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July 24, 2015

Johnny Browning
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Re.: Site Conceptual Model and Remedial Investigation Work Plan Addendum
Automasters
6200 Shattuck Avenue
Oakland, California
ACEH Case #RO0002935

I declare, that to the best of my knowledge at the present time, the information and/or recommendations contained in the attached document are true and correct.

Submitted by,

Johnny Browning
LLC Manager
15 Mulberry Court, #5
Belmont, CA 94002

WEST ASSOCIATES
ENVIRONMENTAL ENGINEERS, INC.

ADDENDUM TO
SITE CONCEPTUAL MODEL AND
REMEDIAL INVESTIGATION WORK PLAN

Automasters
Leaking Underground Tank Site
6200 Shattuck Avenue
Oakland
Case No. RO0002935

Prepared For:
6200 Shattuck Partners LLC
Oakland

Prepared By:
West & Associates Environmental Engineers, Inc.
Vacaville

July 2015

California State Contractor's License No. 734244
PHONE: 707. 451.1360 • FAX: 707.447.0631 • PO BOX 5891 • VACAVILLE, CALIFORNIA 95696

ACKNOWLEDGMENTS

This Workplan Addendum was prepared for our client, 6200 Shattuck Partners LLC and is intended for their exclusive use.

In the preparation of this Workplan Addendum, reliance was made on work product of Pangea, Inc.

This Workplan Addendum was prepared by West & Associates Environmental Engineers, Inc. West & Associates is located at 630 Eubanks Ct., Unit G, Vacaville, CA 95688; mailing address, PO Box 5891, Vacaville, CA 95696; phone, 707.451.1360. Principal author is Mr. Brian W. West, PE. (Registered California Civil Engineer No. 32319 - expires 12/31/16.)

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1.0 INTRODUCTION

West & Associates Environmental Engineers, Inc. (W&A) has prepared this Addendum to the March 2015 Site Conceptual Model and Remedial Investigation Work Plan (WP-SCM) for Automasters and 6200 Shattuck Partners, LLC, based on the comments included in the Alameda County Environmental Health (ACEH) directive letter dated June 26, 2015. The unauthorized release from the former underground storage tanks (USTs) at the Automasters site (the Site) has been assigned ACEH Case #RO0002935. The Site is located at 6200 Shattuck Avenue in Oakland, California and is currently used as an independent automotive repair facility.

2.0 SITE BACKGROUND

In addition to the Site conditions and history described in the March 2015 WP-SCM, it is noted that waste oil has been stored at the Site in various aboveground containers over the years. *Figure 2* of the 2006 Pangea report shows three distinct locations for waste oil storage. There has never been a waste oil UST at this facility.

Waste oil is currently stored in a secondary-contained vessel designed specifically for this purpose. The location of this vessel is shown on the revised *Figure 5*, along with the areas previously used for waste oil storage containers which are now designated as "former waste oil storage" locations.

3.0 SITE CONCEPTUAL MODEL

The Site Conceptual Model submitted in the April 2015 WP-SCM has been amended to incorporate the four sensitive receptor survey components listed in Section 4, additional sampling locations for potential waste oil spills, revised locations for the monitoring wells, and additional analyses to be performed on soil and groundwater samples collected during this Site investigation. The revised SCM is presented in *Table 1*. Data gaps identified in the revised SCM are summarized along with the proposed investigation activities to close these gaps in the revised *Table 2*. These tables are included in *Appendix B*.

4.0 SENSITIVE RECEPTORS

Table 1 and *Table 2* have been amended to reflect the fact that the sensitive receptor survey performed for the Site will include the following components:

1. A utility survey of all existing subsurface utility lines, laterals and trenches;
2. An updated well survey using both the Alameda County Public Works Agency (ACPWA) database and the Department of Water Resources (DWR) database of wells within a ¼ mile radius of the Site;
3. An evaluation of land uses and exposure scenarios on the Site and adjacent properties;
4. An evaluation of planned development activities in the vicinity of the Site.

5.0 DATA GAPS

Data gaps identified in the ACEH letter dated June 26, 2105 will be addressed as described in the revised *Table 2* and the additional site assessment activities described in Section 6 of this SCM-WP Addendum.

6.0 REMEDIAL INVESTIGATION WORK PLAN

The March 2015 SCM-WP is amended as follows:

1. Four additional shallow soil sample locations will be added to evaluate the potential that waste oil spills have impacted shallow sub-surface soils adjacent to the building where waste oil has been stored.
2. In accordance with LTCP guidelines, all soil and groundwater samples will be analyzed for Total Petroleum Hydrocarbons as gasoline (TPH-g), TPH as diesel (TPH-d), and TPH motor oil (TPH-mo) by modified EPA 8015, and full scan volatile organic compounds (VOCs) including naphthalene by EPA Method 8260B.
3. The three monitoring wells will be installed with a wider spacing to provide a better Site groundwater gradient direction.
4. In accordance with LTCP requirements, soil samples will be collected for analysis from both 0 to 5 foot bgs and 5 to 10 foot bgs intervals at all soil boring locations (not including the shallow soil locations, which will be sampled at 2 to 3 feet bgs).

Figure 5 shows the additional/revised locations of all proposed soil borings, monitoring wells, and shallow soil samples. An extended site map to scale using an aerial photographic base map to depict both the site and immediate vicinity is presented on *Figure 6.* Both figures are included in *Appendix A*.

The W&A SOP for soil sample collection and preservation is included in *Appendix C*.

7.0 REPORT OF FINDINGS

At the conclusion of this proposed remedial investigation project a written Report of Findings will be prepared and submitted to ACEH. This Report will be submitted within 30 days of receiving final analytical results.

The Report will include:

- An Executive Summary
- Selected background material
- A summary of any deviations from the approved Workplan
- A description of all field work performed
- Scaled site diagram accurately locating all monitoring well and soil boring locations
- Well top survey data
- Boring logs
- Well completion diagram
- Analytical data in tabular format
- Original laboratory reports with Chain of Custody record

- A description of QA/QC results and any deviations from stated QA/QC procedures
- Technical discussion of investigative results
- Recommendations for further action, as appropriate
- Waste residue disposal documentation
- GeoTracker upload certification

8.0 GEOTRACKER UPLOAD

This SCM-WP Addendum has been uploaded to the ACEH web site per instructions included with the ACEH letter requesting these documents. Once approved by ACEH, it will be uploaded to the Automasters GeoTracker Domain, Global ID T0619748201. The upload certificate is presented in *Appendix D*.

APPENDIX A

Figures

WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS

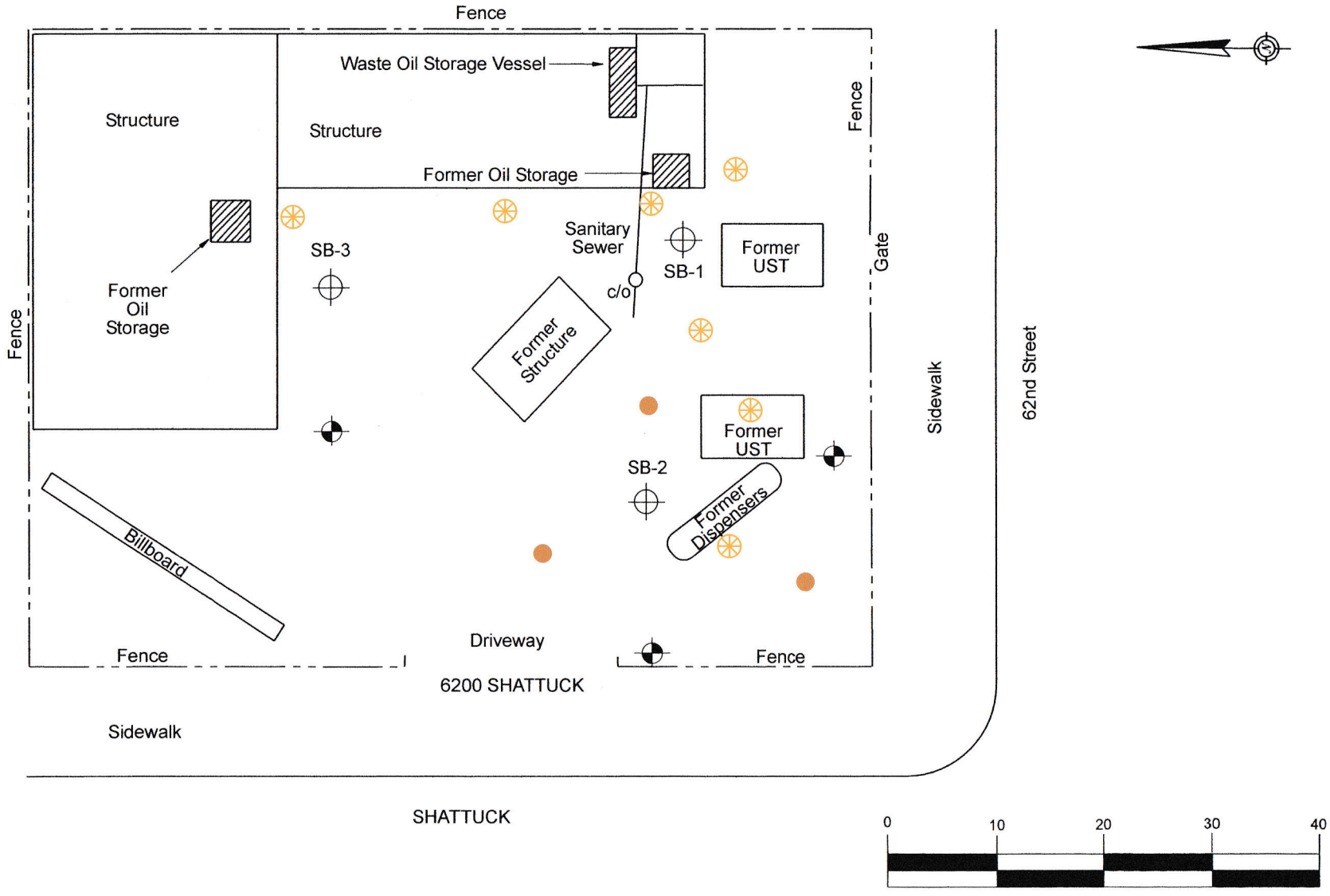
PO Box 5891, Vacaville, CA 95696

Project Name: Automasters	**Date:** March 2015
Location: 6200 Shattuck Avenue, Oakland, CA	
Drawing By: DLG	**Scale:** 1" = 14 ft

Legend

- Proposed Monitoring Well
- Proposed Soil Boring
- Proposed Shallow Soil Sample (Backfill)

FIGURE 5
Proposed Monitoring Well and Soil Sampling Locations



WEST & ASSOCIATES ENVIRONMENTAL ENGINEERS

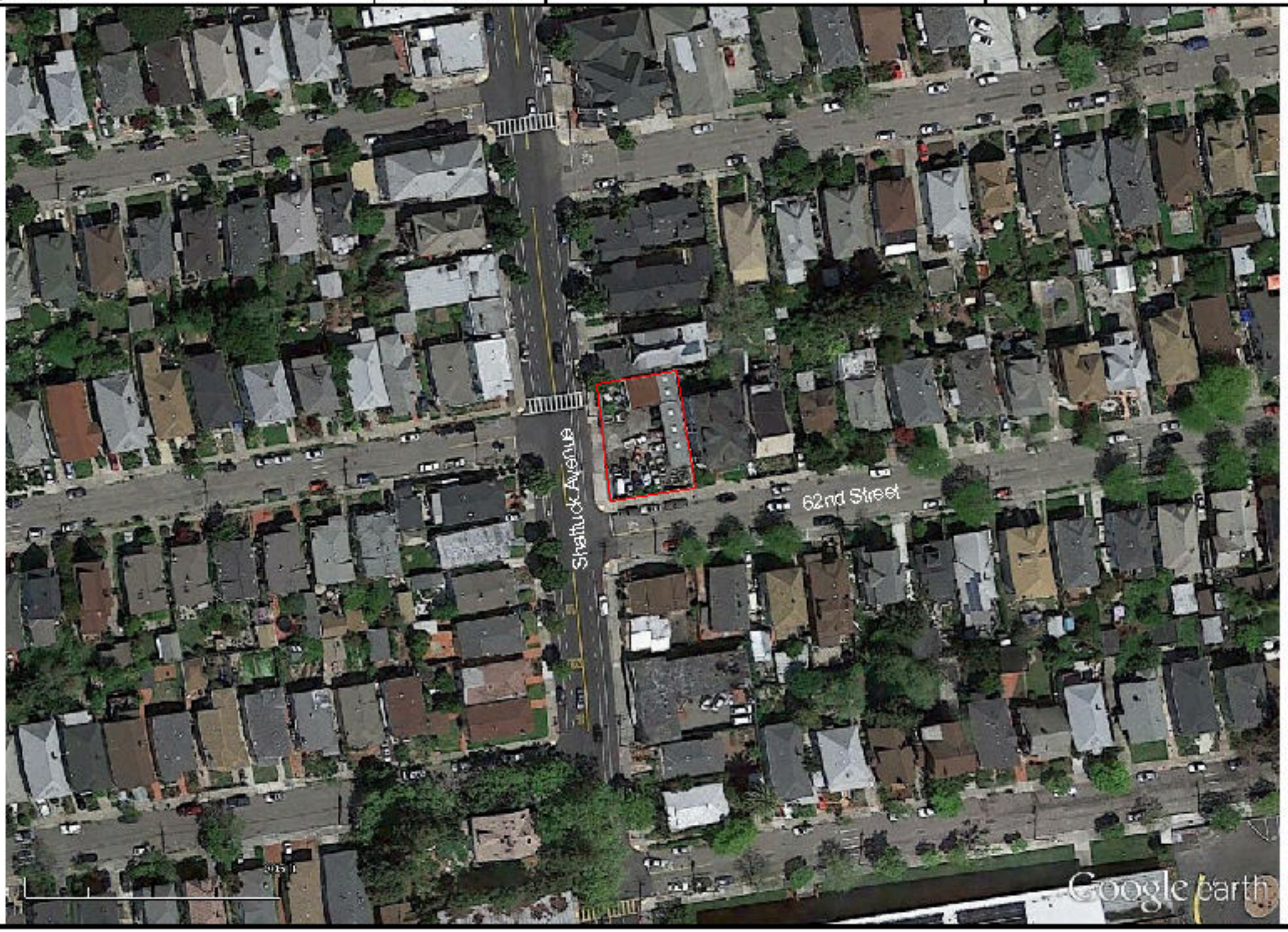
PO Box 5891, Vacaville, CA 95696

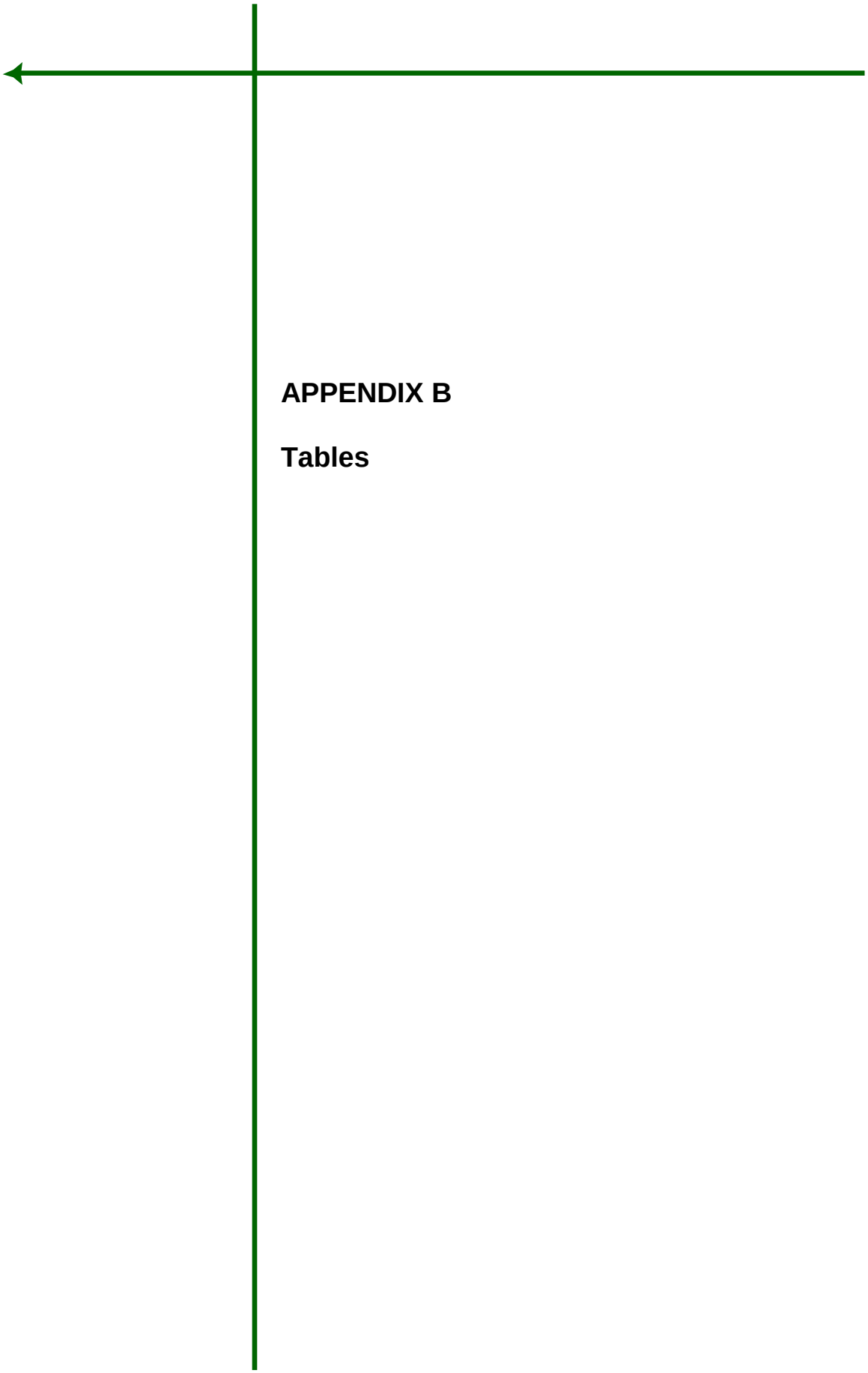
Project Name: Automasters	Date: March 2015
Location: 6200 Shattuck Avenue, Oakland, CA	
Drawing By: DLG	Scale: See Below

Legend

Site Location

FIGURE 6
Site Location
and
Surrounding Vicinity





APPENDIX B

Tables

TABLE 1 - SITE CONCEPTUAL MODEL – REVISED JULY 2015
Automasters
6200 Shattuck Ave, Oakland
July 2015

SCM Element	SCM Sub-Element	Description	Data Gap Item #	Resolution
Geology and Hydrogeology	Regional	The Site is located within the San Francisco Bay structural depression of the Coast Ranges Physiographic Province, within the Oakland Sub-Area of the East Bay Plain. The Site is situated in a relatively flat area between the San Francisco Bay and the Oakland Hills. Bedrock in the area consists of sedimentary, metasedimentary, volcanic, and intrusive rocks from the Jurassic through Paleozene geologic periods. Quaternary-age marine and alluvial sediments ranging in thickness from 300 to 700 feet cover the bedrock. Near the surface this Site is underlain by Holocene alluvium and marsh deposits comprised of silts and clay. The Site lies within the Berkeley Alluvial Plain sub-area of the East Bay Plain groundwater basin. The primary water-bearing unit in this area is comprised of unconsolidated alluvial deposits from the Late Quaternary period. There is also a secondary, older, semi-consolidated deposit from the Neogene-Quaternary period. Groundwater within these deposits is primarily confined although some of the aquifers are unconfined. Throughout most of the Alameda County portion of the East Bay Plain the general direction of groundwater flow follows the surface topography and runs from east to west, i.e. from the Hayward Fault to the San Francisco Bay. Flow direction and velocity are occasionally influenced by buried stream channels that typically are oriented in an east to west direction.	None	N/A
	Site	Soil types encountered during site investigation activities consisted predominantly of silty clay to clayey silt with some sands and gravels to 36 feet below ground surface (bgs) and stiff clay from 36 feet to 48 feet bgs. The two borings advanced by Pangea closest to the former USTs and dispenser islands had a distinct sand and gravel lens at 11 to 12 feet bgs. The only Site-specific information regarding depth to groundwater is the fact that when SB-2 was allowed to stand open overnight groundwater rose to 8 feet bgs by the next morning. Assuming that this is an unconfined or perched aquifer, it is likely that the depth to first encountered groundwater underlying the Site was approximately 8 feet bgs in June 2006. The depth to first groundwater at two nearby sites ranges from 5 to 18 feet bgs, supporting this assumption that the 8-foot depth to water observed in the SB-2 borehole was indicative of Site conditions at that time.	1. Depth to first-encountered groundwater	Determine during 2015 RI

TABLE 1 - SITE CONCEPTUAL MODEL – REVISED JULY 2015
Automasters
6200 Shattuck Ave, Oakland
July 2015

SCM Element	SCM Sub-Element	Description	Data Gap Item #	Resolution
Surface Water Bodies		The nearest surface water body is Claremont Creek, located approximately 0.8 miles northwest of the Site. Claremont Creek flows generally east to west near the Site vicinity. The San Francisco Bay is located approximately 2 miles west of the Site.	None	N/A
Nearby Wells		A well survey of the area performed by Woodward Clyde Consultants (WCC) in 1986 found five wells within a one mile radius of the Site. Two of these wells are (or were) used for industrial purposes, two for irrigation, and one for domestic purposes. No municipal wells were identified anywhere near the Site. The closest well is the irrigation well at 3215 Adeline Street in Berkeley, approximately 1,340 feet west-northwest of the Site. The only other well within a 2000-foot radius of the Site is the domestic well, which is located 1,800 feet south-southeast (cross-gradient) from the Site.	2. Wells not identified on previous well surveys	Perform a well survey that includes both Alameda County Public Works Agency (ACPWA) and Department of Water Resources (DWR) databases
Release Source and Volume		The two USTs removed in 1986 comprise the only known release mechanism impacting soil and groundwater underlying this Site. The surrounding area is primarily residential and there are no current or former UST cases within 1,000 feet of the Site listed on GeoTracker. It is not known whether the UST release was from the piping, dispensers, or USTs themselves. Based on the location of SB-2 and the 11-foot depth at which significant contamination was encountered, it is logical that the release occurred from the USTs. There is no known history of leaks or spills from the aboveground waste oil storage vessel (former or current) or other aspects of the automotive repair operation. The fact that SB-3 was clean is a good indication that there are no other release mechanisms at the Site. There remains the potential, however, that unreported leaks from the waste oil storage vessel(s) other sources such as abandoned USTs, sumps or lifts are present at the Site. The volume of this release is very difficult to ascertain.	3. Other potential release sources	Collect near-surface soil samples in the areas adjacent to the building, closest to the former and current waste oil storage vessels
LNAPL		There are currently no monitoring wells located at the Site. Light non-aqueous phase liquids (LNAPL) were not observed in the groundwater “grab” sample collected from SB-2. The concentration of TPH-g in one soil sample collected from this borehole (3,000 mg/kg) suggests that it is conceivable that LNAPL are present.	4. Need monitoring wells at the Site	Install three monitoring wells on the Site

TABLE 1 - SITE CONCEPTUAL MODEL – REVISED JULY 2015
Automasters
6200 Shattuck Ave, Oakland
July 2015

SCM Element	SCM Sub-Element	Description	Data Gap Item #	Resolution
Source Removal Activities		It is reported that contaminated soil between the USTs was excavated and transported offsite for disposal. No records are available regarding the quantity or final destination of this soil.	None	N/A
Contaminants of Concern		Based on the information available from the Site owner and the Pangea report, contaminants of concern (COCs) are TPH-g, TPH-d, TPH-mo, and VOCs by EPA Method 8260B (including naphthalene). MtBE and other fuel oxygenates/additives were all reported as N.D. at the standard method detection limits in this groundwater sample and in all soil samples collected from the 3 boreholes.	None	N/A
Petroleum Hydrocarbons in Soil		Based on the lack of any detectable concentrations of COCs in SB-1 and SB-3, it is believed that the lateral extent of soil contamination is relatively limited. The low concentrations of COCs in soil samples from SB-2 at 8 and 16 feet bgs suggest that the vertical extent is also limited, perhaps confined to the sand and gravel layer 11-12 feet bgs and the silty clay immediately below. Based on the historic generation and storage of waste oil, it is conceivable that TPH-mo and/or VOCs have migrated into shallow soils adjacent to the building footprint.	5. Lateral and vertical extent of soil contamination	Determine during 2015 RI
Petroleum Hydrocarbons in Groundwater		The only evidence of groundwater contamination is based on a grab sample collected from the SB-2 borehole. Grab samples frequently contain higher COC concentrations than samples collected from a properly developed well, so the nature and extent of groundwater impact as a result of this release is essentially unknown.	6. Nature and extent of groundwater contamination	Determine during 2015 RI

TABLE 1 - SITE CONCEPTUAL MODEL – REVISED JULY 2015
Automasters
6200 Shattuck Ave, Oakland
July 2015

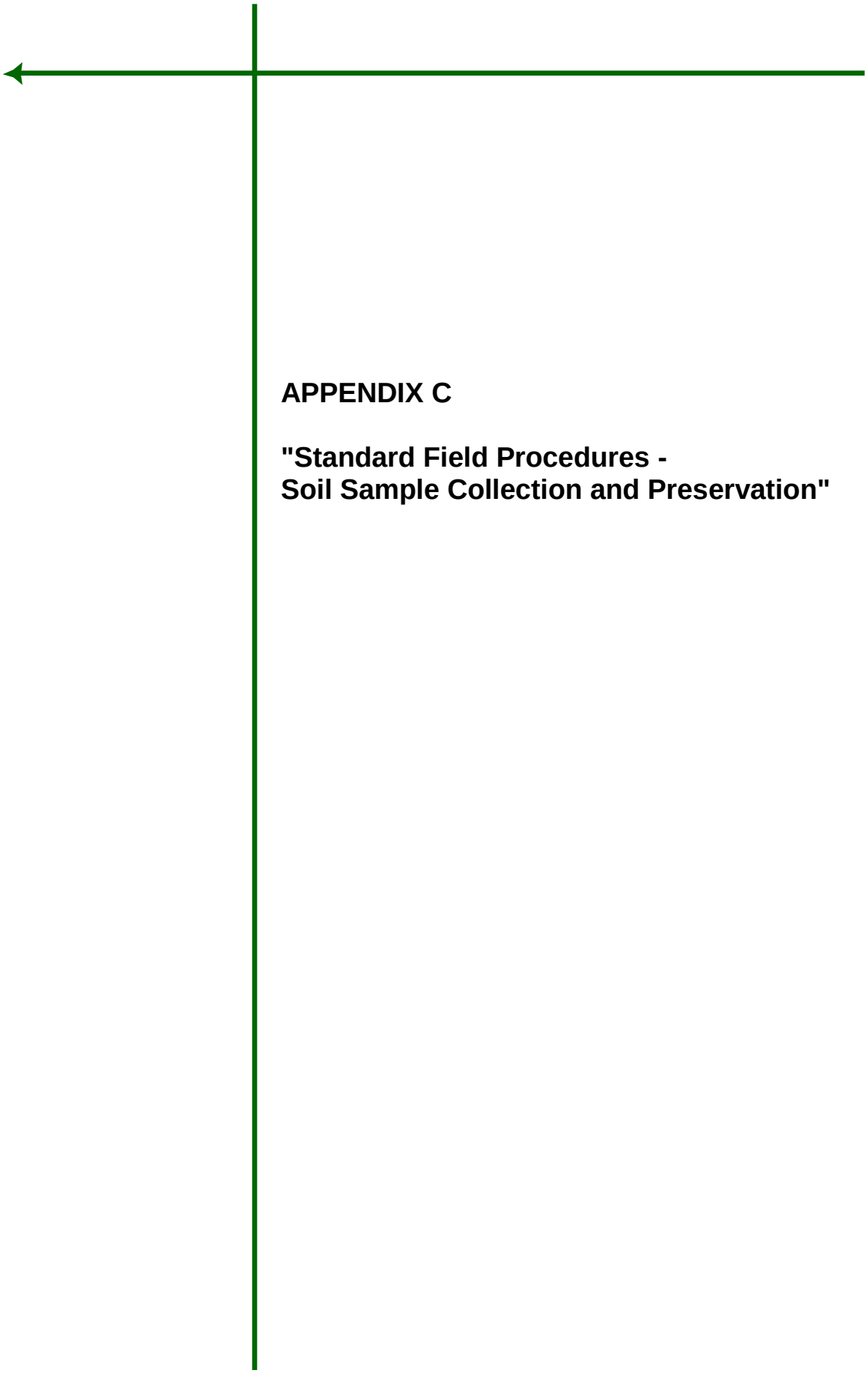
SCM Element	SCM Sub-Element	Description	Data Gap Item #	Resolution
Risk Evaluation		The Site is currently used as an independent automotive repair facility. 6200 Shattuck Partners, LLC would like to proceed with development of the Site, involving demolition of the two existing garage buildings and construction of a mixed-use commercial and residential building. No data has been generated regarding soil vapor conditions at the Site. Based on the soil data from 2006, the only potential onsite receptor would be construction workers exposed to gasoline vapors while excavating into contaminated soil during Site development activities. Even this exposure is unlikely since the identified contamination is 11 feet bgs and the proposed residential development does not include an underground parking garage.	7. Potential complete exposure pathways for identified receptors	Determine during 2015 RI
		The homes and small commercial establishments west of the Site are located downgradient and are considered the only likely offsite receptors. The probability of this release having an impact on these receptors is very low based on the fact that significant concentrations of COCs were only found at a depth of 11 feet bgs. A limited sensitive receptor evaluation has been performed based on Sensitive Receptor Surveys performed at nearby sites. Other potential receptors within 2,000 feet of the Site include the Sankofa Academy Elementary School, whose property begins 400 feet south of the Site, and Colby Park, located 1,800 feet east of the Site. Based on the known direction of groundwater flow in the area these receptors are cross-gradient and upgradient of the Site, so it is highly unlikely that they would be impacted by this release. Identified potential human receptors include residents at the Site and nearby homes and apartments, workers and patrons of nearby commercial establishments, and construction workers involved with Site development. Once the 2015 Remedial Investigation has been completed it will be possible to perform a thorough evaluation of whether Site conditions might impact any of these receptors. As described in the LTCP, the data generated will be used to evaluate whether or not the following potential exposure pathways are complete for any of the identified receptors: incidental ingestion, dermal contact, dust inhalation, and vapor inhalation. If there are complete pathways that require mitigation, a Remedial Action Plan plan will be prepared and submitted to ACEH for approval.	8. Potential of receptors not yet identified	Perform site-specific Sensitive Receptor Survey including utility survey, updated well survey based on both ACPWA and DWR databases, evaluation of land use and exposure scenarios, and planned development activities in the vicinity

Table 2 - DATA GAP SUMMARY AND PROPOSED INVESTIGATION – REVISED JULY 2015
Automasters
6200 Shattuck Ave, Oakland
July 2015

Item #	Data Gap	Proposed Investigation	Rationale	Analyses
1	Depth to first encountered groundwater (dtw)	Install three groundwater monitoring wells and measure dtw in each	Three wells are sufficient to determine dtw and groundwater gradient.	Measure dtw in all three wells, determine groundwater gradient
2	Nearby wells not yet identified	Perform a well survey that includes both Alameda County Public Works Agency (ACPWA) and Department of Water Resources (DWR) databases	The ACPWA and DWR databases are sufficiently different to warrant a current survey that includes both of them.	N/A
3	Other potential release sources	Additional archival investigation and thorough Site inspection for visual evidence of additional USTs or other potential release sources	Site inspection by experienced engineer can uncover evidence of other USTs, sumps, lifts, etc. no longer in use at the Site.	Visual inspection
4	Presence or absence of LNAPL	Using bailers specifically designed to capture and measure FPP to sample each of the three wells for LNAPL	LNAPL can easily be measured using teflon bailers which have been specifically designed to effectively capture and measure FPP.	Visual inspection, product thickness measurement
5	Lateral and vertical extent of soil contamination	Install three groundwater monitoring wells and three additional soil borings; collect shallow soil samples from a total of seven locations adjacent to the building footprint in the areas where waste oil has been stored and in the areas where the dispensers and UST piping were located. Figure 5 shows the locations of the wells, soil borings and shallow soil samples.	The soil boring locations surround the area of known contamination (SB-2 the area between the former USTs). The collection of soil samples from 0-5 feet bgs and 5-10 feet bgs from all boreholes (including those for the three monitoring wells) will provide the data necessary to evaluate the exposure pathways identified in the LTCP. The shallow soil sample results will be used to determine whether there have been any releases from the waste oil storage vessels and/or the former UST piping or dispensers.	TPH-g,TPH-d, TPH-mo, and VOCs (including naphthalene) by EPA Method 8260B

Table 2 - DATA GAP SUMMARY AND PROPOSED INVESTIGATION – REVISED JULY 2015
Automasters
6200 Shattuck Ave, Oakland
July 2015

Item #	Data Gap	Proposed Investigation	Rationale	Analyses
6	Nature and extent of groundwater contamination	Start with installation of three groundwater monitoring wells and sampling of each well a minimum of two occasions (after installation and one to three months later).; additional RI activities as warranted based on these results	Three wells are adequate to determine the dtw and groundwater gradient.	TPH-g, TPH-d, TPH-mo, and VOCs by EPA Method 8260B in all three wells
7	Potential complete exposure pathways for identified receptors	Await results of RI, determine whether soil vapor survey is required in order to satisfy LTCP criteria	Only known contamination is 11 feet bgs, too deep to require soil vapor survey.	Unknown at this time
8	Potential of receptors not yet identified	Perform site-specific Sensitive Receptor Survey including utility survey, updated well survey based on both ACPWA and DWR databases, evaluation of land use and exposure scenarios, and planned development activities in the vicinity.	These activities will determine whether there are any sensitive receptors that could be adversely affected by conditions at the Site in light of the planned development into mixed use residential. If there are, additional soil or groundwater sampling and/or a soil vapor survey will be required in order to satisfy LTCP criteria.	Unknown at this time



APPENDIX C

"Standard Field Procedures -
Soil Sample Collection and Preservation"

STANDARD FIELD PROCEDURES
GROUNDWATER MONITORING

The methods and procedures used by West & Associates Environmental Engineers, Inc. for groundwater sampling are described below. These procedures for groundwater sampling are designed to provide consistent and reproducible results and ensure that the overall objectives of the monitoring program are achieved.

The following documents have been used as guidelines for the development of these procedures:

- *Leaking Underground Fuel Tank Field Manual,* State of California Leaking Underground Fuel Tank Task Force (revised 1989, as updated by memoranda)
- *Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities* (EPA-530/SW-611, August 1997)
- *RCRA Groundwater Monitoring Technical Enforcement Guidance Document* (OSWER 9950.1, September 1986)
- *Standard Guide for Sampling Groundwater Monitoring Wells* (ASTM, D 4448-85a)
- *Standard Practice for Decontamination of Field Equipment Used at Nonradioactive Waste Sites* (ASTM, D 5088-90)
- *Standard Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well (Observation Well)* (ASTM, D 4750-87)
- *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA SW-846, Base Manual [3rd edition, November 1986], through Update III [June 1997])

HYDROLOGIC MONITORING

Before disturbing the water column, the static water level is measured in selected monitoring wells and piezometers.

The water level in wells and piezometers is measured with an electric depth to water gauge (DTWG) with cable markings at 0.01-foot increments. The water level is measured by lowering the sensor in to the monitoring well.

The DTWG is equipped with both visual and audible alarms. A sensitivity control compensates for very saline or conductive water. The electric sounder is decontaminated by washing with a detergent solution then rinsed with deionized water after each use. Depth to water is recorded to the nearest 0.01 foot on a field data form. The groundwater elevation at the monitoring well is calculated by subtracting the measured depth to water from the surveyed elevation of the top of the well casing. A witness mark on the casing is used as a fixed reference for make the depth to groundwater measurement.

FREE PHASE PRODUCT MEASUREMENT

The level and thickness of free phase floating hydrocarbon product in a well is measured using an interface meter and/or a clear bailer. The interface meter works on a principal similar to the electric DTWG, measuring both conductive and non-conductive liquid within the well. Floating product can also be measured using a clear, bottom-filling bailer. The bailer is lowered slowly in to the well until the bailer is approximately half submerged. The bailer is then retrieved from the well and the thickness of floating product in the bailer is measured. The thickness of floating product is recorded to the nearest 0.01 foot on the field data record form.

TOTAL WELL DEPTH

Total well depth is measured in monitoring wells Scheduled for sampling by lowering a probe to the bottom of the well and recording the depth. Total well depth, used to calculate purge volumes and to determine whether the well screen is partially obstructed by silt, is recorded to the nearest 0.1 foot on the Field Data Record form.

GROUNDWATER SAMPLE COLLECTION

Groundwater sample collection procedures include equipment cleaning, well purging, and sampling.

Equipment Cleaning

Before sampling event all downhole equipment, or items which come in contact with groundwater, are dissembled and cleaned thoroughly with detergent solution and then rinsed with deionized water. Any parts that may absorb contaminants, such as plastic pump valves, bladders, etc., are cleaned or replaced.

For electric submersible pumps used for well purging, all external pump surfaces and the discharge tube are cleaned prior to lowering the pump in to the water column. An aqueous solution of Liquinox (phosphate-free detergent), followed by deionized water, is run through the pump and discharge tubing to clean internal surfaces. Water is prevented from draining back through the pump by an inline check valve located immediately above the pump.

Monitoring Well Purging

Before sampling, standing water in the casing and sand pack is purged from the monitoring well using either a positive displacement polyvinyl chloride (PVC) hand pump, a portable or dedicated electric submersible pump, a PVC or polyethylene bailer, a centrifugal pump, a dedicated pneumatic bladder pump, or a peristaltic pump. Field measurements of pH, specific conductance, turbidity, and temperature are made at casing volume intervals during purging and recorded on field data sheets. The field measurements are used as indicator parameters to determine when a representative sample can be collected. Purging is generally performed until stabilization (± 10 percent variation) of the indicator parameters takes place. The amount of water purged before sampling is greater than or equal to three casing volumes, unless the well is dewatered. If a well dewaters during purging, it will be allowed to recharge for up to 24 hours; samples will be collected as soon as sufficient volume is available. If a well does not recharge sufficiently within 24 hours, the well will be considered dry for that sampling event.

Monitoring Well Sampling

Groundwater samples are collected using a Teflon bailer, an individually sealed disposable polyethylene bailer, a dedicated electric submersible or pneumatic bladder pump, or inline through a peristaltic pump with clean tubing. Wells are sampled in progression from "clean wells" to wells yielding poorer-quality water. The purpose of this procedure is to reduce the potential for cross contamination of wells by purging or sampling equipment.

Laboratory supplied clean glass bottles of a t least 40 milliliters volume fitted with Teflon-lined septa are used to collect samples for volatile organic analyses. These bottles are completely filled to prevent air from remaining in the container. A positive meniscus forms when the bottle is completely full. A convex Teflon®-lined septum is placed over the positive meniscus to eliminate air. After capping, the bottles are inverted and tapped to verify that they do not contain air bubbles. The sample containers for other parameters are filled, filtered as required, and capped.

To determine dissolved concentrations of metals, appropriate field filtration techniques are used. When using a bailer for sampling, a transfer vessel is filled with sample and fitted with a disposable 0.45-micron acrylic copolymer filter. Air pressure is applied to the transfer vessel forcing the sample through the filter; the filtrate is then directed in to the appropriate containers. If a pump is used for sampling, the filter is placed inline at the end of the discharge tubing and the filtrate directed into the appropriate containers. Each filter is used once and discarded.

SAMPLE PRESERVATION AND HANDLING

The following section specifies sample containers, preservation methods, and sample handling procedures.

Sample Containers and Preservation

Sample containers and preservatives vary with each type of analytical parameter. Container types and materials are selected to be non-reactive with the particular analytical parameter tested. Sample preservatives used are consistent with regulatory guidelines and specified analytical methods.

Sample Handling

All sample containers are labeled immediately following collection. Samples are kept chilled with blue ice until received by the laboratory. At the time of sampling, each sample is logged on a chain-of-custody record which accompanies the samples to the laboratory. Water samples are transported from the site by the sampler.

Upon receipt of the samples by laboratory personnel, the chain-of-custody record is signed and released, and a unique sample identification number is assigned to each sample container. This number is recorded on the chain-of-custody record and is used to identify the sample in all subsequent internal chain-of-custody and analytical records. The manger of the subcontracted laboratory ensures that the holding times for requested analyses are not exceeded.

SAMPLE DOCUMENTATION

The following procedures are used during sampling and analysis to provide chain-of-custody control during sample handling from collection through storage. Sample documentation includes the use of the following:

- Standardized field data record forms to document sampling activities in the field
- Labels to identify individual samples
- Chain-of-Custody record sheets for documenting possession and transfer of samples

Water Sample Field Data Record Forms

In the field, the ampler records the following information on a standardized water sample field data record form:

- Location
- Project Number
- Client Name
- Sample ID

- Name of Sampler
- Regulatory Agency
- Date and Time
- Pertinent Well Data (e.g., casing diameter, depth to water, well depth)
- Calculated and Actual Purge Volumes
- Purging Equipment Used
- Sampling Equipment Used
- Appearance of Sample (e.g., color, turbidity, sediment)
- Results of Field Analyses (e.g., temperature, pH, specific conductance)
- Purge Water Containment
- General Remarks, Including Well Accessibility and Integrity

The sampler signs the field data sheets.

Labels

Sample labels contain the following information:

- Project Number
- Sample ID (e.g. well designation)
- Sampler's Initials
- Date and Time of Collection
- Type of Preservative Used

Sampling and Analysis Chain-of-Custody Record

The sampling and analysis chain-of-custody record, initiated at the time of sampling contains, but is not limited to, the well number, sample type, analytical request, date of sampling, and the name of the sampler. The record sheet is signed and dated by the sampler when transferring the samples. Custody transfers are recorded for each individual sample. The number of custodians in the chain of possession is dept to a minimum. A copy of the sampling and analysis chain-of-custody record is returned to West & Associates Inc. for inclusion with analytical results.

FIELD QUALITY ASSURANCE PROCEDURES

Field quality assurance procedures are specified for each sampling event. Field quality assurance typically includes documenting field instrument calibration, and collecting and analyzing trip blanks, field blanks, equipment blanks, and duplicate samples.

The analysis of trip, field, and equipment blanks, prepared with organic-free water, are used to detect contamination introduces through sampling procedures, external field conditions, sample transportation, container preparation, sample storage, and the analytical process.

Trip blanks are prepared at the same time and location as the sample containers for a particular sampling event. Trip blanks accompany the containers to and from that event, but at no time are they opened or exposed to the atmosphere. Typically, one trip blank for volatile organic parameters will be included per sampling event.

Field blanks are prepared in the field so they are exposed to the ambient atmosphere at a specified monitoring point during sample collection to determine the influence of the external field conditions on sample integrity. Equipment blanks are prepared in the field to ensure that sampling equipment does not cross-contaminate water samples. Organic-free water is run through the properly cleaned or unused (if disposable) sampling equipment, collected and analyzed. One field blank or equipment blank for volatile organic parameters will typically be included per sampling event.

Duplicate samples are collected to assess sampling and analytical precision. For each sampling event including more than six wells, duplicate monitoring well samples will typically be collected at a frequency of 10 percent. Where possible, field duplicates are collected at sampling points known or suspected to contain chemical constituents of interest. Duplicates are packed and shipped blind to the laboratory for analysis with the samples from that particular event.

SOIL SAMPLE COLLECTION AND PRESERVATION

Soil Borings

Undisturbed soil samples will be collected from open borings utilizing a hammer driven spilt spoon sampler fitted with new stainless steel or brass sleeves.

The spilt spoon sampler will be decontaminated between samples by a triple rinse procedure: 1.) Alconox solution, 2.) Water rinse, and 3.) Distilled water rinse.

Soil samples selected for analysis will be immediately capped and labeled. The capped sample sleeve will then be placed in a closed zip lock plastic bag.

Bagged samples will be immediately placed in an ice chest containing water ice or dry ice. Soil samples will be kept in a chilled state until transfer to the testing laboratory.

All soil samples for chemical analysis will be entered on a chain of custody form in the field which will accompany the complete sample set.

Shallow Soil Samples

The tool used to collect shallow soil samples will be decontaminated with a triple rinse procedure between samples.

Soil samples will be tightly packed into a glass, Teflon lidded, jar. Alternatively, the soil sample may be tightly packed into a brass or stainless steel sample sleeve.

Samples will be immediately sealed, labeled and placed into a closed zip lock plastic bag.

Bagged samples will be immediately placed in an ice chest containing water or dry ice. Soil samples will be kept in a chilled state until transfer to the testing laboratory.

All soil samples for chemical analysis will be entered on a chain of custody form in the field which will accompany the complete sample set.

LABORATORY PROCEDURES

West & Associates Environmental Engineers, Inc. specifies analytical methods and procedures to ensure that proper analytical methods are applied; analytical results are accurate, precise and complete; and the overall objectives of the monitoring program are achieved.

Samples are analyzed in accordance with accepted analytical procedures by laboratories certified by the California Department of Health Services. The following publications are the primary references for analytical procedures:

- *Leaking Underground Fuel Tank Field Manual,* Stat of California Leaking Underground Fuel Tank Task Force (revised 1989, as updated by memoranda)
- *Methods for Chemical Analysis of Water and Wastes* (EPA 600/4-79-020, Revised March 1983)
- *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA 821-B-96-005)
- *Standard Methods for the Examination of Water and Wastewater,* APHA, AWWA, WPCF, 20th edition.
- *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA SW-846, Base Manual [3rd edition, November 1986], through Update III [June 1997])

LABORATORY QUALITY ASSURANCE PROCEDURES

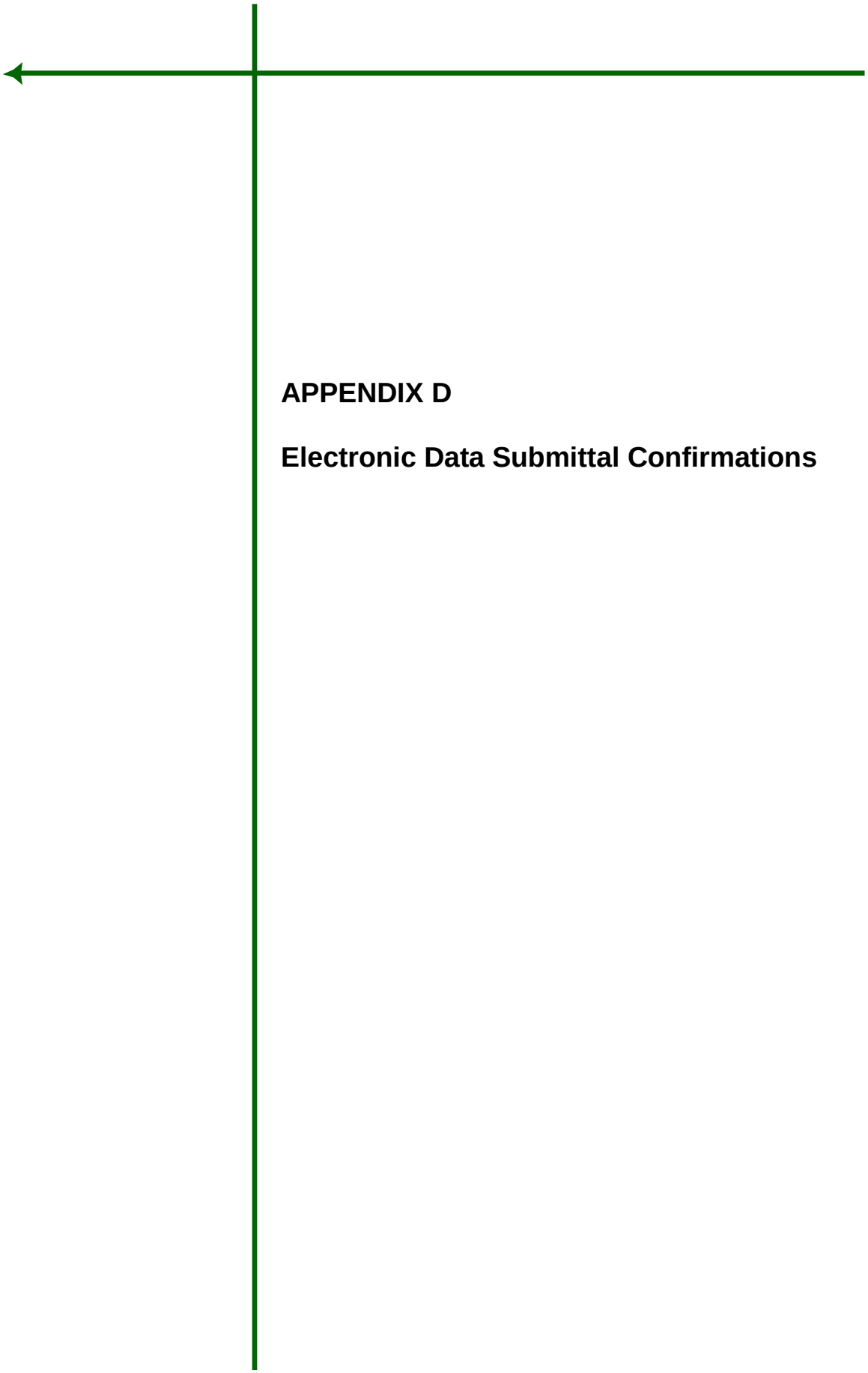
Laboratory quality assurance (QA) procedures include those required under the DTSC hazardous waste testing program. Laboratory-specific procedures are included in the laboratory's QA manual, including the use of method blanks, surrogate spikes, matrix spikes and matrix spike duplicates.

Method blanks are analyzed daily to assess the effect of the laboratory environment on the analytical results. Method blanks are performed for each parameter analyzed.

Each sample analyzed for organic parameters contain surrogate spike compounds. The surrogate recovery is used to determine if the analytical instruments are operating within limits. Surrogate recoveries are compared to control limits established and updated by the laboratory based on its historical operation.

Matrix spikes are analyzed at a frequency of approximately 10 percent. Matrix spike results are evaluated to determine whether the sample matrix is interfering with the laboratory analysis and provide a measure of the accuracy of the analytical data. Matrix spike recoveries are compared to control limits established and updated by the laboratory based on its historical operation.

Laboratory quality control (QC) data are included with the analytical results. This QC data includes method blanks, surrogate spike recoveries (for organic parameters only), matrix spike recoveries, and matrix spike duplicates.



APPENDIX D

Electronic Data Submittal Confirmations