GeoStrategies

WORK PLAN FOR LIMITED SUBSURFACE INVESTIGATION

at

Unocal Station No. 5325
3220 Lakeshore Avenue
Oakland, California

Report No. 7814.21-1

Prepared for:

Mr. David De Witt
Tosco Marketing Company
2000 Crow Canyon Place, Suite 400
San Ramon, California 94583

Prepared by:

GeoStrategies
6747 Sierra Court, Suite J
Dublin, California 94568

Stephen J. Carter
Project Geologist
R.G. 5577

Clyde J. Galantine
Project Geologist

May 5, 1997

3164 Gold Camp Drive, Suite 240 • Rancho Cordova, CA 95670 • (916) 631-1314 • Fax (916) 631-1317

TABLE OF CONTENTS

FIGURES

APPENDICES

WORK PLAN FOR LIMITED SUBSURFACE INVESTIGATION

at

Unocal Station No. 5325
3220 Lakeshore Avenue
Oakland, California

Report No. 7814.21

INTRODUCTION

This *Work Plan for Limited Subsurface Investigation* proposes a scope of work intended to delineate hydrocarbon impacted soil north and west of the site along Lakeshore Avenue and to collect site specific physical soil parameters for a Tier 2 Risk-Based Corrective Action (RBCA) evaluation. In addition, one groundwater sump well will be installed in the underground storage tank (UST) backfill to monitor and provide access to potential separate phase hydrocarbons suspected to be contained in the UST excavation. The proposed scope of work includes: obtaining the necessary encroachment and well installation permits from the City of Oakland and the California Water Resources Management Zone 7 Water Agency (Zone 7; preparing a site safety plan; hand auguring two soil borings for collection of soil samples for geotechnical and/or geochemical analyses; installing one groundwater recovery well; and preparing a report which presents the findings of this investigation. This *Work Plan for Limited Subsurface Investigation* was prepared by GeoStrategies (GSI) at the request of Tosco Marketing Company (Tosco) in response to letters dated March 7 and April 7, 1997 from the Alameda County Environmental Health Services (ACEHS) requesting determination of the extent of off-site soil contamination.

The scope of work described in this report is intended to comply with the State of California Water Resources Control Board's *Leaking Underground Fuel Tanks (LUFT) Manual* and *California Underground Storage Tank Regulations, 1994*, the Regional Water Quality Control Board (RWQCB) *Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites*, and ACEHS guidelines.

SITE DESCRIPTION

The subject site is an operating Unocal Service Station situated on the east corner of the intersection of Lakeshore Avenue and Lake Park Avenue in Oakland, California (Figure 1). The site is bounded to the northwest by Lakeshore Avenue, to the southwest by Lake Park Avenue, to the northeast by a commercial building, and to the southeast by a grocery store parking lot. Properties in the immediate site vicinity are used for commercial purposes that include restaurants and retail shopping facilities. The site is located at an approximate elevation of 7 to 12 feet above mean sea level.

Current site facilities consist of the service station building with three service bays (not in use), three product dispenser islands, and two 12,000-gallon double-wall gasoline underground storage tanks (USTs). Six groundwater monitoring wells (U-1 through U-6) have been installed at the site. Locations of the pertinent site features are shown on the Site Plan (Figure 2).

SCOPE OF WORK

Petroleum hydrocarbons are present in monitoring wells U-1, U-2, U-5, and U-6, situated along the northwest (downgradient) side of the subject site. To assess the extent that the petroleum hydrocarbons have impacted the soil northwest of the subject site, GSI proposes to hand auger one soil boring in Lakeshore Avenue. A second hand augured soil boring will be advanced in the planter area located at the western edge of the site. Soil samples will be collected from these borings to evaluate the lateral extent of the dissolved petroleum hydrocarbons at the groundwater interface. One soil sample from the on-site soil boring will also be collected for site specific physical analysis for use in a Tier 2 RBCA evaluation. Boring locations are shown on Figure 2.

Free product has been observed in monitoring well U-1 and is suspected to be present in the UST pit. To evaluate groundwater in the UST pit for the potential presence of separate phase hydrocarbons, GSI proposes to install one 4-inch diameter groundwater recovery well in the UST pit material (pea gravel).

To perform this scope of work, GSI proposes the following specific tasks:

Task 1. Pre-field Activities

GSI will update the site safety plan. Boring locations will be marked and underground Service Alert (USA) will be notified a minimum of 48 hours prior to initiating work.

Task 2. Permitting

GSI will obtain an encroachment permit from the City of Oakland for the hand auguring of the off-site soil boring and a soil boring/well installation permit from Zone 7.

Task 3. Site Preparation

GSI personnel will cut holes in the asphalt and concrete in preparation for the off-site soil boring and the recovery well installation. If necessary, steel plates will be placed over the holes to prevent an unsafe condition.

Task 4. Soil Borings

GSI will hand auger two soil borings at the locations shown on Figure 2. A GSI geologist will perform the augering activities and prepare a log of each boring. Borings will be augered with 4-inch-diameter hand auger. We anticipate groundwater will be encountered at approximately 6 to 7 feet bgs.

Soil samples for lithological description and possible chemical analysis will be obtained from each boring. Soil samples will be collected as described in Appendix A. One capillary fringe sample from each boring will be submitted for chemical analysis as described in Task 6. In addition, one vadose zone soil sample collected from the on-site soil boring will be submitted for site specific physical analyses as described in Task 6.

Soil samples from each sampled interval will be screened in the field for the presence of volatile organic compounds using a photoionization detector (PID). These data will be collected for screening purposes only, and will not be used as verification of the presence or absence of petroleum hydrocarbons. If an elevated PID reading is encountered, then the sample will be retained for chemical analysis. Screening data will be recorded on the boring log. Field screening procedures are described in Appendix A.

Upon completion of the soil borings, neat cement will be used to backfill the boring cavities. Asphalt or concrete will then be used to seal each area.

Task 5. Well Installation

GSI will install one on-site groundwater recovery well into the UST pit backfill at the location shown on Figure 2. Drilling and well installation will be performed by a California licensed well driller. A GSI geologist will monitor the drilling activities and

prepare a log of each boring. Well borings will be drilled with 10-inch-diameter hollow-stem augers. The groundwater recovery well will be constructed of 4-inch-diameter Schedule 40 polyvinyl chloride (PVC) well casing and 0.03-inch machine-slotted well screen, as shown on the Proposed Well Construction Detail (Figure 3). We anticipate groundwater will be encountered at approximately 6 to 7 feet bgs.

will water be removed or only F.P.? will oils be added?

No soil samples will be collected, since the cuttings will consist of pea gravel (UST backfill). Steam cleaning rinsate waste water will be stored at the site in properly labeled drums pending disposal.

Task 6. Laboratory Analyses.

Soil samples retained for chemical analysis will be submitted to Sequoia Analytical, a California State-Certified Laboratory. Soil samples will be analyzed for TPHg by Environmental Protection Agency (EPA) Method 8015 (Modified) and gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020. Drill cutting composite samples will also be analyzed for TPHg and BTEX.

Soil samples retained from the proposed boring located at the western edge of the site will be submitted for site specific physical parameters by PTS Laboratories, Inc., a California state-certified Material Testing Laboratory. Physical parameters will be analyzed for bulk density by ASTM Method D-2937, water content by ASTM Method D-2216, computed soil porosity, permeability by ASTM Method D-2434, soil pH by EPA Method 150.1/9045, total organic content (TOC) by EPA Method 415.1, and particle size analysis by ASTM Method D 422-63.

and future monitoring events

As requested by ACEHS, additional analyses will be conducted on groundwater samples collected during the next routine quarterly monitoring event, scheduled for June 1997. These additional analysis will include intrinsic bio-parameters such as: dissolved oxygen, nitrate, sulfate, phosphate, iron (+3) and redox potential.

Task 7. Report Preparation.

Following receipt and analysis of all data, a report will be prepared which summarizes this investigation. This report will be submitted to Tosco Marketing Company for their use and distribution.

PROJECT STAFF

Mr. Stephen J. Carter, a Registered Geologist in the State of California (No. 5577), will provide technical oversight and review of the work. Mr. David J. Vossler, Project Manager, will supervise implementation of the field and office operations. GSI employs a staff of geologists, engineers, and technicians who will assist with the project.

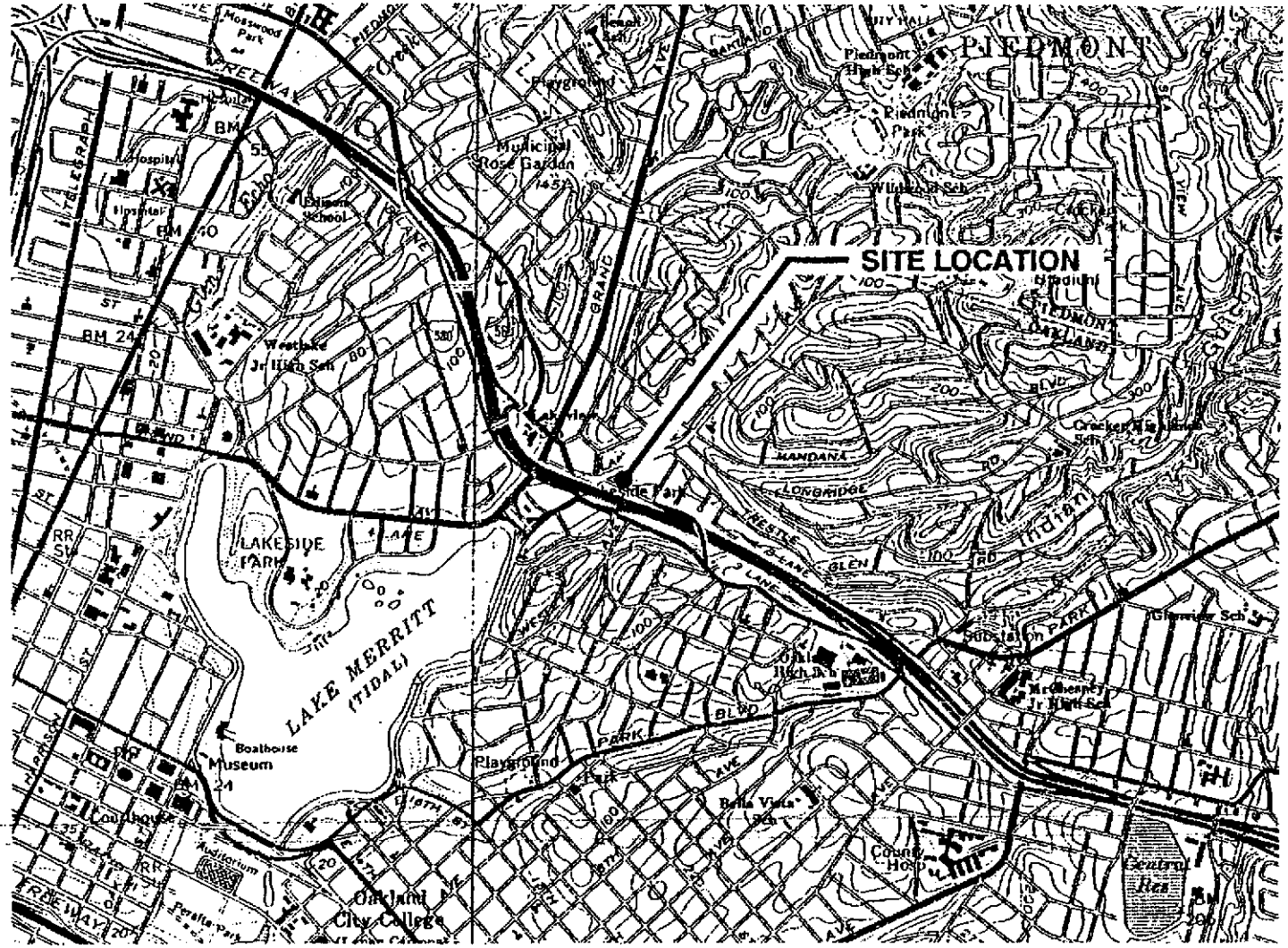
SCHEDULE

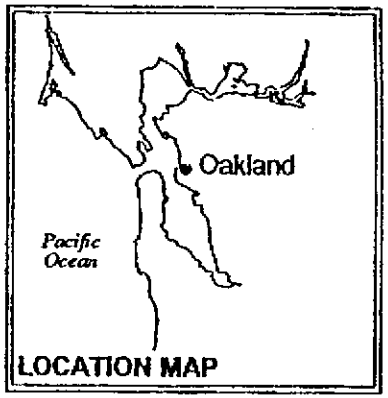
Implementation of the proposed scope of work will commence upon receipt of Work Plan approval from ACEHS. Field work will be initiated when access approval is obtained.

DISTRIBUTION

A copy of this work plan should be forwarded to the following agencies:

Mr. Barney Chan
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577





Base Map: USGS Topographic Map

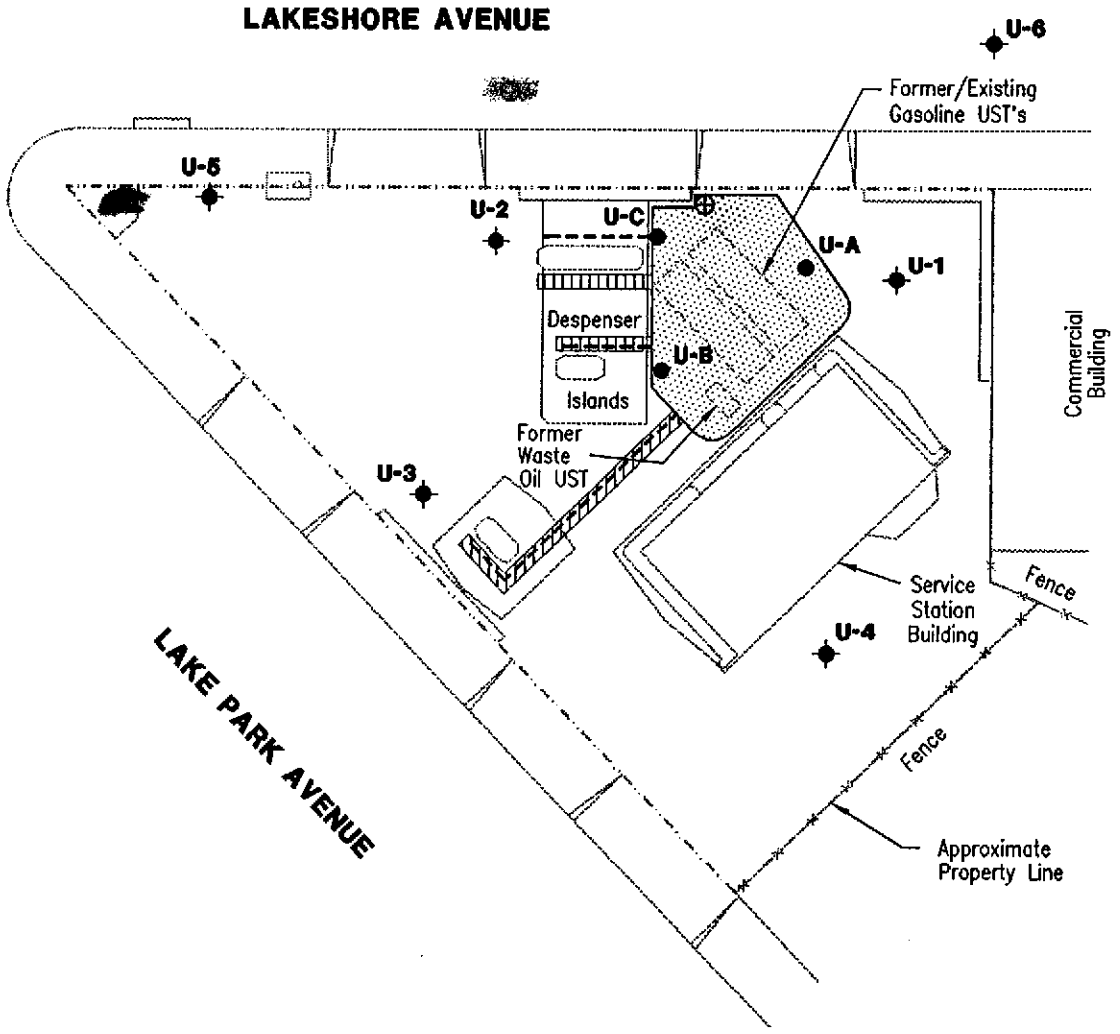
Approximate Scale: 1" = 2000'

GeoStrategies Inc.

Vicinity Map
UNOCAL Service Station #5325
3220 Lakeshore Avenue
Oakland, California

PLATE **1**

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE
7814		6/90	



EXPLANATION

- Ground–water monitoring well
- Soil boring
- Proposed soil boring
- Proposed groundwater recovery well
- Former product line trench (1990)
- Limit of 1990 excavation
- Former product line trench (1996)

N

0 40

Scale in Feet

GeoStrategies Inc.

SITE PLAN
UNOCAL Service Station NO. 5325
3220 Lakeshore Avenue
Oakland, California

FIGURE
2

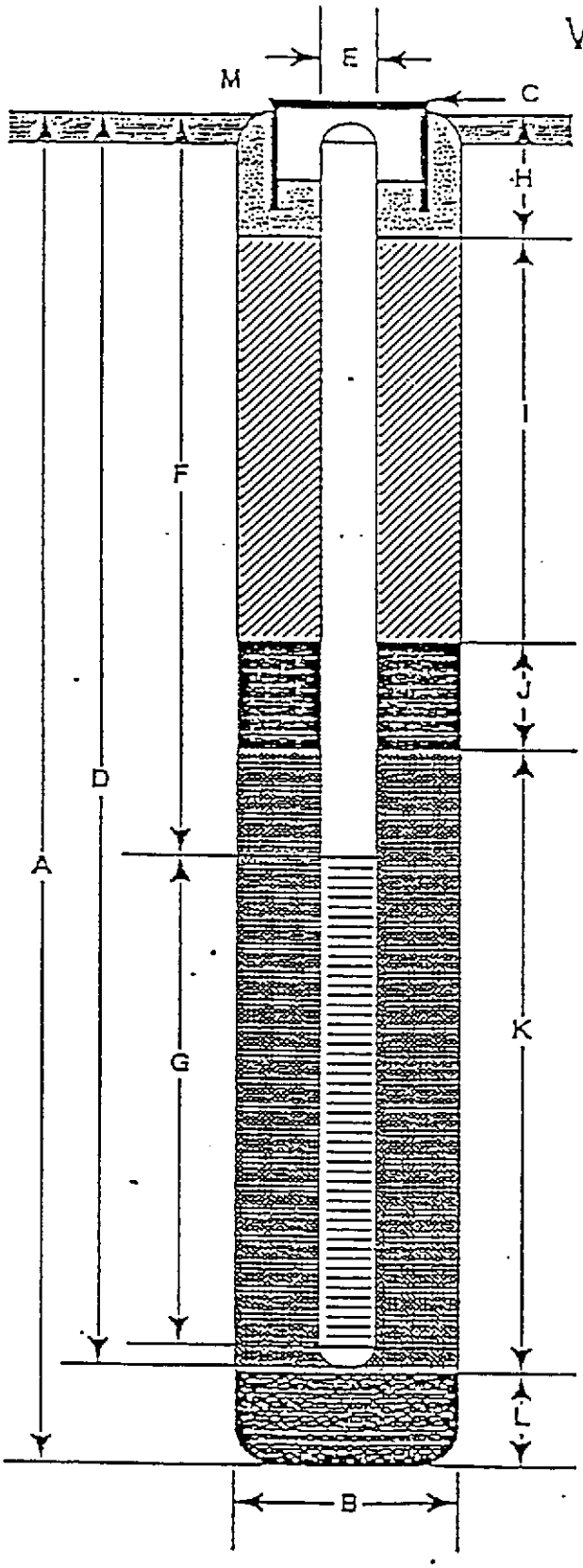
JOB NUMBER
4814.21

REVIEWED BY

DATE
May, 1997

REVISED DATE

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 15 ft.

B Diameter of Boring 10 in.
Drilling Method HSA

C Top of Box Elevation _____ ft.
☒ Referenced to Mean Sea Level
☐ Referenced to Project Datum

D Casing Length 15 ft.
Material SCH 40 PVC

E Casing Diameter 4 in.

F Depth to Top Perforations 5 ft.

G Perforated Length 10 ft.
Perforated Interval from 5 to 10 ft.
Perforation Type SLOTTED SCHD.40 PVC
Perforation Size 0.03 in.

H Surface Seal from 0 to 1 ft.
Seal Material CONCRETE

I Backfill from 1 to 15 ft.
Backfill Material pea gravel (native)

J Seal from none to _____ ft.
Seal Material _____

K Gravel Pack from 1 to 15 ft.
Pack Material pea gravel-see Section I

L Bottom Seal NONE ft.
Seal Material _____

M _____

Note: Depths measured from initial ground surface

GeoStrategies Inc.

TYPICAL Well Construction Detail

FIGURE 3

JOB NUMBER | REVIEWED BY RG/CEG | DATE | REVISED DATE | REVISED DATE

APPENDIX A

GeoStrategies Field Methods And Procedures

GEOSTRATEGIES

FIELD METHODS AND PROCEDURES

Site Safety Plan

Field work performed by GeoStrategies (GSI) is conducted in accordance with GSI's Health and Safety Plan (revised January 16, 1995) and the Site Safety Plan. GSI personnel and subcontractors who perform work at the site are briefed on the contents of these plans prior to initiating site work. The GSI geologist or engineer at the site when the work is performed acts as the Site Safety Officer. GSI utilizes a photoionization detector (PID) to monitor ambient conditions as part of the Health and Safety Plan.

Collection of Soil Samples

Soil borings are to drilled using a hand auger. A GSI geologist is present to perform the hand augering, collect soil samples for description, physical testing, and chemical analysis, and prepare a log of the exploratory soil boring. Soil samples are collected from the soil boring with a hand-driven sampling device fitted with 2-inch-diameter, clean brass tube or stainless steel liners. The encountered soils are described using the Unified Soil Classification System (ASTM 2488-84) and the Munsell Soil Color Chart.

After removal from the sampling device, soil samples for chemical and geotechnical analysis are covered on both ends with teflon sheeting or aluminum foil, capped, labeled, and place in a cooler with blue ice for preservation. A chain-of-custody form is initiated in the field and accompanies the selected soil samples to the analytical laboratory. Samples are selected for chemical analysis based on:

a. depth relative to underground storage tanks and existing ground surface
b. depth relative to known or suspected groundwater
c. presence or absence of contaminant migration pathways
d. presence or absence of discoloration or staining
e. presence or absence of obvious gasoline hydrocarbon odors
f. presence or absence of organic vapors detected by headspace analysis

Field Screening of Soil Samples

A PID is used to perform head-space analysis in the field for the presence of organic vapors from the soil sample. This test procedure involves removing soil from the tip of the sampling device or sample liner into a clean ziplock bag and sealing the bag. After approximately twenty minutes, the bag is opened and the atmosphere within the bag tested using a PID. Head-space screening results are recorded on the boring log. Head-space screening procedures are performed and results recorded as reconnaissance data. GR does not consider field screening techniques to be verification of the presence or absence of hydrocarbons.

Construction of Recovery Wells

Recovery wells are constructed using Schedule 40 polyvinyl chloride (PVC) casing. All joints are thread-joined; no glues, cements, or solvents are used in well construction. The screened interval is constructed of machine-slotted PVC well screen which generally extends from the total well depth to a point above the groundwater.

Wellheads are protected with water-resistant traffic-rated vault boxes placed flush with the ground surface. The top of the well casing is sealed with a locking waterproof cap. A lock is placed on the well cap to prevent vandalism and unintentional introduction of materials into the well.