GeoStrategies Inc.

February 23, 1993

Alameda County Department of Environmental Health
800 Swan Way, Room 200
Oakland, California 94621

Attn: Mr. Barney M. Chan

Re: **WORK PLAN**
Shell Service Station
4411 Foothill Boulevard
Oakland, California
WIC #204-5508-3400

Mr. Chan:

This Work Plan by GeoStrategies Inc. (GSI) has been prepared at the request of Shell Oil Company, for the Shell Service Station located at the above referenced site. The Work Plan was prepared in response to a letter by the Alameda County Health Care Services Agency dated January 24, 1993. GSI proposes that two additional ground-water monitoring wells be installed, to determine the extent of soil and ground-water contamination at the site, and to investigate if offsite sources could affect groundwater quality below the site. The proposed monitoring wells will be installed in accordance with all applicable State and local regulations, and according to previously appended GSI Field Methods and Procedures.

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HYDROGEOLOGIC SETTING

Project Description

The service station is located at the intersection of Foothill and High Streets in Oakland, and is underlain by Quaternary alluvial deposits of the East Bay Plain. A waste oil tank was removed from the site in February, 1992. Verification soil samples were ND for petroleum hydrocarbons, but stockpile soils contained TPH-Gasoline, TPH-Diesel and Total Oil and Grease at concentrations of 5.2 ppm, 14 ppm and 130 ppm, respectively. In November, 1992, GSI installed Monitoring Well S-1 downgradient of the former waste oil tank, to a depth of 25 feet. Soil samples from the capillary fringe (11.0 feet) and from a sand lens below the water table (16.0 feet) contained TPH-Gasoline at concentrations of 110 ppm and 2.8 ppm, respectively. The same soil samples contained benzene at concentrations of 0.45 ppm and 0.050 ppm, respectively. During the initial sampling on December 13, 1992, groundwater from Well S-1 contained TPH-Gasoline, TPH-Motor Oil, and Benzene at concentrations of 41 ppm, 9.4 ppm and 3.1 ppm, respectively.

A Chevron service station and a BP service station are located at the intersection of Foothill and High Streets, north and northeast of the Shell site, respectively. Contaminated groundwater is reported below each of the stations, and active investigation and remediation programs exist at each site. The reported groundwater flow direction ranges from northeast to northwest.

GSI proposes to install additional on-site Monitoring Wells S-2 and S-3 at the locations shown on Plate 2, to investigate the extent of contaminated groundwater, and to determine the groundwater gradient below the site.The proposed wells should provide data to indicate whether off-site sources are impacting groundwater quality below the Shell service station.

TECHNICAL APPROACH

Scope of Work

The field work will be performed according to procedures which are in compliance with current State of California LUFT Manual, RWQCB Tri-Regional Guidelines, Alameda County permit and guidance documents, and the GSI Methods and Procedures presented in the original GSI Work Plan for the site, dated October 15, 1991.

TASK 1: Obtain the necessary ground-water monitoring well installation permits.

TASK 2: Two 10-inch diameter exploratory borings (S-2 and S-3, see Plate 2) will be drilled to an anticipated depth of approximately 25 feet below ground surface. Conventional hollow-stem auger techniques will be used to advance the borings.

TASK 3: The monitoring wells will be constructed using 4-inch diameter, precleaned Schedule 40 PVC well casing with 0.02-inch machine slotted well screen. The well screens will extend a minimum of 3-feet above the first encountered water-level. The annular sandpack will extend a minimum of 2-feet above the well screen. A minimum of 1-foot bentonite seal will be placed above the sandpack, followed by a cement grout seal to ground surface. All wells will be constructed to be compatible with subsurface geologic conditions. No well screens will be installed that could potentially permit cross-contamination.

TASK 4: Soil samples will be collected at five-foot intervals from the two proposed exploratory boreholes, and will be analyzed for the chemical parameters discussed in Task 6, below. Collected soil samples will be field screened for visual evidence of contamination (i.e., product saturation, discoloration, etc.) and for organic vapors using an Organic Vapor Monitor (OVM) photoionization detector.

TASK 5: The monitoring wells will be properly developed prior to collecting ground-water samples. Following well development, the wells will be sampled by the approved Shell groundwater sampling subcontractor for parameters in Task 6.

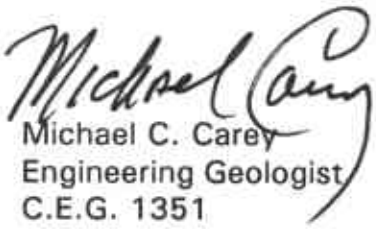
TASK 6: Soil and ground-water samples will be analyzed for TPH-Gasoline, TPH-Diesel and TPH-Motor Oil using EPA Method 8015 (Modified); and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) using EPA Methods 8020/602. The groundwater samples will also be analized for semi-volatile organic compounds (VOCs), using EPA Method 8270.

TASK 7: A Well Installation Report will be prepared to document field procedures, and to describe the subsurface geology (boring logs), well construction, chemical analytical results, and a brief discussion of results.

If you have any questions, please call.

GeoStrategies Inc. by,

Robert A. Lauritzen
Project Manager



Michael C. Carey
Engineering Geologist
C.E.G. 1351

MCC/rt

Plate 1. Location Map
Plate 2. Site Plan

cc: Mr. Dan Kirk, Shell Oil Company
Mr. R. Hiett, Regional Water Quality Control Board

QC: _____

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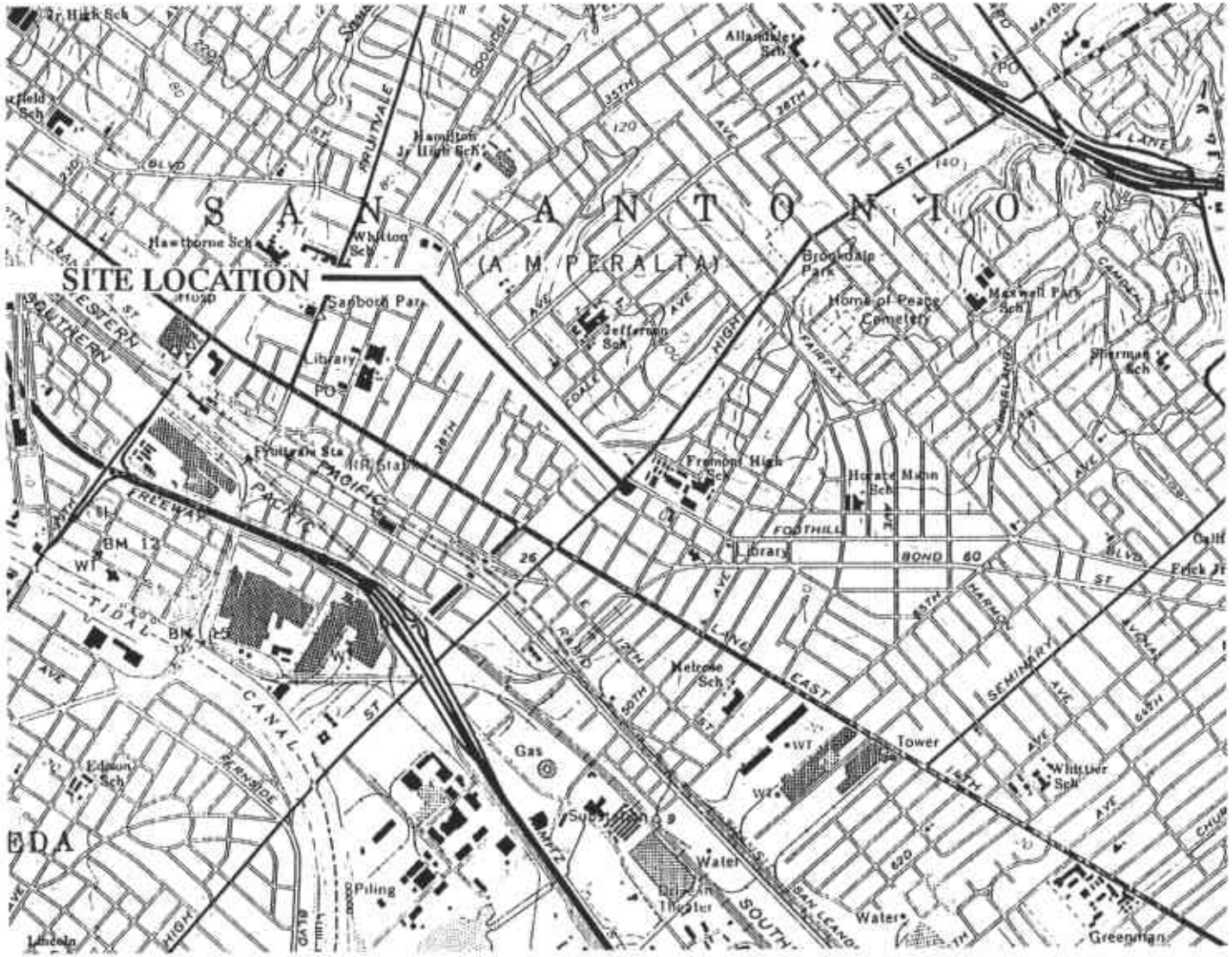

Base Map: USGS Topographic Map

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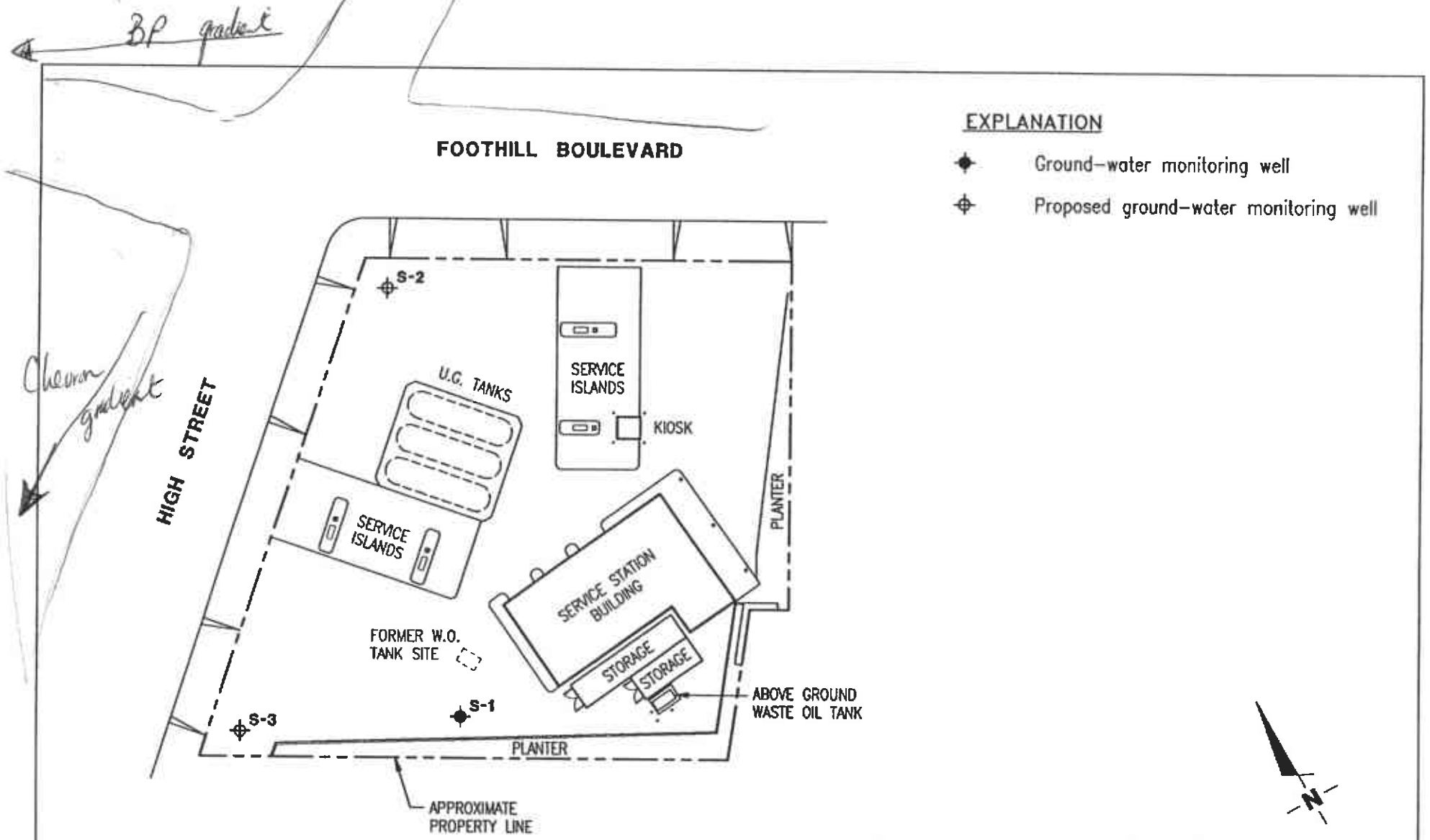
VICINITY MAP
Shell Service Station
4411 Foothill Boulevard
Oakland, California

PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7681		3/92	



Base Map: Shell Oil Company Site Plan dated 3/6/91 (Rev. 1/10/92)

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SITE PLAN
Shell Service Station
4411 Foothill Boulevard
Oakland, California

PLATE **2**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7681		2/93	