



SP ENVIRONMENTAL SYSTEMS, INC.

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September 27, 1990

Mr. Dennis Byrne
Alameda County Health Care Services Agency
Department of Environmental Health - Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

**Subject: Work Plan for Soil and Groundwater Investigation
5th & Kirkham Streets Site
Oakland, California
SPEvS Job # 05032**

Dear Mr. Byrne:

On behalf of Southern Pacific Transportation Company (SPTCo), SP Environmental Systems Inc. (SPEvS) has enclosed a proposed work plan for an investigation of the soil and groundwater quality in the vicinity of underground storage tanks that were removed last February. Please indicate if the proposed location of monitoring wells will satisfy your requirements for groundwater monitoring near the tank excavations.

We would like to start work the week of October 15, 1990.

If there are any questions do not hesitate to contact Walter Floyd at 916-369-8971.

Sincerely,

John F Spisak / RWG

John Spisak
President

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PROPOSED WORK PLAN

BACKGROUND INFORMATION

This work plan describes the procedures for installing 6 groundwater monitoring wells at the Southern Pacific Transportation Company (SPTCo) facility located at 5th and Kirkham Streets in Oakland, California. An approximate location map of the site relative to a portion of the city of Oakland is included as Figure 1.

In February 1990, 4 underground storage tanks were removed from the 5th and Kirkham Street site. A detailed report of the tank pull operations and findings can be found in the SP Environmental Systems (SPEvS) report dated March 1990. A map showing the approximate location of the former underground storage tanks is included as Figure 2. The tanks removed are as follows:

- o Tank #1 - 10,000 gallon diesel tank located at 330 Cypress Street
- o Tank #2 - 500 gallon used-oil tank at 330 Cypress Street
- o Tank #3 - 1,500 gallon used-oil tank to the west of the two above listed tanks; south of Third Street between Cypress and Center Streets
- o Tank #4 - 1,500 gallon used-oil tank furthest to the west of all the tanks, south of Third Street between Center and Chester Streets.

Approximately 250 gallons of product were removed from tank #2, 1,450 gallons were removed from tank #3, and 50 gallons from tank #4. Tank #1 did not contain any residual product that required removal.

Soil samples were collected from beneath each tank by driving a brass tube into the soil in the excavator bucket and then immediately sealing the ends of the tube with teflon, plastic end caps, and tape. The samples were labeled, logged on a chain of custody forms and stored on ice for shipment to Central Coast analytical Services, a California certified laboratory in San Luis Obispo, California. The results of the laboratory analyses are summarized on Table 1.

Water was encountered at the bottom of the excavation for tanks #1 and #2 at depths of approximately 10 and 5 feet, respectively. A water sample was collected from each excavation with a disposable bailer for analysis. Small pools of oily liquid were observed in

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the excavation of tank #3. No free product was observed in the other excavations.

Permission was received to temporarily backfill the excavations with the soil removed during excavation activities. Clean imported backfill was added to bring the soils to grade.

SCOPE OF WORK

Six groundwater monitoring wells will be drilled and installed in the approximate positions shown on Figure 3. Where possible these wells will be located within 10 feet (lateral distance) from the excavation in the assumed downgradient position and will be drilled in native formation material. Gradient in the nearby area is reported to be in a south to southwest position.

WELL INSTALLATION

One soil boring will be drilled at each of the proposed locations as shown on Figure 3. The wells MW-1, MW-3, and MW-4 are located in the assumed downgradient direction of the former underground storage tanks number 1,3, and 4 respectively. The former location of tank number 2 is adjacent to a property occupied by DC Metals. A fence and equipment storage on this property prevents a well placement within ten feet of the tank excavation pit. For this reason the well (MW-2) will be located downgradient from Tank #2. The hydraulic gradient will be determined by SPEVs staff surveying monitoring wells #1,4,&6 prior to the installation of MW-2.

The well borings will be drilled using a truck mounted drilling rig utilizing 10-inch or 12-inch hollow stem augers (nominal outside diameter) as the drilling method. Soil samples for lithologic determination will be collected continuously using a 5-foot split spoon core barrel which shall be pushed into the soil concurrently with the drilling of each 5-foot flight of auger. Soils will be logged by a SPEVs geologist.

Soil samples for laboratory analysis will be collected every 5 feet and at changes in lithology. Samples will be collected using a California modified split spoon sampler driven into the soil approximately 18 inches every sample interval. The split spoon sampler will have 6-inch long brass liners inserted inside to retain the samples. After collection, one sample liner at each sample interval will be selected for shipment to the laboratory. The liner will be covered with teflon sheets, capped with plastic on each end, and sealed with black electrical tape. A label will

be placed on each liner with the site name, date, time of collection, unique sample number, depth, initials of collector, and any other pertinent information recorded on it. The brass liners will be placed in a cooled ice chest for preservation purposes and transported within 48 hours of collection to a state certified laboratory for analysis. A chain-of-custody form will be filled out for each sample and included in the ice chest upon shipment. The proposed analyses to be performed for these samples are shown on Table 2. To summarize, the water samples collected from each of the six wells will be analyzed for total petroleum hydrocarbons as gasoline (TPH-G) using EPA Method 5030/8015, total petroleum hydrocarbons as diesel (TPH-D) using EPA Method 3510/8015, total oil and grease (TOG) using SM 503E, and volatile organic compounds (VOC) using EPA Method 8240. All soil samples collected below grade during the well installations will be analyzed for TPH-G, TPH-D, TOG, & VOC. In addition soil samples collected at the near surface at MW-3 and MW-4, the wells in the former junkyard, will be analyzed for total lead using EPA Method 7421 and Organochlorine pesticides including PCB's using EPA Method 8080.

The boring will be advanced approximately 13 feet below the water table which is estimated to be approximately 7 to 10 feet below the ground surface. After drilling and sampling of the boring is completed, a 4-inch diameter groundwater monitoring well will be immediately installed. The well will be constructed with PVC well construction materials. The well screen will be 15 feet in length and will extend approximately 13 feet below and 2 feet above the water table as measured at the time of well installation. After the well screen and blank casing have been installed through the augers, an artificial filter pack will be placed between the PVC well casing and the inside annulus of the hollow stem augers.

The artificial filter pack will consist of a Monterey No. 1C or equivalent and shall extend approximately 1-foot above the top of the well screen. The filter pack sand will be allowed to free-fall through the center of the auger between the PVC well casing and the auger. The auger will be withdrawn at approximately 1-to 2-foot intervals which will allow the filter pack sand to flow out of the auger and be placed between the well casing and the boring wall. This process will be repeated until the filter pack sand is at the appropriate depth.

A 1-foot thick bentonite pellet seal consisting of 1/4-inch bentonite pellets will be installed on top of the artificial filter pack sand in a similar fashion to the filter pack sand installation. The bentonite pellets will be hydrated with potable water obtained from the site or the drilling rig (approximately 3 gallons) and will be allowed to hydrate for approximately 15 minutes.

A cement/bentonite grout will then be placed on top of the bentonite pellet seal and shall extend to approximately 6-inches below grade. The grout mixture ratio will consist of approximately 2 pounds of bentonite powder, approximately 7 gallons of potable water, and approximately 94 pounds (1 sack) of Portland cement. The bentonite will be allowed to hydrate in the water for approximately 10 minutes before the cement is added. After the cement is added and sufficiently mixed, the grout will be poured through the center of the augers while the augers are positioned on top of the bentonite pellet seal. The augers will be withdrawn at 1- to 2-foot intervals, allowing the grout to flow out of the augers and into the boring. This process will be repeated until the remainder of the annular space is filled with grout.

The lower portion of the wells will consist of 4-inch (outside diameter) Schedule 40 PVC well screen with 0.020-inch machine cut slots. A PVC threaded end cap will be attached to the bottom of the well screen to prevent formation sand and other material from entering through the bottom of the well casing. The well screen will be joined to 4-inch (outside diameter) Schedule 40 PVC blank (non-slotted) casing that will extend approximately 2-inches below grade. A PVC slip cap will be installed on top of the casing to help prevent water from entering down the casing.

The wells will be completed with a water-tight traffic-rated vault placed approximately 2-inches above grade to allow for surface water run-off. A locking steel conductor casing will be placed inside the vault and over the PVC well casing. A lock will be installed on the steel conductor casing to limit access.

Excess soils generated from the drilling process are anticipated to be minimal. Soils will be stockpiled on visqueen and stored on site until receipt of laboratory data for determination of their proper treatment/disposal.

WELL DEVELOPMENT, PURGING, AND SAMPLING

After construction is completed the wells will be developed to stabilize the artificial filter pack and to remove fine sediments from the adjacent soils. Well development will be performed by pumping with a surface pump and surging with a 4-inch surge block. Surging will be accomplished by raising and lowering the surge block approximately 20 times across the length of the well screen. Pumping will continue until the water flows clear or until 55 gallons have been removed (whichever is the smallest volume).

After development is completed, the well will be purged prior to sampling by removing the equivalent of approximately 3 additional well volumes of water. Temperature, pH, and conductivity will be measured throughout the purging process. After 3 well volumes have

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been removed the well will be sampled using a pre-cleaned Teflon bailer.

As part of the Quality Assurance/Quality Control (QA/QC) Program, a travel blank (originating from the laboratory), a field blank (collected in the field using deionized water), and a field duplicate (from one of the wells) will be collected and analyzed. The groundwater sample containers will be placed in a cooled ice chest for preservation purposes and transported within 48 hours of collection to a state certified laboratory for analysis. A chain-of-custody form will be filled out for each sample and included in the ice chest upon shipment. A list of proposed analyses for groundwater is included in Table 2.

All development and purge water will be collected in certified DOT steel drums approved for the temporary storage and transport of hazardous materials. Drums will be labeled with the well number to indicate where the material originated. The drums will also be labeled to indicate drum contents and date of generation of material contained therein.

REPORT OF FINDINGS

A letter report will be submitted within 6 weeks after the drilling and sampling have been completed.

TABLE 1
RESULTS OF PREVIOUS SOIL SAMPLING
HYDROGEOLOGIC SITE ASSESSMENT
5TH AND KIRKHAM STREET SITE - OAKLAND, CALIFORNIA
SPEvS JOB # 05032

Sample Number ^{ab}	Type	Depth ^c	TPH ^d	Benzene	Xylene	Toluene	Ethylbenzene
S-1-1	soil	BOE	700	ND	58	11	12
S-1-2	soil	BOE	ND	0.004	ND	ND	ND
S-1-3	soil	BOE	12	0.002	ND	0.004	ND
W-1-1	water	BOE	70	1.5	9.8	1.2	1.7
S-2-1	soil	BOE	1500	1.9	ND	18	ND
S-2-2	soil	BOE	6.3	0.004	0.018	0.006	0.003
W-2-1	water	BOE	50	0.0003	0.0019	0.0016	0.0003
S-3-1	soil	BOE	8.1	1.1	1	0.6	0.033
S-3-2	soil	BOE	1100	2.1	67	18	11
S-4-1	soil	BOE	ND	0.0017	0.0043	0.0023	ND
S-4-2	soil	BOE	1600	1.3	110	17	20

- a Samples collected by S P Environmental Systems, Inc. .
- b See Figure 2 for the approximate location of each sample.
- c Depth in feet below ground surface.
- d TPH = Total Petroleum Hydrocarbons as Gasoline and Diesel Constituents. Units reported in mg/Kg for soil samples and mg/L for water samples.

Benzene, Xylene, Toluene, Ethylbenzene: Units reported in mg/Kg for soil, mg/L for water.

ND Denotes that concentrations were not detected above the reported method detection limits.

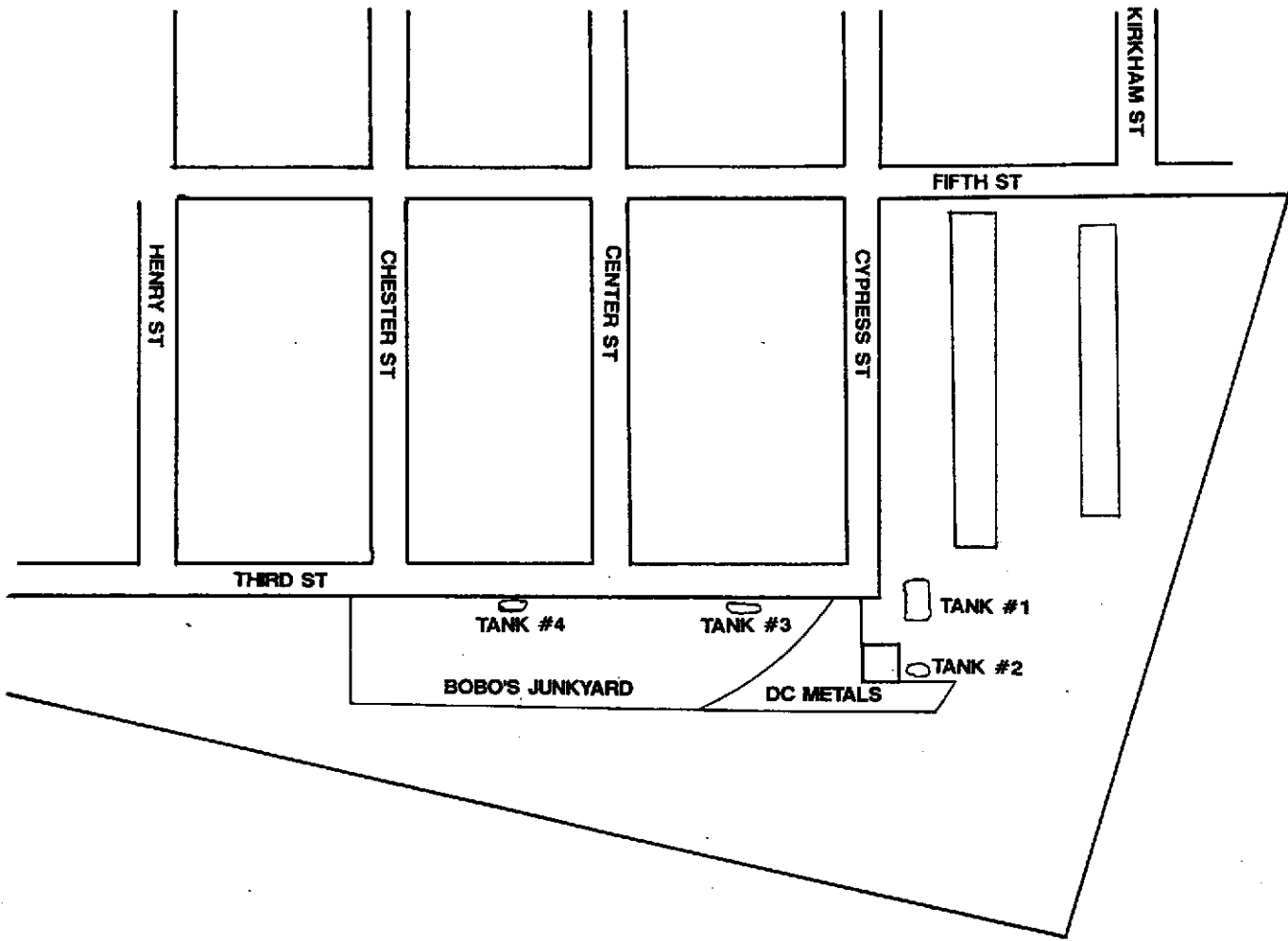
BOE Bottom of excavation.

TABLE 2
 PROPOSED GROUNDWATER AND SOIL ANALYSES
 HYDROGEOLOGIC SITE ASSESSMENT
 5TH AND KIRKHAM STREET SITE - OAKLAND, CALIFORNIA
 SPEvS JOB # 05032

Sample Number	TPH-G	TPH-D	TOG	VOC	LEAD	PCB's
MW-1-H ₂ O	X	X	X	X		
MW-1 dup.	X	X	X	X		
MW-1-4'	X	X	X	X	X	
MW-1-9'	X	X	X	X		
MW-2-H ₂ O	X	X	X	X		
MW-2-4'	X	X	X	X	X	
MW-2-9'	X	X	X	X		
MW-3-H ₂ O	X	X	X	X		
MW-3/surf.		X	X		X	X
MW-3-4'	X	X	X	X	X	X
MW-3-9'	X	X	X	X		
MW-4-H ₂ O	X	X	X	X		
MW-4/surf.		X	X		X	X
MW-4-4'	X	X	X	X	X	X
MW-4-9'	X	X	X	X		
MW-5-H ₂ O	X	X	X	X		
MW-5-4'	X	X	X	X		
MW-5-9'	X	X	X	X		
MW-6-H ₂ O	X	X	X	X		
MW-6-4'	X	X	X	X		
MW-6-9'	X	X	X	X		



FIGURE 1
USGS TOPOGRAPHIC MAP



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LOCATION OF UNDERGROUND STORAGE TANKS at FIFTH and KIRKHAM ST PROPERTY

FIGURE
2

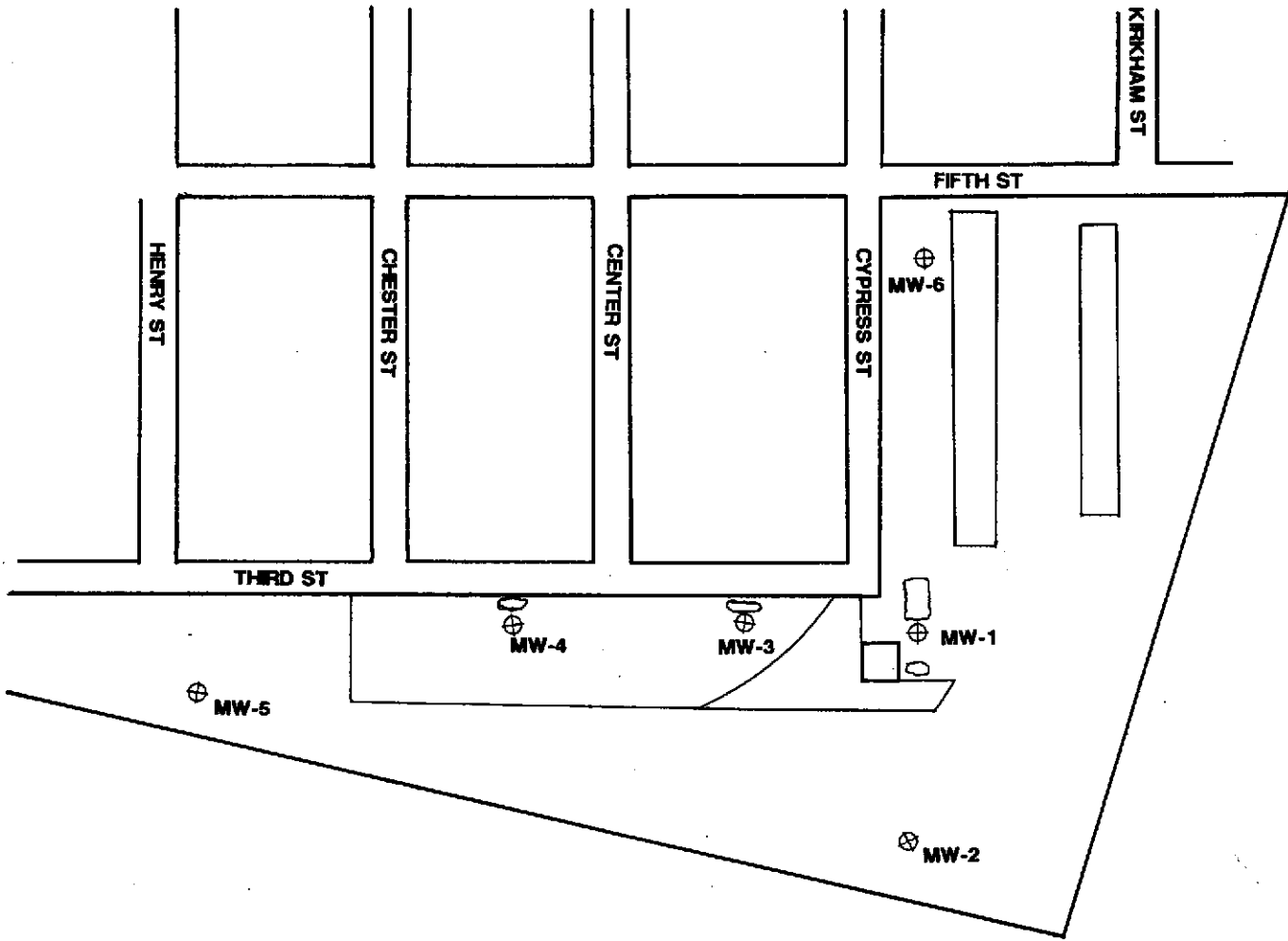
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DRAWN BY: WDF

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1" = 300'
SCALE



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PROPOSED LOCATION OF MONITORING WELLS

FIGURE
3

PROJECT NO. 05032

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1" = 300'
SCALE

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