THRIFTY OIL CO.

February 13, 1987

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ENVIRONMENTAL HEALTH
ADMINISTRATION

Mr. Ted Gerow
Alameda County
Environmental Health Services
470 27th Street
Suite 324
Oakland, CA 94612

RE: Thrifty Oil Co. Station #49
3400 San Pablo Avenue
Oakland, CA 94608

Dear Mr. Gerow,

Enclosed please find Woodward-Clyde Consultants proposed Remediation Plan dated January 26, 1987 for the above referenced site.

Please review this report and advise if you concur or have any specific requirements. Do not hesitate to contact Howard Platt or the undersigned if you have any questions or desire to discuss this project.

Very truly yours,

Peter D'Amico
Manager
Environmental Affairs

PD/dmt
Enclosure

cc: Peter Johnson, Regional Water Quality Control Board (W/Enc.)
Mark B. Gilmartin, Straw & Gilmartin
James D. Sartor, Woodward-Clyde Consultants

100 Pringle Avenue Suite 300
Walnut Creek, CA 94596-3564
415-945-3000

Woodward-Clyde Consultants

January 26, 1987
90386A/0000

Mr. Pete D'Amico
Manager, Environmental Affairs
Thrifty Oil Co.
10000 Lakewood Blvd.
Downey, CA 90240

Subject: Proposal for Remediation of Subsurface Contamination at
Service Station No. 49
3400 San Pablo Avenue, Oakland, California

Dear Mr. D'Amico:

Woodward-Clyde Consultants is pleased to submit the following proposal for the installation of a subsurface petroleum product recovery system at your service station No. 49 in Oakland, California. The proposal is based on information generated by Woodward-Clyde Consultants' investigations during November of 1986.

No formal cleanup action levels for petroleum products exist, although the California Regional Water Quality Control Board, San Francisco Bay Region, Guidelines for Addressing Fuel Leaks (1985) states that "Removal of free product from the groundwater surface is required in all cases where more than 1/4 inch of floating free material is detected in an appropriately designed monitoring well or where lesser quantities contaminate or threaten to contaminate groundwater that is being used for domestic water supply." No known wells nor use of shallow groundwater in the area of concern has been identified. Local regulatory concerns also lie with the removal of the free product and heavily contaminated soil (State guidelines suggest a heavy contamination limit of 1000 mg/kg). A soil concentration exceeding this level (1200 mg/kg) was reported in only a single sample from the site, suggesting that the primary recovery operation should be directed toward cleanup of free floating product.

The proposed recovery plan involves the application of a two-phase system. The two-phase system functions by pumping groundwater to draw down the water table in the well and tank backfill, thus creating a "cone of depression." By changing the local groundwater gradient, the product will flow toward the center of the depression (recovery well) where a second pump (skimmer) will move the product from the the surface of the water and pump it to a storage tank. As a result of the

groundwater depression pumping, contaminated water will be produced. If the level of hydrocarbons in this water is sufficient (usually in excess of 15 ppm), it will require treatment prior to disposal in a storm or sanitary sewer. Therefore, the produced water will be pumped first to a holding tank where gravity separation can occur, then through a pair of activated carbon filters prior to discharge to the sewer. Pending the results of discharge water monitoring, it may be possible to eventually bypass these filters. The entire system will be equipped with a series of sensors and automatic controls to regulate pumping rates and prevent tank overfilling. A diagram of the system layout and estimated zone of contamination is shown in Figure 1. A schematic of the conceptual system is shown in Figure 2.

Prior to installation, tests will be conducted in existing wells to evaluate various physical parameters of the local hydrogeological regime. In a addition to providing information for sizing of components of the system, these tests will provide insight into the likely rate and effectiveness of the recovery system operation.

The two-phase system will be installed in a 6-inch diameter well located at the edge (and at least party within) the tank backfill. The system will include water table and depression pumps, control panels, water treatment equipment, air compressor and associated wiring and hoses. All plumbing will be installed below grade in shallow trenches. To facilitate inspection and repair, these trenches should be covered with steel plate. With the exception of the skimmer and depression pump, all of the equipment will be installed in a secure storage area behind the existing station office.

The proposed technique may require an NPDES or local permit for discharging the treated water to the sanitary sewer system. The permit will probably stipulate that samples of the discharge water be taken periodically to ensure that any effluent limitations are not exceeded. The frequency for sampling is assumed to be once per month. Other operating costs would include a system check and well monitoring once a week. Water samples may also be taken and analyzed periodically to chart the anticipated decreases in hydrocarbon levels, if desired.

The estimated costs for the proposed remediation are outlined in Table 1. As discussed previously, the proposed methods, and therefore the associated costs, are based on several assumptions concerning ambient subsurface conditions at the site. Should these conditions vary significantly from those assumed, system modification may be

necessary. Costs also assume that no significant problems are encountered during well or system installation and that sampling frequencies required by the agencies will not exceed those described above. These costs also do not include the disposal of contaminated cuttings or fluids that may be generated during well installation or any other activities conducted during remediation. In addition, the recovery system equipment, installation and maintenance costs are based on Thrifty Oil contracting directly with the supplier (Clean Environment Engineers).

If you have any questions or comments, please feel free to contact Mr. Martin Cramer, as he will be the manager of this project.

Sincerely,

James D. Sartor
Manager
Environmental and Engineering Services

MC/sst
COT/90386P

TABLE 1. ESTIMATED COST BREAKDOWN

1.	Project Management - regulatory interaction, permits, Q.A., health and safety, field coordination, etc.		
	20 hrs Project Management	1,920	
	2 hrs Health and Safety	120	
	2 hrs Project Review	200	
			2,240
2.	Well Installation		
	5 hrs Driller	625	
	8 hrs Geologist	480	
	1 Materials	350	
	1 Equipment Rental	250	
	3 Soil Sample Analyses	600	
	1 Concrete Cutter	125	
			2,430
3.	Recovery System Installation		
	1 Hardware (pumps, controls, hoses, compressor, etc.)	11,000	
	1 Water Tank	500	
	1 Product Tank	500	
	1 Secure Cage	2,000	
	1 Concrete Cutting and Paving	1,000	
	1 Carbon Water Treatment System	6,000	
	1 Misc. Materials	500	
	1 Labor	5,000	
			26,500
	Total Installation Costs		$31,170
4.	Monthly Recovery System Operation Costs		
	1 Checkup and Maintenance	400	
	1 Effluent Sample	200	
	20 hrs Field Technician - well monitoring and sampling	1,000	
	1 Activated Carbon Replacement	500	
	1 Equipment Rental	400	
			$2,500

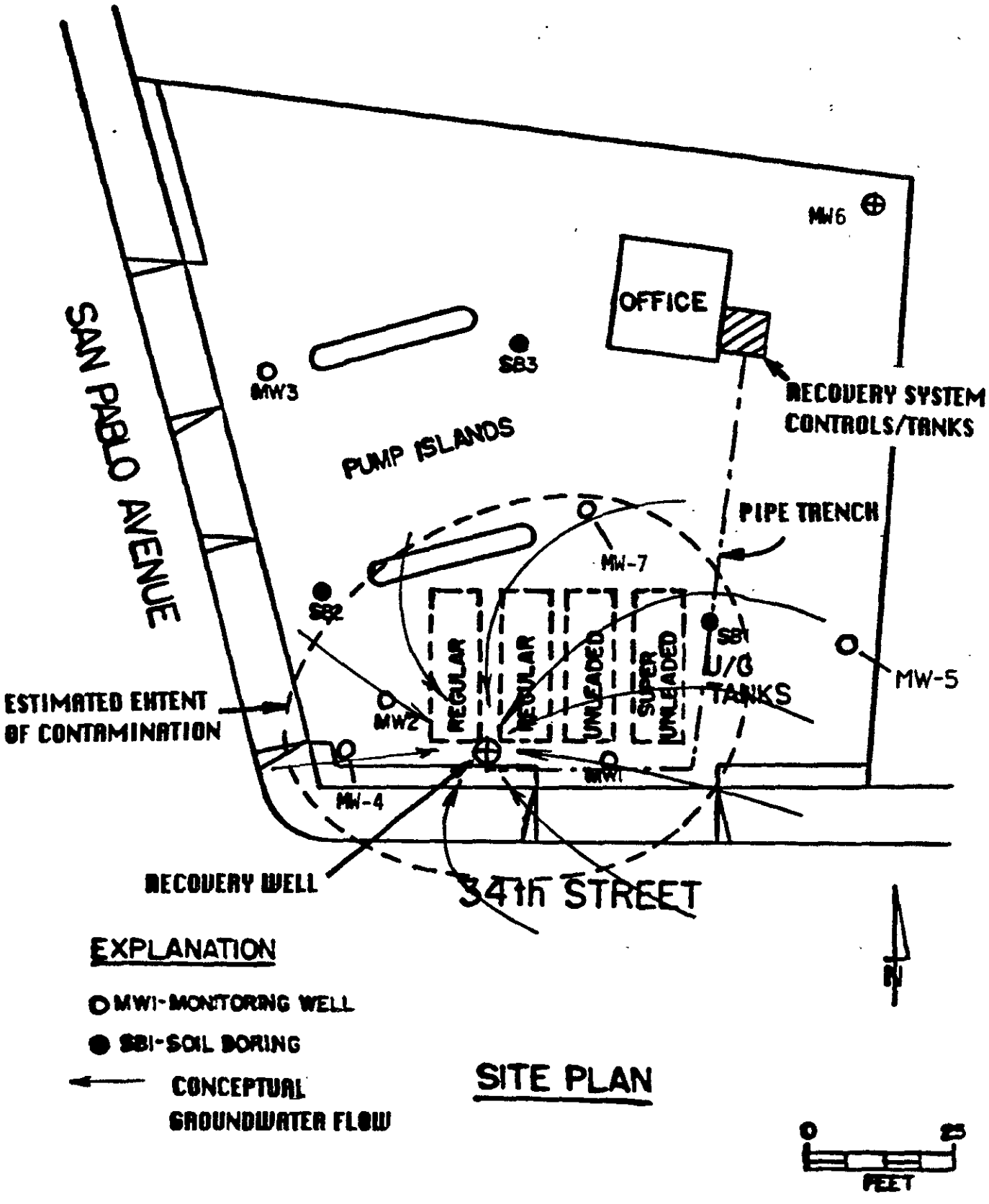

FIGURE 1 CONCEPTUAL RECOVERY SYSTEM LAYOUT

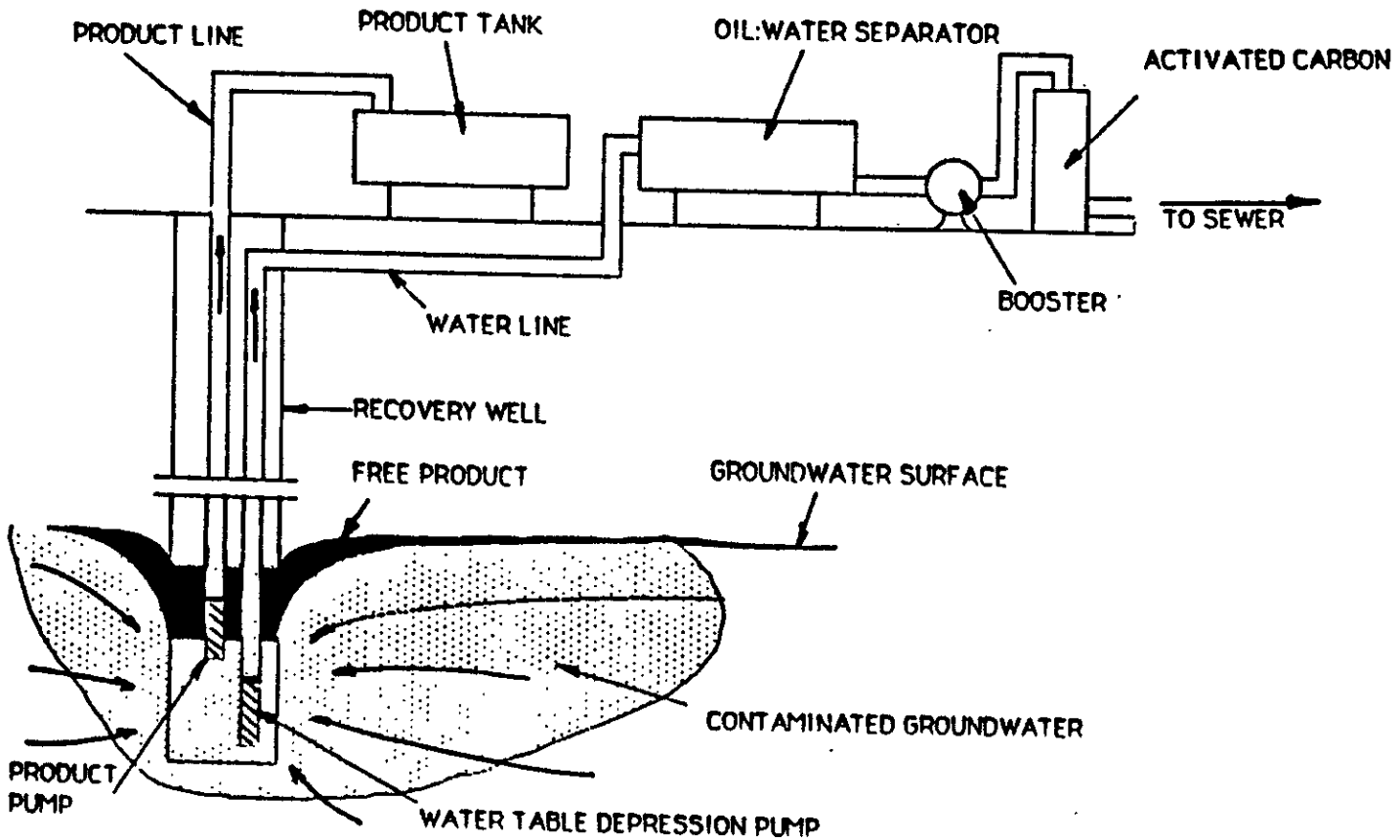

FIGURE 2. CONCEPTIONAL RECOVERY SYSTEM SCHEMATIC

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