ENVIRONMENTAL ENGINEERING • HYDROGEOLOGY • SITE ASSESSMENTS
• REMEDIATION OF CONTAMINATED SOIL AND GROUNDWATER •

MILLER ENVIRONMENTAL COMPANY

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(415) 233-9068
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June 6, 1990

Alameda County Health Agency
Division of Hazardous Materials
80 Swan Way, Room 200
Oakland, CA 94621

Attn: Dennis Byrne

Re: Workplan for continuing investigation at 800 Franklin, Oakland, Ca.

Dear Mr. Byrne:

Enclosed for your review is a workplan submitted by Miller Environmental Company (MEC) for a continuing subsurface investigation at the above-mentioned site. Work can begin approximately two to three weeks after receiving written approval of this workplan.

Please note our new mailing address is:

385 Pittsburg Avenue
Richmond, CA 94801

If you have any questions please do not hesitate to call me.

Sincerely

Reinhard Ruhmke

Reinhard Ruhmke
Hydrogeologist

Enc: work plan

cc: Tai Ling Tsou - Dynagroup Development
Lester Feldman - RWQCB
file 90-1008

9/12/90
① 3 Boreholes → within 2 weeks, waiting permit
② 3 additional monitoring well → 2 weeks after Boreholes

WORKPLAN FOR FOLLOW-ON SUBSURFACE INVESTIGATION
RELATED TO WELL INSTALLATION AND BORINGS

FOR:

Dynagroup Development, Inc.
(Alex Shaw)
1516 Noriega Street
San Francisco, CA 94122

SITE LOCATION:

800 Franklin Street
Oakland, CA

MEC Project No. 90-1008

JUNE 6, 1990

PREPARED BY:

MILLER ENVIRONMENTAL COMPANY
385 Pittsburg Avenue
Richmond, CA 94801
Tel: (415) 233-9068
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INTRODUCTION and SITE BACKGROUND

The site is located at the northeast corner of Franklin Street and Eighth Street in Oakland, California. (See Site Vicinity Map, Figure 1.) It is a rectangular-shaped lot of approximately 0.1 acre, bounded on two sides by commercial properties. The property is located in a highly congested area of downtown Oakland, which is primarily commercial but with numerous restaurants and a good deal of pedestrian traffic. Correspondence can be directed to Dynagroup Development, Inc., 1516 Noriega Street, San Francisco, CA, 94122; attention Mr. Tai-Ling Tsou.

This workplan addresses the steps necessary for bringing the site into compliance with local and regional environmental laws and regulations. Miller Environmental Company (MEC) has been retained by the property owner to investigate possible subsurface contamination and to further define the lateral extent of such contamination.

Our preliminary record search indicated that the property has been owned by Alex Shaw and Associates since March 1989. Prior to 1989, the site was operated as a gasoline service station. Three underground tanks are known to have existed on this small lot, and two additional tanks were buried beneath the adjacent sidewalk along Franklin Street (a total of five tanks). At some time prior to August 1988, one of the tanks was removed. Available records do not indicate who pulled the tank, the contents of the tank, or the exact date of removal. We understand that the tank may have been located in the northeast central portion of the site, southeast of the tanks containing gasoline product. (Locations of the underground storage tanks and other selected site features are shown on the Generalized Site Plan, Figure 2.)

PREVIOUS WORK

Due to proposed commercial development plans for the site, a soil and foundation study was conducted by Frank Lee & Associates in June 1988. Limited analysis of samples collected from soil borings did not indicate the presence of fuel hydrocarbon contamination (Report Frank Lee & Assoc's., June 13, 1988).

An additional soil investigation was conducted by LW Environmental Services, Inc. (LWESI), in August 1988. High concentrations of gasoline hydrocarbons (1580 and 8340 mg/kg) were detected in the vicinity of existing underground tanks at the site. Removal of the tanks and contaminated soil was recommended by LWESI (Report LWESI, August 26, 1988).

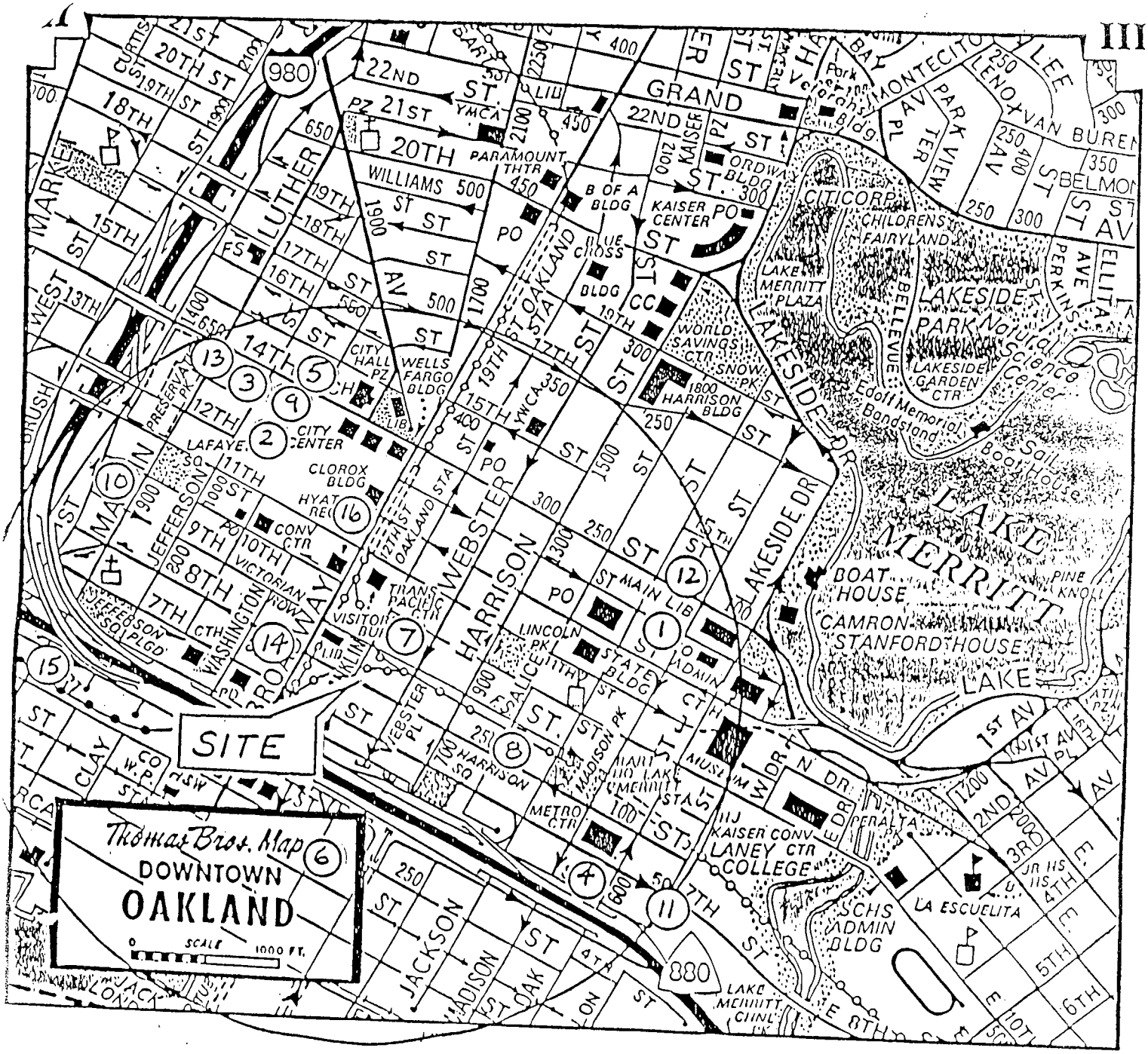


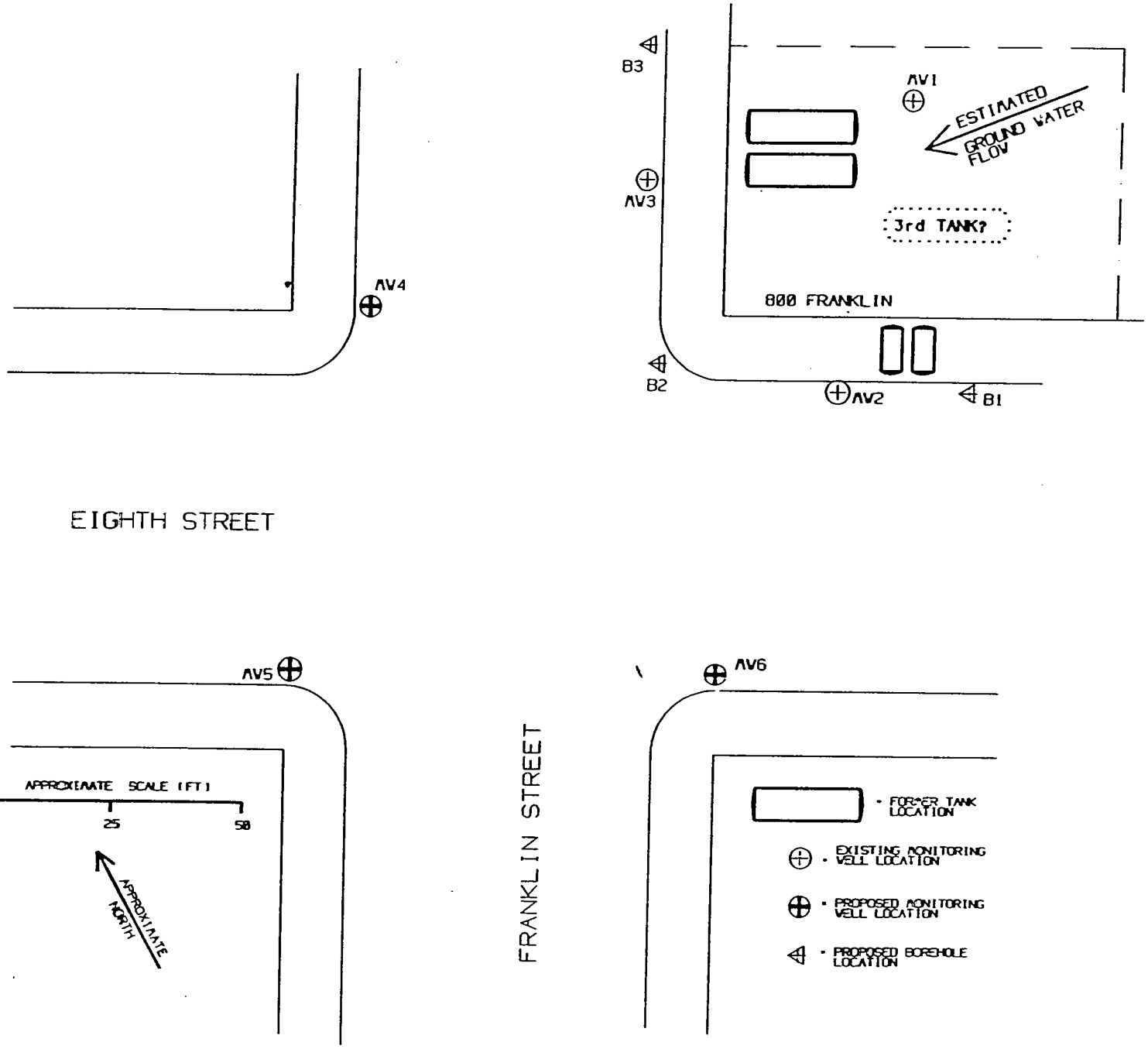
FIGURE 1
SITE LOCATION MAP SHOWING SUBSURFACE CONTAMINATION SITES
WITHIN 1/2-MILE RADIUS OF SITE

N

circle outlines radius of 1/2-mile

map adapted from Thomas Bros. Maps, 1985

FIGURE 2 - GENERALIZED SITE PLAN



PROPOSED BOREHOLE AND MONITORING WELL LOCATIONS
INTERSECTION OF 8TH AND FRANKLIN STREETS, OAKLAND, CA

In June 1989, the Robert J. Miller Company removed and arranged for disposal of the four remaining tanks: two 6,000-gallon tanks containing gasoline, a 550-gallon waste-oil tank and a 1,000-gallon tank containing solvent. We understand that the tanks had been installed circa 1970 (Figure 2).

We further understand that a representative of the Traverse Group, Inc. (TGI), was present to observe the June 1989 tank removal operations and to collect soil samples from beneath the excavated tanks. TGI [an environmental consulting firm with corporate offices in Ann Arbor, Michigan] was employed as an environmental consultant by R.J. Miller Company, the tank excavation contractor.

The TGI limited environmental report dated July 14, 1989, indicated that no holes, pitting or areas of weakness were observed in the outer surface of the tanks. Soil samples collected from the excavation and spoils pile were analyzed for total petroleum hydrocarbons (TPH) as gasoline, TPH as diesel, TPH as waste oil, and for benzene, toluene, ethylbenzene, and xylene (BTEX). In addition to these analyses, selected samples were tested for purgeable organics (EPA 8240) and semi-volatile organics (EPA 8270). The semi-volatile chemical scan was requested by the Alameda County Health Services Agency (ACHSA) due to the unknown nature of products stored in the solvent and waste oil tanks. Laboratory results from the tank pull were submitted to the ACHSA with the July 1989 report.

Laboratory analytical results from the TGI study indicated relatively high levels (3,100 ppm TPH as gasoline and 1,350 ppm TPH as waste oil) of fuel hydrocarbon contamination in the northeast corner of the larger tank cavity. The waste oil-solvent tank pit beneath the Franklin Street sidewalk also contained high levels (up to 2,300 ppm TPH as gasoline and 4,000 ppm TPH as waste oil) of hydrocarbon contamination. Composite soil samples were collected from the spoils pile generated during the above-referenced tank removal; excavated material was separated and stockpiled into "clean" and "contaminated" piles.

Of the purgeable and semi-volatile organics analyzed (other than BTEX), trace amounts of bis(2-ethylhexyl) phthalate, napthalene, and 2-methyl-napthalene were detected. The concentrations measured were all less than 1.0 ppm.

Members of the Traverse Group Inc. (authors of the above-referenced 1989 report concerning the Alex Shaw Property), joined the newly formed Miller Environmental Company (MEC) between August and December, 1989. At the invitation of Alex Shaw, Inc. and with the agreement of Dynagroup

Development, Inc., contractors for development of the property, MEC was authorized to continue the investigation carried out by TGI and others at the 8th and Franklin site.

A workplan was prepared by MEC for continuation of the site investigation and submitted to appropriate regulatory agencies on August 24, 1989.

Upon acceptance of the workplan by ACHSA, MEC overexcavated both former tank cavities (sidewalk and site interior locations). An engineer from MEC was present to supervise this work and collect soil samples on September 7, 1989. The contaminated soil removed from the excavations was stockpiled onsite. With permission from ACHSA, the "clean" soil (less than 100 ppm TPH as gasoline) which had remained stockpiled at the site from previous tank removal operations was reinterred into the large onsite excavation. This was done on the condition that when construction operations commenced, the soil would be removed from the excavation and properly disposed of at a Class III landfill. The over-excavated sidewalk cavity was backfilled with clean fill. The areal extent of the overexcavation work and the approximate locations of soil samples collected are described in a report submitted by MEC dated November 3, 1989.

Laboratory analytical results from soil samples collected at a maximum depth of 16 feet in the onsite cavity indicated that most of the contaminated soil had been successfully removed through overexcavation. However, overexcavation was not successful in removing all of the contaminated soil from the sidewalk location. A soil sample collected from the sidewall, 12 feet below grade in the sidewalk cavity closest to 8th Street, contained 10,000 ppm of TPH/gasoline.

All soil removed during overexcavation, along with the stockpiled "contaminated" soil generated during tank removal operations, was hauled by a licensed hazardous waste hauler to the Class I disposal facility located in Kettleman City.

On September 12 and 13, 1989, an MEC geologist was at the site to install three ground-water monitoring wells. The well locations are shown on Figure 3. Ground water contamination was detected in all three wells. Water samples from well MW-1, the easternmost well, located nearest to and upgradient from the former onsite storage tanks, indicated no detectable TPH/gasoline, TPH/diesel, or BTEX. However, contamination from semi-volatile organics (chloroform and 1,2-dichloroethene, [EPA 601]) was detected in this well (MW-1) and in well MW-3. Ground water samples from wells MW-2 and MW-3 which are located on Eighth Street and Franklin Street respectively, contained minor (less than 0.40 mg/L) levels of diesel contaminant, less than 100 mg/L of TPH/gasoline and detectable levels of BTEX. Soil contaminated with high concentrations of gasoline was also

detected below 20 feet in samples from wells MW2 and MW3. A site plan showing the well locations was included in the MEC report dated November 3, 1989. All analytical results and hazardous waste manifest forms were also included with the MEC report.

CLIENT/GOVERNMENT COORDINATION - MILLER ENVIRONMENTAL COMPANY

In accordance with guidelines set by the Regional Water Quality Control Board (RWQCB) - San Francisco Bay Region for investigation of subsurface contamination related to underground storage tank releases, MEC shall provide geologic and engineering services for further subsurface investigation at this site.

MEC shall prepare permit applications, necessary reports and certifications, site condition reports, and recommendations for any remedial action required. MEC shall maintain communication with appropriate local government agencies having jurisdiction.

SCOPE OF PROPOSED WORK - MILLER ENVIRONMENTAL COMPANY

Three monitoring wells shall be installed and three additional boreholes shall be drilled at the site under the direction of a California Registered Geologist. Proposed well and borehole locations are indicated on Figure 2. The wells shall be located so as to further define the lateral extent of hydrocarbon contamination levels. Because the contamination appears to be beneath 8th and Franklin streets, the monitoring wells will be located on the opposite sides of the street from each of the existing wells at the site. MEC proposes the following:

1. Prepare a Site Safety Plan (included with this workplan) discussing the precautions and protective equipment required for the work.

2. Obtain appropriate permits (drilling, encroachment, excavation, parking, etc.) to drill six soil borings and to install ground-water monitoring wells in three of the borings. All borings and well installations are to be located offsite.

3. Log and collect appropriate soil samples from the borings.

4. Install three 2-inch-diameter ground-water monitoring wells (MW-4 through MW-6) in selected borings.

5. Develop, purge, and collect ground water samples from the newly-constructed monitoring wells for laboratory analysis. In addition, obtain water samples from existing monitoring wells MW-1 through MW-3 for analysis.

6. Subcontract a licensed surveyor to properly survey the wells and selected on-and-offsite features. Evaluate the ground-water gradient from the data collected.

7. Interpret field and laboratory data, including all soil samples from the six borings and ground water samples from onsite and offsite monitoring wells.

8. Prepare a report documenting field methodology, conclusions and recommendations.

SITE SAFETY PLAN

Field work by MEC at the site will be conducted in accordance with a prescribed Site Safety Plan (SSP). This plan describes basic safety requirements for the subject environmental investigation. The Site Safety Plan is applicable to personnel and subcontractors of MEC. Briefings on the contents of the Site Safety Plan will be conducted by the Site Safety Officer (Project Geologist) before work begins. A copy of the Site Safety Plan will be available for reference at the site during the time that the work is being performed. A copy is also included in the Appendix to this workplan.

DISCUSSION

Drilling of Boring/Monitoring Wells

The above-referenced offsite work is based on information contained in our November 1989 report (MEC report, 11/03/89), indicating the depth to groundwater to be approximately 25 feet below grade beneath the site. Accordingly, MEC shall install three ground-water monitoring wells to an approximate depth of 35 feet below grade, with a screened section of approximately 15 feet. In addition, three preliminary boreholes (B-1, B-2 and B-3) will be drilled to a depth of approximately 25 feet (ground water) and logged for the purpose of subsurface correlation. The precise location of the proposed borings will be subject to approval by the appropriate regulatory agencies and by the constraints that may be imposed on drilling operations by underground and overhead utilities or other obstructions.

A 6- 1/4-inch-diameter, continuous-flight, hollow-stem auger and a Mobile B-53 (or similar) truck-mounted drill rig will be used for drilling the borings. The auger flights will be steam-cleaned before use to minimize the possibility of introducing contamination.

Drilling will be performed under the guidance of the Project Geologist. Subsurface materials will be logged as drilled, and soil samples will be classified using the Unified Soil Classification System, a copy of which is included in the Appendix. Drilling will be halted if a saturated clay layer greater than 5 feet thick is encountered below the water table. MEC will contact Underground Service Alert (USA) at least 48 hours before drilling to identify public utility lines in the site area.

Collection of Soil Samples

During installation of the wells and boreholes, soil samples shall be collected using a California-modified, split-spoon sampler (2-inch inside-diameter) equipped with clean brass sleeves. The samples will be collected by advancing the boring to a point just above the sampling depth, then driving the sampler into the native soil through the hollow center of the auger. The sampler will be driven 18 inches with a standard 140-pound hammer dropped 30 inches. The number of blows required to drive the sampler each successive 6 inches will be counted and recorded to provide an indication of soil consistency. These data along with geologic observations will be recorded in a well log. The boreholes will be backfilled with neat cement.

Soil samples shall be collected at five-foot intervals beginning at five feet below grade until ground water is encountered. A final soil sample shall be collected at the soil/ground water interface.

Disposal of Soil Cuttings

Soil cuttings derived from auger drilling will be temporarily placed on and covered with visquene at the 8th and Franklin site. Once laboratory results are complete, a determination will be made of whether the soil is hazardous material. If hazardous, the material will be properly manifested and disposed of by a licensed waste hauler. Otherwise cuttings will be removed to a Class III landfill.

Preliminary Borings

Exploratory borings, B-1 through B-3 described above, will provide information regarding soil contamination. These data will be used to determine the approximate optimum placement for the three ground-water monitoring wells to be installed in boreholes B-4 through B-6. After logging and sampling the exploratory boreholes will be backfilled to grade with neat cement.

Monitoring-Well Construction

The monitoring wells (MW-4 through MW-6) will be constructed using two-inch diameter, threaded PVC casing. No chemical cements, glues or solvents will be used in the construction of the well. The well will be screened with .01 inch slotted casing from 10 feet below the water table to approximately five feet above the water table. The well annuli will be packed with washed No. 2/12 Monterey sand from the bottom of the borehole to approximately 2 feet above the screened interval. A minimum 1-foot bentonite seal will be used above the filter pack. The well annulus will then be filled to the surface with cement grout. The casing will be capped at both ends and a Christy box installed. The box has a watertight seal to protect against surface-water infiltration. The well head will be provided with a locking cap and seal. A typical monitoring well construction diagram will be included in our final report. If actual well construction is modified to suit field conditions, changes will be noted on boring logs included with the report.

The new offsite monitoring wells and the existing onsite wells will be surveyed based on mean sea level datum.

Well Development and Ground-Water Sampling

A water sample will be collected from both the existing wells (MW-1 through MW-3) and the newly developed offsite wells (MW-4 through MW-6) using a clean Teflon bailer. Water samples from these wells will be collected on successive days if possible.

Provided that no free product is observed, the new offsite wells will be developed by swabbing, surge-pumping or other suitable methods, until the discharged water is relatively clean and free of suspended sediment. The wells will be allowed to equilibrate for at least 24 hours after development to reach static water level. A water sample will then be collected from each well for laboratory analysis. The existing onsite wells will be purged and allowed to reach a minimum of 80 percent of static water level before sampling. Water brought to the surface during development

and purging will be temporarily stored onsite in 17E, 55-gallon, waste-liquid drums, properly labeled, and approved for use by the Department of Transportation (DOT).

Subjective evaluation of water samples from all wells will be made to check for floating product or sheen. If the observed sample is "clean," each well will then be purged of approximately four well volumes of water or until readings of temperature, pH, and conductivity stabilize. Water level measurements (measured to the nearest 0.01-foot) will be made in the wells prior to sampling. Water samples for laboratory analysis, taken with a clean Teflon bailer, will be transferred to clean, 40-milliliter volatile-organic glass vials or to clean 1-liter glass bottles, depending on the analysis required. Hydrochloric acid may be added as a preservative.

Quality Assurance/Quality Control

Soil and ground water samples shall be handled in accordance with standard sampling methods as described in the LUFT manual. All samples shall be delivered to a laboratory certified by the State of California Department of Health Services (CDHS) for testing and analysis of water and hazardous waste. Samples will be analyzed using procedures developed by the Environmental Protection Agency (EPA). Detection limits suitable for the soil and water tests requested and concentrations present will be stated on the laboratory reports. Copies of laboratory reports will be included in MEC reports for each phase of the work completed.

ANALYSES

Soil and ground water samples will be analyzed for TPH as gasoline, TPH as diesel, total oil and grease (EPA 418.1), and benzene, toluene, ethylbenzene and xylene (BTEX) by EPA method 8020. In addition, water samples will be analyzed for purgeable organics using EPA method 601/5030.

REPORTING

MEC shall submit a technical report upon completion of this work. The report shall include all analytical results, interpretation of data, site plan, permits, boring and well construction logs, chain-of-custody forms, ground water level data and appropriate recommendations regarding site closure and/or additional investigation. Hazardous waste manifest forms will be included as necessary. This report shall be submitted to the appropriate agencies, including ACHSA and the RWQCB.

TIMETABLE

The borehole drilling and installation of the monitoring wells should begin approximately two weeks after this Workplan has been approved by ACHSA/RWQCB. This time estimate is contingent upon receipt of drilling/excavation permits, as well as minor encroachment permits for city sidewalks, and parking meter cover requests for occupation of space while the work is in progress. Jurisdictional staff members will be notified of upcoming scheduled work activities at the site.

Submitted by:
MILLER ENVIRONMENTAL CO.

Reinhard Ruhmke
Hydrogeologist

Date:

Walter H. Howe
Registered Geologist

Date: 6/6/90

APPENDIX

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		LTR	DESCRIPTION	MAJOR DIVISIONS		LTR	DESCRIPTION
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravels or gravel sand mixtures, little or no fines.	FINE GRAINED SOILS	SILTS AND CLAYS LL<50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		GP	Poorly-graded gravels or gravel sand mixture, little or no fines			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		GM	Silty gravels, gravel-sand-clay mixtures.			OL	Organic silts and organic silt-clays of low plasticity.
		GC	Clayey gravels, gravel-sand-clay mixtures.		SILTS AND CLAYS LL<50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
	SAND AND SANDY SOILS	SW	Well-graded sands or gravelly sands, little or no fines.			CH	Inorganic clays of high plasticity, fat clays.
		SP	Poorly-graded sands or gravelly sands, little or no fines.			OH	Organic clays of medium to high plasticity.
		SM	Silty sands, sand-silt mixtures.	HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils.
		SC	Clayey sands, sand-clay mixtures.				

Depth through which sampler is driven

Relatively undisturbed sample

Missed sample

Ground water level observed in boring

S-10 Sample number

Sand pack

Bentonite annular seal

Neat cement annular seal

Blank PVC

Machine-slotted PVC

BLOW/FT. REPRESENTS THE NUMBER OF BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES TO DRIVE THE SAMPLER THROUGH THE LAST 12 INCHES OF AN 18 INCH PENETRATION.

DASHED LINES SEPARATING UNITS ON THE LOG REPRESENT APPROXIMATE BOUNDARIES ONLY. ACTUAL BOUNDARIES MAY BE GRADUAL. LOGS REPRESENT SUBSURFACE CONDITIONS AT THE BORING LOCATION AT THE TIME OF DRILLING ONLY.

UNIFIED SOIL CLASSIFICATION SYSTEM AND SYMBOL KEY

DYNAGROUP DEVELOPMENT, INC.
1516 Noriega Street
San Francisco, CA 94122

SITE SAFETY PLAN FOR WELL INSTALLATION AND BORINGS

at
800 Franklin Street
Oakland, CA

INTRODUCTION

This Site Safety Plan (SSP) delineates the basic safety requirements for the subsurface investigation project. The provisions set forth in this Plan will apply to the employees of Miller Environmental Company (MEC) and its subcontractors working on this phase of the project. The subcontractors may elect to modify these provisions, but only to upgrade or increase the safety requirements, and only with the concurrence of MEC, as designated and accepted in writing.

This Site Safety Plan will address the expected potential hazards that may be encountered for this project. Field activities are planned to begin two weeks after approval of this workplan, with the duration of the project estimated at two to three weeks. If changes in site or working conditions occur as the activities progress, addenda to this Plan will be provided by MEC.

AUTHORITY FOR SITE SAFETY

The employee responsible for the project safety is the Project Geologist for MEC. The Project Geologist is responsible for implementing the provisions of this Plan and providing a copy of this Plan to each subcontractor firm working under MEC on the project. The Project Geologist has the authority to audit site activities for compliance with the provisions of this Plan and may suspend or modify work practices or dismiss contractors whose conduct does not meet the requirements specified in this Plan.

HAZARD ASSESSMENT

Hazards that may be encountered on the project include potential accidents involving automobiles and pedestrians. MEC and subcontractor personnel will be drilling in the parking lanes of 8th and Franklin streets, separated by only a few feet from automobile and pedestrian traffic. Pedestrians may ignore warning signs and step into the street to avoid construction barriers.

Another hazard that may be encountered is hydrocarbon contamination. The major contaminants expected to be present are gasoline, diesel, waste oil, chloroform and 1,2-dichloroethane. Inhalation and dermal contact will be the potential exposure pathways of concern. Protective clothing will be mandatory for all field personnel as specified in this Plan. In addition, respiratory protective devices will be within easy reach should irritating odors or irritation of the respiratory tract become detectable.

Using the National Institute for Occupational Safety and Health Pocket Guide to Chemical Hazards a brief synopsis of the physical characteristics, incompatibilities, toxic effects, routes of entry, and target organs has been summarized below for the major components of the anticipated contaminants to be encountered.

Benzene

Benzene is a colorless liquid with an aromatic odor. Benzene may potentially create an explosion hazard. Benzene is irritating to the eyes, nose and respiratory system. Prolonged exposure may result in giddiness, headache, nausea, staggering gait, fatigue, bone marrow depression, or abdominal pain. Routes of entry include inhalation, absorption, ingestion, and skin and eye contact. The target organs are blood, the central nervous system (CNS), skin, bone marrow, eyes, and respiratory system. Benzene is a carcinogenic.

Ethylbenzene

Ethylbenzene is a colorless liquid with an aromatic odor. Ethylbenzene may potentially create an explosion hazard. Ethylbenzene is irritating to the eyes and mucous membranes. Prolonged exposure may result in headaches, dermatitis, narcosis, or coma. Routes of entry include inhalation, ingestion, and skin or eye contact. The target organs are the eyes, upper respiratory system, skin and CNS.

Toluene

Toluene is a colorless liquid with an aromatic odor. Toluene may potentially create an explosion hazard. Prolonged exposure may result in fatigue, confusion, euphoria, dizziness, headache, dilation of pupils, lacrimation, insomnia, dermatitis or photophobia. Routes of entry are inhalation, absorption, ingestion, and skin or eye contact. The target organs are the CNS, liver, kidneys, and skin.

Xylene Isomers

Xylene is a colorless liquid with an aromatic odor. Xylene may potentially create an explosion hazard. Xylene is irritating to the eyes, nose and throat. Prolonged exposure may result in dizziness, excitement, drowsiness, staggering gait, corneal vacuolization, vomiting, abdominal pain and dermatitis. Routes of entry are inhalation, absorption, ingestion, skin or eye contact. The target organs are the CNS, eyes, gastrointestinal tract, blood, liver, kidneys and skin.

Chloroform

Chloroform is a noncombustible, colorless liquid with a pleasant, sweet odor. It is irritating to the eyes and skin. Prolonged exposure may cause dizziness, mental dullness, nausea, fatigue and headaches. Routes of entry are inhalation, ingestion and skin or eye contact. The target organs are the liver, kidneys, heart, eyes and skin.

1,2-Dichloroethane

1,2-Dichloroethane is clear liquid with a sweet odor similar to chloroform. It is irritating to the eyes. Prolonged exposure may cause nausea, vomiting, dermatitis, CNS depression and corneal opacity. Routes of entry are inhalation, ingestion and skin or eye contact.

GENERAL PROJECT SAFETY REQUIREMENTS

Project activities will be conducted in accordance with the following minimum safety requirements:

- Eating, drinking and smoking will be restricted to a designated area.

- Gross decontamination and removal of all personal protective equipment will be performed prior to leaving the site. Contaminated clothing will be removed and collected for proper disposal.

- Prevention of accidental ignition:

  * No smoking allowed within delineated work area.
  * Reasonable precaution against open flame and sparks shall be taken whenever working on-site.

- The Project Geologist will be responsible for taking necessary steps to protect employees from physical hazards, including:

    * Falling objects, such as tools or equipment
    * Tripping over hoses, pipes, tools, or equipment
    * Slipping on wet or oily surfaces
    * Insufficient or faulty protective equipment
    * Insufficient or faulty equipment or tools.
    * Automobile traffic

- All personnel will be required to wash hands and faces before eating, drinking or smoking in the aforementioned areas.

- Field operations personnel will be cautioned to inform each other of the non-visual effects of the presence of toxics, such as:

    * Headaches
    * Dizziness
    * Nausea
    * Blurred vision
    * Cramps
    * Irritation of eyes, skin or respiratory tract
    * Changes in complexion or skin discoloration
    * Changes in apparent motor coordination
    * Changes in personality or demeanor
    * Excessive salivation or changes in pupillary response
    * Changes in speech ability or pattern.

- Alcoholic beverages are not allowed on-site.

PROTECTIVE EQUIPMENT REQUIREMENTS

Field personnel and visitors are required to wear the following clothing and equipment, as a minimum, while in the work area at 800 Franklin project site:

- Coveralls
- Steel-toed boots

Fied personnel engaged in work operations are required to wear the following additional equipment:

- Standard Tyvek (when required)
- Gloves (when required)
- Respirator (readily available and usable if required)
- Hard hat (when required)
- Safety glasses (when required)

WORK ZONES AND SECURITY MEASURES

The Project Geologist will contact the Underground Services Alert (USA) and the utilities will be marked before any drilling is conducted. The boreholes and monitoring wells will be installed at a safe distance from the utilities.

The locations where the monitoring wells and boreholes are to be installed will be designated as Exclusion Zones. The Exclusion Zones will incorporate approximately one-half the width of the sidewalk and one traffic lane. Only essential personnel will be allowed into the Exclusion Zones. Cones, wooden barricades, portable fences or a suitable alternative will be used to deny public access to the Exclusion Zones. The public will not be allowed close to the work area under any conditions. If for any reason the safety of a member of the public may be endangered, work will cease until the situation is remedied. Cones and warning signs will be used when necessary to redirect pedestrians and automobiles.

DECONTAMINATION PROCEDURES

Drilling equipment and personal protective equipment will undergo gross decontamination onsite. This gross decontamination will include the washing of contaminated equipment with a trisodium phosphate (TSP) solution. Steam-cleaning is an acceptable alternative.

EMERGENCY RESPONSE PROCEDURES

In the event of an accident resulting in physical injury, first aid will be administered and the injured worker will be transported to the nearest hospital or emergency medical clinic for emergency treatment. A physician's attention is required regardless of the severity of the injury.

In the event of a fire, explosion, or property damage, MEC will be immediately notified. If necessary, local fire or response agencies will be called.

EMERGENCY TELEPHONE NUMBERS

Fire and Police 911

Ambulance 911

Providence Hospital 835-4500
3100 Summit Avenue
Oakland, CA

Directions
North on Broadway to Webster. Left on Webster. Left on 30th Street. Right on Summit Avenue. Hospital located at 3100 Summit Avenue.

ADDITIONAL CONTINGENCY TELEPHONE NUMBERS

Oakland Fire Dept. ..... (415) 273-3331
Poison Control Center ..... (800) 523-2222
Miller Environmental Company ..... (415) 233-9068

This Site Safety Plan has been reviewed by the following person:

MEC Project Geologist: ----------
Reinhard Ruhmke

Amendments or modifications to this Plan may be written on a separate page and attached to this Plan. Any amendments or modifications must be reviewed and approved by the personnel named above.