



Chevron U.S.A. Inc.

2410 Camino Ramon, San Ramon, California • Phone (415) 842-9500
Mail Address: P.O. Box 5004, San Ramon, CA 94583-0804

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Marketing Operations

D. Moller
Manager, Operations
S. L. Patterson
Area Manager, Operations
C. G. Trimbach
Manager, Engineering

November 5, 1990

Mr. Rafat Shahid
Alameda County
Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Re: Chevron Service Station #9-0338
5500 Telegraph Avenue/55th
Oakland, CA 94609

Dear Mr. Shahid:

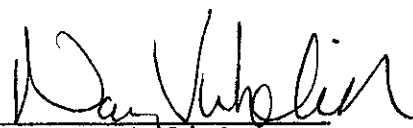
Enclosed we are forwarding results of the Trace Element Occurrence in Soil and Groundwater Report dated October 19, 1990, submitted by our consultant GeoStrategies, Inc. at the above reference site. This report documents the literature search conducted to gather geologic and petrologic data regarding the mineralogical composition of the rocks in the East Bay Hills near the above referenced site.

As indicated in the report, the metal concentrations detected are within the typical value ranges and are not unusual for the geology of the region. Based on these findings, we will discontinue analyzing for ICAP metals in subsequent sampling events.

Chevron will continue to monitor this site and report findings on a quarterly basis.

If you have any questions or comments please do not hesitate to call Nancy Vukelich at (415) 842-9581.

Very truly yours,
C. G. Trimbach

By 
Nancy Vukelich

NLV/jmr
Enclosures

cc: Mr. Lester Feldman
RWQCB-Bay Area
1800 Harrison Street
Suite # 700
Oakland, CA 94612

W.T. Scudder
Property Management Specialist

00129 90 T.E.H.



GeoStrategies Inc.

TRACE ELEMENT OCCURRENCE IN SOIL AND GROUNDWATER

Chevron Service Station No. 0338
5500 Telegraph Avenue
Oakland, California

Report No. 7263-4

October 19, 1990



GeoStrategies Inc.

2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545

(415) 352-4800

October 19, 1990

Gettler-Ryan Inc.
2150 West Winton Avenue
Hayward, California 94545

Re: TRACE ELEMENT OCCURRENCE IN SOIL AND GROUNDWATER
Chevron Service Station #0338
5500 Telegraph Avenue
Oakland, California

Gentlemen:

This letter report presents the results of a review of possible natural inorganic element (trace elements) occurrence at or near the above referenced site. The purpose of the review will be to compare observed concentrations of trace elements in soil and groundwater to those concentrations which may occur naturally in geologic materials.

SITE BACKGROUND

A subsurface 1,000 gallon waste oil tank was removed in October 1988 (Plates 1 and 2). A soil sample from beneath the tank was collected by Blaine Tech Services, Inc. (Blaine). Blaine presented the results of this sampling event in their report dated October 11, 1988. In this report, Blaine inadvertently stated that all constituents analyzed were reported as none detected (ND). GeoStrategies Inc. (GSI) reviewed the certified analytical reports which indicated that the chemical analyses revealed Total Oil and Grease (TOG) at a concentration of 81 parts per million (ppm). Total Petroleum Hydrocarbons calculated as Diesel (TPH-Diesel) and Volatile Organic Compounds (VOCs) were reported by the laboratory as ND.

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In July 1989, Chevron replaced the subsurface piping associated with the underground gasoline storage tanks. During the removal and replacement of the subsurface piping, contaminated soil was discovered in the western-most pipe trench (closest to Telegraph Avenue). Blaine collected soil samples in the gasoline product line trench on July 11 and 14, 1989. Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) ranged from ND to 480 ppm. Blaine issued a report summarizing analytical results and field procedures dated August 9, 1989.

The contaminated soil was excavated and removed from the piping trench in July 1989, in compliance with the Regional Water Quality Control Board (RWQCB) guidelines for investigations associated with leaking underground fuel tanks.

Three ground-water monitoring wells, C-1, C-2 and C-3, were installed by GeoStrategies Inc. (GSI) on-site on November 13, 1989. Data reported in GSI's report dated February, 1990 revealed soil and ground-water samples collected during that phase of investigation revealed presence of low concentrations of chromium, cadmium, zinc and lead in soil and groundwater (see Table 1 and Table 2). Organic chemicals were not detected.

REGIONAL GEOLOGY

The project site lies on the westward sloping alluvial plain in Oakland, California. According to Radbruch (1957, 1969) the site vicinity is underlain by Quaternary Temescal Formation which is composed of sand with lenses and silty clayey sand and clay. The Temescal Formation is underlain by the Alameda Formation which contains several hundred feet of marine gravel sand silt and clay, and the upper portion of the unit is sandy silty clay. Upland areas to the east are composed of Mesozoic and Cenozoic metamorphic and sedimentary rocks, and some igneous rocks, all of which have been highly deformed by folding and faulting.

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TABLE 1

Metal Concentration in Soil Samples *

<u>SAMPLE/DEPTH (ft)</u>	<u>TOTAL CHROMIUM</u> ⁽¹⁾	<u>CADMIUM</u> ⁽²⁾	<u>ZINC</u> ⁽³⁾	<u>LEAD</u> ⁽⁴⁾
C-3 / 10.5	16	1.0	39	<10
C-3 / 15.5	12	0.6	60	<10
C-3 / 25.5	27	1.4	74	10
Common Trace Element Concentration in Soils	7-1000	0.01-7.0	10-600	3-350

* All concentrations in milligrams per kilogram (mg/kg)

- (1) Detection level 2 mg/kg for chromium
- (2) Detection level 0.2 mg/kg for cadmium
- (3) Detection level 0.2 mg/kg for zinc
- (4) Detection level 10 mg/kg for lead

TABLE 2

Metal Concentrations in Ground-water Samples *

<u>SAMPLE ID</u>	<u>TOTAL CHROMIUM</u> ⁽¹⁾	<u>CADMIUM</u> ⁽²⁾	<u>ZINC</u> ⁽³⁾	<u>LEAD</u> ⁽⁴⁾
C-3	500	20	1000	<500
Common Trace Element Concentrations in Groundwater	0.43-21	20-71	10-980	<5-1300
State of California Current Maximum Contaminant Levels	50-100 ⁽⁵⁾	10	NA-5000 ⁽⁵⁾	50

* All concentrations in micrograms per liter (ug/l)

- (1) Detection level 100 ug/l for chromium
- (2) Detection level 10 ug/l for cadmium
- (3) Detection level 10 ug/l for zinc
- (4) Detection level 500 ug/l for lead
- (5) EPA value

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The underlying site geology is composed of alluvium derived from the upland geology. Possible source rocks for the trace elements in question are the Cretaceous Franciscan Group, Knoxville Formation, serpentine rocks and gabbros. Repeated faulting has sheared and mixed individual rock bodies in the hills east of the site. The faulting may also create favorable trace element depositional zones.

Each trace element, chromium, cadmium, lead and zinc, may occur in trace quantities in the rocks which crop out east of the site. For example, chromium may occur in serpentine, and cadmium, lead and zinc may occur together in the rocks or in fault or rock-contact zones (Bulletin 191, 1966). Hence, since the source rocks from which the alluvium is derived contains these trace elements, the underlying site soil and alluvium may contain similar trace elements.

Trace Elements General Occurrence and Soil and Groundwater

Trace elements are common constituents in all soils and alluvium. Mitchell (1955) and Hornick (1983) have compiled trace element concentration ranges in soils, variations of which may spread over three orders of magnitude (see Table 1). Observed concentrations in soils may vary given local and regional soil or sediment texture, clay abundance and moisture content, and proximity to trace elements geologic sources.

Trace elements also occur in groundwater and vary with dissolved concentrations, geology and local or regional aquifer water mixing. Ranges of dissolved trace elements from data collected by Matthes (1982) and Hem (1970) are presented on Table 2.

DISCUSSION

Trace elements have been observed to occur in soil and ground-water samples collected from the site. These same samples reported by GSI in the report dated February 14, 1990 revealed that organic contaminations (fuel constituents and waste oil) were not detected. Only trace elements were observed with no associated evidence of "man made" contaminants. In our opinion, these values are not unusual for soils, sediments and geology of the region. Concentrations of trace elements for soils are within typical value ranges, and higher concentrations of lead, for example, have been reported by Peterson and others (1972). Shacklette and Boerngen (1984) also report higher concentrations of chromium, lead and zinc may occur in this region than those values observed at the specific site.

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Concentrations of trace elements for groundwater are also typical for soils, sediment and geology of the region. Concentrations of chromium and zinc fall toward the higher range of values which may occur naturally. This is to be expected however, given the proximity of ultramafic metamorphic rocks, and marine sedimentary rocks of the Franciscan Group. Since aquifer geochemistry should reflect source rock geochemistry, and trace element sources are nearby, these values are not unusual.

CONCLUSION

Soil and groundwater samples collected at the site contain trace elements, chromium, cadmium, lead and zinc. A review of published regional geology and geochemical data collections indicate that the observed concentrations fall within value ranges typical of natural occurrences. In our opinion, these observed trace element concentrations are not unusual and are considered typical for this region.

If you have any questions, please call.

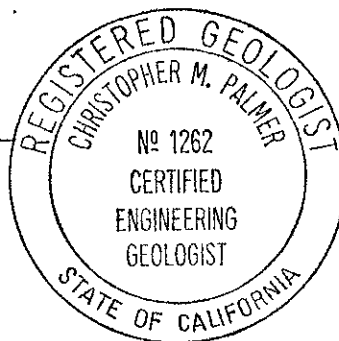
GeoStrategies Inc. by,

Randy S. Young

Randy S. Young
Geologist

Christopher M. Palmer

Christopher M. Palmer
Senior Geologist
C.E.G. 1262, R.E.A. 285



RSY/CMP/mlg

Plate 1. Vicinity Map
Plate 2 Site Plan

Report No. 7263-4

GeoStrategies Inc.

References Cited

GeoStrategies Inc., February 14, 1990, "Well Installation Report" Report No. 7263-2.

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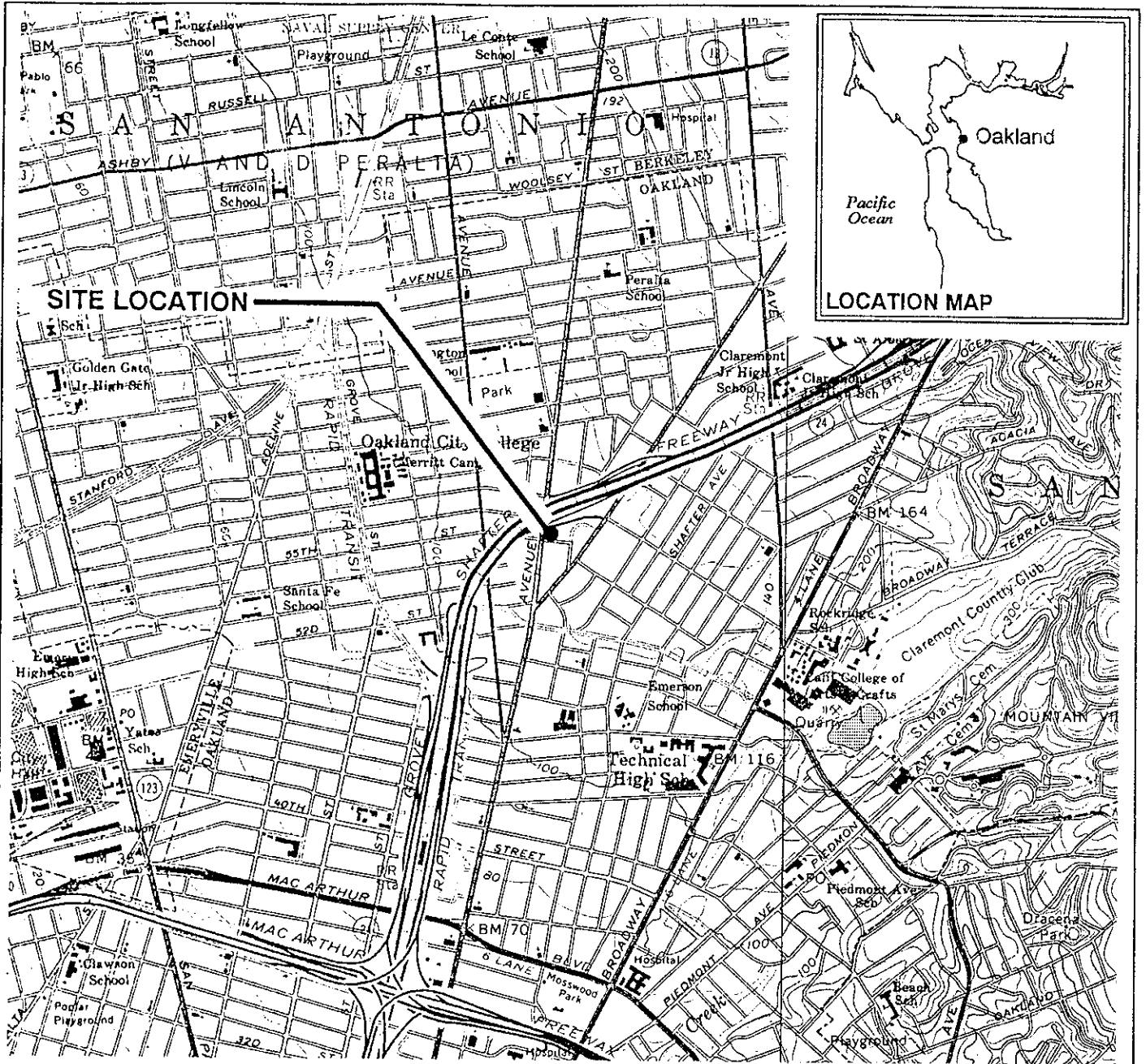
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Radbruch, D.H., 1957, Areal and engineering geology of the Oakland West Quadrangle, California: U.S. Geological Survey, Miscellaneous Geologic Investigation Map I-239.

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Shacklette, H.T. and Boerngen, J.G., 1984, Element concentrations in soils and other surficial materials of the conterminous United States: U.S. Geological Survey, Professional Paper 1270, 105 p.

State of California, 1966, Mineral Resources of California, California Division of Mines and Geology, Bulletin 191, 450 p.



Base Map: USGS Topographic Map

Approximate Scale : 1" = 2000'



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Vicinity Map
 Chevron Service Station #0338
 5500 Telegraph Avenue
 Oakland, California

PLATE

1

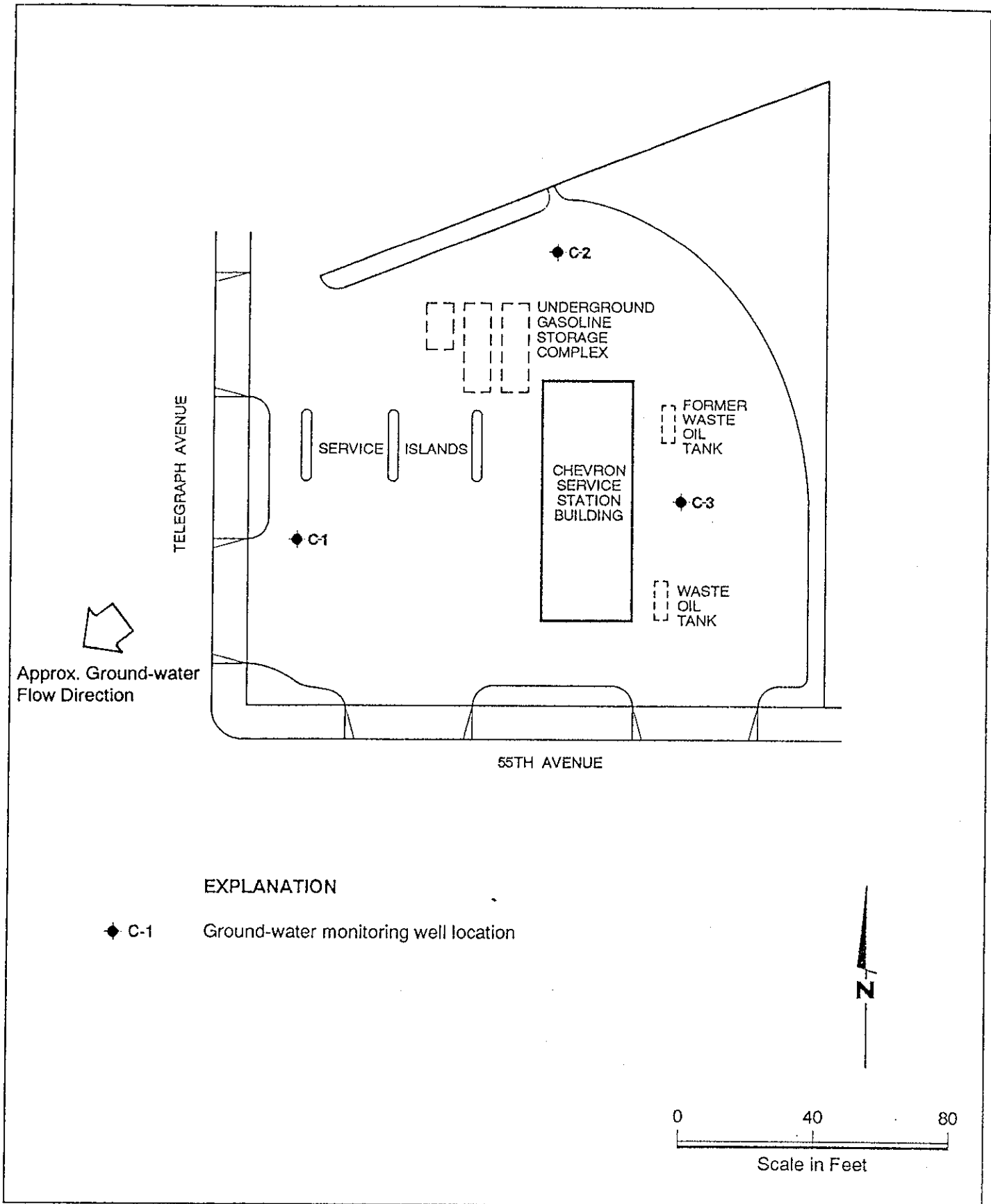
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DATE
 1/90

REVISED DATE

REVISED DATE



EXPLANATION

◆ C-1 Ground-water monitoring well location



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Site Plan
 Chevron Service Station #0338
 5500 Telegraph Avenue
 Oakland, California

PLATE

2

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UMP CEG 1262

DATE
07/90

REVISED DATE

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