TRC

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TRANSMITTAL

TO: Mr. David DeWitt
ConocoPhillips
76 Broadway
Sacramento, CA 95818

DATE: 8/28/03
PROJECT NO. 140081.3
SUBJECT: Service Station No. 5043

From: Jeremy Smith

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3	8/28/03	DPE Work Plan

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COMMENTS:
Dave
Attached are three copies of the DPE Work Plan for you to send out.
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GETTLER-RYAN INC.

DUAL PHASE EXTRACTION WORK PLAN

for

ConocoPhillips (76) Service Station No. 5043
449 Hegenberger Road
Oakland, California

Report No. 140081.3

Prepared for:

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August 28, 2003

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DUAL PHASE EXTRACTION WORK PLAN

for

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1.0 INTRODUCTION

At the request of ConocoPhillips, Gettler Ryan, Inc. (GR) has prepared this Dual Phase Extraction (DPE) Work Plan for the subject site. This Work Plan details the proposed five to six week DPE event at the site. The DPE event is proposed to address the elevated hydrocarbon concentrations in groundwater in the vicinity of monitoring well MW-6. The proposed scope of work includes:

- preparing a site safety plan;
- obtaining the required DPE test permits;
- performing a 5 to 6-week DPE event; and
- preparing a report presenting the observations associated with the above scope of work

The scope of work described in this report is intended to comply with the California Code of Regulations, Title 23, Division 3, Chapter 16, *Underground Tank Regulations*, the California Regional Water Quality Control Board (RWQCB) *Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites*, and Alameda County guidelines.

2.0 SITE DESCRIPTION

2.1 General

The subject site is an operating ConocoPhillips (76) service station, situated on the southwestern corner of Hegenberger Road and Edgewater Drive in Oakland, California (Figure 1). Station facilities include three underground storage tanks (USTs), four dispenser islands, and a station building. A total of six groundwater monitoring wells are located at or near the site. Locations of the pertinent site features are shown on Figure 1.

2.2 Previous Environmental Work

1991: In October, four soil samples were collected from the product pipe trenches at depths of approximately 3 feet below ground surface (bgs) during a dispenser island modification project at the site. In addition, to determine the depth to water, two shallow borings were hand-augered to groundwater at a depth of approximately 4 to 4.5 feet bgs. The product pipe trenches were subsequently excavated to the groundwater depth. All soil samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg), total petroleum hydrocarbons

as diesel (TPHd), and benzene, toluene, ethylbenzene, and xylenes (BTEX). TPHg concentrations ranged from 370 to 9,000 parts per million (ppm), TPHd concentrations ranged from 420 to 8,400 ppm, and benzene concentrations ranged from 7.4 to 48 ppm (KEI, 1995).

1992: In February, three monitoring wells (designated as MW-1, MW-2, and MW-3) were installed at the site to total depths ranging from 13.5 to 15 feet bgs. Soil samples from the wells were analyzed for TPHg, TPHd, and BTEX. TPHg concentrations were detected up to 14,000 ppm, TPHd concentrations were detected up to 2,400 ppm, and benzene concentrations were detected up to 160 ppm (KEI, 1995).

In August, three additional monitoring wells (designated as MW-4, MW-5, and MW-6) were installed at the site to total depths of 13.5 feet bgs. Selected soil samples from the borings were analyzed for TPHg, TPHd, and BTEX. TPHg concentrations were detected up to 340 ppm, TPHd concentrations were detected up to 43 ppm, and benzene was detected up to 1.1 ppm (KEI, 1995).

1994: In September, one 280-gallon waste oil UST was removed from the site. The tank was made of steel, and no apparent holes or cracks were observed in the tank. One soil sample was collected from beneath the former tank at a depth of approximately 9 feet bgs. The soil sample was analyzed for TPHg, TPHd, total oil and grease (TOG), BTEX, EPA method 8010 constituents, EPA method 8270 constituents, and the metals cadmium, chromium, lead, nickel, and zinc. The metals chromium, lead, nickel, and zinc were report at concentrations of 37, 6.0, 42, and 51 ppm, respectively. All other constituents were reported as non detect (ND) (KEI, 1995).

1995: In January, two additional monitoring wells (designated as MW-9 and MW-10) were installed at the site to a total depth of 13 feet bgs. Originally wells MW-7 through MW-10 were to be installed, but due to difficulty obtaining offsite access, MW-7 and MW-8 were postponed. Selected soil samples from the borings were analyzed for TPHg, TPHd, and BTEX. TPHg concentrations were detected up to 44 ppm, TPHd concentrations were detected up to 17 ppm, and benzene was detected up to 2.0 ppm. In addition, two existing monitoring wells (MW-4 and MW-5) were destroyed in order to accommodate the construction of a car wash at the subject site. Wells MW-4 and MW-5 were destroyed by being fully drilled and backfilled with neat cement (KEI, 1995).

In March, two 10,000 gallon gasoline USTs and one 10,000 gallon diesel UST, four dispenser islands and associated product piping were removed from the site. The gasoline USTs were made of steel, and the diesel UST was made of fiberglass. No apparent holes or cracks were observed in the tanks. Groundwater was encountered in the tank cavity at a depth of approximately 8.5 feet bgs, thus prohibiting the collection of soil samples from immediately beneath the tanks. Eight soil samples were collected from the sidewalls of the fuel tank pit, approximately six inches above the observed water table. In addition, due to observed soil staining in the south sidewall of the fuel tank pit between depths of 2 feet and 6

feet bgs, one additional soil sample was collected from the south sidewall at a depth of about 4 feet bgs. The soil samples were reported to contain TPHd concentrations up to 140 ppm, TPHg concentrations up to 2,000 ppm, and benzene concentrations up to 3.8 ppm (KEI, 1995).

The fuel tank pit was excavated to a depth of approximately 16 feet bgs. A total of 36,000-gallons of groundwater were intermittently pumped from the fuel tank pit excavation and stored on-site in a temporary 20,000-gallon storage tank for subsequent disposal. Groundwater was observed in the fuel tank pit at a depth of about 15 feet bgs. One water sample was collected from the tank cavity and analyzed for TPHg and BTEX. TPHg was detected at a concentration of 31,000 parts per billion (ppb) and benzene was detected at a concentration of 4,000 ppb. An additional 59,000-gallons of groundwater were intermittently pumped from the fuel tank cavity excavation and one additional groundwater sample was collected from the tank cavity. TPHd, TPHg, and BTEX constituents were reported as ND in the groundwater sample. An additional 30,000-gallons of groundwater were intermittently pumped from the fuel tank cavity excavation subsequent to the collection of the second water sample. In summary, a cumulative total of approximately 125,000 gallons of groundwater were pumped from the site and properly disposed of (KEI, 1995).

During excavation activities in the vicinity of the former product dispenser islands, two initial soil samples were collected from beneath two former product dispensers at depths of approximately 3 feet bgs. TPHd was detected at concentrations up to 97 ppm, TPHg was detected at concentrations up to 1,200 ppm, and benzene was detected at concentrations up to 1.6 ppm. The product dispenser islands were overexcavated to approximately 6 feet bgs and four confirmatory soil samples were collected from beneath the former product pump islands, and four soil samples were collected from the areas located on the north side and south side of the island excavation. In addition, four soil samples were collected from the east sidewall of the pump island excavation at depths of about 4 feet bgs. TPHd concentrations were detected up to 9.4 ppm, TPHg concentrations were detected up to 150 ppb, and benzene was detected up to 6.8 ppb (KEI, 1995).

In March and April, two existing monitoring wells (MW-1 and MW-2) were destroyed during the UST and product piping replacement project at the subject site. The destruction of these two wells was necessary in order to allow for overexcavation activities to extend to an area adjacent to the dispenser islands in the southeastern quadrant of the site. The two wells were destroyed by fully excavating the well casing, filter pack, and seal materials to the total depth of each well. The excavated areas were subsequently backfilled with clean engineered fill (KEI, 1995).

Also in March and April, during demolition activities of the former station building, two soil samples were collected from two excavating located inside the former building in an attempt to characterize the subsurface soil condition where hydrocarbon impact was detected by the use of a photo ionization detector (PID). The samples were collected at depths of approximately 3 feet bgs. TPHd concentrations were detected up to 330 ppm, TPHg concentrations were detected up to 3,300 ppm, and benzene was detected up to 18 ppm.

Following overexcavation activities beneath the former station building to a depth of approximately 4.5 feet bgs, four soil samples were collected from the bottom of the excavation, and four soil samples were collected from the west sidewall of the former building excavation at depths of approximately 3 feet bgs. TPHd concentrations were detected up to 8.6 ppm, TPHg concentrations were detected up to 25 ppm, and benzene concentrations were detected up to 2.1 ppm (KEI, 1995).

An additional area (located on the South side of the former station building) was excavated due to observed hydrocarbon impact detected by the use of a PID. Three soil samples were collected from the new excavation at depths of approximately 4.5 feet bgs. Approximately 20 feet of abandoned sewer piping were removed and one soil sample was collected from the excavated trench at a depth of approximately 4 feet bgs. In addition, two soil samples were collected from the adjacent sidewalls of the former monitoring well MW-1 that was destroyed on April 4, 1995, at depths of approximately 5 feet bgs. TPHd concentrations were detected up to 5.1 ppm, TPHg concentrations were detected up to 26 ppm, and benzene concentrations were detected up to 2.1 ppm (KEI, 1995).

1997: In April, two additional monitoring wells (designated as MW-7 and MW-8) were installed in the vicinity of the site to total depths of 13 to 15 feet bgs. In addition, well MW-3, which was damaged during the UST cavity overexcavation in 1995, was fully drilled out and reconstructed in the same borehole. One soil sample from boring MW-8 at a depth of six feet bgs was analyzed for TPHg, TPHd, BTEX, and methyl tertiary butyl ether (MtBE). TPHg were reported as 1.3 ppm, TPHd were ND, benzene was reported as 0.0051 ppm, and MtBE was reported as ND (KEI, 1997).

2003: Groundwater samples have been collected on a quarterly basis since 1992. During the most recent sampling event, TPHd were reported at concentrations ranging from 56 ppb to 35,000 ppb. TPHg were reported at concentrations ranging up to 3,000,000 ppb. Benzene was reported at concentrations ranging up to 8,000 ppb, and MtBE was reported at concentrations ranging up to 9.4 ppb. Since 1995, the highest hydrocarbon concentrations, with the exception of MtBE, have been observed in well MW-6 (GR, 2003).

2.3 Geology and Hydrogeology

Based on review of regional geologic maps, the subject site is underlain by Holocene-age Bay Mud. The Bay Mud typically consists of unconsolidated, saturated clay and silty clay that is rich in organic material. The Bay Mud locally contains lenses and stringers of well-sorted silt, sand, and beds of peat (KEI, 1995).

Based on the results of historical subsurface studies performed at the site, the site is underlain by artificial fill materials that extend to approximately 2 to 4.5 feet below grade. The fill materials are underlain by Bay Mud, which consists predominantly of organic-rich silty clay and clayey silt, with minor interbeds of sand, peat, sandy silt, and silty clay (KEI, 1995).

The results of the particle size analysis (sieve and hydrometer) previously conducted on a soil sample collected from the saturated zone in the boring for monitoring well MW-5 at a depth of 9 feet bgs indicate that the sample is composed of approximately 70% clay, 27% silt, and 3% fine-grained sand. The sample is classified as an organic clay with silt (KEI, 1995).

During the most recent groundwater monitoring and sampling event, conducted on April 1, 2003, groundwater was encountered at depths ranging from 4.56 to 6.25 feet below the top of the well casing (TOC). The groundwater flow direction was reported towards the southeast at a calculated gradient of 0.006 to 0.01 ft/ft (GR, 2003).

3.0 DUAL PHASE EXTRACTION EVENT

GR proposes that a DPE event be performed by a ConocoPhillips contractor. This work is proposed to reduce the mass of dissolved hydrocarbons in groundwater in the vicinity of monitoring well MW-6.

3.1. Dual-Phase Extraction

GR proposes to perform a DPE event at the site. The DPE will be performed on well MW-6, and be performed for a minimum of 5 weeks and a maximum of 8 weeks. Additional monitoring wells may be used as extraction points if site conditions warrant. The DPE will be performed using a liquid ring vacuum pump connected to a thermal oxidizer for treatment of the extracted soil vapors prior to discharge to the atmosphere. Extracted groundwater will be pumped into a temporary storage tank prior to transportation for treatment and disposal at the ConocoPhillips Refinery in Rodeo, California.

Physical and chemical parameters including applied vacuum, flow rate, and flame ionization detector (FID) readings will be monitored throughout the test. Vacuum gauges will be placed at nearby monitoring wells in order to monitor the negative pressure gradient induced by the extraction well. Depth to groundwater measurements will be obtained in order to determine the groundwater radius of influence. Influent vapor samples will be collected from the system influent vapor stream on a weekly basis and analyzed for TPHg, BTEX, and MtBE by EPA Methods 8015 (modified) and 8020. These data will be used to calculate the hydrocarbon mass removal rate.

Groundwater from well MW-6 will be sampled prior to, and after, the DPE event. The groundwater data, along with the DPE data, will be assessed to determine the effectiveness of DPE event.

4.0 SCHEDULE AND REPORTING

GR and ConocoPhillips will implement the DPE event upon approval of this Work Plan by the RWQCB and the acquisition of required permits. Upon completion of the DPE event and evaluation of the data, GR will prepare and submit a technical report including recommendations for future recommendations, if warranted.

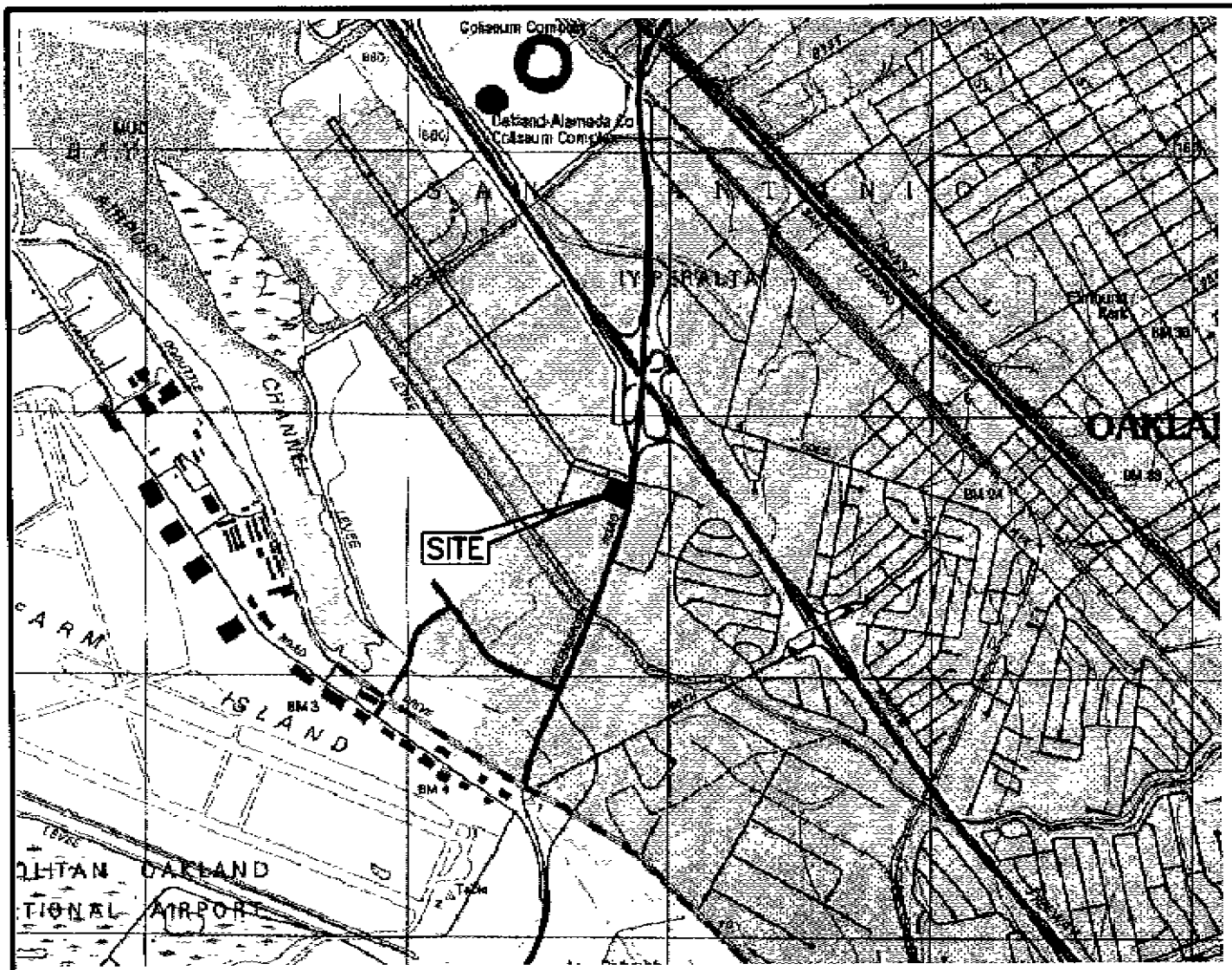
5.0 REFERENCES

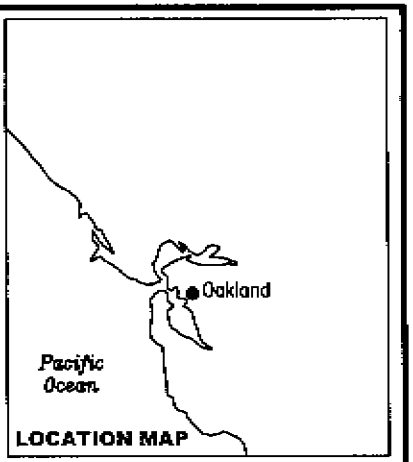
Gettler-Ryan Inc., 2003, Groundwater Monitoring and Sampling Report, Second Quarter – Event of April 1, 2003, Tosco (Unocal) Service Station #5043, 449 Hegenberger Road, Oakland, California, dated May 12, 2003.

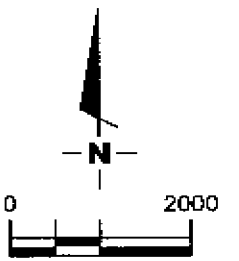
Kaprealian Engineering Inc., 1997, Continuing Ground Water Investigation at Unocal Service Station #5043, 449 Hegenberger Road, Oakland, California, dated October 13, 1997.

..., 1995, Soil Sampling Report and Continuing Ground Water Investigation at Unocal Service Station #5043, 449 Hegenberger Road, Oakland, California, dated June 2, 1995.

FIGURES







Source: National Geographic California Seamless USGS Topographic Maps on CD-ROM

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VICINITY MAP
ConocoPhillips (76) Service Station #5043
449 Hegenberger Road
Oakland, California

FIGURE
1

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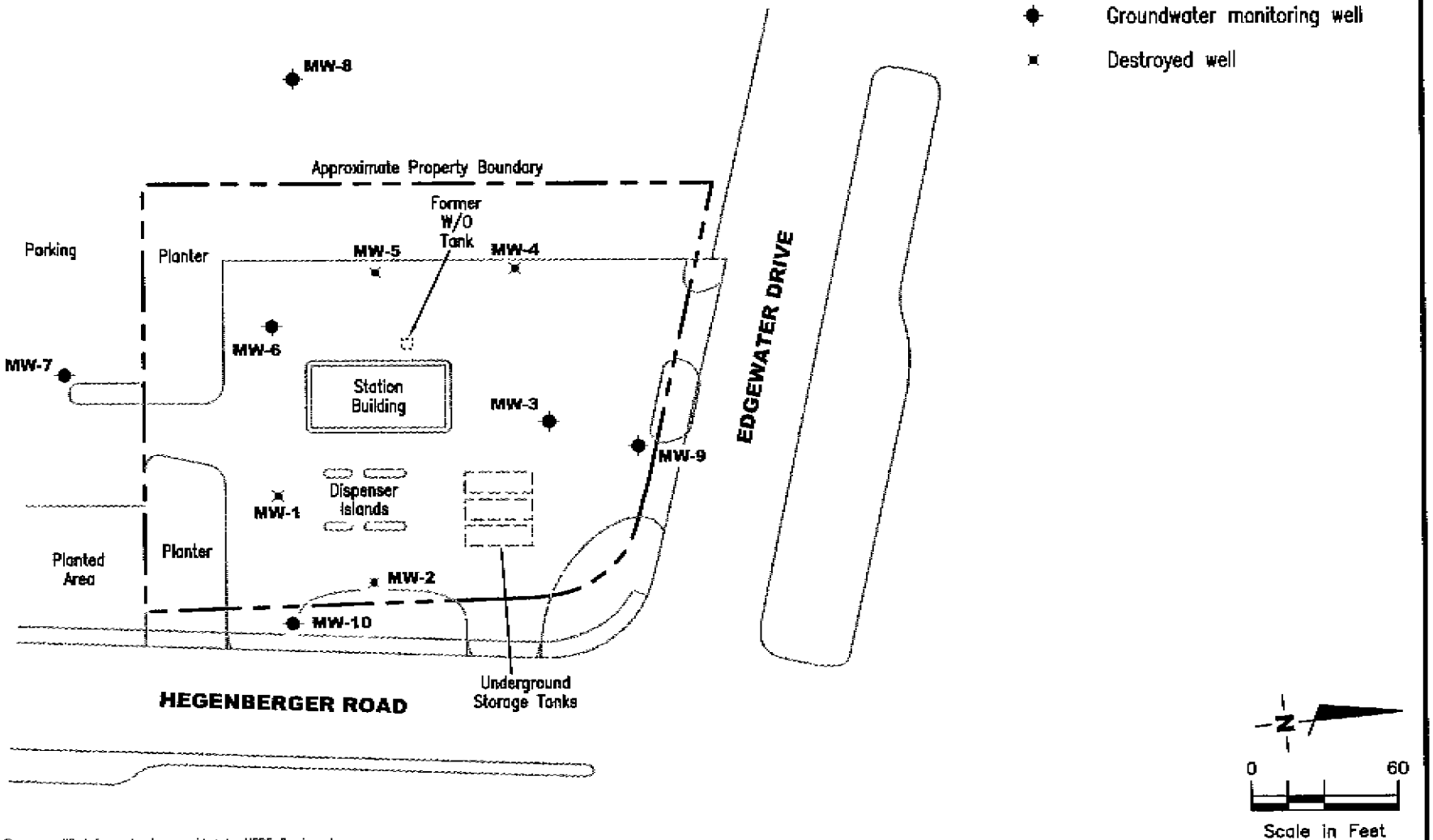

Source: Figure modified from drawing provided by MPDS Services Inc..

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SITE PLAN
ConocoPhillips (76) Service Station #5043
449 Hegenberger Road
Oakland, California

FIGURE
2

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