



Stantec

Stantec Consulting Corporation
3017 Kilgore Road Suite 100
Rancho Cordova CA 95670
Tel: (916) 861-0400
Fax: (916) 861-0430

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Alameda County
Environmental Health

**Revised Work Plan for Additional Site Assessment
76 Service Station No. 5760
376 Lewelling Boulevard
San Lorenzo, California**

**Fuel Leak Case No.:
RO0000344**

**Stantec Project No.:
211402378**

**Submitted to:
Ms. Barbara Jakub
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502**

(Sent Via Electronic Upload to Alameda ftp)

**Submitted by:
Stantec Consulting Corporation
3017 Kilgore Road, Suite 100
Rancho Cordova, California 95670
916-861-0400**

**Prepared on behalf of:
ConocoPhillips Company
Mr. Ted Moise
Site Manager
76 Broadway
Sacramento, California 95818**

April 27, 2009

INTRODUCTION

On behalf of ConocoPhillips, Stantec Consulting Corporation (Stantec) has prepared this *Revised Work Plan for Additional Site Assessment* (work plan) for 76 Service Station No. 5760, located at 376 Lewelling Boulevard, San Lorenzo, California (Figures 1 and 2). Stantec has recently taken over the role of lead environmental consultant for the site from Delta Environmental (Delta). Stantec has reviewed Delta's *Work Plan – Additional Assessment*, dated December 1, 2008, as well as the Alameda County Environmental Health Services (ACEHS) letter dated March 27, 2009, approving Delta's work plan pending modification. Based on Stantec's review of Delta's work plan, Stantec has determined that several modifications to the work plan may be appropriate.

Based on a review of previously-collected soil and groundwater analytical data, and the observed groundwater gradient direction, Stantec's proposed revised scope of work consists of advancing two soil borings and advancing one cone penetrometer test (CPT) boring. Stantec does not feel confirmation soil borings up- and cross-gradient of the dispenser islands, and CPT borings up-gradient of the USTs are warranted at this time.

Additionally, Stantec does not feel that a further preferential pathway analysis (as proposed in Delta's work plan) is warranted at this time. Being as depth to water is generally greater than 10 feet below ground surface (bgs), underground utility trenches are not expected to have acted as preferential pathways for contaminant migration. The observed hydrocarbon concentration distribution maps created by TRC Consultants (TRC) in their monitoring and sampling reports support this conclusion.

A brief discussion of site background, the revised proposed scope of work, and schedule are presented below.

SITE DESCRIPTION

The site is currently an active 76-branded gasoline service station and auto repair shop located on the southeast corner of the intersection of Lewelling Boulevard and Usher Street in San Lorenzo, California. Site facilities include two underground storage tanks (USTs) used for gasoline storage and associated piping and fuel dispensers. A station building containing two mechanic's service bays, as well as a waste-oil UST are also present at the site. A detailed site plan is included as Figure 2.

SITE GEOLOGY AND HYDROGEOLOGY

The site is located on the East Bay Plain, a gentle westward slope extending from the foothills to the east towards the San Francisco Bay. The area is underlain by Holocene-age alluvial deposits. Sand and gravel stream channel deposits are mapped along the alignment of San Lorenzo Creek, which is located approximately 500 feet south of the site. Based on assessment activities performed by various consultants, the subsurface generally consists of highly permeable soils to depths of 15 to 20 feet bgs. Underlying these soils are low permeability soils with occasional sand lenses to the maximum depth explored of approximately 30 feet bgs.

As outlined in the California Department of Water Resources 2003 *California Groundwater: Bulletin 118*, the site lies within the East Bay Plain Subbasin of the Santa Clara Valley Groundwater Basin. The East Bay Plain Subbasin is a northwest trending alluvial plain of Quaternary Age, bounded on the north by San Pablo Bay, on the east by the contact with Franciscan Basement rock, on the south by the Niles Cone Groundwater Basin. The East Bay Plain Subbasin extends beneath San Francisco Bay to the west.

A soil sieve/hydrometer sample and permeability test was performed in August 1990 by GeoStrategies Incorporated (GSI) on a sample collected from boring U-2 at a depth of 30 feet bgs. In the associated boring log, the soil was classified as a clay; the laboratory determined the soil to have a permeability of 6.0×10^{-8} centimeters per second, a typical value for clay.

A three-hour step-drawdown and 24-hour constant-rate discharge test were performed utilizing well U-1 in February 1994. The step-drawdown test indicated a sustainable yield of 2 gallons per minute (gpm). Hydraulic conductivity calculated during the constant-rate discharge test ranged from 175.4 gallons per day per square foot (gpd/ft²) to 350 gpd/ft².

As outlined in Delta's *Quarterly Summary Report – Third Quarter 2008*, dated October 27, 2008, the observed groundwater flow direction has been towards the southwest for the past 36 consecutive monitoring events.

PREVIOUS ASSESSMENT

In November 1987, Woodward-Clyde Consultants (WCC) oversaw the removal of the former USTs, and the installation of the current USTs. Based on petroleum hydrocarbon impact observed during UST replacement activities, groundwater monitoring well U-1 was installed. Well installation activities are documented in WCC's *Well Installation Report* dated March 25, 1988.

In August 1990, GSI oversaw the installation of monitoring wells U-2 through U-4. Well installation activities are documented in GSI's *Monitoring Well Installation Report*, dated November 16, 1990.

In March 1992, GSI oversaw the installation of monitoring wells U-5 through U-8 to delineate impact off-site. Well installation activities are documented in GSI's *Well Installation Report*, dated August 9, 1993.

In November 2003, Delta oversaw the advancement of five direct push soil borings, GP-1 through GP-5, to a maximum depth of 20 feet bgs. Hydrocarbon impact was observed in the soil sample collected from GP-4 at a depth of 19 feet bgs; TPHg, ethylbenzene, and total xylenes were detected at concentrations of 1,600, 26, and 130 milligrams per kilogram, respectively. A soil sample collected from GP-4 at a depth of 12 feet bgs was "non-detect" for all analyzed constituents. Site assessment activities are documented in Delta's *Baseline Assessment Report*, dated December 10, 2003.

In July 2007, Delta abandoned monitoring wells U-1 and U-3 and installed replacement wells U-1R and U-3R. Wells U-1 and U-3 were destroyed because Delta believed that hydrocarbon impacts observed in the wells were originating at the surface and migrating down the well boring. Well destruction and abandonment activities are documented in Delta's *Monitoring Well Abandonment and Replacement Report*, dated August 27, 2007.

SENSITIVE RECEPTORS

In 1992, GSI contacted the Alameda County Flood Control and Water Conservation District (ADFCWD) to identify water supply wells located within 0.5 mile of the site. Of the six wells identified (all being classified as irrigation wells) as being located within 0.5 mile of the site, 5 of the wells were determined to be located hydraulically up-gradient of the site, while one well was determined to be located hydraulically cross-gradient of the site. Of the up-gradient wells, one (identified in GSI's *Well Installation Report*, dated June 15, 1992 as well #1) appears to be located immediately east of the site.

In 2006 Delta reviewed California Department of Water Resources (DWR) well completion logs to identify all wells located within 1 mile of the site. Based on a review of Delta's reports, Delta appears to have identified 39 wells within 1 mile of the site. The six wells identified by GSI in 1992 were not located during the 2006 review of DWR files.

In 2006, Delta mailed a Public Health Assessment Questionnaire to all properties and owners of properties located within 1,000 feet of the site. Of the 164 questionnaires sent out, Delta received 13 responses and four returned by the United States Postal Service due to invalid addresses. Of the 13 responses, none of the respondents indicated the presence of a sump on their properties.

Based on the U.S. Geological Survey Topographic Map for the area (San Leandro quadrangle, 1980), the nearest surface water body is the San Lorenzo Creek, located approximately 500 feet southeast (cross-gradient) to southwest (down-gradient) of the site. In the vicinity of the site, San Lorenzo Creek is a concrete-lined channel.

REMEDIATION STATUS

No active remediation has been performed at the site.

SCOPE OF WORK

The proposed scope of work includes advancing two confirmation soil borings (GP-6 and GP-7) and one CPT boring (CPT-1) at the locations shown on Figure 2. The confirmation soil borings are being advanced to further delineate the lateral extent of hydrocarbon impact to soil and groundwater beneath the site. The CPT boring is being advanced adjacent to well U-1R and former well U-1, in an attempt to achieve vertical delineation of hydrocarbon impact in the known source zone. Down-gradient hydrocarbon delineation in the vicinity of well U-1R and former well U-1 are achieved by well MW-8 to the south, and off-site wells U-6 and U-7 to the west-southwest and southwest, respectively.

The proposed scope of work is outlined below.

- **Site Health and Safety Plan (HASP).** As required by the Occupational Safety and Health Administration (OSHA) Standard “Hazardous Waste Operations and Emergency Response” guidelines (29 CFR 1910.120), and by the California OSHA (Cal-OSHA) “Hazardous Waste Operations and Emergency Response” guidelines (CCR Title 8, Section 5192), Stantec will prepare a site-specific HASP prior to the commencement of fieldwork. The HASP will be reviewed by the field staff and contractors before beginning field operations at the site.
- **Permitting.** Prior to performing the proposed scope of work, Stantec will obtain soil boring permits from the Alameda County Public Works Agency.
- **Underground Utility Location and Clearance.** In advance of field activities, Stantec will mark the location of the proposed borings in accordance with the Underground Service Alert (USA) guidelines, and notify USA of upcoming subsurface activities so that existing underground utilities in the area of proposed work can be located and avoided. Stantec will contact a private utility locator to confirm the locations of underground utilities in the vicinity of the proposed borings. Prior to the onset of drilling, the borings will be air-knifed to the minimum depth of 5 feet bgs.
- **Confirmation Soil Borings.** Two confirmation soil borings, GP-6 and GP-7 will be advanced at the locations shown on Figure 2. The confirmation soil borings will be advanced using direct-push drilling equipment to a total depth of approximately 25 feet bgs, in an attempt to reach a sand layer determined to be located under a clay layer that generally extends from approximately 15 to 20 feet bgs. If no sand layer is encountered between 18 and 25 feet bgs, the soil borings will subsequently be advanced to a maximum depth of 30 feet bgs. The borings will be continuously cored for lithologic descriptions and possible laboratory analysis. Field procedures are included in Attachment 1.
- **CPT Boring.** One CPT boring, CPT-1, will be advanced at the location shown on Figure 2. The CPT boring will be advanced using direct-push technology to a total depth of approximately 50 feet bgs for lithologic description. Upon completion of the boring, a second boring (also named CPT-1) will be advanced within one foot of the first boring. The second boring will be used to collect discrete soil and groundwater samples based on the lithologic log generated from the first boring. Field procedures are included in Attachment 2.
- **Sample Selection and Analysis.** Soil samples will be collected continuously from the confirmation soil borings and depending on elevated PID readings, will be sent under chain-of-custody procedures to a California State-certified laboratory. Soil samples will be collected at 10-foot intervals from CPT-1. A minimum of three samples from each of the confirmation soil borings, and all soil samples collected from the CPT boring will be submitted for laboratory analysis. Grab groundwater samples will be collected from the two confirmation soil borings and from likely discrete water bearing zones encountered in the CPT boring (expected to be two or three samples). Selected soil and groundwater samples will be analyzed for TPHg, BTEX, fuel oxygenates MTBE, tert-butyl alcohol, diisopropyl ether, ethyl tert-butyl ether, tert-amyl methyl ether, and ethanol, and lead scavengers dibromoethane and 1,2-dichloroethane by EPA Method 8260. If hydrocarbon impact in GP-7 is encountered at concentrations exceeding their respective California Regional Water Quality Control Board – San Francisco Bay Region Environmental Screening Levels, Stantec will request that TRC commence with annual

sampling of existing well U-4 to confirm lateral delineation of the dissolved-phase hydrocarbon plume.

- **Soil and Water Disposal.** Soil cuttings and water generated during drilling operations will be stored in Department of Transportation (DOT)-approved 55-gallon drums. The drilling waste will be stored onsite pending transport by a licensed disposal contractor to an appropriate disposal or treatment facility.
- **Report.** A report will be prepared upon completion of necessary fieldwork. The report will include soil boring logs, soil and groundwater analytical results, chain-of custody documentation, waste disposal manifests, and a determination as to if additional site assessment activities appear warranted.

SCHEDULE

Stantec is prepared to initiate the coordination of fieldwork approximately four weeks after receiving approval of the work plan by the ACEHS.


LIMITATIONS

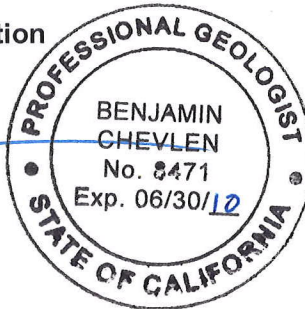
This work plan has been prepared for the exclusive use of ConocoPhillips and its representatives as it pertains to the property located at 376 Lewelling Boulevard, San Lorenzo, California. The evaluation of subsurface conditions at the site for the purpose of this investigation is inherently limited due to the number of points of investigation. There are no representations, warranties, or guarantees that the results are representative of the entire site. Data from this report reflect the conditions at locations at a specified time. No other interpretation, representations, warranties, guarantees, express or implied, are included or intended in the report findings. Stantec makes no warranties or guarantees for reports prepared by other contractors.


If you have any questions regarding the proposed scope of work, please contact Benjamin Chevlen at (916) 861-0400 ext. 289.

Sincerely,

Stantec Consulting Corporation


Benjamin Chevlen, P.G.
Associate Geologist

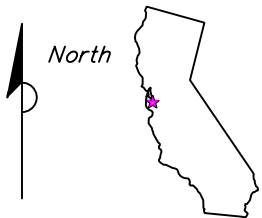
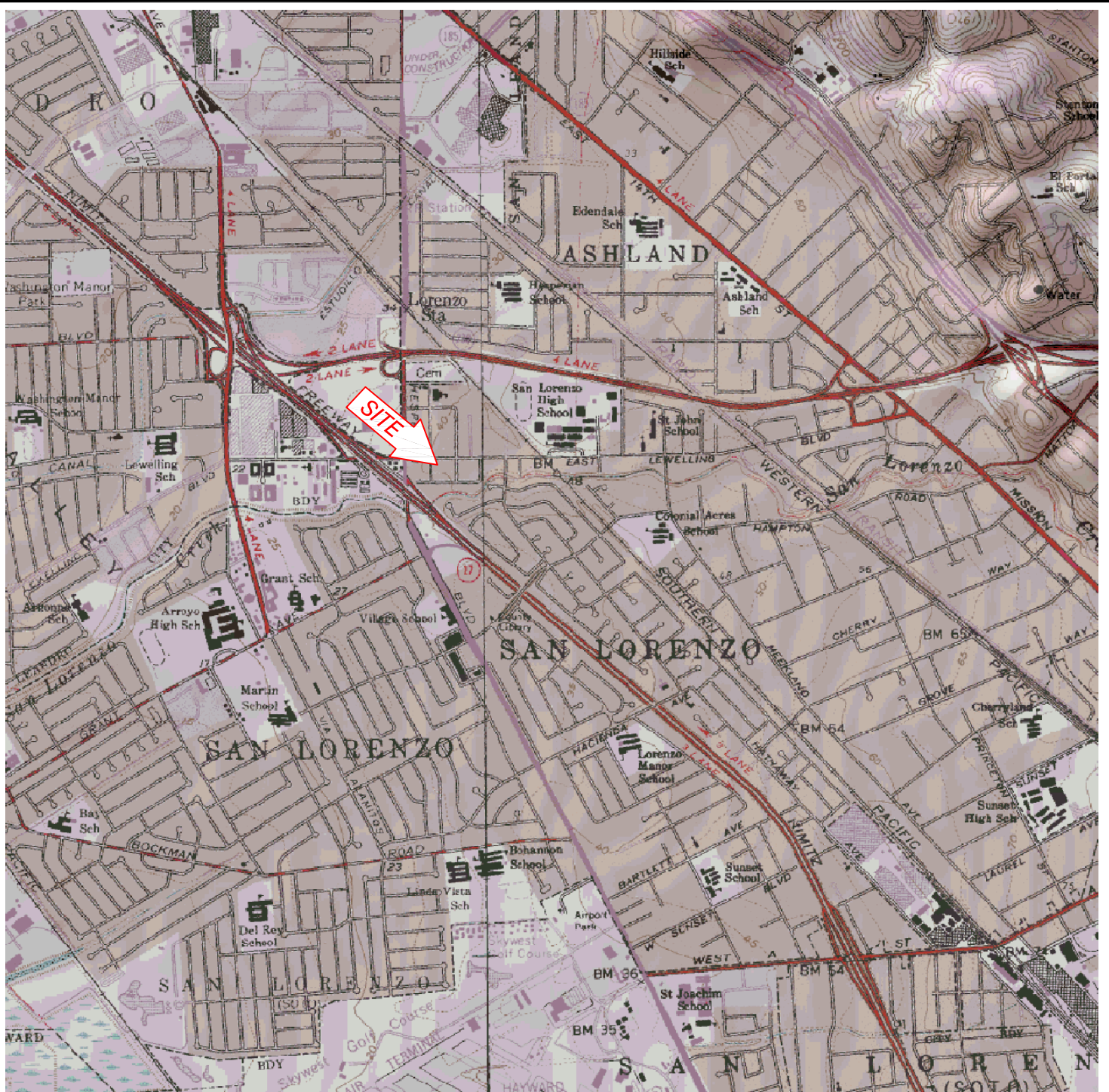



Ed Simonis
Senior Geologist

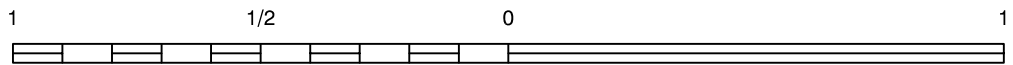
- Attachments: Figure 1 – Site Location Map
Figure 2 – Site Plan with Proposed Boring Locations
Attachment 1 – Field Procedures

cc: Mr. Ted Moise, ConocoPhillips

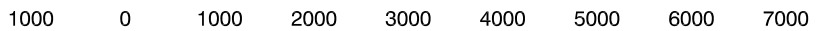
FIGURES



CALIFORNIA



SCALE (MILES)



SCALE (FEET)

REFERENCE: USGS 7.5 MINUTE QUADRANGLE, SAN LORENZO, CALIFORNIA



Stantec

FOR:
76 SERVICE STATION #5760
376 LEWELLING BOULEVARD
SAN LORENZO, CALIFORNIA

SITE LOCATION MAP

FIGURE:

1

JOB NUMBER:
211402275

DRAWN BY:
CM

CHECKED BY:
BC

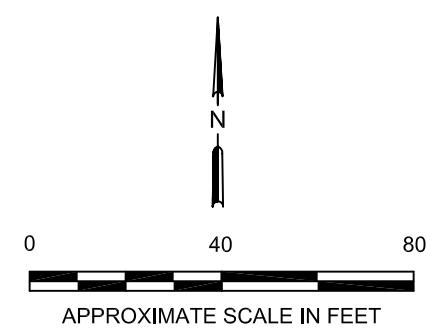
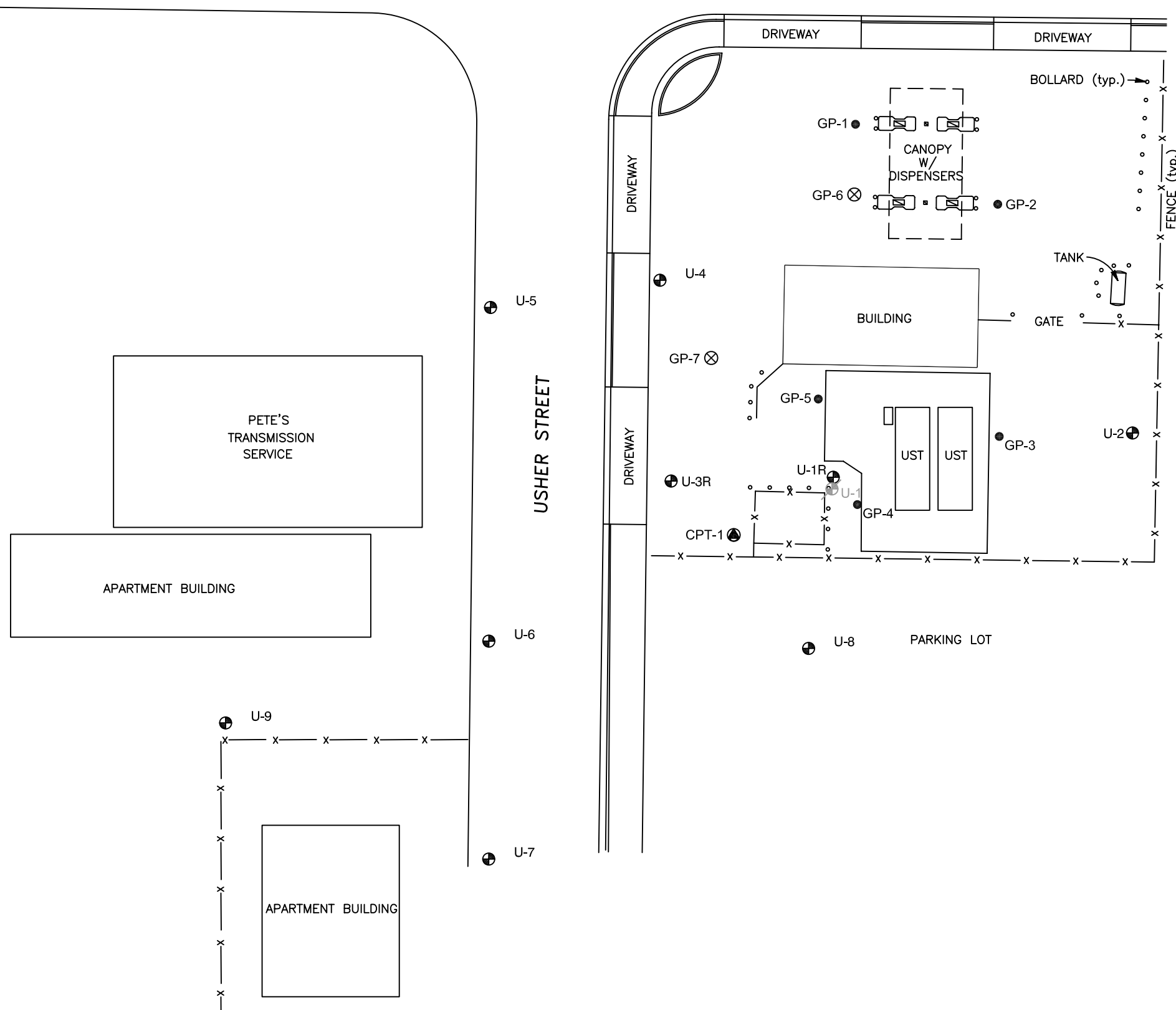
APPROVED BY:
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DATE:
04/13/09

LEWELLING BOULEVARD

LEGEND:

- U-2 ⊕ GROUNDWATER MONITORING WELL LOCATION
- U-1 ∅ DESTROYED MONITORING WELL LOCATION
- GP-1 ● GEOPROBE SOIL BORING LOCATION
- GP-9 ⊗ PROPOSED GEOPROBE SOIL BORING LOCATION
- CPT-1 ⊕ PROPOSED CPT LOCATION



No warranty is made by Stantec Consulting Corp. as to the accuracy, reliability, or completeness of these data. Original data were compiled from various sources. This information may not meet National Map Accuracy Standards. This product was developed electronically, and may be updated without notification. Any reproduction may result in a loss of scale and/or information.

REFERENCE: SITE PLAN BASED ON FIGURE PROVIDED BY DELTA



Stantec

FOR:
76 SERVICE STATION #5760
376 LEWELLING BOULEVARD
SAN LORENZO, CALIFORNIA

SITE PLAN WITH PROPOSED BORING LOCATIONS

FIGURE:
2

JOB NUMBER:
211402275

DRAWN BY:
CM

CHECKED BY:
BC

APPROVED BY:
--

DATE:
04/13/09

ATTACHMENT 1
FIELD PROCEDURES

Revised Work Plan for Additional Site Assessment
76 Service Station No. 5760
376 Lewelling Boulevard
San Lorenzo, California

ATTACHMENT 1

FIELD PROCEDURES

Stantec Consulting Corporation

STANDARD PROCEDURE FOR DIRECT PUSH DRILLING (INCLUDING CPT BORINGS)

Prior to drilling, all boring locations are marked with white paint or other discernible marking and cleared for underground utilities through Underground Service Alert (USA). In addition, the first five feet of each borehole are drilled with a hand auger or air-knifed to evaluate the presence of underground structures or utilities.

Once predrilling efforts to identify subsurface structures are complete, precleaned push rods (typically one to two inches in diameter) are advanced using a hydraulic push type rig for the purpose of collecting samples and evaluating subsurface conditions.

Upon completion of drilling and sampling, the rods are retracted and the resulting borehole is filled with concrete, bentonite grout, hydrated bentonite chips, or pellets as required by the regulatory agency. In areas where the borehole penetrates asphalt or concrete, the borehole is capped with an equivalent thickness of asphalt or concrete patch to match finish grade.

All down-hole drilling equipment will be steam-cleaned following the completion of each boring. Down-hole sampling equipment will be washed in an Alconox solution between samples.

All soil cuttings generated during site assessment activities will be contained in 55-gallon Department of Transportation (DOT) – approved 55-gallon drums. The drums will be labeled (to identify the contents, generation date and project) and stored on-site pending waste profiling and disposal.

STANDARD PROCEDURE FOR EQUIPMENT DECONTAMINATION

All equipment that could potentially contact subsurface media and compromise the integrity of the samples is carefully decontaminated prior to drilling and sampling. Drill augers and other large pieces of equipment are decontaminated using high pressure hot water spray. Samplers, groundwater pumps, liners and other equipment are decontaminated in an Alconox scrub solution and double rinsed in clean tap water rinse followed by a final distilled water rinse.

The rinsate and other wastewater are contained in 55-gallon DOT-approved drums, labeled (to identify the contents, generation date and project) and stored on-site pending waste profiling and disposal.