CONESTOGA-ROVERS & ASSOCIATES

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TRANSMITTAL

DATE: February 8, 2011

REFERENCE NO.: 060204

PROJECT NAME: 2301-2307 Lincoln Avenue, Alameda

TO: Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

RECEIVED
2:13 pm, Feb 16, 2011
Alameda County
Environmental Health

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QUANTITY	DESCRIPTION
1	Subsurface Investigation Work Plan

- ☐ As Requested
- ☐ For Your Use
- ☒ For Review and Comment
- ☐
- ☐

COMMENTS:
If you have any questions regarding the contents of this document, please call Peter Schaefer at (510) 420-3319.

Copy to: Denis Brown, Shell Oil Products US (electronic copy)
Alan A. and Beverly M. Sebanc, Trustees, 2805 Ralston Avenue, Hillsborough, CA 94010
Jake Torrens, AMEC Geomatrix, Inc., 2101 Webster Street, 12th Floor, Oakland, CA 94612

Completed by: Peter Schaefer Signed: Peter Schaefer

Filing: **Correspondence File**

Denis L. Brown
Shell Oil Products US
HSE – Environmental Services
20945 S. Wilmington Ave.
Carson, CA 90810-1039
Tel (707) 865 0251
Fax (707) 865 2542
Email denis.l.brown@shell.com

Mr. Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: 2301-2307 Lincoln Avenue
Alameda, California
SAP Code 165255
Incident No. 97767044
Agency No. RO0002971

Dear Mr. Wickham,

The attached document is provided for your review and comment. Upon information and belief, I declare, under penalty of perjury, that the information contained in the attached document is true and correct.

As always, please feel free to contact me directly at (707) 865-0251 with any questions or concerns.

Sincerely,

Denis L. Brown
Senior Program Manager

SUBSURFACE INVESTIGATION WORK PLAN

FORMER SHELL SERVICE STATION
2301-2307 LINCOLN AVENUE
ALAMEDA, CALIFORNIA

SAP CODE	165255
INCIDENT NO.	97767044
AGENCY NO.	RO0002971

Prepared by:
Conestoga-Rovers & Associates

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FEBRUARY 8, 2011
REF. NO. 060204 (18)
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1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) prepared this work plan on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell) to obtain additional soil vapor data from the south end of the second-generation underground storage tank (UST) excavation.

The site is a former Shell service station located at the northeastern corner of Lincoln Avenue and Oak Street in Alameda, California (Figure 1). The area surrounding the site is mixed commercial and residential. The current site layout (Figure 2) includes a parking lot and commercial building housing a convenience store, a cleaners (not a dry cleaner), and a laundromat. The former service station layout included a station building, two dispenser islands, and seven fuel USTs. According to the Alameda Fire Department, the seven USTs were removed from the site in June 1982.

A summary of previous work performed at the site and additional background information is contained in Appendix A.

2.0 WORK TASKS

CRA proposes installing one nested soil vapor probe (SVP-9) at depths of 2 and 5 feet below grade (fbg) near the southern end of the second-generation UST excavation (Figure 2).

2.1 PERMIT

CRA will obtain a drilling permit from the Alameda County Public Works Agency (ACPWA).

2.2 HEALTH AND SAFETY PLAN (HASP)

CRA will prepare a HASP to protect site workers. The plan will be kept on site during field activities and will be reviewed and signed by each site worker.

2.3 UTILITY CLEARANCE

CRA will mark the proposed probe location, and the location will be cleared through Underground Service Alert and a private line locator service prior to drilling.

2.4 SOIL VAPOR PROBE INSTALLATION

CRA proposes to install one soil vapor probe (SVP-9) into the subsurface beneath the site (Figure 2). Probe SVP-9 will be installed with nested screens at 2 and 5 fbg in order to assess vertical attenuation of soil vapors.

Assuming the absence of subsurface obstructions, CRA will advance the soil boring to 5 fbg using an air-knife rig. After the boring is advanced, CRA will install a fixed vapor-sampling point in the boring using ¼-inch diameter Teflon tubing at 5 fbg. The point will use a ¾-inch screen interval attached to the Teflon tubing. To ensure the tubing does not curl or kink during installation, CRA will first straighten out each length of tubing prior to installation, and then use a small-diameter PVC guide pipe to hold the tubing in place within the boring while packing the annulus with sand. A clean, fine-grained silica sand filter pack will be installed approximately 3 inches below and above the screened interval, and the guide pipe will be lifted as the sand pack is installed to ensure the pack stabilizes the tubing within each boring. The annulus will then be sealed with a bentonite slurry set atop a 2-inch base of bentonite pellets up to the next probe interval at 2 fbg, and another probe will be installed in a similar manner. The probe will completed from 18 inches below grade to the surface using bentonite slurry, set atop a 2-inch base of bentonite pellets. The nested soil vapor probe will be completed at the surface using a traffic-rated well box at grade.

CRA will perform the work under the supervision of a professional geologist or engineer.

2.5 SOIL VAPOR PROBE SAMPLING

At least 2 weeks following probe installation, CRA will collect soil vapor samples from soil vapor probe SVP-9. Sampling is affected by rain. CRA's standard procedure is to allow 2 days or more following a heavy rain event prior to collecting soil vapor samples.

CRA will sample soil vapor probe SVP-9 using a vacuum pump and Tedlar® bags. A soil vapor sample will be collected from both screened intervals in SVP-9. Prior to

sampling, CRA will purge at least three tubing volumes of air from the probe using a vacuum pump. Then CRA will attach a sealed "lung sampler" containing a 1-liter Tedlar® bag to the probe and attach the vacuum pump to the box. The vacuum pump will lower the pressure in the "lung sampler" and draw air from the probe into the Tedlar® bag. To avoid breakage, CRA will fill the bag no more than two-thirds full. Each sample will be labeled, entered onto a chain of custody, and placed into a protective box at room temperature for transport to a State of California State-certified laboratory for analysis within 72 hours.

2.6 LEAK TESTING

To check the system for leaks, CRA will cover the soil gas probe surface casing and sampling manifold with a containment unit (or shroud). Prior to soil gas probe purging, CRA will introduce helium into the containment unit to obtain a minimum 50 percent helium content level. CRA will confirm the helium content within the containment unit using a helium meter and will record the helium meter readings in our field notes. Helium will continue to be introduced to the containment unit during soil gas probe purging and sampling.

The samples will be analyzed in a laboratory for helium. In the event that a soil vapor sample contains a helium content of greater than 10 percent of the source concentration (i.e., 10 percent of the helium content measured within the containment unit), the soil gas sample will be considered invalid.

2.7 CHEMICAL ANALYSES

The vapor samples will be analyzed for total petroleum hydrocarbons as gasoline, benzene, toluene, ethylbenzene, xylenes, and naphthalene by EPA Method 8260B and for oxygen plus argon, carbon dioxide, methane, and helium by ASTM D Method 1946 (M).

2.8 REPORT PREPARATION

Following receipt of the analytical report from the laboratory, CRA will prepare a written report, which will include field procedures, tabulated analytical data, a boring log, and the analytical laboratory report.

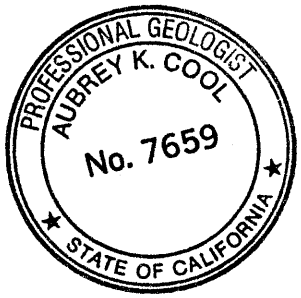
3.0 SCHEDULE

CRA will initiate the soil vapor probe installation upon receiving Alameda County Environmental Health's approval of this work plan and the drilling permit from ACPWA.

All of Which is Respectfully Submitted,
CONESTOGA-ROVERS & ASSOCIATES

Peter Schaefer, CEG, CHG

Aubrey K. Cool, PG



FIGURES

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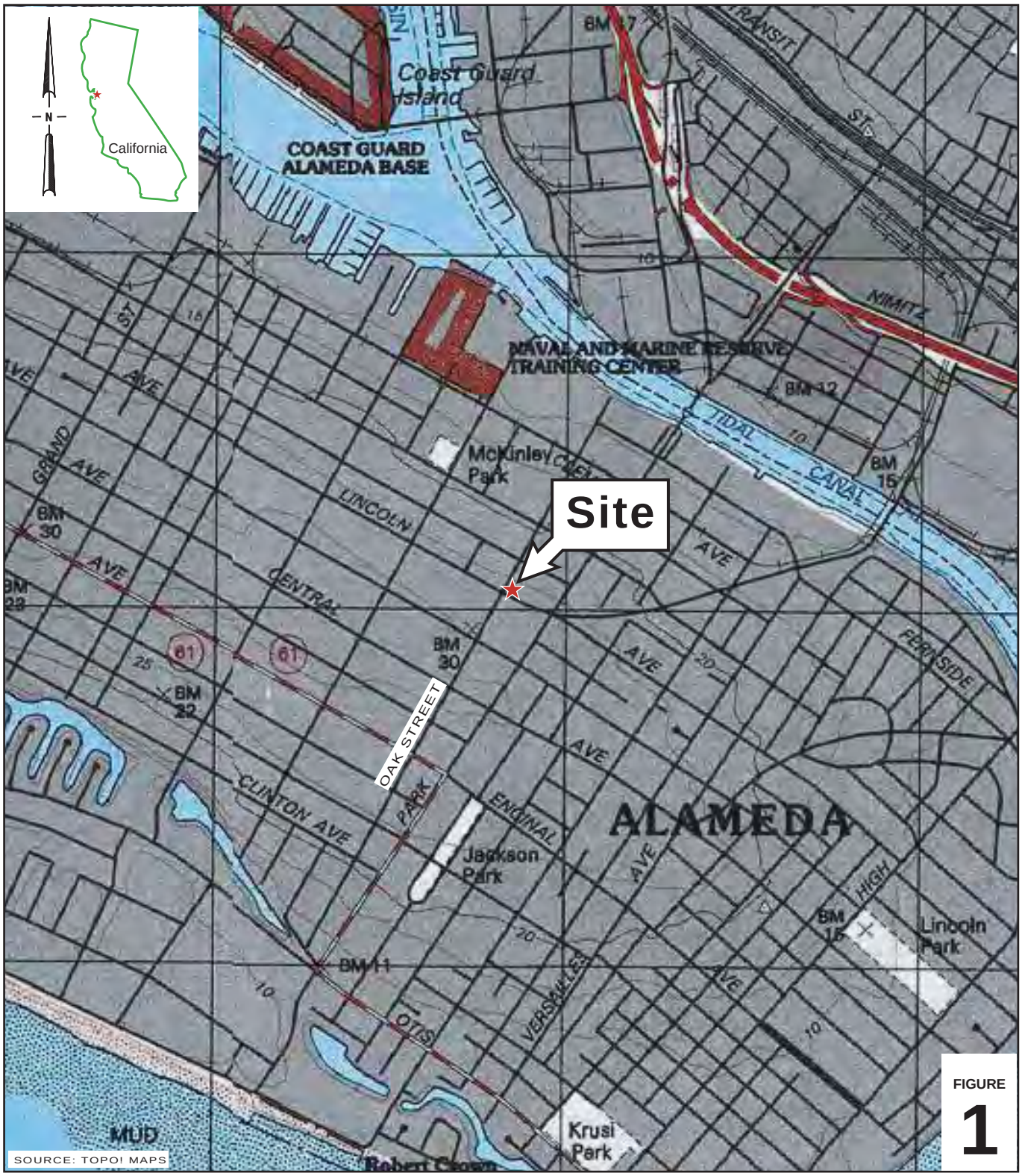

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FIGURE
1

0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

Former Shell Service Station

2301-2307 Lincoln Avenue

Alameda, California

CONESTOGA-ROVERS & ASSOCIATES

Vicinity Map

01/04/2011

Site Plan

EXPLANATION

- SVP-9 — Proposed soil vapor probe location
- MW-1 — Monitoring well location
- B-6 — Soil boring location (CRA, 7/10)
- SVP-1 — Soil vapor probe location (CRA, 2/09, 3/10)
- B-5 — Geoprobe boring location (CRA, 2/09)
- EB-1 — Soil boring location (Geomatrix, 8/07)
- SB-1 — Soil boring location (Basics Environmental, 7/99)
- Electrical & Telecommunications line (E)
- Telecommunications & Cable TV line (T)
- Gas line (G)
- Storm drain line (STM)
- Sanitary sewer line (SAN)
- Water line (W)

Sources:
1. Sanborn Fire Insurance Map, 1950
2. Majors Civil Engineering, 1982

OAK STREET

LINCOLN AVENUE

Former 76 Station
2267 Lincoln Avenue

Former Shell Station
2301-2307 Lincoln Avenue

Former Building (circa 1950)[1]
7-11 Store Building
Former Tire Recapping Facility (circa 1950)[1]
Former Oil Sump (circa 1982)[2]
Former Station Building (circa 1982)[2]
Laundorland Building
Commercial Building
Former Gasoline & Oil USTs (installed in 1920s)
Former Building (circa 1950)[1]
Former Dispensers (circa 1982)[2]
Former Dispensers (circa 1982)[2]
Former USTs (installed in 1970s)
Agronomatic Property Line
Proposed Lead Excavation
Proposed Petroleum Hydrocarbon Excavation

Alameda County Police Dept.
Alameda Free Library

Sidewalk, Parking, Driveway, Planter, Overhang

SB-1, SB-2, SB-3, SB-4, SB-5, SB-6, B-7, B-8, B-5, EB-1, EB-2, EB-3, EB-4, EB-5, EB-6, EB-8, EB-9, EB-10, EB-11

MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9

SVP-1, SVP-2, SVP-3, SVP-4, SVP-5, SVP-5A, SVP-6, SVP-7, SVP-8, SVP-9

B-6

N

0 15 30 60
Scale (ft)

FIGURE
2

Former Shell Service Station
2301-2307 Lincoln Avenue
Alameda, California

CONESTOGA-ROVERS & ASSOCIATES

Basemap modified from data from Virgil Chavez Land Surveying and drawing provided by Geomatrix

I:\Shell\6-chars\0602--\060204-Alameda 2301-2307 Lincoln Ave\060204 FIGURES\060204 SITE PLAN.DWG

APPENDIX A

SITE HISTORY

SITE HISTORY

July 1999 Phase II Site Investigation: Basics Environmental (Basics) drilled six borings (SB-1 through SB-6, Figure 2) in the western portion of the site. Single soil samples were collected from all of the borings at 5 or 7.5 feet below grade (fbg) and grab groundwater samples were obtained from five of the borings (all except SB-5). Benzene and methyl tertiary-butyl ether (MTBE) were not detected in any of the samples. Analyses of the soil sample from boring SB-3 at 7.5 fbg showed concentrations of 40 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as gasoline (TPHg) and 0.012 mg/kg ethylbenzene. Analyses of the grab groundwater sample from SB-3 showed concentrations of up to 4,500 micrograms per liter (µg/l) TPHg, 4.4 µg/l toluene, 2.7 µg/l ethylbenzene, 4.0 µg/l xylenes, 10 µg/l n-butylbenzene, 14 µg/l sec-butylbenzene, 45 µg/l isopropyl benzene, 60 µg/l n-propylbenzene, and 26 µg/l vinyl acetate. Basics' August 12, 1999 *Limited Phase II Environmental Site Investigation* report presents details of this investigation.

August 2000 Site Assessment: Toxichem Management Systems, Inc. (Toxichem) conducted a site assessment which included a review of Basics' investigation, aerial photographs, Sanborn maps, and agency files. The site assessment is presented in Toxichem's May 1, 2000 *Site Assessment Report.*

February 2007 Site Investigation: Geomatrix installed three groundwater monitoring wells (MW-1 through MW-3, Figure 2) in the western former UST (USTs originally installed in the 1920's) area and drilled 11 exploratory borings (EB-1 through EB-6 and EB-8 through EB-11, Figure 2) in the area of the eastern former USTs (USTs originally installed in the 1970's) and fuel dispensers. No toluene, fuel oxygenates, or lead scavengers were detected in any of the soil samples. No petroleum hydrocarbons were detected in samples collected from 1.5 to 6.5 fbg. Soil samples collected from 8.5 to 14.0 fbg showed concentrations of up to 1,600 mg/kg TPHg, 0.99 mg/kg benzene, 100 mg/kg ethylbenzene, 1.1 mg/kg xylenes, and 21 mg/kg lead. Sample EB-10-2.0 contained a concentration of 550 mg/kg lead. Grab groundwater samples collected from the wells and exploratory borings EB-1 and EB-4 contained concentrations of up to 7,000 µg/l TPHg, 980 µg/l benzene, 490 µg/l ethylbenzene, 11 µg/l toluene, and 19 µg/l xylenes. Groundwater was gauged at 8.37 to 9.26 fbg and flow direction was calculated to be to the east-northeast. Geomatrix's December 2007 *Subsurface Investigation Summary Report* presents details of this investigation.

February 2009 Subsurface Investigation: Conestoga-Rovers & Associates (CRA) installed five groundwater monitoring wells (MW-4, MW-5, MW-6, MW-7, and MW-8), installed five soil vapor probes (SVP-1 through SVP-5), and drilled three soil borings

(B-5, B-7, and B-8). No benzene, toluene, or MTBE were detected in soil samples collected during this investigation. Only the TPHg (7,900 mg/kg), ethylbenzene (120 mg/kg), and total xylenes (150 mg/kg) detections in soil sample B-8-8.5' exceeded the San Francisco Bay Regional Water Quality Control Board's (RWQCB's) environmental screening levels (ESLs) for shallow soil where groundwater is not a source of drinking water[1]. TPHg, benzene, ethylbenzene, and xylenes were detected in grab groundwater samples collected from some of the borings. Only TPHg (up to 470 µg/l) exceeded the ESL in two grab groundwater samples; no other constituents of concern exceeded ESLs. MTBE was not detected in grab groundwater. Soil vapor samples from soil vapor probe SVP-5 contained concentrations of TPHg (up to 11,000,000 micrograms per cubic meter [µg/m^3]), benzene (up to 12,000 µg/m^3), and ethylbenzene (up to 23,000 µg/m^3), which exceeded ESLs. TPHg and benzene, toluene, ethylbenzene, and xylenes concentrations in soil vapor samples collected from the other three soil vapor probes (SVP-1, SVP-2, and SVP-3) were all below ESLs. MTBE was not detected in soil vapor. Soil vapor probe SVP-4 could not be sampled due to an obstruction in the sample line. CRA's April 9, 2009 *Subsurface Investigation Report* presents details of this investigation.

March 2010 Subsurface Investigation: CRA installed one groundwater monitoring well (MW-9), installed four soil vapor probes (SVP-5A and SVP-6 through SVP-8), and reinstalled one soil vapor probe (SVP-4). No TPHg, benzene, toluene, ethylbenzene, or xylenes were detected in soil samples collected from well boring MW-9. Up to 450 mg/kg total petroleum hydrocarbons as motor oil (TPHmo), 54 mg/kg total petroleum hydrocarbons as diesel (TPHd), and 17.1 mg/kg lead were detected (in sample MW-9-12'). None of the detections exceeded the ESLs. CRA's May 12, 2010 *Subsurface Investigation Report* provides details of this investigation.

June 2010 Soil Vapor Sampling: CRA sampled five soil vapor probes (SVP-4, SVP-5A, and SVP-6 through SVP-8) and in July 2010 CRA sampled one soil vapor probe (SVP-5). Only the TPHg (8,400,000 µg/m^3) and ethylbenzene (14,000 µg/m^3) detections from SVP-5 (at 5 fbg) exceeded ESLs. Soil vapor concentrations are defined below ESLs vertically by SVP-5A (at 2 fbg) and horizontally by SVP-2 through SVP-4 and SVP-6 through SVP-8. CRA's August 24, 2010 *Soil Vapor Sampling Report* provides details of this investigation.

July 2010 Subsurface Investigation: CRA drilled one off-site boring B-6 at 2267 Lincoln Avenue to further assess the extent of petroleum hydrocarbons in soil and groundwater. No TPHmo, TPHd, TPHg, benzene, toluene, ethylbenzene, and xylenes (BTEX), fuel

1 *Screening for Environmental Concerns at Site With Contaminated Soil and Groundwater,* California Regional Water Quality Control Board, Interim Final – November 2007 [Revised May 2008]

oxygenates, 1,2-dichloroethane (1,2-DCA), or 1,2-dibromoethane (EDB) were detected in soil samples collected from boring B-6. Up to 2.72 mg/kg lead was detected (B-6-8.0). No TPHg, BTEX, fuel oxygenates, 1,2-DCA, or EDB were detected in the grab groundwater sample collected from boring B-6. The grab groundwater sample contained 56 µg/l TPHd. None of the detections exceeded the ESLs. CRA's August 27, 2010 *Subsurface Investigation Report* provides details of this investigation.

Groundwater Monitoring: Geomatrix sampled wells MW-1 through MW-3 in August 2007, and groundwater monitoring was initiated beginning with the first quarter of 2009 in wells MW-1 through MW-8 and the second quarter of 2010 in well MW-9. Fuel oxygenates were not detected in any of the August 2007 groundwater samples and are not included in the groundwater monitoring program, because gasoline station operations ceased at the site prior to the use of MTBE in gasoline. No constituents of concern have been detected above non-drinking water ESLs in wells MW-2, MW-3, and MW-5 through MW-9. Concentrations up to 17,000 µg/l TPHg, 1,700 µg/l TPHd, 280 µg/l benzene, 270 µg/l ethylbenzene, 25 µg/l toluene, and 360 µg/l xylenes have been detected in groundwater samples from MW-1 and MW-4.