell Analytical is a State of California Department of Health Services certified hazardous waste laboratory (Environmental Laboratory Accreditation Program [ELAP] #1644). A summary of the types of analyses and analytical methods is presented below.

All soil and groundwater samples collected at the site will be analyzed for the following constituents by the indicated methods:

- Total Petroleum Hydrocarbons as Gasoline (TPH-G) in accordance with Environmental Protection Agency (EPA) Method 8015-m.
- BTEX and MTBE by EPA Method 8020.

5. FIELD QUALITY ASSURANCE/QUALITY CONTROL

The following Quality Assurance/Quality Control (QA/QC) program describes equipment calibration and field documentation procedures that will be implemented by PSI personnel.

5.1 SAMPLE IDENTIFICATION

Soil samples collected in the field will be labeled according to standard protocol, as described in Appendix A.

5.2 CHAIN OF CUSTODY PROCEDURES

Chain of custody records will be used to document sample handling and shipping procedures. Chain of custody records will trace the samples from collection, through any custody transfers to the analytical laboratory. Information recorded on the Chain of custody records will include location of sample collection, sample identification (I.D.) number, date and time of collection, number and type of sample containers and analyses requested. The shipping conditions will also be described on the Chain of custody records. The name of the sampler(s) as well as the name of the person relinquishing the samples will be documented.

5.3 FIELD INSTRUMENTS

The following instruments will be used in the field for health and safety, as well as, site assessment purposes.

5.3.1 Organic Vapor Analyzer (OVA)

An organic vapor analyzer with a photo ionization detector (PID) will be calibrated daily using a reference calibration gas. Calibration gas is pre-bottled by a laboratory supply house and has a listed calibration value in parts per million for each specific gas. The field OVA will be used as an indicator of total petroleum hydrocarbons in soil samples and for health and safety purposes.

5.3.2 Temperature, pH, and Conductivity Meter

This meter will be calibrated prior to use each day. The meter will be used during well development to collect temperature, pH, and conductivity data. Laboratory supplied buffer and standard solutions will be used to calibrate the instrument.

6. DATA MANAGEMENT

A Daily Work Force Log will be completed by on-site personnel for each day in the field. The log will include the following items listed below:

- Project number;
- Project name and location;
- Name, Title and Company of person performing the work;
- Date work is being performed;
- Actual begin and end times of work;
- Description of work being performed;
- Additional notations, observations or remarks to further characterize or clarify work being performed;
- Equipment utilized on site; and
- Change orders issued during site activities.

6.1 DATA STORAGE

Project correspondence, field notes, maps, and data will be filed within the main Project File at PSI's Hayward office. Chemical data will be entered onto a spreadsheet program for ease of organization, review, and presentation of data in the report. Hard copy files within the main Project File may include, but not be limited to:

- Basic Data: Soil boring logs, field procedures, forms, maps, analytical data.
- Project Field Logs: The project notebook and all field memorandums.
- Correspondence: All written correspondence and telephone conversation records.
- Data Presentation: All maps and tables generated from basic data analyses.
- Data Verification: Documentation that all tables, maps and texts using basic information have been reviewed.

7. REPORT PREPARATION

Upon completion of the project activities described in this workplan, an investigation report will be prepared presenting the investigation methodology, analytical results, measurements collected, and conclusions. The final report will be reviewed and approved by a California Registered Geologist. The report will include the following elements:

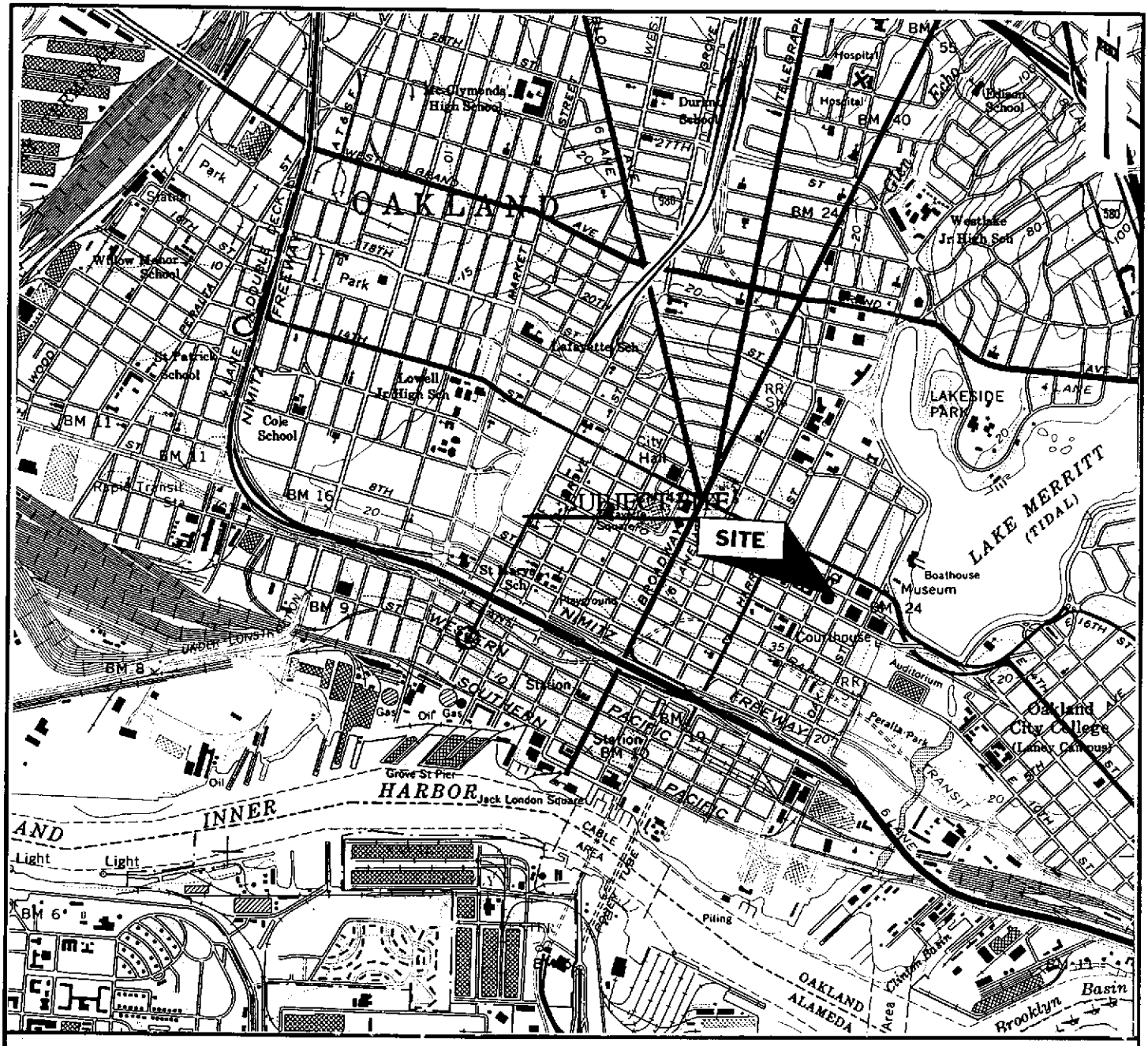
- Title sheet,
- Signature page,
- Table of contents,
- Investigative summary,
- Introductory narrative of the project,
- Investigative methods,
- Investigative results and field observations,
- Data evaluation and discussion,
- Graphs, Tables and Figures,
- Summary table (s) indicating laboratory results,
- Contaminant concentrations, analytical methods, and detection limits,
- Copies of original laboratory documentation,
- Field procedure forms, and chain of custody records,
- Well Survey Results,
- Conclusions

REFERENCES

GSA, 1997, RFP for Groundwater Investigation Services, December 2.

HCSA, 1997a, Workplan Request Letter to Mr. Rodman Freitag, September 11.

HCSA, 1997b, Continuation of Groundwater Monitoring Request Letter to Mr. Jim De Voss, May 20.



REFERENCE:
U.S.G.S. OAKLANDWEST, CALIFORNIA, 1959
PHOTOREVISED 1980

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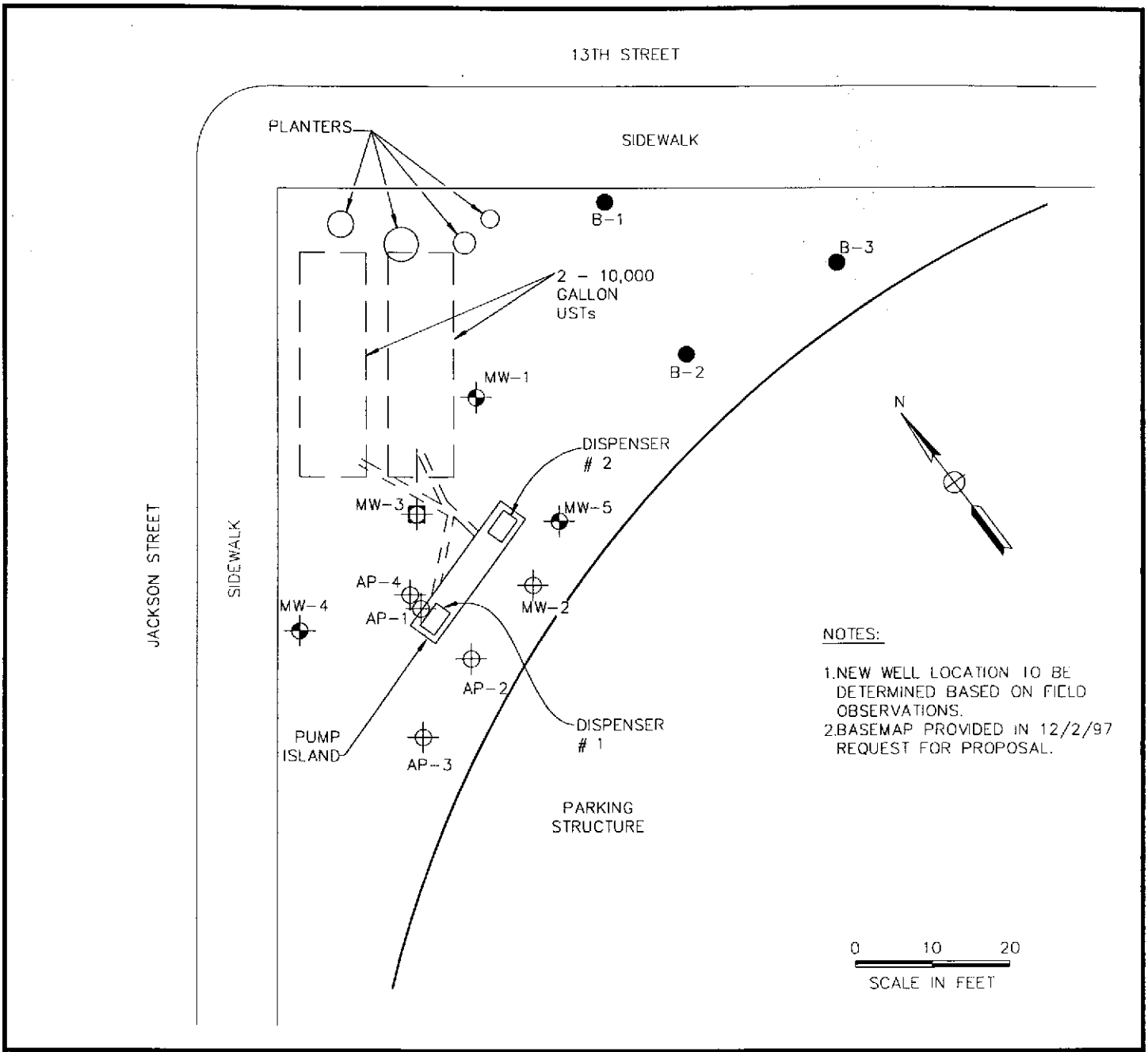
SITE LOCATION
ALCOPARK FUELING STATION
165 13TH STREET
OAKLAND, CALIFORNIA
PROJECT NUMBER: 575-8G004

DATE: 1/14/98	CKD BY:	FIGURE NO: 1
FILE NO: 8G004 -1		DRAWN BY: S.BOWERS



LEGEND

MW-1 GROUNDWATER MONITORING WELL

AP-3 SOIL BORING LOCATION

MW-3 VADOSE MONITORING WELL LOCATION

B-1 PROPOSED MONITORING WELL LOCATION

UNDERGROUND PIPING

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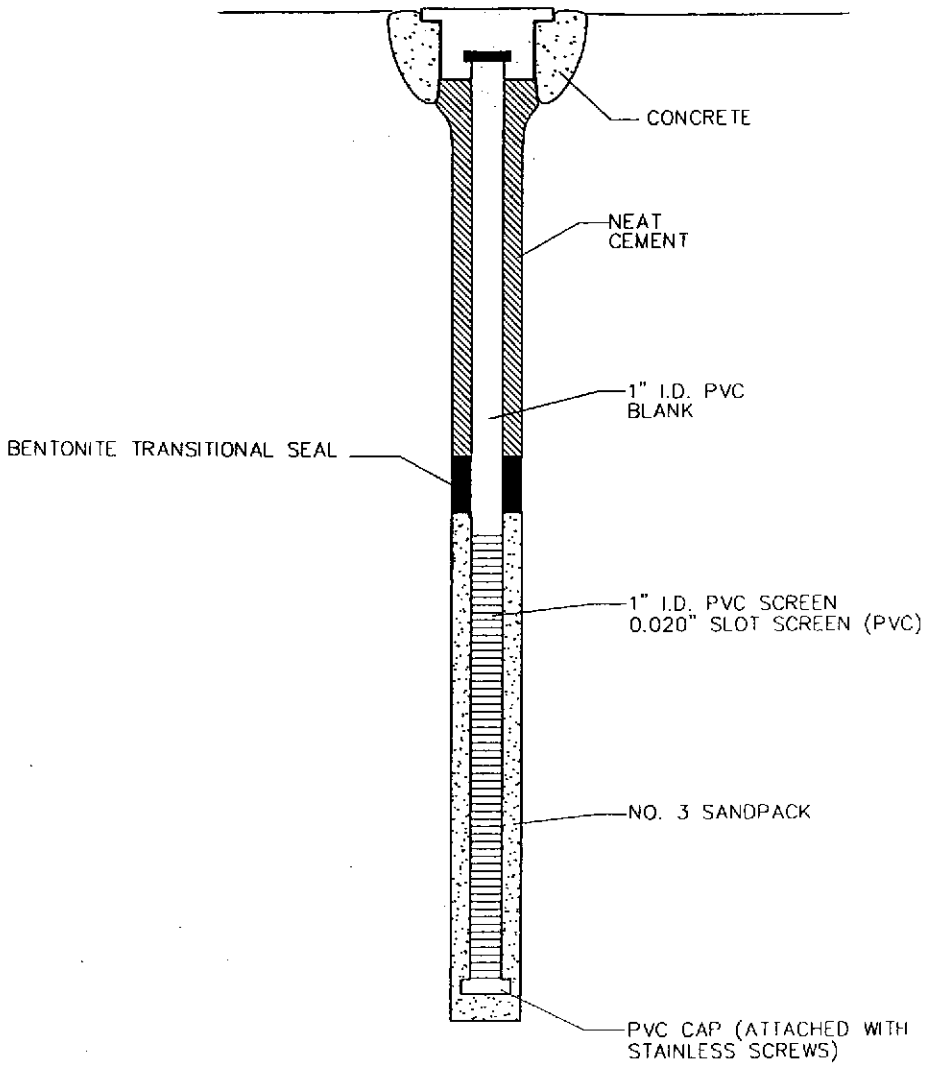
SITE PLAN
ALCOPARK FUELING STATION
165 13TH STREET
OAKLAND, CALIFORNIA
PROJECT NUMBER: 575-8G004

DATE: 1/13/98	CKD BY: JD	FIGURE NO.: 2
FILE NO: 8g004-2		DRAWN BY: S.BOWERS



NOTES:

WELL CONSTRUCTION TO BE DETERMINED BASED ON FIELD BORING LOG.

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TYPICAL WELL CONSTRUCTION DIAGRAM
ALCOPARK FUELING STATION
165 13TH STREET
OAKLAND, CALIFORNIA
PROJECT NUMBER: 575-8G004

DATE: 1/15/98	CKD BY:	FIGURE NO.: 3
FILE NO: 8g004-3		DRAWN BY: S.BOWERS

APPENDIX A

FIELD PROCEDURES

APPENDIX A
FIELD PROCEDURES

I. DRILLING OF SOIL BORINGS AND COLLECTION OF SOIL SAMPLES

The following procedures will be used for the drilling and sampling of the soil borings drilled at the site:

1. Drilling will be conducted by Fisch Environmental under the supervision of PSI. Drilling equipment will be pressure washed at the beginning of the day and between soil borings.

2. Prior to the commencement of drilling activities at the site, Underground Service Alert (USA) will be contacted to identify underground utilities in the areas that the borings will be located.

3. Boring logs for the soil borings drilled at the site will be prepared under the supervision of a State of California-registered geologist. The soil cuttings observed during drilling will be described in accordance with the Unified Soil Classification System.

4. Soil samples will be collected using a continuous core, stainless steel sampler. Undisturbed soil samples are collected by pushing the sampler into the subsurface using a hydraulic press or percussion hammer.

5. Once the sampler has been retrieved the ends of the sample tube will be covered with Teflon sheets and capped with polyethylene end caps. The sample will be labeled and placed in a zip-lock bag in a chilled cooler pending delivery to the laboratory for analysis.

6. Soil samples will be assigned identification numbers such as S-B1-12, where "S" indicates a soil sample, "B1" indicates Boring 1 and "12" indicates that the sample was collected at 12 feet bgs. The samples will be labeled with the sampling designation, depth, date, client name, and project number.

7. Continuous core barrels will be washed between sampling intervals with Alconox soap followed by two deionized-water rinses.

8. Chain of custody procedures using chain of custody forms will be used to document sample handling and transportation.

9. A photo ionization detector (PID) will be used to monitor volatile organic compounds (VOCs) in the ambient air during drilling at the site in accordance with the site health and safety plan. VOC concentrations in the soil will be measured and recorded on the borings logs for depths that soil samples were collected. VOCs in the soil will be

measured at the sampling depths by punching holes in the sample tubes and inserting the PID probe into the hole. PID measurements will be recorded on the boring log.

10. Soil cuttings and steam wash water generated during drilling activities at the site will be contained in Department of Transportation (DOT) approved drums. The drums will be labeled with the contents, date, well or boring number, client name, and project number.

II FIELD DOCUMENTATION OF SAMPLING PROCEDURES

The following outline describes the procedures adhered by PSI for proper sampling documentation.

1. Sampling procedures will be documented in a field notebook that will contain:

    1. Sample collection procedures
    2. Date and time of collection
    3. Date of shipping
    4. Sample collection location
    5. Sample identification number(s)
    6. Intended analysis
    7. Quality control samples
    8. Sample preservation
    9. Name of sampler
    10. Any pertinent observations

2. Samples will be labeled with the following information:

    1. Sample number
    2. Well number
    3. Date and time sample was collected
    4. Sampler's name
    5. Sample preservatives (if required)

3. The following is the sample designation system for the site:

    For Borings and Hand-Auger Borings the samples will be labeled B-(Boring Number)-(Depth) (i.e. sample collected from boring 4 at 0.9 meters would be B4-0.9)

    For groundwater samples (W) (Boring Number) (i.e. WB4)

3. Handling of the samples will be recorded on a chain of custody form which shall include:

    1. Site name
    2. Signature of Collector
    3. Date and time of collection
    4. Sample identification number
    5. Number of containers in sample set
    6. Description of sample and container
    7. Name and signature of persons, and the companies or agencies they represent, who are involved in the chain of possession
    8. Inclusive dates and times of possession
    9. Analyses to be completed

III. GROUND-WATER SAMPLING

The following procedures will be used for ground water sampling:

1. All equipment shall be washed prior to entering the well with an Alconox solution, followed by two tap water rinses and a deionized water rinse.

2. Prior to purging wells, depth-to-water will be measured using an Solinst water-interface probe to an accuracy of approximately 0.01 foot. The measurements will be made to the top of the well casing on the north side.

4. Free floating product thickness and depth-to-ground water will be measured in wells containing free floating product using a Solinst oil-water interface probe to an accuracy of approximately 0.003 meters (0.01 foot). The measurements will be made to the top of the well casing on the north side.

5. Water samples will be collected with a polyethylene disposable bailer. The water collected will be immediately decanted into laboratory-supplied vials and bottles. The containers will be overfilled, capped, labeled, and placed in a chilled cooler, prior to delivery to the laboratory for analysis.

6. Chain of custody procedures, including chain of custody forms, will be used to document water sample handling and transport from collection to delivery to the laboratory for analysis.

7. Ground-water samples will be delivered to a State-certified hazardous waste laboratory within approximately 24 hours of collection.