

April 29, 1988

THRIFTY OIL CO.

File 54-P

Greg Zentner
Regional Water Quality Control Board
San Francisco Bay Region
1111 Jackson Street
Room 6000
Oakland, CA 94607

RE: Thrifty Oil Co. Station #054
2504 Castro Valley Blvd.
Castro Valley, CA 94546

Dear Mr. Zentner,

Pursuant to our phone conversation today, this letter will confirm Thrifty Oil Co.'s plans to remediate the soil/groundwater contamination at the above referenced location.

A contract has been issued to Robert Elbert & Associates to install the remediation system that was sent to you on April 26, 1988. Additional vapor extraction wells will be installed in the tank backfill to enhance the operation of this system.

Our plans are to proceed with the installation as soon as the appropriate permits are received. Robert Elbert & Associates are in the process of permitting and I have been assured that copies of all pertinent information will be sent to you for your files.

Our lessee, Circle K Corporation, is proceeding with plans to install new underground tanks and lines approximately May 5, 1988. As per our agreement, the soil excavated from the old tanks will be used as backfill for the new tanks.

Your cooperation in this sensitive project is greatly appreciated by our company. Please contact me if you have any questions or require more information.

Very truly yours,



Peter D'Amico
Manager
Environmental Affairs

PD/dmt
Enclosures

cc: Larry Seto, Alameda County Health Department
Barbara Biles, Manager of Corporate Affairs



Robert Elbert & Associates

18 Anacapa Street, Second Floor

Santa Barbara, California 93101

P. O. Box 40180, Santa Barbara CA 93140-0180

TELEPHONE (805) 963-1808

FEDERAL EXPRESS

April 14, 1988

Mr. Larry Seto
Alameda County Health Care Services
470 27th Street
3rd Floor
Oakland, CA 94612

Re: Thrifty Oil Company
Station No. 054
2504 Castro Valley Blvd.
Castro Valley, CA

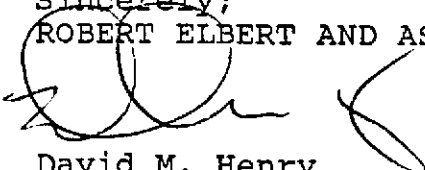
Dear Mr. Seto:


Robert Elbert and Associates on behalf of Thrifty Oil Company hereby submits the Report of Subsurface Investigation for the above referenced facility. This report is also submitted to Mr. Thomas J. Callaghan at the California Regional Water Quality Control Board.

Please feel free to call if you have any questions or comments.

Sincerely;

ROBERT ELBERT AND ASSOCIATES


David M. Henry

cc Mr. Darrell Fah, Thrifty Oil Company


RECEIVED
APR 15 1988
ENV./CONSTR

Proposed Remediation Plan
THRIFTY OIL COMPANY
Station No. 054
2540 Castro Valley Boulevard
Castro Valley, California

prepared for
THRIFTY OIL COMPANY
10000 Lakewood Blvd.
Downey, CA 90240

by
ROBERT ELBERT AND ASSOCIATES
P.O. Box 40180
Santa Barbara, CA 93140-0180
(805)963-1808

April 26, 1988

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1.0 INTRODUCTION

Previous investigations have shown the presence of soil and groundwater contamination at Thrifty Oil Company Station No. 054, 2504 Castro Valley Boulevard, Castro Valley, California (see Figure 1). This report outlines Robert Elbert and Associates (RE&A) proposal for the remediation of the soils and groundwater at this site.

The site is located at the extreme eastern edge of Castro Valley, which is an approximately mile and one half wide valley lying at the base of the U-shaped surrounding San Leandro Hills. The valley itself has a rather shallow slope and drains to the south by way of Cull and Crow Creeks and several other small drainages, that all join San Lorenzo Creek.

The location is an operating retail gasoline station with three underground tanks for leaded, unleaded and premium gasolines. These tanks will shortly be replaced with new fiberglass tanks by Circle K. Figure 2 is a site plan showing the location of buildings, storage tanks and other relevant features.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS

Two investigations have been undertaken: 4 borings to 20 feet in the vicinity of the tanks in December 1986 by Interstate Soils Sampling, and 7 groundwater monitoring wells installed February 1988 by RE&A. These investigations show that the geology of the site consists of 15 to 20 feet of clay overlying shale bedrock. The second investigation found groundwater at approximately 6 to 8 feet below the ground surface with a gradient of 1 foot per 35 feet to the

southeast. See Figures 3A and 3B for Water Table Elevations and Figure 4 for the Elevation of the Top of the Shale.

The soil sampling shows shallow contamination within the top ten feet of the surface in most of the wells/borings north of the pump island. All of the groundwater samples show significant dissolved gasoline constituents. No free product was found initially although a month after drilling a skim of gasoline was noted in RE-3.

3.0 PLAN OF REMEDIATION

3.1 Groundwater Remediation

To begin groundwater remediation and to reverse the direction of groundwater flow back on site, we propose to install a Thermal Vacuum Spray Aeration-Compressive Thermal Oxidation (TVSA-CTO) system (see Appendix A for Schematic diagrams and equipment lists). RE&A proposes to install this system which would involve placing a vacuum, along with accompanying downhole pulse pumps, on each of the RE&A wells. Water levels will be maintained near the bottom of the wells.

Each of the wells will be under vacuum which has the effect of increasing the flow rates and the area of influence of the wells. The vapors will be extracted via vacuum extraction, and the contaminated water will be pumped to the surface where both vapors and water will be treated via a spray aeration system (discussed below) to remove contaminants per discharge requirements and discharged via either a storm drain or sanitary sewer, as regulated by the appropriate agencies.

To establish a baseline, the existing wells will be bailed and resampled before the remediation system begins. The water levels will then be monitored after pumping is initiated to determine the effect of pumping. Periodic samples will be taken via a sample port and transported to a laboratory for analysis. Because of the low hydraulic conductivity of clays, the yield of the wells are expected to be very low although flow rates and zone of influence may be increased under a vacuum (Blake 1986). Pumping may therefore be intermittent.

3.2 Remediation of Soils

The soil contamination beneath the station will be addressed, in place, using the vacuum extraction system. The cleanup is generally in a zone horizontal to the screened interval extending radially outward 30 to 50 feet. Because of the fine nature of these soils, the radius of influence is expected to be near the minimum. Additional vapor recovery wells will be installed within the tank backfill either at the time of the new tank installation or subsequently.

Thus with all of the wells on the vacuum system, most of the site should be able to be addressed. Although the screens on the wells are below the contamination that is within the top 5 feet of the surface, it is hoped that surface infiltration of air will reach these areas.

4.0 EQUIPMENT OPERATION

The equipment used in this system operates as follows: the wells will be manifolded together, with the manifold being directed to the intake of the spray aerator. Water being

pumped to the surface through the use of pulse pumps will be combined with the vapors being extracted via a vacuum pump.

The aeration system works in the following manner. Contaminated water is pumped to a set of nozzles at the bottom of the spray aeration tank where it is sprayed upward in the tank. The spraying causes the hydrocarbons to volatilize and be extracted with vapors being drawn through the vacuum pump. The vacuum on the tank increases the volatilization rate of the hydrocarbons. The spray from the nozzles falls due to gravity to the bottom of the tank where it is heated via a heat exchanger with the engine cooling fluid. This heating also increases the volatilization of the hydrocarbons. The heated water is then recirculated through a second set of nozzles where hydrocarbons are further reduced by spray aeration. As the water level rises from influx of water from the wells a float will trigger a discharge of an equal amount of remediated water. The level of clean up of water will be determined by sampling water inputs and discharges from the equipment.

The hydrocarbons extracted from the water are combined in the spray aerator with the vapors drawn out of the wells. The combined vapors are withdrawn from the aeration tank by the vacuum pump. The exhaust from the vacuum is manifolded directly to the intake of the engine where the hydrocarbons will be mixed with primary fuel, propane, and then combusted in the engine, thus consuming the total hydrocarbon mixture.

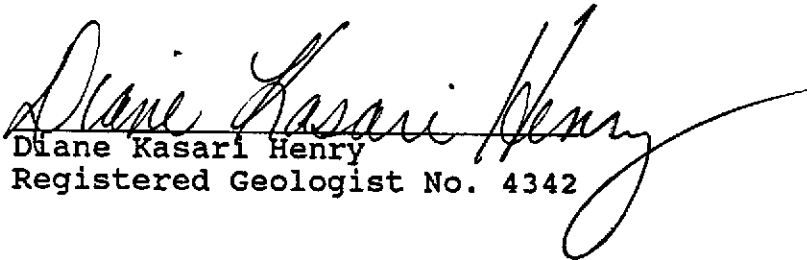
Because the entire system is under vacuum until the vapors enter the cylinders of the engine for combustion, any possible leaks of seals or connections are into the system, resulting in no loss of hydrocarbons into the atmosphere. If the engine stops running, the entire system ceases to operate, thereby stopping any uncontrolled releases to the

atmosphere. In addition, the engine will have shut off devices triggered by low oil pressure, or engine overheat.

5.0 LIMITATIONS OF INVESTIGATIONS

Soil and groundwater conditions can vary significantly between borings. The interpretations and proposals presented herein were performed to meet current professional standards. No other guarantee is expressed or implied regarding the conclusions or recommendations presented.

Respectfully submitted;
ROBERT ELBERT & ASSOCIATES


Diane Kasari Henry
Registered Geologist No. 4342

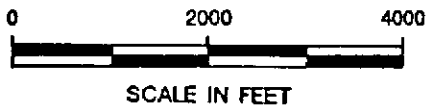
References

Blake, Steven B. and Gates, Michael M., November 1986.
Vacuum Enhanced Hydrocarbon Recovery: A case study in
Proceedings of Petroleum Hydrocarbons and Organic
Chemicals in Groundwater. Prevention, Detection, and
Restoration, National Well Association and American
Petroleum Institute.



A PORTION OF THE U.S.G.S. HAYWARD 7.5' QUADRANGLE

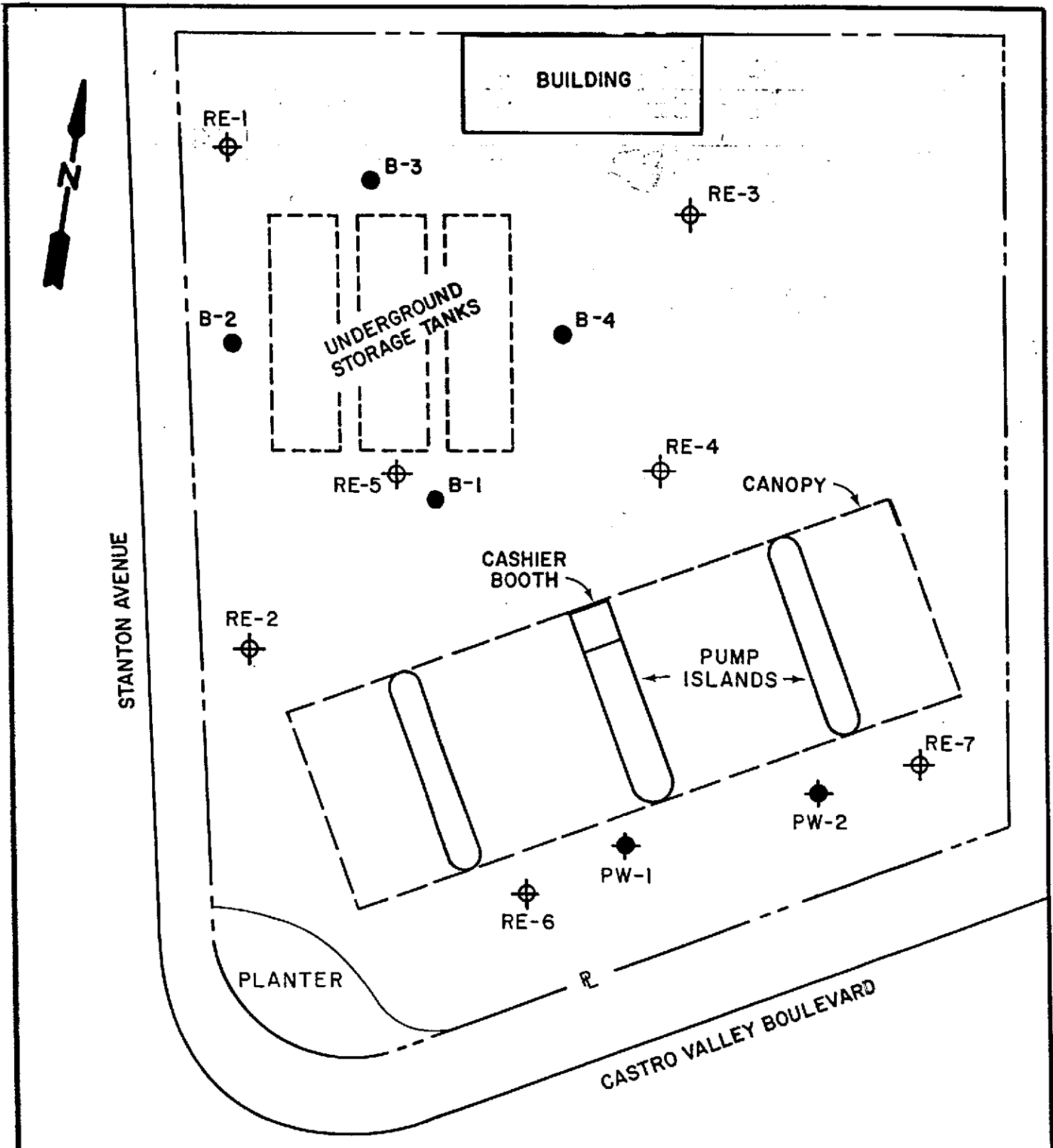
LOCATION MAP
THRIFTY OIL STATION NO. 054
CASTRO VALLEY, CALIFORNIA
 Prepared for
THRIFTY OIL COMPANY
DOWNEY, CALIFORNIA



SCALE IN FEET

RE & A
 Santa Barbara
 California

Figure 1



EXPLANATION:

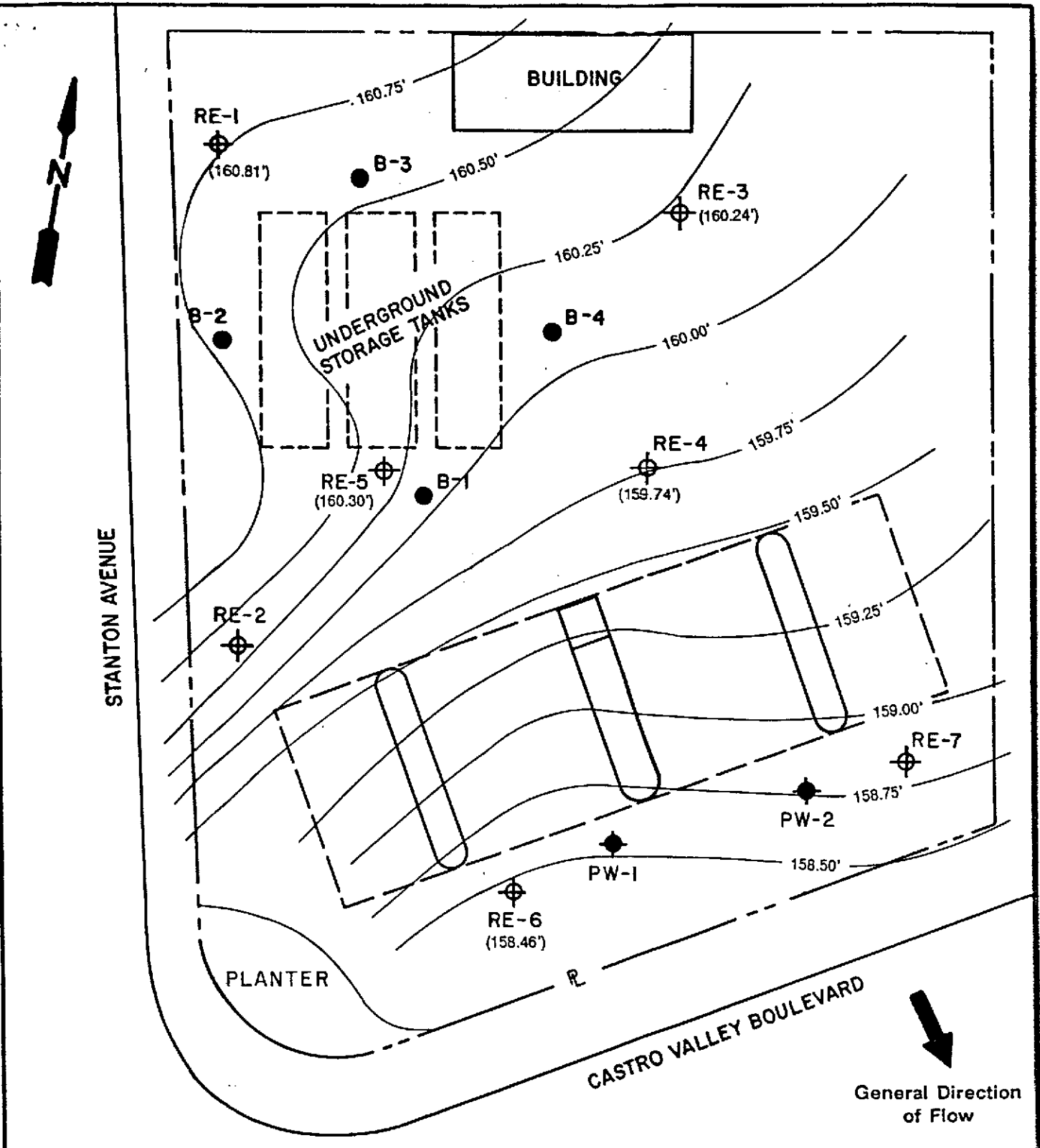
- B-4 ● Exploratory Boring
- RE-7 ⊕ Monitoring Well
- PW-1 ● Pre-existing Well



SITE PLAN
THRIFTY OIL STATION NO. 054
CASTRO VALLEY, CALIFORNIA
 Prepared for
THRIFTY OIL COMPANY
DOWNEY, CALIFORNIA

FEB 1988
RE & A
Santa Barbara
California

Figure 2



EXPLANATION:

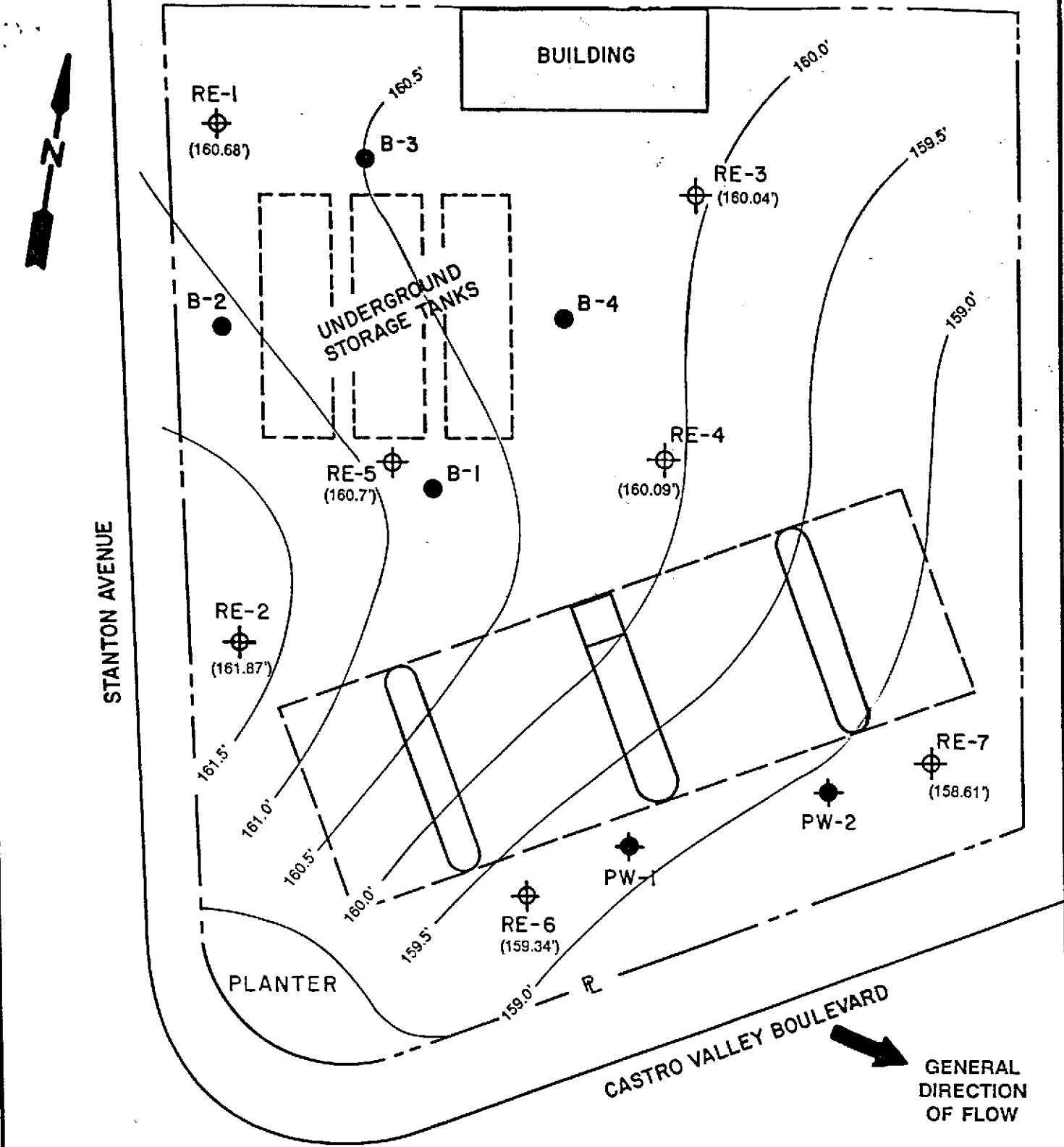
- B-4 ● Exploratory Boring
- RE-7 ⊕ Monitoring Well
- PW-1 ● Pre-existing Well



WATER TABLE ELEVATION 2/16/88
THRIFTY OIL STATION NO. 054
CASTRO VALLEY, CALIFORNIA
 Prepared for
THRIFTY OIL COMPANY
DOWNEY, CALIFORNIA

RE & A
Santa Barbara
California

Figure 3A.



EXPLANATION:

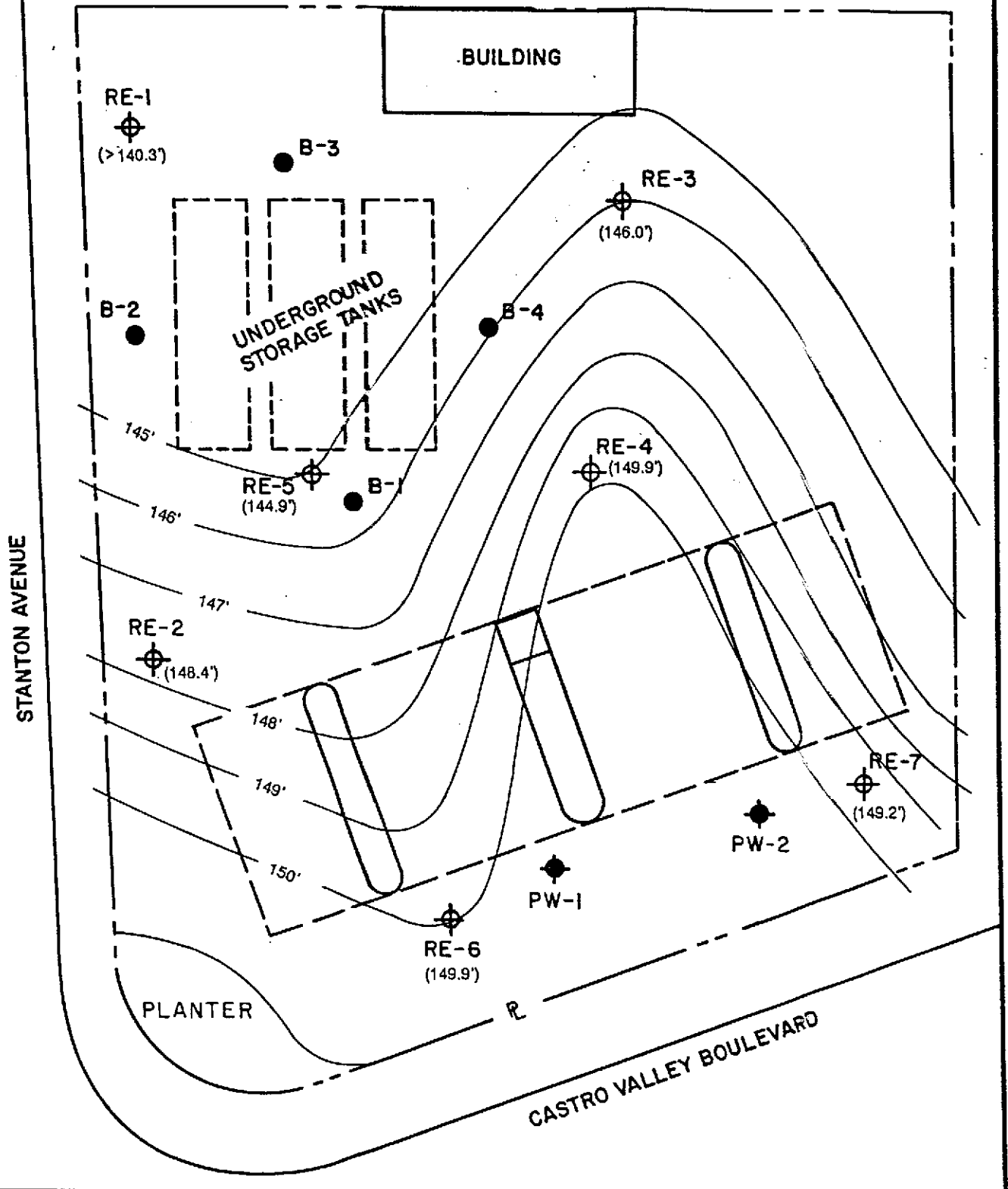
- B-4 ● Exploratory Boring
- RE-7 ⊕ Monitoring Well
- PW-1 ● Pre-existing Well



WATER TABLE ELEVATION 3/30/88
THRIFTY OIL STATION NO.054
CASTRO VALLEY, CALIFORNIA
 Prepared for
THRIFTY OIL COMPANY
DOWNEY, CALIFORNIA

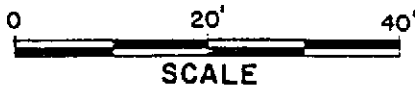
RE & A
Santa Barbara
California

Figure 3B



EXPLANATION:

- B-4 ● Exploratory Boring
- RE-7 ⊕ Monitoring Well
- PW-1 ● Pre-existing Well



**ELEVATION OF TOP OF SHALE
THRIFTY OIL STATION NO. 054
CASTRO VALLEY, CALIFORNIA
Prepared for**

**THRIFTY OIL COMPANY
DOWNEY, CALIFORNIA**

FEB 1988
RE & A
Santa Barbara
California

Figure 4