**RECEIVED**
*By Alameda County Environmental Health at 11:06 am, Sep 22, 2014*

# REMEDIAL DESIGN AND IMPLEMENTATION PLAN

## FORMER GROVE STREET WASH RACK SITE
## 3884 MARTIN LUTHER KING JUNIOR WAY
## OAKLAND, CALIFORNIA

*Prepared for*

**Neil Cotter and John Coyle**
**2847 Arguello Drive**
**Burlingame, California 94010**

*Prepared by*

URS

**URS Corporation**
Post Montgomery Center
One Montgomery Street, Suite 900
San Francisco, CA 94104

September 2014

# CERTIFICATION

## Remedial Design and Implementation Plan
## Former Grove Street Wash Rack Site
## 3884 Martin Luther King Junior Way
## Oakland, California

### September 2014

This report has been prepared by the staff of URS Corporation and has been reviewed and approved by the professionals whose signatures appear below.

The findings, conclusions, or professional opinions are presented, within the limits prescribed by the client, after being prepared in accordance with generally accepted geological and engineering practice in Northern California at the time this report was prepared. No other warranty is either expressed or implied.

**URS CORPORATION AMERICAS**

Erik Skov, P.G., C.H.G.
Senior Geologist

Jil Finnegan, P.E.
Environmental Engineer

Mr. Neil and Mrs. Mary Cotter
John and Antoinette Coyle
2847 Arguello Drive
Burlingame, CA 94010

September 18, 2014

Ms. Karel Detterman
Alameda County Environmental Health Services
1131 Harbor Bay Parkway

Subject: Responsible Party Perjury Statement for Remedial Design Implementation Plan, Former Grove Street Wash Rack Site, 3884 Martin Luther King Jr. Way Oakland, California (Fuel Leak Case RO000027 and Global ID # T0600102106)

Dear Ms. Detterman:

Attached for your review please find the URS Site Investigation Data Report with the results of the soil and groundwater investigation at the above referenced site.

I declare under penalty of perjury that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

Sincerely,

Neil and Mary Cotter ____________________ 9/18/14

John and Antoinette Coyle ____________________ 9/18/14

September 18, 2014

Ms. Karel Detterman
Alameda County Environmental Health Services
1131 Harbor Bay Parkway

Subject: Responsible Party Perjury Statement for Remedial Design Implementation Plan, Former Grove Street Wash Rack Site, 3884 Martin Luther King Jr. Way Oakland, California (Fuel Leak Case RO000027 and Global ID # T0600102106)

Dear Ms. Detterman:

Attached for your review please find the URS Site Investigation Data Report with the results of the soil and groundwater investigation at the above referenced site.

I declare under penalty of perjury that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

Please contact me at 415-243-3878 or at kali.futnani@urs.com should you have any questions or require any clarifications.

Sincerely,
URS CORPORATION

Kali Futnani
Environmental Scientist/ Project Manager

**TABLE OF CONTENTS**

**Page**

**Figures**

## 1.0 INTRODUCTION

This Remedial Design and Implementation Plan (RDIP) was prepared by URS Corporation (URS) on behalf of Neil Cotter and John Coyle and presents the design for implementation of the site remedy described in the approved Feasibility Study/Corrective Action Plan (FS/CAP) for the former Grove Street Wash Rack located at 3884 Martin Luther King Junior Way (Site) in Oakland, California (Figure 1). The FS/CAP was conditionally approved by Alameda County Environmental Health (ACEH) on October 24, 2013 contingent on successful completion of a public participation comment period and submittal of an RDIP in accordance with technical comments. The public participation period concluded with no comments: the ACEH therefore considers the FS/CAP to be final as noted in their December 24, 2013 letter.

### 1.1. Feasibility Study / Corrective Action Plan

The FS/CAP was developed in October 2013 at which time the plans for redevelopment of the Site include the construction of a subterranean parking garage, commercial businesses and additional parking on the ground floor, and residential housing above. The selected alternativefrom the FS/CAP, therefore, assumed that the first 12 feet of Site soil would have been excavated as part of the parking garage construction. However, plans for sale of the development were not completed and the proposed development was not constructed. There is currently no pending development for the Site. However, the owners of the Site are going ahead with the implementation of the selected Site corrective action as presented in the FS/CAP. As such, this RDIP also addresses excavation and handling of soil previously anticipated to have been removed from the proposed remedial area prior to implementation of corrective action activities.

### 1.2. Site Location and Historical Uses

The Site is located in a mixed commercial and residential area in the City of Oakland, California. It occupies approximately 10,250 square feet, and is identified as Assessor's Parcel Number (APN) 012-0968-31. The property is currently zoned for residential use.

The Site is bordered by the following:

- North: 39th Street, followed by a retail business;
- East: the Highway 24 right-of-way, followed by the MacArthur BART station;
- South: a multi-story commercial/residential building; and
- West: Martin Luther King Junior Way (MLK Jr. Way), followed by residential and vacant properties.

The Site is the former location of the Grove Street Wash Rack and Lucky's Auto. Known historical Site uses include the following:

- A gas station operated on the Site in the 1950s and 1960s. Three underground storage tanks (USTs) from the gas station were removed on January 5, 1995 (Figure 2).
- An auto body shop operated on the eastern portion of the Site until at least 2004.

A fuel and feed store and fuel yard operated at the adjacent parcel to the south (3860 MLK Jr. Way) from the 1930s to the 1950s. A lumber store and warehouse operated on the parcel in the 1960s, but the business closed and the buildings were demolished in 1971. The adjacent parcel was redeveloped into a multi-story residential and commercial building in 2006.

The Site is currently not in use. The former Site buildings have been demolished, and only concrete pads and paved areas remain on the Site, with the exception of a large advertising billboard located in the western corner of the parcel. The Site is secured with a chain link fence and locking gate.

### 1.3. Purpose of Plan

The purpose of this RDIP is to present the design and implementation procedures for the selected alternative in the FS/CAP. The selected corrective action for soil is source removal consisting of excavation of soil containing total petroleum hydrocarbons as gasoline (TPH-g) and/or benzene, as well as other fuel related constituents, and off-haul of excavated soil to a licensed landfill in order for the Site to be considered for closure under the State Water Resources Control Board (SWRCB), Low Threat Underground Storage Tank Case Closure Policy (LTCP).

The selected corrective action for groundwater is in-situ chemical oxidation (ISCO) using RegenOxTM, a sodium percarbonate-based chemical oxidant, and Oxygen Release Compound (ORC) Advanced® pellets, a controlled-release oxygen source for the enhanced aerobic biodegradation of petroleum hydrocarbons.

## 2.0 CLEANUP GOALS

### 2.1. Soil

The remedial alternative for soil selected in the FS/CAP is excavating soil containing TPHg and/or benzene above specified cleanup goals (i.e., 500 micrograms per kilogram [ug/kg] and 740 ug/kg, respectively). The cleanup goals are based on the State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels, Table D (SWRCB, 2013).

## 2.2. Groundwater

The remedial approach for groundwater includes source removal and ISCO followed by groundwater performance monitoring. Groundwater cleanup will be evaluated in accordance with the Groundwater Specific Criteria contained in the SWRCB LTCP.

# 3.0 SITE ENVIRONMENTAL CONDITIONS

A detailed presentation of known Site environmental investigations conducted to date and the resulting soil and groundwater data are provided in the FS/CAP. The following is a summary of the same information. This data is also presented graphically on Figures 2 through 10.

## 3.1. Summary of Previous Investigations

### 3.1.1. 1995 UST Removal

A limited soil sampling was conducted during the removal of three Site USTs in 1995. One soil sample was collected from each of the excavated UST pits, and analytical results indicated detectable concentrations of total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethylbenzene, and xylenes (BTEX), and lead. Soil sample results are presented on Figure 2.

### 3.1.2. 2004 URS Investigation

In 2004, URS performed a soil and groundwater investigation at the Site and then adjacent adjoining property to the southwest under the Department of Toxic Substances Control (DTSC) Brownfield's and Remediation Program. The investigation included the collection and analysis of 19 surface soil samples, 57 subsurface soil samples, 10 grab groundwater samples, 3 off-site background surface soil samples, 6 duplicate soil samples, and 1 duplicate grab groundwater sample. URS submitted samples for analysis for volatile organic compounds (VOCs), TPH-g, semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), herbicides, pesticides, asbestos (in soil), lead (in water), TPH as motor oil (TPH-mo [in water]), and pH. The soil and grab groundwater sample locations and analytical results are shown graphically on Figures 3 and 4.

In general, the soil analytical results indicate soil beneath the former USTs has been impacted with TPH in the gasoline range (C6-C12), diesel range (C9-C25), and motor-oil range (C24-C40); however, there are low levels of TPH concentrations throughout the Site.

VOCs were analyzed from subsurface soil samples at 1, 3.5, and 10 or 14 feet below ground surface (bgs) at all boring locations. Elevated concentrations of benzene were detected in the 10 and 14 foot soil samples collected from the former UST locations.

VOCs were present in every grab groundwater sample collected from the Site, and one sample collected from the lot adjacent to the south.

### 3.1.3. 2006 John Carver Consulting Investigation

John Carver Consulting (JCC) advanced eight additional boreholes at the Site in 2006 to collect soil and grab groundwater samples. Soil samples were generally collected at 5, 10, and 12, 14, or 15 feet bgs. Samples were analyzed for TPH-g, fuel oxygenates, and BTEX. The JCC investigation results were generally consistent with the URS 2004 investigation results: elevated concentrations of TPH-g and benzene above the cleanup goals were present in soil samples from 12 and 14 feet bgs primarily on the northwestern portion of the Site adjacent to the former USTs; and lower concentrations were present across the western portion of the Site. Concentrations of TPH-g in grab groundwater samples ranged from non-detect (below the laboratory reporting limit) to 79,800 µg/L. Benzene concentrations were generally consistent with the TPH-g concentrations, and ranged from non-detected to 17,600 µg/L. JCC sample locations and data are presented on Figures 5 and 6.

### 3.1.4. 2013 URS Investigation

URS conducted an additional investigation in 2013 that focused on Site soil at depths greater than 12 feet bgs. The objectives of the investigation were to assess potential areas of concern that might warrant remediation after completion of the construction excavation for the planned underground garage associated with previously proposed site redevelopment.

Soil analytical results are shown on Figures 7 and 8. The highest TPH-g concentrations observed were in the vicinity of UST #3 (1,400,000 µg/kg and 77,000 µg/kg) at depths of 16 and 15 feet bgs, respectively. The soil sample collected from MW-4 at 16 feet bgs was found to have a TPH-g concentration of 2,700,000 µg/kg. These sample locations also coincided with the highest BTEX concentrations found on the Site. It should be noted that groundwater is encountered at approximately 15 to 16 feet bgs at these locations, so that these soil samples were collected from the saturated zone. The deeper interval TPH-g sample concentrations from these locations at 20 feet bgs were either non-detect or significantly lower.

Soil samples collected from beneath the sidewalk in the vicinity of USTs #1 and 2 did not show elevated TPH-g or BTEX concentrations between 12 and 20 feet bgs. However, the sample collected at 7 feet bgs from the MW-1 boring was found to have a concentration of 750,000 µg/kg. This sample was collected based on elevated PID readings and odors observed at this depth interval.

Figure 9 shows the monitoring well locations and analytical results. The highest concentrations of contaminants in the groundwater monitoring wells were observed in MW-4, with TPH-g at 13,000 µg/l (duplicate sample) and benzene at 1,100 µg/l, also from the duplicate sample. The concentrations of toluene, ethyl benzene, and xylenes were also elevated at this location. Elevated TPH-g and benzene concentrations were also observed in the downgradient well MW-2 (560 µg/l and 220 µg/l, respectively). There were no detections of TPH-g or BTEX in monitoring wells MW-1, MW-3, and MW-5.

Grab groundwater data (Figure 10) is qualitative only, and tends to be biased high, as grab samples typically have a higher sediment loading than samples collected from a developed and purged monitoring well. The grab groundwater sample collected from SB-6, adjacent to MW-4, showed elevated TPH-g and BTEX levels—the TPH-g concentration (150,000 µg/l) being approximately ten times the TPH-g concentration observed in MW-4. The grab sample collected from SB-9 was found to have elevated TPH-g and BTEX concentrations with a TPH-g concentration of 19,000 µg/l.

### 3.2. Groundwater Gradient

Based on October 2013 and July 2014 groundwater gauging, groundwater beneath the site flows to the west at an approximate gradient of 0.02 to 0.008. Figure 11 presents the July 2014 elevation and gradient information. It should be noted that the groundwater elevation from MW-5 was considered anomalous and was not included in generating the groundwater elevation contour map.

## 4.0 CORRECTIVE ACTIONS

This section describes the corrective actions to be implemented to address contaminated soil and groundwater at the Site. Implementation and sequencing of these remedial actions are described in Section 5.

### 4.1. Soil Excavation

Excavation will address contaminated soil between 12 and 18 feet bgs as source removal. Soil shallower than 12 feet bgs in the area of proposed excavation will be excavated, stockpiled, sampled, and managed onsite for potential reuse as backfill following the completed excavation as described in more detail below.

#### 4.1.1. Excavation and Shoring

The excavation area (AOC-1) shown in Figure 12 was developed to achieve the cleanup for TPH-g and benzene for the Site. The approximate 53-foot by 53-foot planned remedial excavation extends down to 18 feet bgs.

The excavation will be shored in accordance with plans to be developed by a California-licensed engineer on behalf of the selected Corrective Action Contractor. The location of anticipated shoring is shown on Figure 13 and is likely to consist of either a sheet pile or lag and beam system. All shoring designs will be submitted to and approved by the City of Oakland as part of the permitting process.

The top 12 feet of overburden will be excavated, stockpiled on site, and sampled for evaluation and reuse as backfill. Overburden soil suspected of being impacted based on existing analytical data, observed staining, or odor will be stockpiled on-site and managed separately from soil without known or observed impacts. All stockpiled overburden soil will be sampled and soil that exceeds the project cleanup goals will be disposed of off-site at a licensed landfill facility. Overburden soil that does not exceed the cleanup goals will be reused as backfill.

Following removal and stockpiling of the overburden, soil from between 12 and 18 feet bgs will be excavated and stockpiled onsite on visqueen for subsequent sampling and disposal profiling. Groundwater is anticipated to be encountered at approximately 14 feet bgs. As such, soil from the top two feet of the remedial excavation is anticipated to be dry while the lower 4 feet of soil will likely be saturated. Saturated soil will be stockpiled on visqueen and allowed to free drain back into the excavation. Dry remedial excavation soil will be mixed with the drained remedial excavation soil until the material meets disposal facility moisture requirements as determined by a paint filter test.

#### 4.1.2. Waste Management

Waste management will include management of materials generated from clearing and debris removal, demolition of existing asphalt and concrete paving and pads, and excavation of soil. Waste materials generated during soil excavation activities are anticipated to include soil, personnel protective equipment (PPE), and miscellaneous construction debris.

#### 4.1.3. Backfilling

Following placement of ISCO products as described in Section 4.2 below, the excavation will be backfilled with an estimated 4 feet of gravel to bridge the groundwater. A geotextile filter fabric will be placed on top of the gravel and the excavation will be backfilled to grade using overburden material meeting the site cleanup goals and imported backfill as needed to complete the backfill.

#### 4.1.4. Drainage

Following backfilling, the site will be minimally graded to direct surface flow across the remediated area towards the interior of the Site. Perimeter sediment controls such as straw wattles will be installed along the northern and western edges of the remedial area to capture and contain Site sediment.

## 4.2. GROUNDWATER TREATMENT

### 4.2.1. In-situ Chemical Oxidation

ISCO followed by application of enhanced bioremediation augmentation materials and performance monitoring was selected as the preferred treatment alternative for groundwater remediation at the Site.

The selected alternative uses a two-phase approach; in situ chemical oxidation (ISCO) using RegenOx™, a sodium percarbonate-based chemical oxidant and ORC Advanced® pellets, a controlled-release oxygen source for the enhanced aerobic biodegradation of petroleum hydrocarbons. The intent is to conduct short-duration ISCO to oxidize the majority of the material in the saturated zone over an approximately 7-day period, and then to enhance aerobic bioremediation of petroleum hydrocarbons in the groundwater by the addition of ORC Advanced®. The ORC Advanced® is effective in the subsurface for approximately 1 year.

ORC Advanced® Pellets are a pelletized version of Regenesis' ORC Advanced® that are designed specifically for direct application into excavations, tank pits and trenches. This pelletized, dry application material minimizes airborne dust while eliminating the need for specialized equipment and spray water required for powder-slurry applications. The pellets are approximately 3-10 mm in size.

The primary function of ORC Advanced® pellets is to provide a controlled-release oxygen source for the enhanced aerobic bioremediation of petroleum hydrocarbons or other aerobically degradable compounds. This product is designed to slow the reaction that releases oxygen upon hydration, producing an optimized, controlled-release of oxygen over a period of up to 12 months. The pellets deliver up to 15 percent active oxygen by weight and contain micro-nutrients such as: nitrogen, phosphorous, and potassium which are beneficial to aerobic biodegradation processes.

RegenOx™ is a binary system consisting of a percarbonate oxidant (Part A) and an iron-containing activator (Part B). Once in the subsurface, RegenOx™ produces a cascade of efficient oxidation reactions via a number of mechanisms including: surface mediated oxidation, direct oxidation and free radical oxidation.

### 4.2.2. Performance Monitoring Plan for Groundwater

Following completion of the remedial excavation and backfilling, performance monitoring will be conducted to evaluate the effectiveness of the ISCO. Additional detail of the performance monitoring is provided in Section 7.

## 5.0 REMEDIATION IMPLEMENTATION

This section describes the means and methods needed to implement this RDIP. All corrective action activities will be performed by California-licensed contractors under the supervision of URS. Work will be performed in accordance with an approved Health and Safety Plan.

### 5.1. Permits

The contractor will be responsible for obtaining all necessary and required permits to complete the shoring and excavation from the City of Oakland. A well destruction permit for monitoring well MW-4 will be obtained from the Alameda County Public Works Agency (ACPWA) as this well will be destroyed during excavation activities.

Encroachment and street closure permits for 39th Street and for the sidewalk along Martin Luther King Jr. Way immediately adjacent to the Site are anticipated as the area within the fenced Site is not sufficient for stockpiling of all excavated overburden and remedial excavation soil, and equipment and truck staging and movement.

The shoring permit will require the services of a California-licensed engineer and possibly a Site soils report. A detailed shoring design will be submitted to the City of Oakland to support the Shoring Permit application.

### 5.2. Utilities

There are no known active utilities within the limits of the corrective action excavation area. The contractor will use a private utility locator to mark any utilities in the immediate vicinity of the remedial area and will obtain an underground service alert ticket at least 48 hours prior to any ground disturbing activities.

### 5.3. Site Preparation

This section describes the activities to be performed to prepare the Site for shoring, excavation, and stockpiling. If the contractor determines that the existing chain link fence abutting the remedial excavation must be removed to install the shoring and complete the excavation, a temporary chain-link fence will be installed to separate the Site excavation from the adjacent sidewalks and public. Windscreen fabric or other material may be attached to the temporary fencing as a visual barrier.

#### 5.3.1. Work and Stockpile Areas

Figure 12 presents a conceptual Site layout plan. However, the final Site layout plan will be the responsibility of the Corrective Action Contractor. Stockpile areas will be managed so that clean overburden soil is segregated from remedial excavation soil and so that water free draining from the saturated remedial excavation soil can drain back into the open excavation.

### 5.3.2. Air Monitoring

Perimeter and worker air monitoring will occur in accordance with a project-specific Health and Safety Plan to be developed prior to initiation of Site remedial activities.

### 5.3.3. Site Clearing and Debris Removal

Prior to excavation, the excavation foot print and stockpile areas will be cleared of obstructing features. Existing concrete foundations and/or asphalt paving within the excavation footprint will be removed and disposed of or recycled at an appropriate facility.

### 5.3.4. Monitoring Well Destruction

Monitoring Well MW-4 lies within the footprint of the remedial excavation and will be destroyed as part of the corrective action. As indicated previously, a well destruction permit will be required from the ACPWA.

### 5.3.5. Erosion and Sediment Control

Erosion control measures will be implemented to control incidental run-off from the excavation area, as necessary. Sand bags or gravel bags will be placed around all vicinity storm drain inlets. Erosion and sediment control materials including straw wattles and silt fence will be stored onsite for installation as needed during the course of the project.

All stockpiles will be covered with visqueen or equivalent type material at the end of daily activities in order to mitigate fugitive dust emissions from the Site. Stockpiles uncovered for the addition of material will be kept sufficiently wet to minimize the generation of dust.

### 5.3.6. Personnel Decontamination

All personnel exiting the work areas will decontaminate and remove personal protective equipment (PPE) at the personnel decontamination station(s) established adjacent to the work areas. Personnel will follow decontamination procedures described in an approved Health and Safety Plan. Boot wash water will be placed back in the excavation. Used PPE such as gloves and work coveralls will be discarded and placed in containers for disposal as regular municipal waste.

### 5.4. Excavation Activities

Excavation and management of the soil will be performed by a California-licensed hazardous waste removal contractor. Personnel on site will observe Occupational Health and Safety Administration (OSHA) safety standards and will follow the approved Health and Safety Plan which will address safety issues associated with proposed Site activities.

#### 5.4.1. Shoring

The shoring type, design, and installation method will be developed by the Corrective Action Contractor, or their appointed subcontractor, for approval by the City of Oakland as part of the permitting process. Shoring is anticipated to be installed immediately beyond the 53-foot by 53-foot excavation limits as shown on Figure 13. The type and location of the shoring may be partially dependent on the contractor's site layout. It is anticipated that the shoring will consist of either a sheet pile or lag and beam system

#### 5.4.2. Excavation Perimeter Control

The perimeter of the excavation will be protected by a perimeter railing or other barrier to prevent falls into the excavation. This barrier must be compliant with all applicable OSHA safety standards.

#### 5.4.3. Excavation and Stockpiling

Soil within the approximate 53-foot by 53-foot remedial excavation footprint will be excavated to a depth of 18 feet bgs as measured from the adjacent ground. The final depth will be measured and recorded on each of the four sides of the excavation. Conventional heavy earthwork equipment will be used to excavate, handle, and load excavated soil.

The top 12 feet of overburden will be stockpiled on-site and will be sampled for TPH-g, TPH-d, TPH-mo, and VOCs (including benzene), and soil that exceeds the project reuse criteria for TPHg or benzene will be disposed of off-site at a licensed facility. One four-point composite sample will be collected for each approximate 100 cubic yards of stockpiled soil resulting in an estimated 17 samples. Overburden soil that meets the reuse criteria will be reused as backfill.

Following removal of the top 12 feet of overburden, soil from 12 to 18 feet bgs will be excavated and stockpiled for draining, mixing with dry soils (as needed to meet disposal facility moisture requirements), and disposal profile sampling. Samples will be analyzed for a suite of constituents required by the candidate landfill facility using a state-certified laboratory. Once the material is profiled and accepted for disposal, the soil will be loaded into trucks for transport to the disposal facility.

The Corrective Action Contractor will determine the best means of access into the excavation based on site constraints. However, it is anticipated that access to the excavation will be via an earthen access ramp with a suitable gradient for equipment to access the excavation area.

Dust-control measures will be implemented during excavation and soil moving activities in accordance with an approved Health and Safety Plan. Water for dust control will be applied in such a manner that run-off water will not travel outside the Site. The Corrective Action Contractor will be responsible for the supply of water used for dust suppression activities.

### 5.5. Soil Loading and Off-Haul

Stockpiled soil that has been profiled and accepted for disposal will be loaded into trucks for transport to the landfill facility. Loading zone locations may shift as the work progresses. Soil will be managed for dust control by wetting with water as necessary based on air monitoring measurements and physical conditions. If wetting with water is insufficient for dust control, soil stockpiles may have to be partially covered during soil load out activities.

All loaded trucks will pass through a truck decontamination station where soil will be removed from the fenders and the tires and the bed will be covered. Each loaded truck will leave the Site with a completed non- hazardous or hazardous waste manifest for transport to the landfill or recycling facility, in the case of recyclable materials (e.g. concrete and asphalt). Trucks and equipment are anticipated to enter and exit the Site via 39$^{th}$ Street but the contractor may revise the Site layout and the entry and exit location. The Corrective Action Contractor will provide required traffic control for entry and exit of equipment from the work area on to public streets.

### 5.6. In-situ Chemical Oxidation

Following completion of the remedial excavation, application of the RegenOx™ and ORC Advanced® Pellets will be conducted by mixing the amendments into the first 2 feet of backfill in the over-excavated area. A total of 4,150 lbs of RegenOx™ Part A, 1,800 lbs of RegeneOx™ Part B will be mixed into the 2 feet of 1 inch-minus gravel backfill and placed in the excavation. The excavation is expected to contain approximately 4 feet of water, since it extends below the water table. The RegenOx™ will treat the water in the pit. Approximately 1,160 lbs of ORC Advanced® Pellets will subsequently be distributed evenly throughout the excavation. Once all three products are in place, then the excavator bucket will be used to mix the products in place.

An estimated 450 cubic yards or gravel will be used in backfilling the deeper portion of the excavation in order to bridge the water table.

## 5.7. Excavation Backfill

The gravel will be placed to bridge the water table by approximately 4-6 inches and will be covered with a non-woven geotextile filter fabric. Adjacent lengths of fabric will overlap a minimum of 2 feet. Following placement of the geotextile, the excavation will be backfilled and compacted in 2-foot lifts to 95 percent relative compaction. Compaction will be achieved using conventional earth working equipment such as a power roller or sheep's foot roller. Compaction of each two foot lift will be verified with a nuclear density gauge in accordance with ASTM D2922 with at least one test per 750 square feet.

Import soil will be approved for use prior to transport to the Site and will be delivered to the Site and stored temporarily as needed before placement and compaction. As imported soil is unloaded from delivery trucks, it will be sprayed with water as necessary based on air monitoring measurements and physical conditions. If wetting with water is insufficient for dust control, stockpiled import soil will be covered with visqueen or equivalent type material.

Surface grades will conform to adjacent grade elevations and will direct surface flows toward the interior of the Site.

## 5.8. Post-Remediation Activities

Following completion of the backfill, the lateral extent of the site remediation excavation will be documented with an as-built survey.

# 6.0 GROUNDWATER PERFORMANCE MONITORING

Quarterly groundwater performance monitoring will be conducted until ACEH determines that groundwater contamination trends indicate that the remedy for AOC-1 is performing as intended. Monitoring will be conducted for a minimum of one year.

Groundwater performance monitoring wells have been installed as shown in Figure 12. Monitoring wells MW-6 and MW-7 were installed in the sidewalk downgradient of the Site, as shown on Figure 12. Monitoring well MW-8 was installed on the sidewalk across MLK. The wells were screened consistent with the existing groundwater monitoring wells. The new wells were developed and a baseline sampling conducted in accordance with the URS work plan (July, 2013).

Prior to any remediation, all groundwater monitoring wells will be sampled using the sampling methodology specified in the URS work plan (URS, 2013). All samples will be analyzed for TPH-g and BTEX. This sampling event will constitute the baseline sampling event in which subsequent groundwater performance monitoring will be compared. During excavation for the remedial action, groundwater monitoring well MW-4 will be destroyed in accordance with

Alameda County Public Works Agency regulations, as it falls within the excavation footprint. Performance monitoring will therefore be limited to monitoring wells MW-1, MW-2, MW-3, MW-5, MW-6, MW-7, and MW-8. For each quarterly sampling event these seven wells will be sampled and the samples analyzed for TPH-g and BTEX, in accordance with the URS work plan.

## 7.0 HEALTH AND SAFETY MONITORING

A project-specific Health and Safety Plan will be developed for the remediation work prior to the initiation of any field activities. Perimeter and personal air monitoring action levels will established and presented in the Health and Safety Plan.

## 8.0 SCHEDULE

The following schedule provides an overview of the expected durations of each of the key tasks.

| Task | Duration Months) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| Bidding/Award | | | | | | | | | | | | | | | | | | | |
| Permitting | | | | | | | | | | | | | | | | | | | |
| Remedial Excavation and Backfilling | | | | | | | | | | | | | | | | | | | |
| Performance Monitoring | | | | | | | | | | | | | | | | | | | |
| Acceptance | | | | | | | | | | | | | | | | | | | |

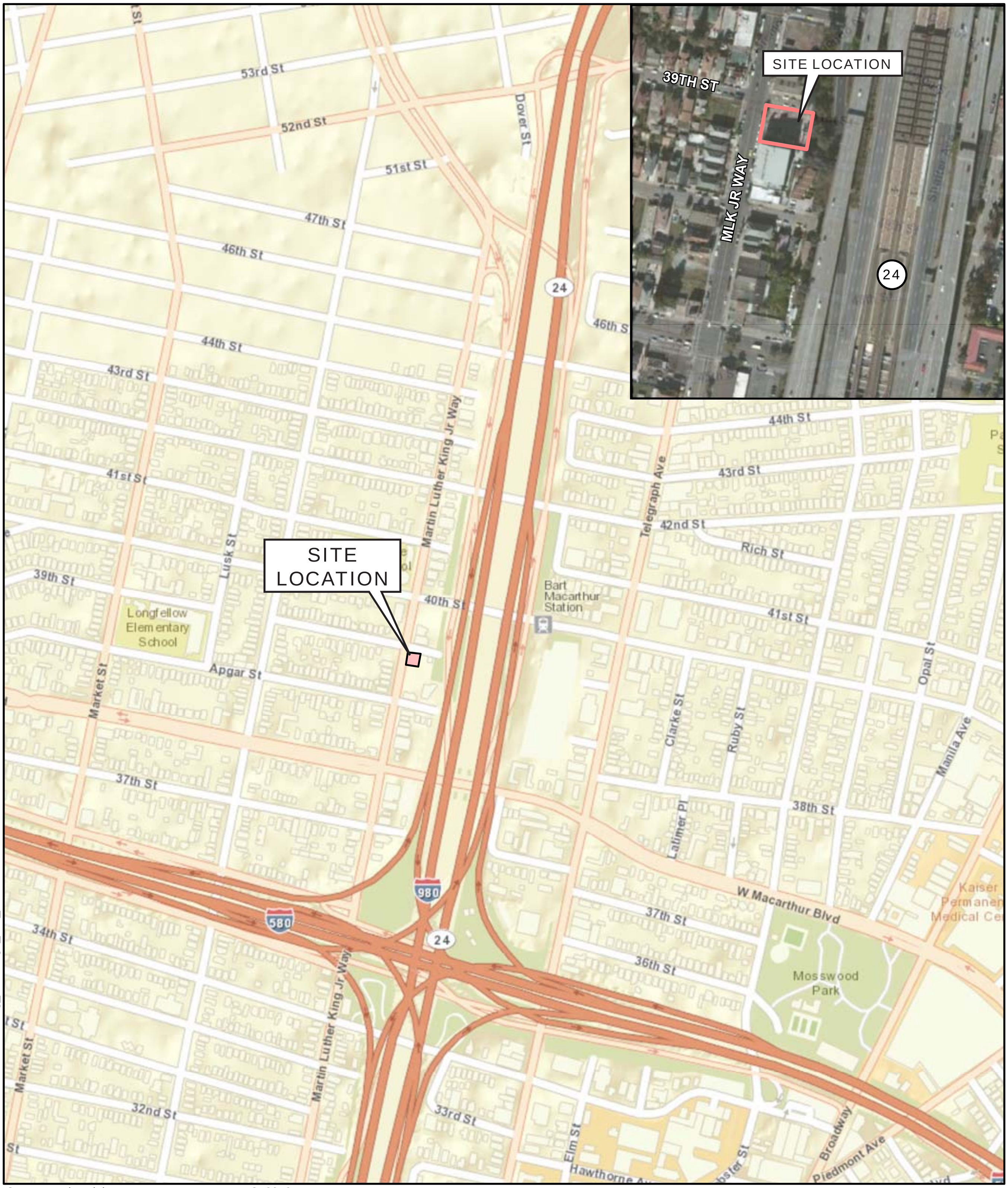
## 9.0 REFERENCES


State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, 2013. *Environmental Screening Levels, Table D (Deep Soils[>3m bgs]), Groundwater is not a Current or Potential Source of Drinking Water*. December.

URS, 2013a. *Site Investigation Work Plan, Former Grove Street Wash Rack Site, 3884 Martin Luther King Junior Way, Oakland, CA 94609.* September.

URS Corporation, 2013b. *Feasibility Study/Corrective Action Plan (FS/CAP), Former Grove Street Wash Rack Site, 3884 Martin Luther King Junior Way*. October.

## Figures




Source: Esri Aerial Inagery, DeLorme, NAVTEC, 2012

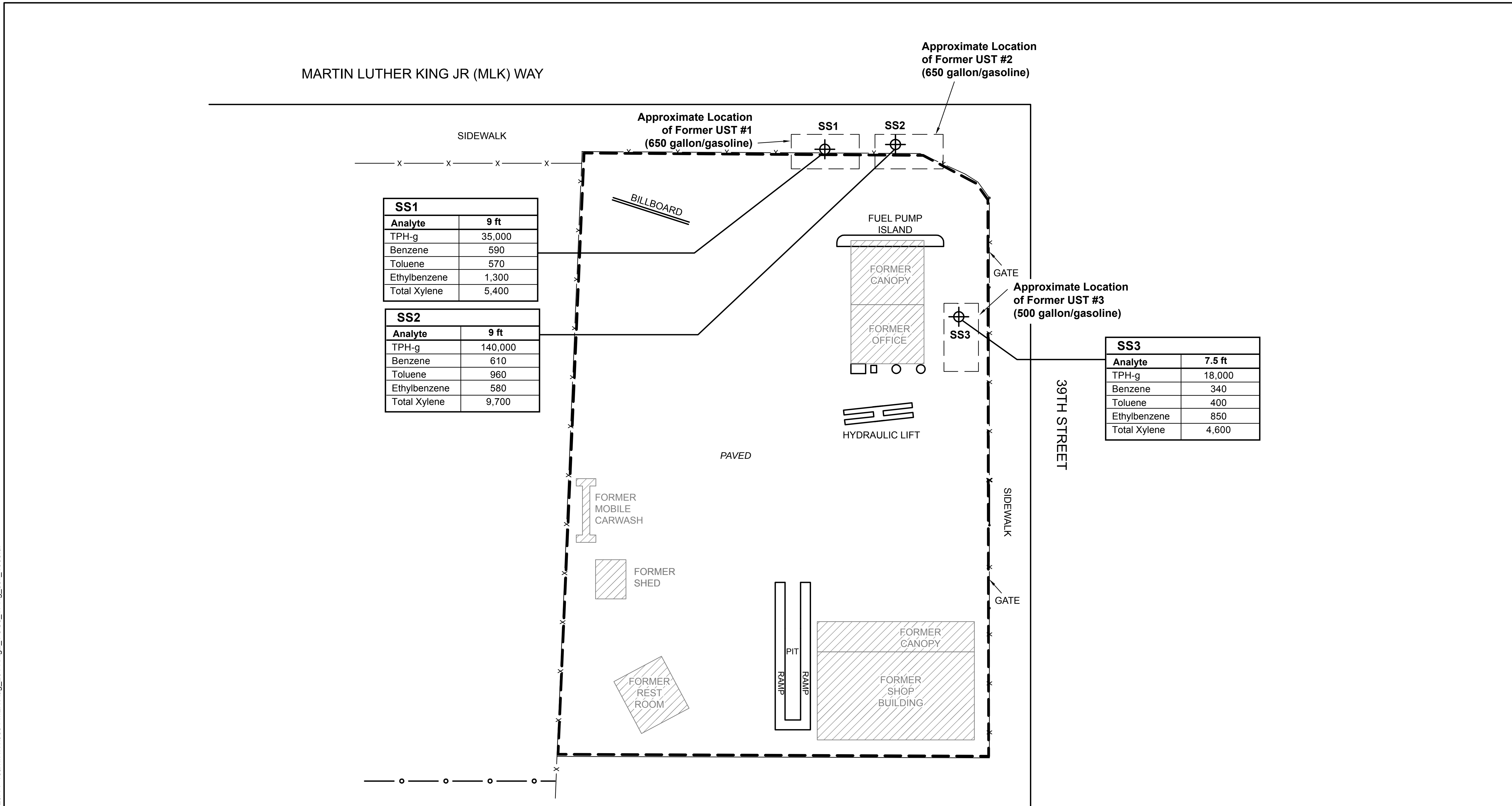
0 500 1000 FEET

## SITE LOCATION MAP

| | |
|---|---|
| September 2014 | 3884 Martin Luther King, Jr. Way |
| 28068161 | Oakland, California |

**FIGURE 1**

8/29/14 vsa/hk ..T:\3884 MLKAug_2014\Fig1_site_location.ai




**SS1**

| Analyte | 9 ft |
|---|---|
| TPH-g | 35,000 |
| Benzene | 590 |
| Toluene | 570 |
| Ethylbenzene | 1,300 |
| Total Xylene | 5,400 |

**SS2**

| Analyte | 9 ft |
|---|---|
| TPH-g | 140,000 |
| Benzene | 610 |
| Toluene | 960 |
| Ethylbenzene | 580 |
| Total Xylene | 9,700 |

**SS3**

| Analyte | 7.5 ft |
|---|---|
| TPH-g | 18,000 |
| Benzene | 340 |
| Toluene | 400 |
| Ethylbenzene | 850 |
| Total Xylene | 4,600 |

SS1 ⌖ Soil Boring Location, URS Geoprobe (2004)
Site Boundary
Chain Link Fence
Wood Fence

TPH-g Total Petroleum Hydrocarbon - Gasoline

Note:
All concentrations in micrgrams per kilogram (µg/kg)

Project North

0 10 20 FEET

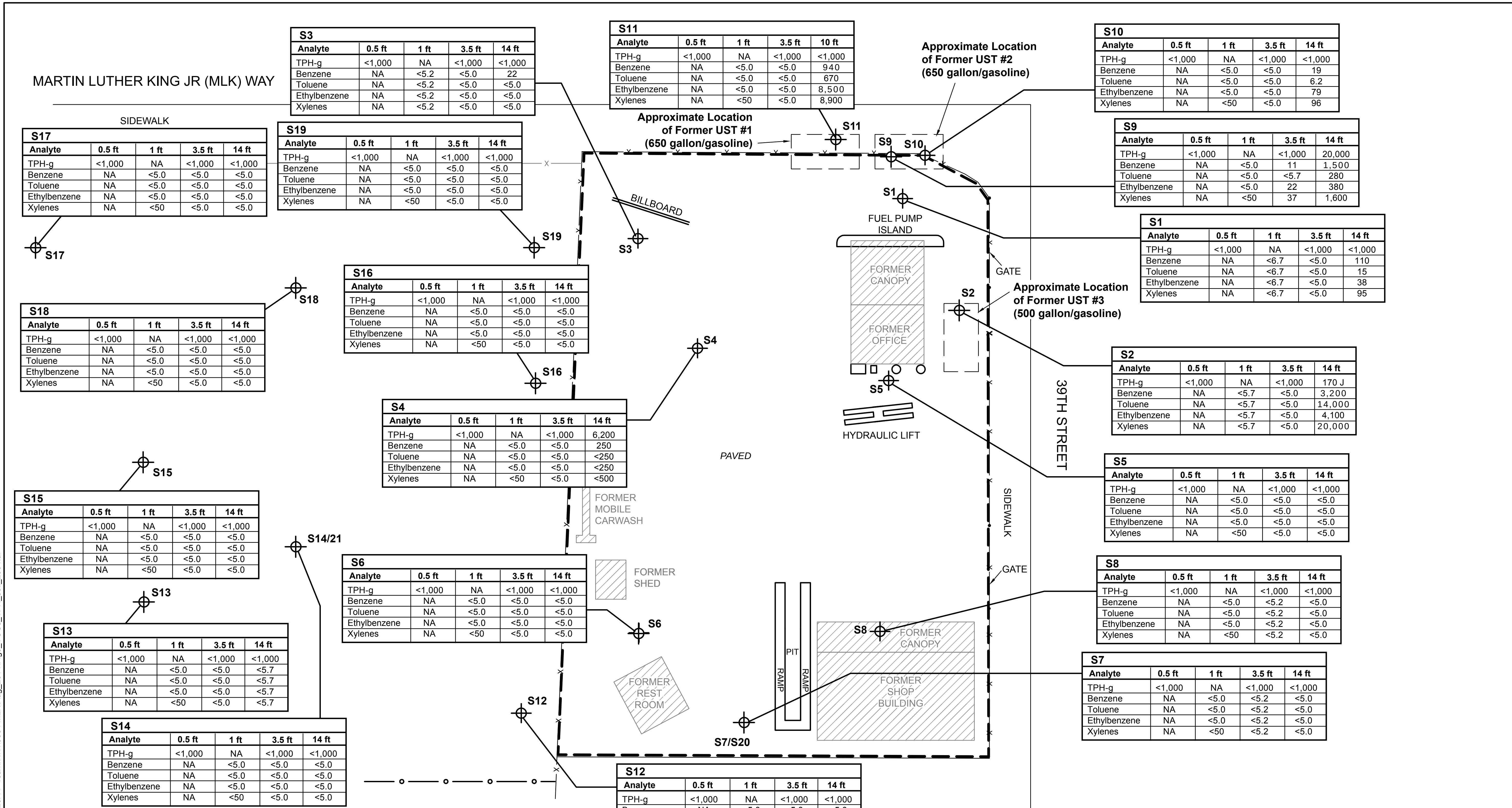
## VOCs AND TPH-g IN SOIL (µg/kg) – 1995

September 2014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

**FIGURE 2**




**S3**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.2 | <5.0 | 22 |
| Toluene | NA | <5.2 | <5.0 | <5.0 |
| Ethylbenzene | NA | <5.2 | <5.0 | <5.0 |
| Xylenes | NA | <5.2 | <5.0 | <5.0 |

**S11**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 10 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | 940 |
| Toluene | NA | <5.0 | <5.0 | 670 |
| Ethylbenzene | NA | <5.0 | <5.0 | 8,500 |
| Xylenes | NA | <50 | <5.0 | 8,900 |

**S10**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | 19 |
| Toluene | NA | <5.0 | <5.0 | 6.2 |
| Ethylbenzene | NA | <5.0 | <5.0 | 79 |
| Xylenes | NA | <50 | <5.0 | 96 |

**S17**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | <5.0 |
| Toluene | NA | <5.0 | <5.0 | <5.0 |
| Ethylbenzene | NA | <5.0 | <5.0 | <5.0 |
| Xylenes | NA | <50 | <5.0 | <5.0 |

**S19**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | <5.0 |
| Toluene | NA | <5.0 | <5.0 | <5.0 |
| Ethylbenzene | NA | <5.0 | <5.0 | <5.0 |
| Xylenes | NA | <50 | <5.0 | <5.0 |

**S9**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | 20,000 |
| Benzene | NA | <5.0 | 11 | 1,500 |
| Toluene | NA | <5.0 | <5.7 | 280 |
| Ethylbenzene | NA | <5.0 | 22 | 380 |
| Xylenes | NA | <50 | 37 | 1,600 |

**S1**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <6.7 | <5.0 | 110 |
| Toluene | NA | <6.7 | <5.0 | 15 |
| Ethylbenzene | NA | <6.7 | <5.0 | 38 |
| Xylenes | NA | <6.7 | <5.0 | 95 |

**S16**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | <5.0 |
| Toluene | NA | <5.0 | <5.0 | <5.0 |
| Ethylbenzene | NA | <5.0 | <5.0 | <5.0 |
| Xylenes | NA | <50 | <5.0 | <5.0 |

**S18**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | <5.0 |
| Toluene | NA | <5.0 | <5.0 | <5.0 |
| Ethylbenzene | NA | <5.0 | <5.0 | <5.0 |
| Xylenes | NA | <50 | <5.0 | <5.0 |

**S2**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | 170 J |
| Benzene | NA | <5.7 | <5.0 | 3,200 |
| Toluene | NA | <5.7 | <5.0 | 14,000 |
| Ethylbenzene | NA | <5.7 | <5.0 | 4,100 |
| Xylenes | NA | <5.7 | <5.0 | 20,000 |

**S4**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | 6,200 |
| Benzene | NA | <5.0 | <5.0 | 250 |
| Toluene | NA | <5.0 | <5.0 | <250 |
| Ethylbenzene | NA | <5.0 | <5.0 | <250 |
| Xylenes | NA | <50 | <5.0 | <500 |

**S5**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | <5.0 |
| Toluene | NA | <5.0 | <5.0 | <5.0 |
| Ethylbenzene | NA | <5.0 | <5.0 | <5.0 |
| Xylenes | NA | <50 | <5.0 | <5.0 |

**S15**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | <5.0 |
| Toluene | NA | <5.0 | <5.0 | <5.0 |
| Ethylbenzene | NA | <5.0 | <5.0 | <5.0 |
| Xylenes | NA | <50 | <5.0 | <5.0 |

**S6**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | <5.0 |
| Toluene | NA | <5.0 | <5.0 | <5.0 |
| Ethylbenzene | NA | <5.0 | <5.0 | <5.0 |
| Xylenes | NA | <50 | <5.0 | <5.0 |

**S8**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.2 | <5.0 |
| Toluene | NA | <5.0 | <5.2 | <5.0 |
| Ethylbenzene | NA | <5.0 | <5.2 | <5.0 |
| Xylenes | NA | <50 | <5.2 | <5.0 |

**S13**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | <5.7 |
| Toluene | NA | <5.0 | <5.0 | <5.7 |
| Ethylbenzene | NA | <5.0 | <5.0 | <5.7 |
| Xylenes | NA | <50 | <5.0 | <5.7 |

**S7**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.2 | <5.0 |
| Toluene | NA | <5.0 | <5.2 | <5.0 |
| Ethylbenzene | NA | <5.0 | <5.2 | <5.0 |
| Xylenes | NA | <50 | <5.2 | <5.0 |

**S14**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | <5.0 |
| Toluene | NA | <5.0 | <5.0 | <5.0 |
| Ethylbenzene | NA | <5.0 | <5.0 | <5.0 |
| Xylenes | NA | <50 | <5.0 | <5.0 |

**S12**

| Analyte | 0.5 ft | 1 ft | 3.5 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | <1,000 | NA | <1,000 | <1,000 |
| Benzene | NA | <5.0 | <5.0 | <5.0 |
| Toluene | NA | <5.0 | <5.0 | <5.0 |
| Ethylbenzene | NA | <5.0 | <5.0 | <5.0 |
| Xylenes | NA | <50 | <5.0 | <5.0 |

S1 — Soil Boring Location, URS Geoprobe (2004)

S7/S20 — Duplicate Sample

Site Boundary

Chain Link Fence

Wood Fence

TPH-g — Total Petroleum Hydrocarbon - Gasoline

Notes:
1. All concentrations in micrograms per kilogram (µg/kg).
2. Bolded values indicate an exceedance of the applicable environmental screening level.

Project North

0 10 20 FEET

## VOCs AND TPH-g IN SOIL (µg/kg) – 2004

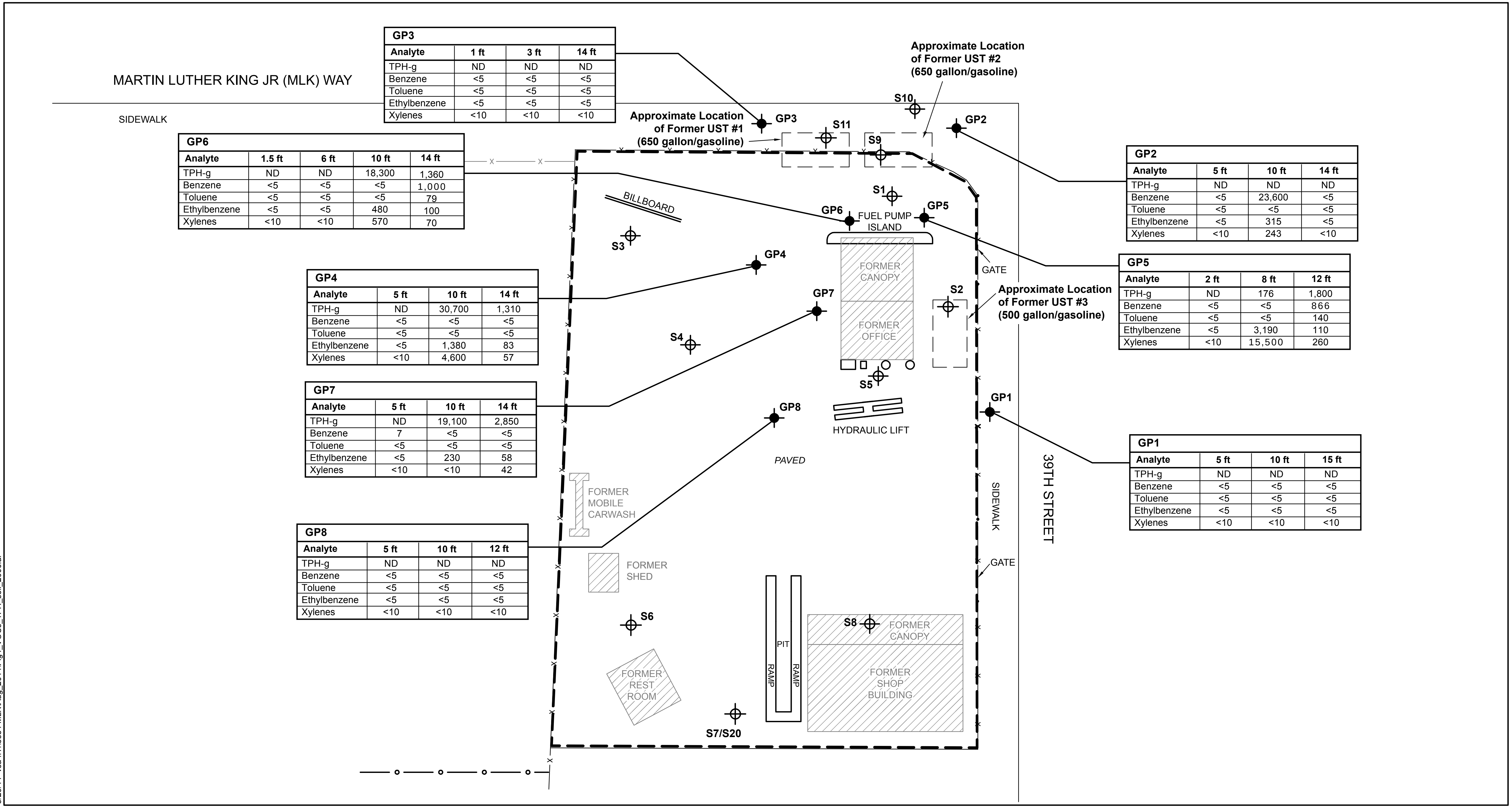
September 2014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

FIGURE 3

8/29/14 vsa/hk ..T:\3884 MLK\Aug_2014\Fig3_VOCs_TPH_soil_2004.ai




**GP3**

| Analyte | 1 ft | 3 ft | 14 ft |
|---|---|---|---|
| TPH-g | ND | ND | ND |
| Benzene | <5 | <5 | <5 |
| Toluene | <5 | <5 | <5 |
| Ethylbenzene | <5 | <5 | <5 |
| Xylenes | <10 | <10 | <10 |

**GP6**

| Analyte | 1.5 ft | 6 ft | 10 ft | 14 ft |
|---|---|---|---|---|
| TPH-g | ND | ND | 18,300 | 1,360 |
| Benzene | <5 | <5 | <5 | 1,000 |
| Toluene | <5 | <5 | <5 | 79 |
| Ethylbenzene | <5 | <5 | 480 | 100 |
| Xylenes | <10 | <10 | 570 | 70 |

**GP2**

| Analyte | 5 ft | 10 ft | 14 ft |
|---|---|---|---|
| TPH-g | ND | ND | ND |
| Benzene | <5 | 23,600 | <5 |
| Toluene | <5 | <5 | <5 |
| Ethylbenzene | <5 | 315 | <5 |
| Xylenes | <10 | 243 | <10 |

**GP4**

| Analyte | 5 ft | 10 ft | 14 ft |
|---|---|---|---|
| TPH-g | ND | 30,700 | 1,310 |
| Benzene | <5 | <5 | <5 |
| Toluene | <5 | <5 | <5 |
| Ethylbenzene | <5 | 1,380 | 83 |
| Xylenes | <10 | 4,600 | 57 |

**GP5**

| Analyte | 2 ft | 8 ft | 12 ft |
|---|---|---|---|
| TPH-g | ND | 176 | 1,800 |
| Benzene | <5 | <5 | 866 |
| Toluene | <5 | <5 | 140 |
| Ethylbenzene | <5 | 3,190 | 110 |
| Xylenes | <10 | 15,500 | 260 |

**GP7**

| Analyte | 5 ft | 10 ft | 14 ft |
|---|---|---|---|
| TPH-g | ND | 19,100 | 2,850 |
| Benzene | 7 | <5 | <5 |
| Toluene | <5 | <5 | <5 |
| Ethylbenzene | <5 | 230 | 58 |
| Xylenes | <10 | <10 | 42 |

**GP1**

| Analyte | 5 ft | 10 ft | 15 ft |
|---|---|---|---|
| TPH-g | ND | ND | ND |
| Benzene | <5 | <5 | <5 |
| Toluene | <5 | <5 | <5 |
| Ethylbenzene | <5 | <5 | <5 |
| Xylenes | <10 | <10 | <10 |

**GP8**

| Analyte | 5 ft | 10 ft | 12 ft |
|---|---|---|---|
| TPH-g | ND | ND | ND |
| Benzene | <5 | <5 | <5 |
| Toluene | <5 | <5 | <5 |
| Ethylbenzene | <5 | <5 | <5 |
| Xylenes | <10 | <10 | <10 |

S1 — Soil Boring Location, URS Geoprobe (2004)
GP1 — JCC Geoprobe (Feb 21, 2006)
S7/S20 — Duplicate Sample
Site Boundary
Chain Link Fence
Wood Fence

TPH-g — Total Petroleum Hydrocarbon - Gasoline
ND — Non-detect (reporting limits not available); reporting limit expected to be between 500 µg/kg and 1,000 µg/kg.

Notes:
1. All concentrations in micrograms per kilogram (µg/kg).
2. Bolded values indicate an exceedance of the applicable environmental screening level.

Project North

0 10 20 FEET

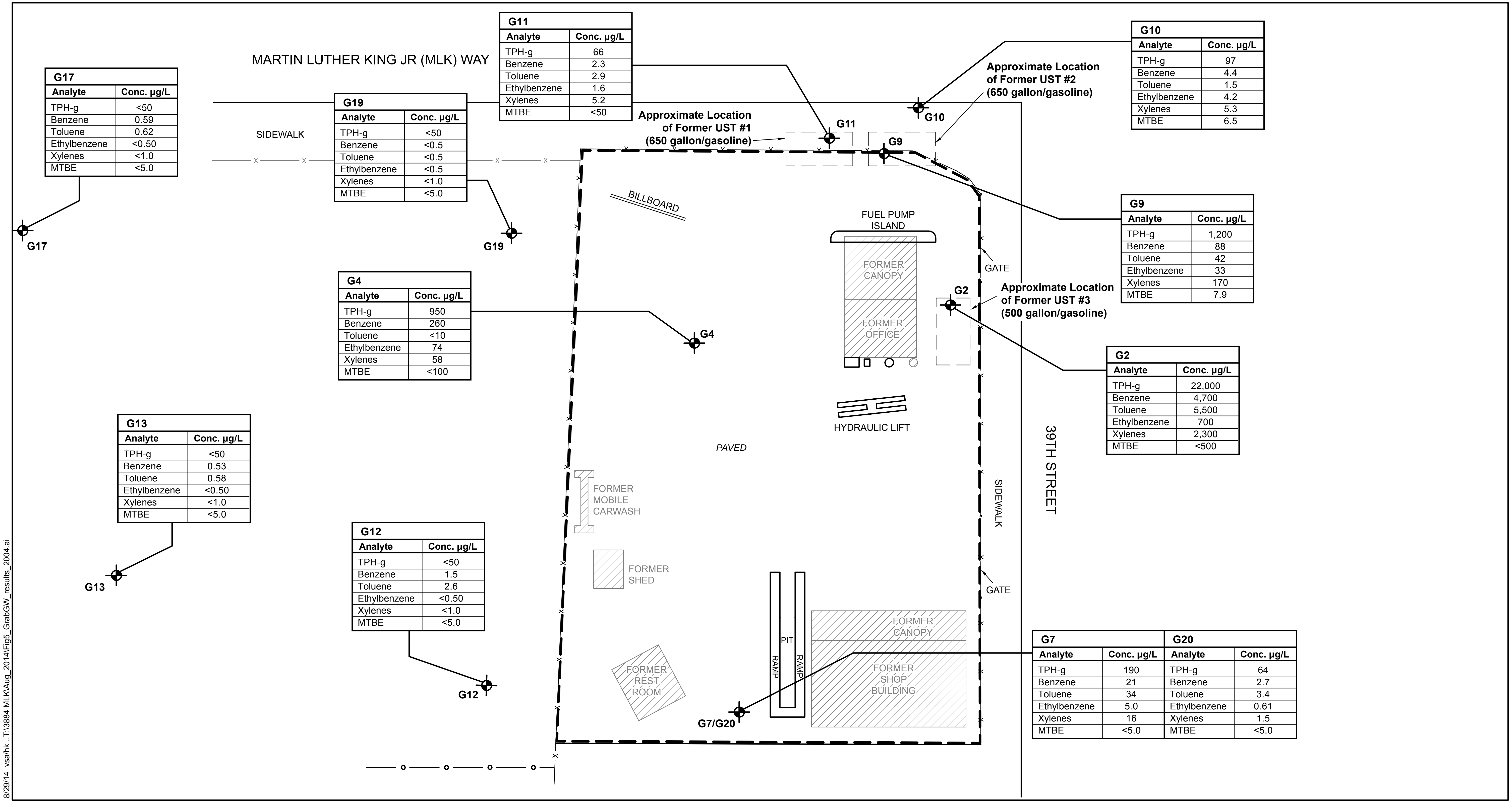
## VOCs AND TPHg IN SOIL (µg/kg) – 2006

September 20014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

FIGURE 4




**G17**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | <50 |
| Benzene | 0.59 |
| Toluene | 0.62 |
| Ethylbenzene | <0.50 |
| Xylenes | <1.0 |
| MTBE | <5.0 |

**G19**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | <50 |
| Benzene | <0.5 |
| Toluene | <0.5 |
| Ethylbenzene | <0.5 |
| Xylenes | <1.0 |
| MTBE | <5.0 |

**G11**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | 66 |
| Benzene | 2.3 |
| Toluene | 2.9 |
| Ethylbenzene | 1.6 |
| Xylenes | 5.2 |
| MTBE | <50 |

**G10**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | 97 |
| Benzene | 4.4 |
| Toluene | 1.5 |
| Ethylbenzene | 4.2 |
| Xylenes | 5.3 |
| MTBE | 6.5 |

**G9**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | 1,200 |
| Benzene | 88 |
| Toluene | 42 |
| Ethylbenzene | 33 |
| Xylenes | 170 |
| MTBE | 7.9 |

**G4**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | 950 |
| Benzene | 260 |
| Toluene | <10 |
| Ethylbenzene | 74 |
| Xylenes | 58 |
| MTBE | <100 |

**G2**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | 22,000 |
| Benzene | 4,700 |
| Toluene | 5,500 |
| Ethylbenzene | 700 |
| Xylenes | 2,300 |
| MTBE | <500 |

**G13**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | <50 |
| Benzene | 0.53 |
| Toluene | 0.58 |
| Ethylbenzene | <0.50 |
| Xylenes | <1.0 |
| MTBE | <5.0 |

**G12**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | <50 |
| Benzene | 1.5 |
| Toluene | 2.6 |
| Ethylbenzene | <0.50 |
| Xylenes | <1.0 |
| MTBE | <5.0 |

| G7 | | G20 | |
|---|---|---|---|
| Analyte | Conc. µg/L | Analyte | Conc. µg/L |
| TPH-g | 190 | TPH-g | 64 |
| Benzene | 21 | Benzene | 2.7 |
| Toluene | 34 | Toluene | 3.4 |
| Ethylbenzene | 5.0 | Ethylbenzene | 0.61 |
| Xylenes | 16 | Xylenes | 1.5 |
| MTBE | <5.0 | MTBE | <5.0 |

G2 Grab Groundwater Sample Location, URS 2004

G7/G20 Duplicate Sample

Site Boundary

Chain Link Fence

Wood Fence

TPH-g Total Petroleum Hydrocarbon - Gasoline

Note:
All concentrations in micrograms per kilogram (µg/kg)

Project North

0 10 20 FEET

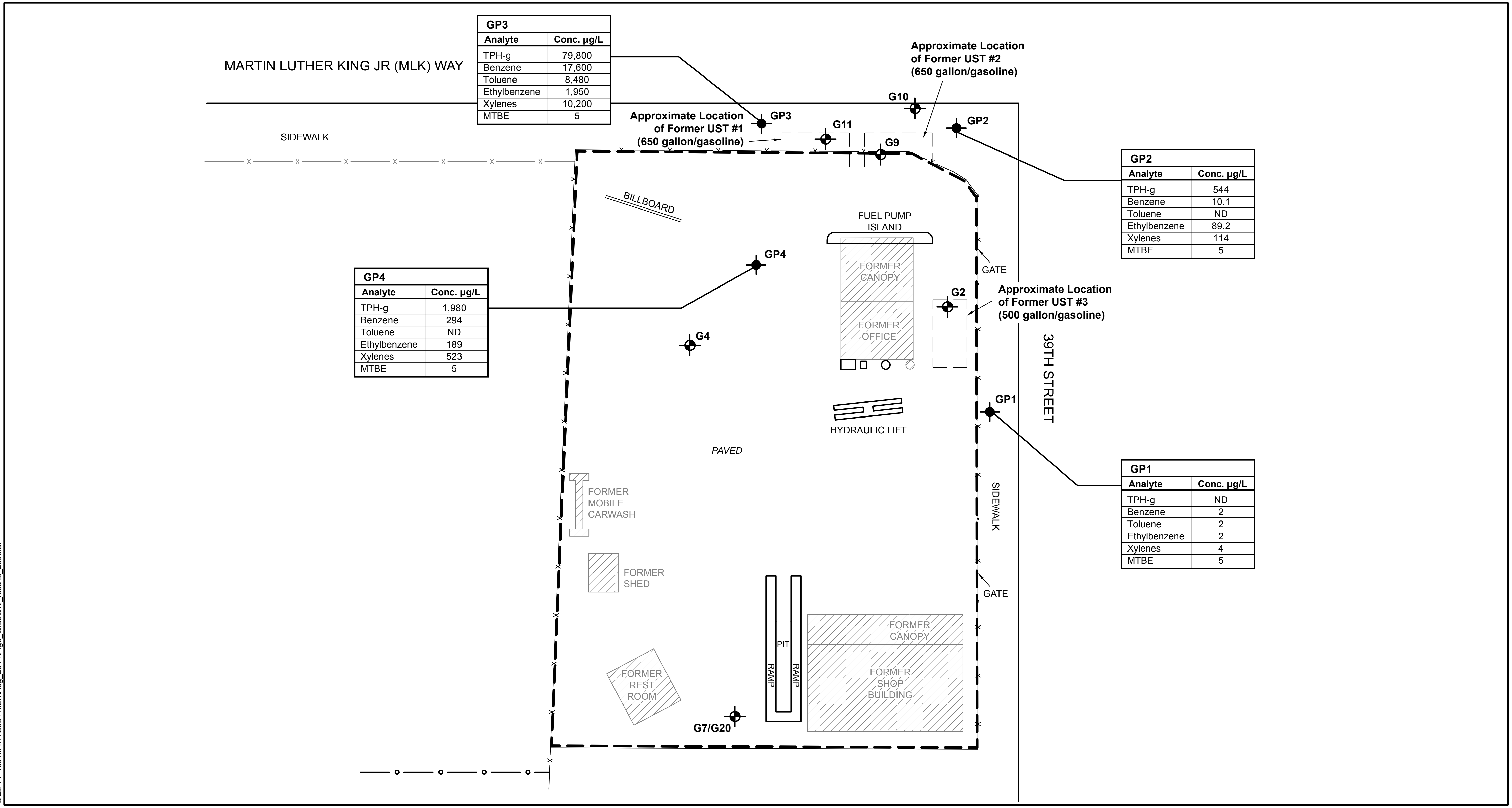
# GRAB GROUNDWATER SAMPLE RESULTS (µg/L) – 2004 (URS)

September 2014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

FIGURE 5




**GP3**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | 79,800 |
| Benzene | 17,600 |
| Toluene | 8,480 |
| Ethylbenzene | 1,950 |
| Xylenes | 10,200 |
| MTBE | 5 |

**GP2**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | 544 |
| Benzene | 10.1 |
| Toluene | ND |
| Ethylbenzene | 89.2 |
| Xylenes | 114 |
| MTBE | 5 |

**GP4**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | 1,980 |
| Benzene | 294 |
| Toluene | ND |
| Ethylbenzene | 189 |
| Xylenes | 523 |
| MTBE | 5 |

**GP1**

| Analyte | Conc. µg/L |
|---|---|
| TPH-g | ND |
| Benzene | 2 |
| Toluene | 2 |
| Ethylbenzene | 2 |
| Xylenes | 4 |
| MTBE | 5 |

8/29/14 vsa/hk ..T:\3884 MLK\Aug_2014\Fig6_GrabGW_results_2006.ai

G2 Grab Groundwater Sample Location, URS 2004
GP1 JCC Geoprobe (Feb 21, 2006)
G7/G20 Duplicate Sample
Site Boundary
Chain Link Fence
Wood Fence

TPH-g Total Petroleum Hydrocarbon - Gasoline
ND Non-detect. Reporting limits were not available for TPH-g. Reporting limit is assumed to be between 500 and 1,000 µg/L

Note:
All concentrations in micrograms per kilogram (µg/kg)

Project North

0 10 20 FEET

**GRAB GROUNDWATER SAMPLE RESULTS (µg/L) – 2006 (JCC)**

September 2014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

**FIGURE 6**

| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **SB-4-12** | <220 | <4.3 | <4.3 | <4.3 | <8.6 | <8.6 | <4.3 | <4.3 |
| **SB-4-15** | <200 | <4.0 | <4.0 | <4.0 | <7.9 | <7.9 | <4.0 | <4.0 |
| **SB-4-20** | 680 | <3.7 | <3.7 | <3.7 | <7.4 | <7.4 | <3.7 | <3.7 |

| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **SB-5-12** | 2600 | **1000** | 13 | 560 | <8.3 | <8.3 | <4.2 | <4.2 |
| **SB-5-15** | <200 | <4.1 | <4.1 | <4.1 | <8.1 | <8.1 | <4.1 | <4.1 |
| **SB-5-20** | <210 | <4.2 | <4.2 | <4.2 | <8.4 | <8.4 | <4.2 | <4.2 |

| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **SB-6-12** | 780 | <4.3 | <4.3 | 7.6 | 9.2 | <8.7 | <4.3 | <4.3 |
| **SB-6-15** | 4800 | 180 | 7.6 | 330 | 29 | 13 | <4.1 | <4.1 |
| **SB-6-16** | **1,400,000** | **4600** | **70000** | **32000** | **180000** | **10000** | <3900 | <3900 |
| **SB-6-20** | 650 | 6.6 | 34 | 14 | 78 | <7.6 | <3.8 | <3.8 |

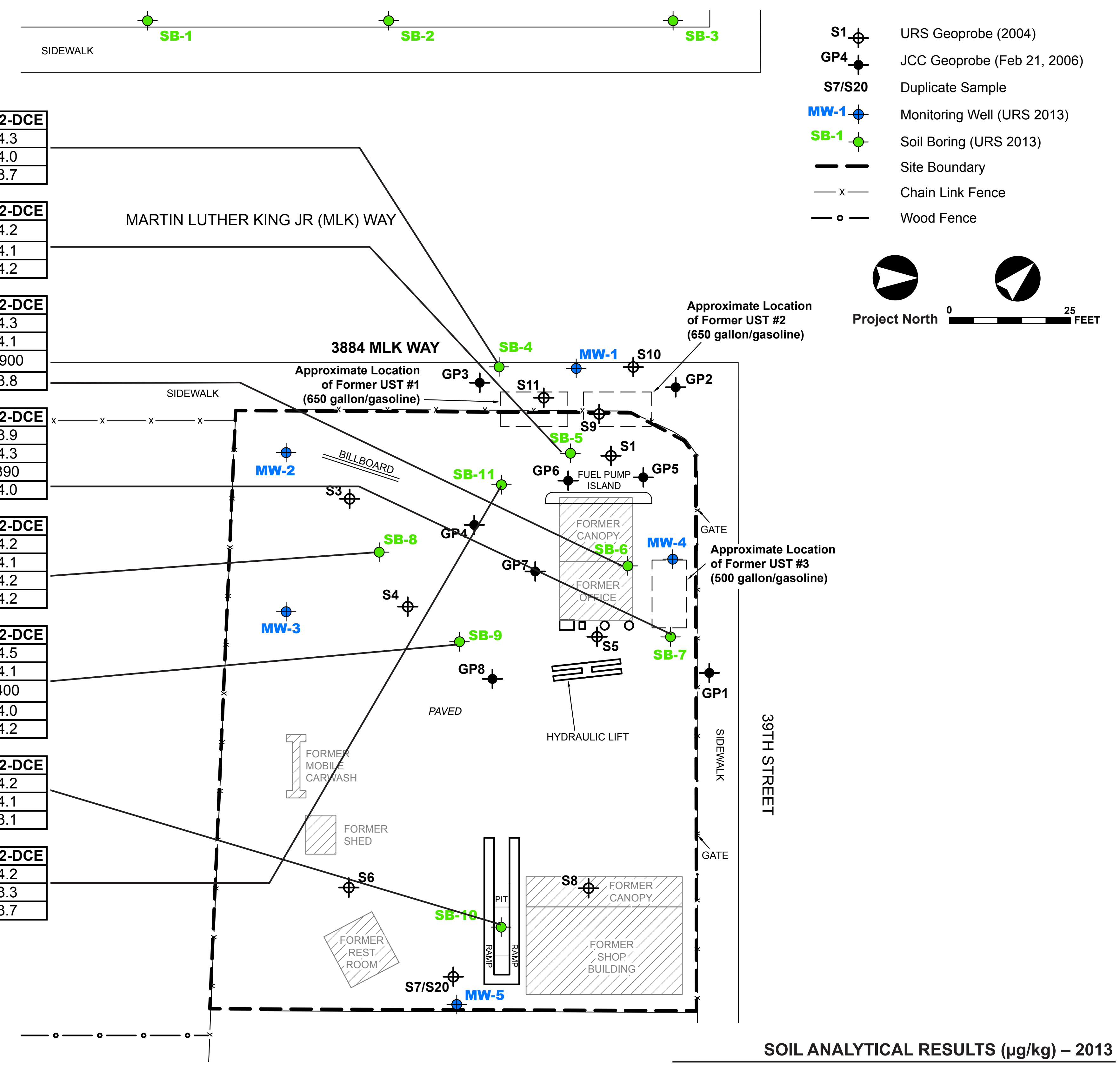
| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **SB-7-12** | <190 | <3.9 | <3.9 | <3.9 | <7.8 | <7.8 | <3.9 | <3.9 |
| **FD-1-12*** | <210 | <4.3 | <4.3 | <4.3 | <8.6 | <8.6 | <4.3 | <4.3 |
| **SB-7-15** | 77,000 | 420 | <390 | 1300 | 2800 | <790 | <390 | <390 |
| **SB-7-20** | <200 | <4.0 | <4.0 | <4.0 | <8.1 | <8.1 | <4.0 | <4.0 |

| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **SB-8-12** | <210 | 7.5 | <4.2 | <4.2 | <8.4 | 11 | <4.2 | <4.2 |
| **SB-8-15** | <200 | <4.1 | <4.1 | <4.1 | <8.2 | <8.2 | <4.1 | <4.1 |
| **SB-8-20** | <210 | <4.2 | <4.2 | <4.2 | <8.4 | <8.4 | <4.2 | <4.2 |
| **FD-3-20**** | <210 | <4.2 | <4.2 | <4.2 | <8.5 | <8.5 | <4.2 | <4.2 |

| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **SB-9-12** | 230 | <4.5 | <4.5 | <4.5 | <8.9 | <8.9 | <4.5 | <4.5 |
| **SB-9-15** | <21,000 | 130 | 7.6 | 48 | 340 | 110 | <4.1 | <4.1 |
| **SB-9-18** | 27000 | **1400** | <400 | 790 | <800 | <800 | <400 | <400 |
| **SB-9-20** | <200 | <4.0 | <4.0 | <4.0 | <8.0 | <8.0 | <4.0 | <4.0 |
| **FD-2-20***** | <210 | <4.2 | <4.2 | <4.2 | <8.4 | <8.4 | <4.2 | <4.2 |

| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **SB-10-12** | <210 | <4.2 | <4.2 | <4.2 | <8.4 | <8.4 | <4.2 | <4.2 |
| **SB-10-15** | <200 | <4.1 | <4.1 | <4.1 | <8.1 | <8.1 | <4.1 | <4.1 |
| **SB-10-20** | <150 | <3.1 | <3.1 | <3.1 | <6.2 | <6.2 | <3.1 | <3.1 |

| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **SB-11-12** | 790 | 80 | <4.2 | 55 | <8.5 | 8.9 | <4.2 | <4.2 |
| **SB-11-15** | <170 | <3.3 | <3.3 | <3.3 | <6.6 | <6.6 | <3.3 | <3.3 |
| **SB-11-20** | <180 | <3.7 | <3.7 | <3.7 | <7.4 | <7.4 | <3.7 | <3.7 |




## SOIL ANALYTICAL RESULTS (µg/kg) – 2013

September 2014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

FIGURE 7

Note:
1. All concentrations in micrograms per kilogram (µg/kg).
2. Bolded values indicate an exceedance of the applicable environmental screening level.

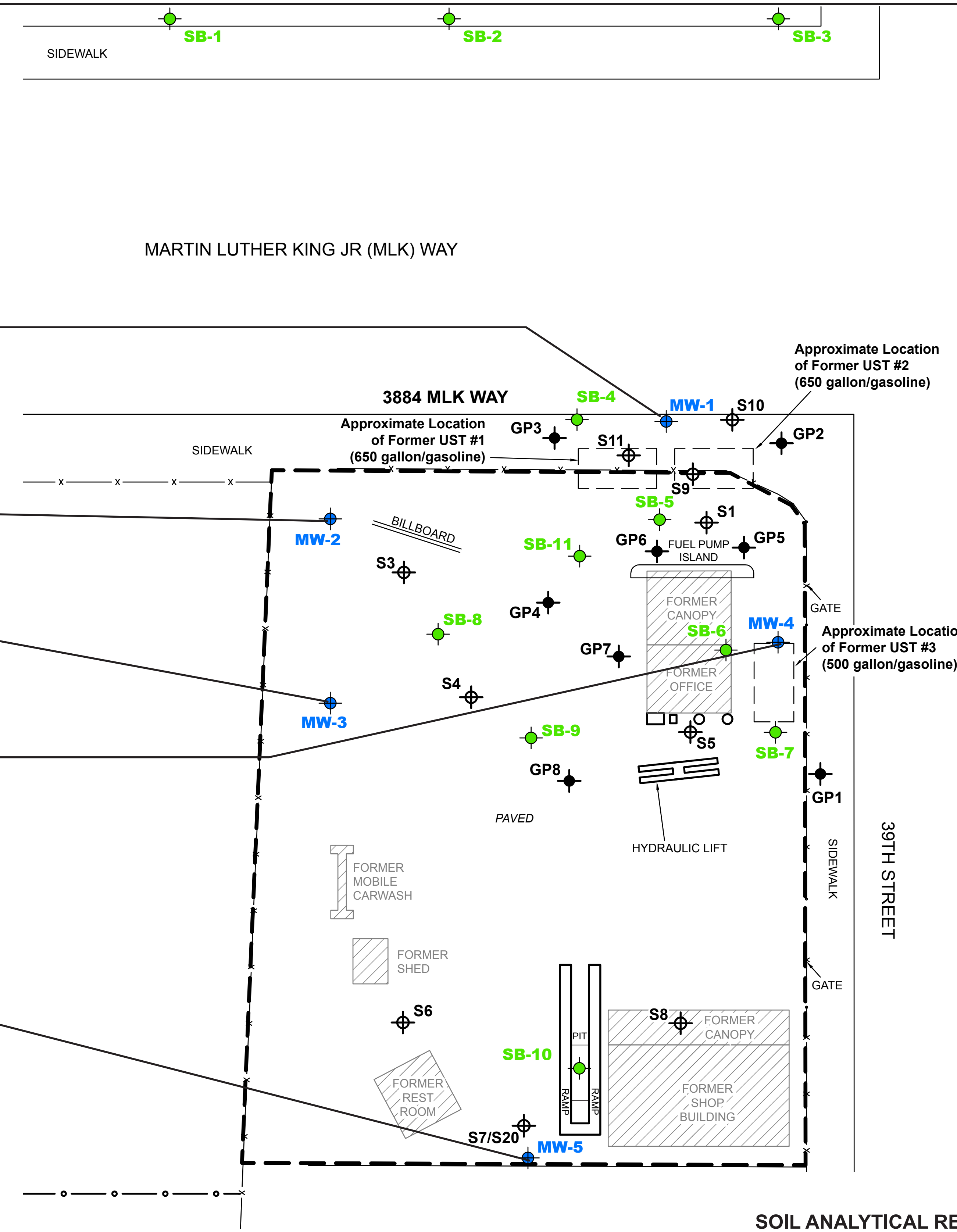
| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **MW-1-7** | **750,000** | <460 | <460 | <460 | <910 | <910 | <460 | <460 |
| **MW-1-12** | <230 | <4.5 | <4.5 | <4.5 | <9.1 | <9.1 | <4.5 | <4.5 |
| **MW-1-15** | <210 | <4.1 | <4.1 | <4.1 | <8.3 | <8.3 | <4.1 | <4.1 |
| **MW-1-20** | <210 | <4.1 | <4.1 | <4.1 | <8.2 | <8.2 | <4.1 | <4.1 |
| **FD-5-20****** | <240 | <3.6 | <3.6 | <3.6 | <7.1 | <7.1 | <3.6 | <3.6 |

| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **MW-2-12** | <200 | <3.6 | <3.6 | <3.6 | <8.0 | <7.1 | <3.6 | <3.6 |
| **MW-2-15** | <190 | <3.8 | <3.8 | <3.8 | <8.1 | <7.7 | <3.8 | <3.8 |
| **MW-2-18.5** | <20000 | **1700** | <400 | <400 | <800 | <800 | <400 | <400 |
| **MW-2-20** | <190 | <3.8 | <3.8 | <3.8 | <7.6 | <7.6 | <3.8 | <3.8 |

| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **MW-3-12** | <210 | <4.2 | <4.2 | <4.2 | <8.4 | <8.4 | <4.2 | <4.2 |
| **MW-3-15** | <200 | <4.1 | <4.1 | <4.1 | <8.4 | <8.4 | <4.1 | <4.1 |
| **MW-3-20** | <210 | <4.1 | <4.1 | <4.1 | <8.3 | <8.3 | <4.1 | <4.1 |

| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **MW-4-12** | 2200 | 240 | 22 | 220 | 88 | 31 | <5.0 | <5.0 |
| **MW-4-15** | 400,000 | **1300** | 1800 | **9000** | **38000** | 2400 | <800 | <800 |
| **MW-4-16** | **2,700,000** | **2700** | 3900 | **48000** | **110000** | **12000** | <380 | <380 |
| **MW-4-20** | <21000 | <420 | <420 | <420 | <830 | <830 | <420 | <420 |

| | TPH-g | Benzene | Toluene | Ethylbenzene | Xylenes | Napthalene | 1,2-DCA | cis-1,2-DCE |
|---|---|---|---|---|---|---|---|---|
| **MW-5-12** | <220 | <4.5 | <4.5 | <4.5 | <8.9 | <8.9 | <4.5 | <4.5 |
| **MW-5-15** | <200 | <4.1 | <4.1 | <4.1 | <8.2 | <8.2 | <4.1 | <4.1 |
| **MW-5-20** | <220 | <4.3 | <4.3 | <4.3 | <8.6 | <8.6 | <4.3 | <4.3 |




S1 — URS Geoprobe (2004)
GP4 — JCC Geoprobe (Feb 21, 2006)
S7/S20 — Duplicate Sample
MW-1 — Monitoring Well (URS 2013)
SB-1 — Soil Boring (URS 2013)
Site Boundary
Chain Link Fence
Wood Fence
* — Field Duplicate Sample

Project North

0 25 FEET

Note:
1. All concentrations in micrograms per kilogram (µg/kg).
2. Bolded values indicate an exceedance of the applicable environmental screening level.

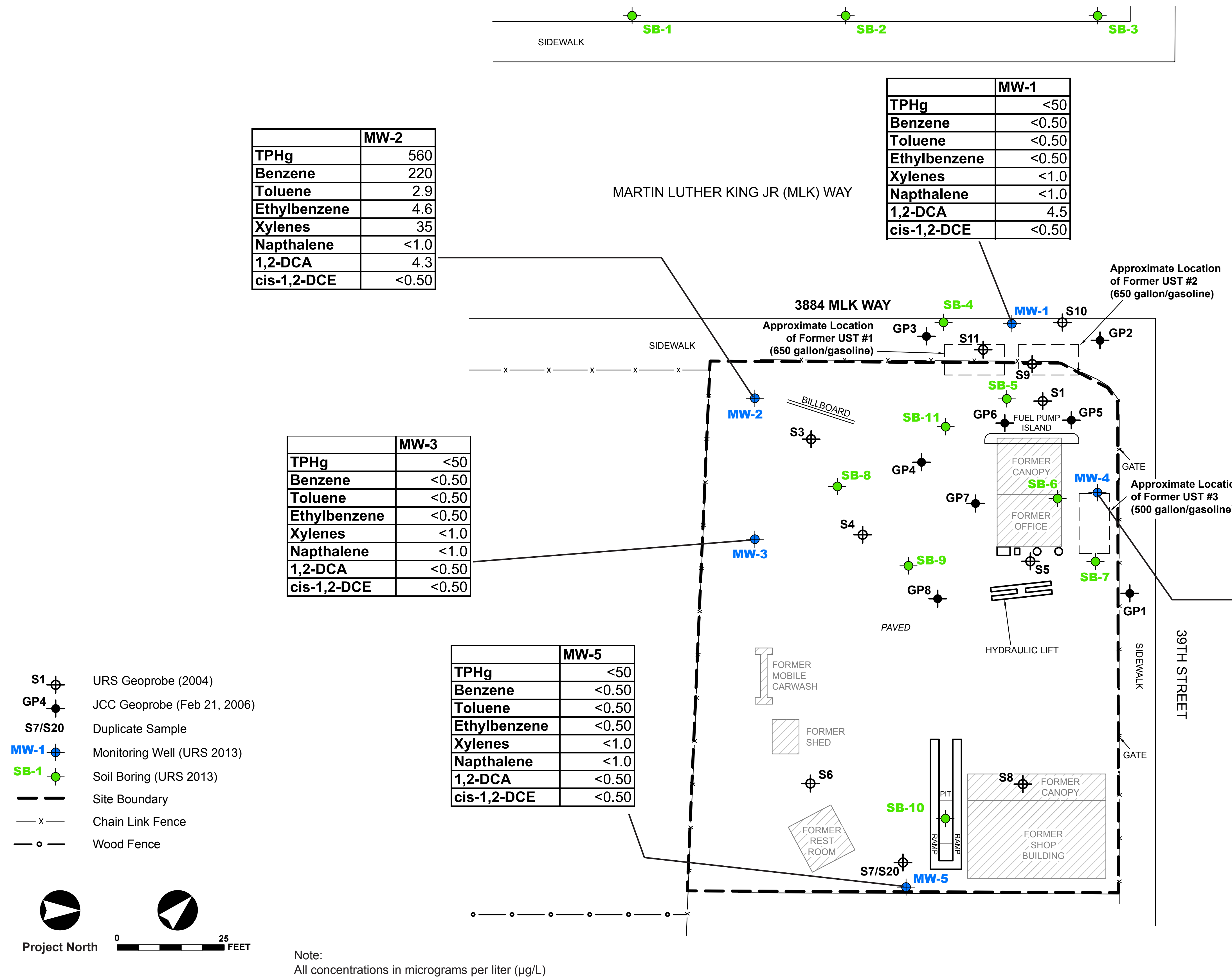
## MONITORING WELL SOIL ANALYTICAL RESULTS (µg/kg) – 2013

September 2014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

**FIGURE 8**




| | MW-2 |
|---|---|
| TPHg | 560 |
| Benzene | 220 |
| Toluene | 2.9 |
| Ethylbenzene | 4.6 |
| Xylenes | 35 |
| Napthalene | <1.0 |
| 1,2-DCA | 4.3 |
| cis-1,2-DCE | <0.50 |

| | MW-1 |
|---|---|
| TPHg | <50 |
| Benzene | <0.50 |
| Toluene | <0.50 |
| Ethylbenzene | <0.50 |
| Xylenes | <1.0 |
| Napthalene | <1.0 |
| 1,2-DCA | 4.5 |
| cis-1,2-DCE | <0.50 |

| | MW-3 |
|---|---|
| TPHg | <50 |
| Benzene | <0.50 |
| Toluene | <0.50 |
| Ethylbenzene | <0.50 |
| Xylenes | <1.0 |
| Napthalene | <1.0 |
| 1,2-DCA | <0.50 |
| cis-1,2-DCE | <0.50 |

| | MW-4 | MW-40* |
|---|---|---|
| TPHg | 9500 | 13000 |
| Benzene | 980 | 1100 |
| Toluene | 510 | 930 |
| Ethylbenzene | 270 | 800 |
| Xylenes | 2600 | 3500 |
| Napthalene | 180 | 180 |
| 1,2-DCA | 0.71 | 0.61 |
| cis-1,2-DCE | <0.50 | <0.50 |

| | MW-5 |
|---|---|
| TPHg | <50 |
| Benzene | <0.50 |
| Toluene | <0.50 |
| Ethylbenzene | <0.50 |
| Xylenes | <1.0 |
| Napthalene | <1.0 |
| 1,2-DCA | <0.50 |
| cis-1,2-DCE | <0.50 |

Note:
All concentrations in micrograms per liter (µg/L)

08/29/14 hk/vsa T:\3884 MLK\Aug_2014\GW_Sample_Results Aug14 Folder\GW_Sample_Results.indd

**GROUNDWATER RESULTS – MONITORING WELLS (µg/L) – 2013**

September 2014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

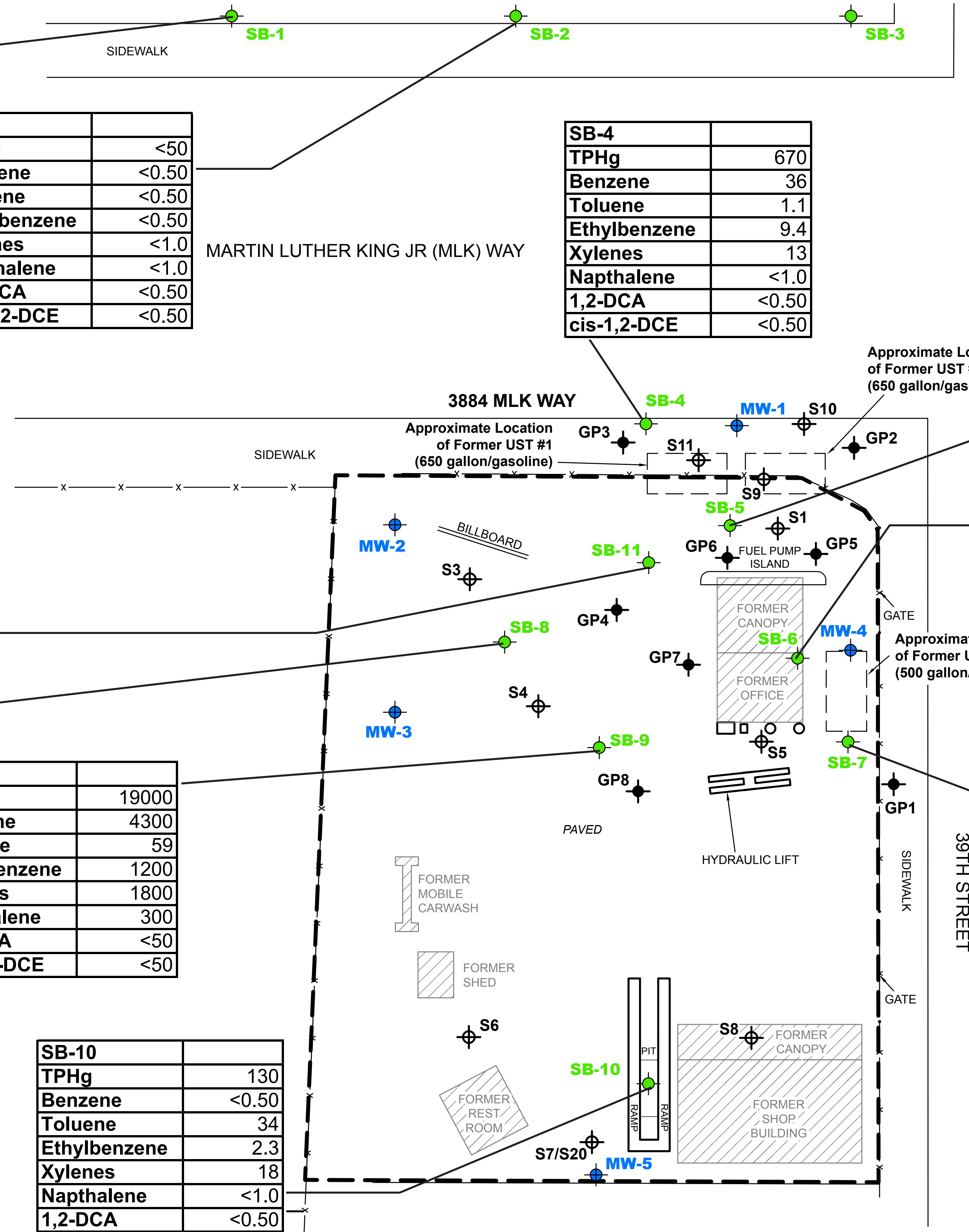
**FIGURE 9**

| SB-1 | |
|---|---|
| TPHg | 120 |
| Benzene | <0.50 |
| Toluene | <0.50 |
| Ethylbenzene | <0.50 |
| Xylenes | <1.0 |
| Napthalene | <1.0 |
| 1,2-DCA | <0.50 |
| cis-1,2-DCE | <0.50 |

| SB-2 | |
|---|---|
| TPHg | <50 |
| Benzene | <0.50 |
| Toluene | <0.50 |
| Ethylbenzene | <0.50 |
| Xylenes | <1.0 |
| Napthalene | <1.0 |
| 1,2-DCA | <0.50 |
| cis-1,2-DCE | <0.50 |

| SB-4 | |
|---|---|
| TPHg | 670 |
| Benzene | 36 |
| Toluene | 1.1 |
| Ethylbenzene | 9.4 |
| Xylenes | 13 |
| Napthalene | <1.0 |
| 1,2-DCA | <0.50 |
| cis-1,2-DCE | <0.50 |

| SB-5 | |
|---|---|
| TPHg | 200 |
| Benzene | 13 |
| Toluene | 4.7 |
| Ethylbenzene | 13 |
| Xylenes | 38 |
| Napthalene | 1.7 |
| 1,2-DCA | 1.3 |
| cis-1,2-DCE | <0.50 |




| SB-6 | | SB-90* |
|---|---|---|
| TPHg | 150000 | 120000 |
| Benzene | 5100 | 5300 |
| Toluene | 17000 | 18000 |
| Ethylbenzene | 2600 | 2500 |
| Xylenes | 23000 | 22000 |
| Napthalene | 980 | 820 |
| 1,2-DCA | <50 | <50 |
| cis-1,2-DCE | <50 | <50 |

| SB-11 | |
|---|---|
| TPHg | 260 |
| Benzene | 3.6 |
| Toluene | 8 |
| Ethylbenzene | 9.9 |
| Xylenes | 30 |
| Napthalene | 2.6 |
| 1,2-DCA | 2 |
| cis-1,2-DCE | <0.50 |

| SB-8 | |
|---|---|
| TPHg | <50 |
| Benzene | <0.50 |
| Toluene | <0.50 |
| Ethylbenzene | <0.50 |
| Xylenes | <1.0 |
| Napthalene | <1.0 |
| 1,2-DCA | <0.50 |
| cis-1,2-DCE | <0.50 |

| SB-9 | |
|---|---|
| TPHg | 19000 |
| Benzene | 4300 |
| Toluene | 59 |
| Ethylbenzene | 1200 |
| Xylenes | 1800 |
| Napthalene | 300 |
| 1,2-DCA | <50 |
| cis-1,2-DCE | <50 |

| SB-7 | | SB-91* |
|---|---|---|
| TPHg | 620 | 110 |
| Benzene | 14 | 5.2 |
| Toluene | 4.1 | 2.4 |
| Ethylbenzene | 24 | 6.8 |
| Xylenes | 37 | 11 |
| Napthalene | 9.3 | 2.5 |
| 1,2-DCA | 0.78 | <0.50 |
| cis-1,2-DCE | <0.50 | <0.50 |

| SB-10 | |
|---|---|
| TPHg | 130 |
| Benzene | <0.50 |
| Toluene | 34 |
| Ethylbenzene | 2.3 |
| Xylenes | 18 |
| Napthalene | <1.0 |
| 1,2-DCA | <0.50 |
| cis-1,2-DCE | <0.50 |

S1 — URS Geoprobe (2004)
GP4 — JCC Geoprobe (Feb 21, 2006)
S7/S20 — Duplicate Sample
MW-1 — Monitoring Well (URS 2013)
SB-1 — Soil Boring (URS 2013)
Site Boundary
Chain Link Fence
Wood Fence

Project North

0 25 FEET

Notes:
1. SB-3 not sampled/did not produce water
2. All concentrations in micrograms per liter (µg/L)

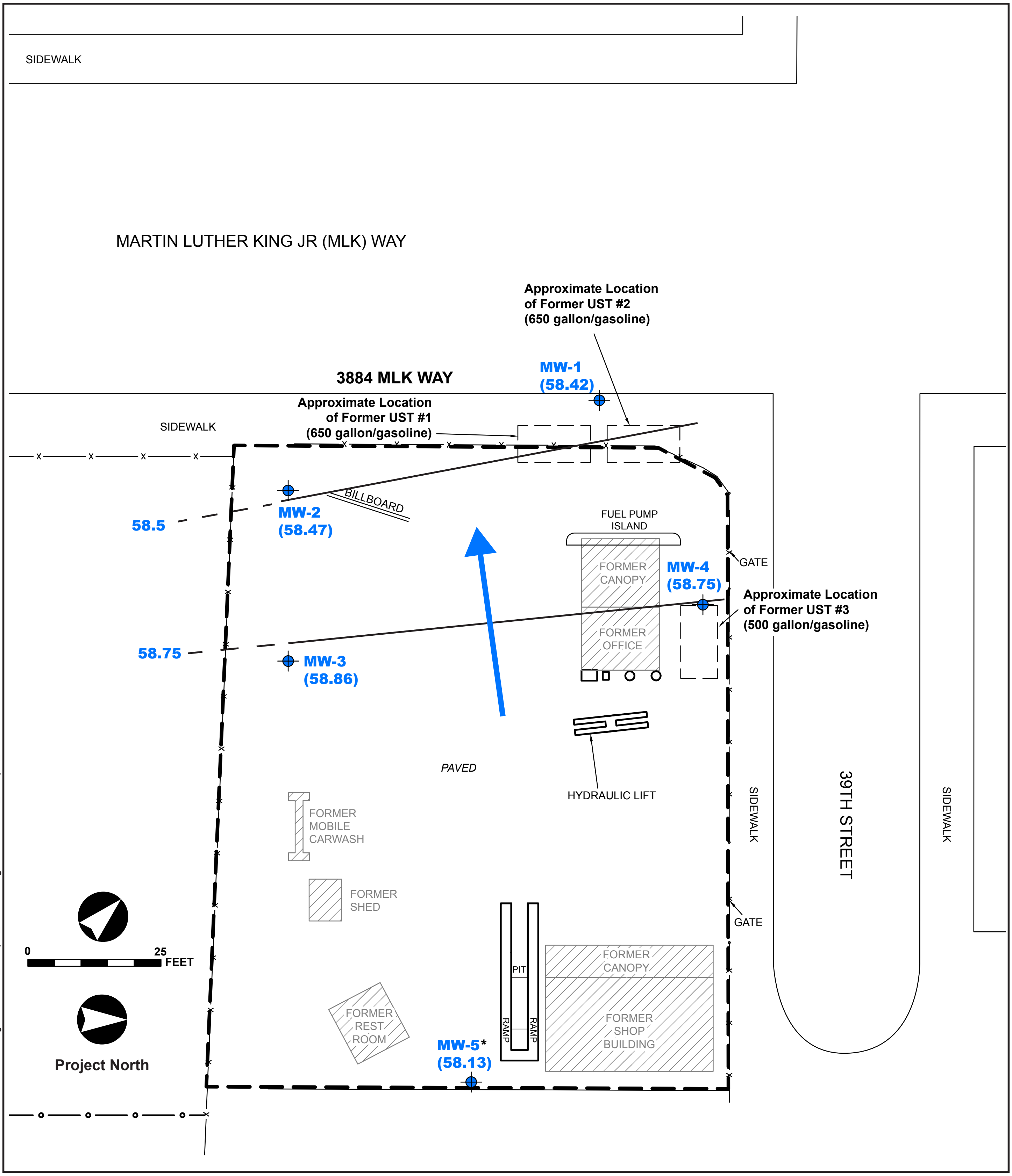
## GRAB GROUNDWATER ANALYTICAL RESULTS (µg/L) – 2013

September 2014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

**FIGURE 10**




08/29/14 hk T:\3884 MLK\Aug_2014\GW_Sample_Results Aug14 Folder\GW_Sample_Results.indd

**MW-1 (57.42)** Monitoring Well and Groundwater Elevation – July 2014

Interpreted Groundwater Flow Direction
Approximate Average Gradient = 0.008
Based on July 2014 data

Site Boundary

Chain Link Fence

Wood Fence

*Elevation data not used for contouring.

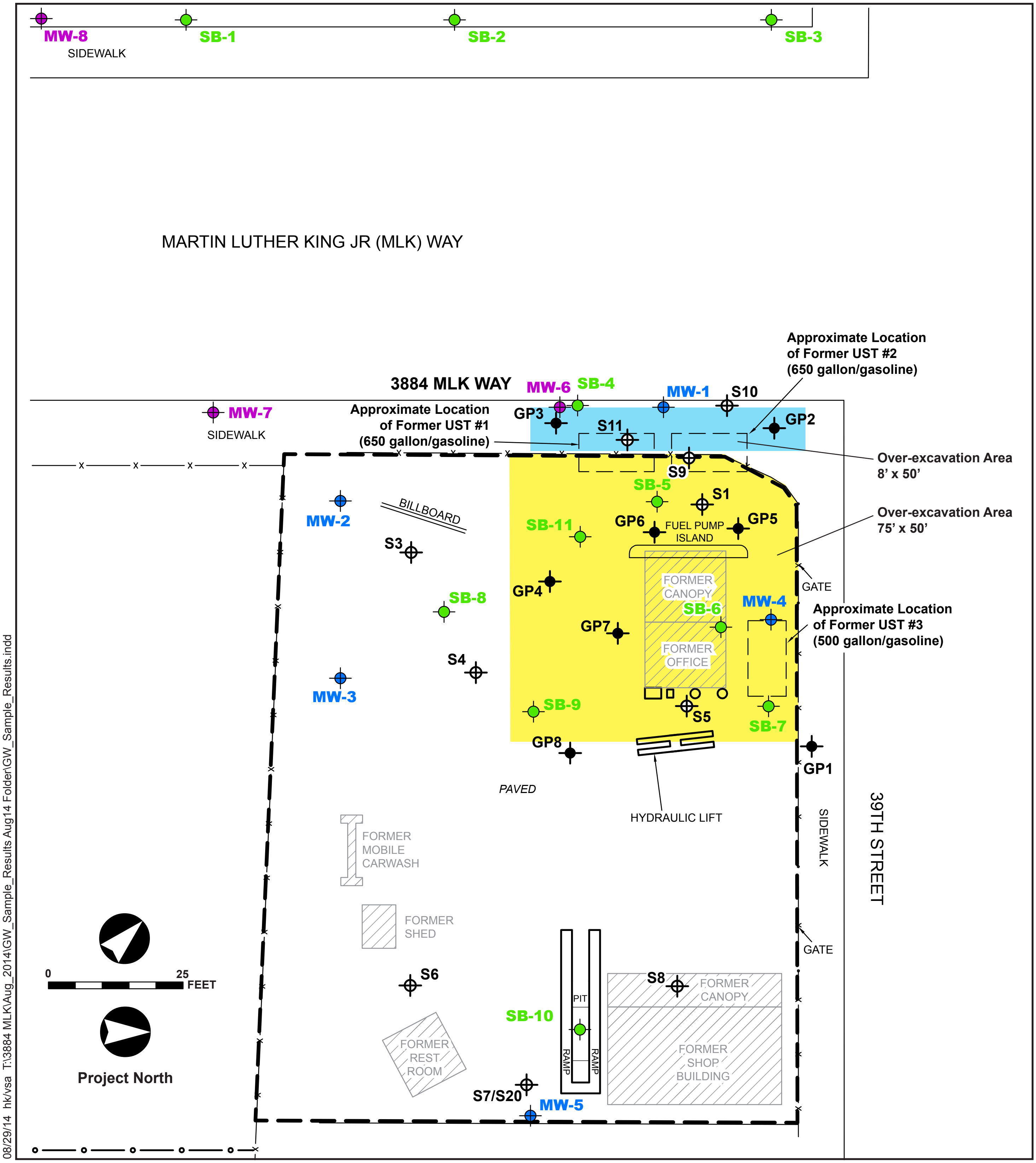
**GROUNDWATER ELEVATION**

September 2014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

**FIGURE 11**




S1 — URS Geoprobe (2004)
GP4 — JCC Geoprobe (Feb 21, 2006)
S7/S20 — Duplicate Sample
MW-1 — Monitoring Well (URS 2013)
MW-7 — Proposed Performance Monitoring Well
AOC-1 Over-Excavation Area to 18 feet bgs
AOC-2

Site Boundary
Chain Link Fence
Wood Fence

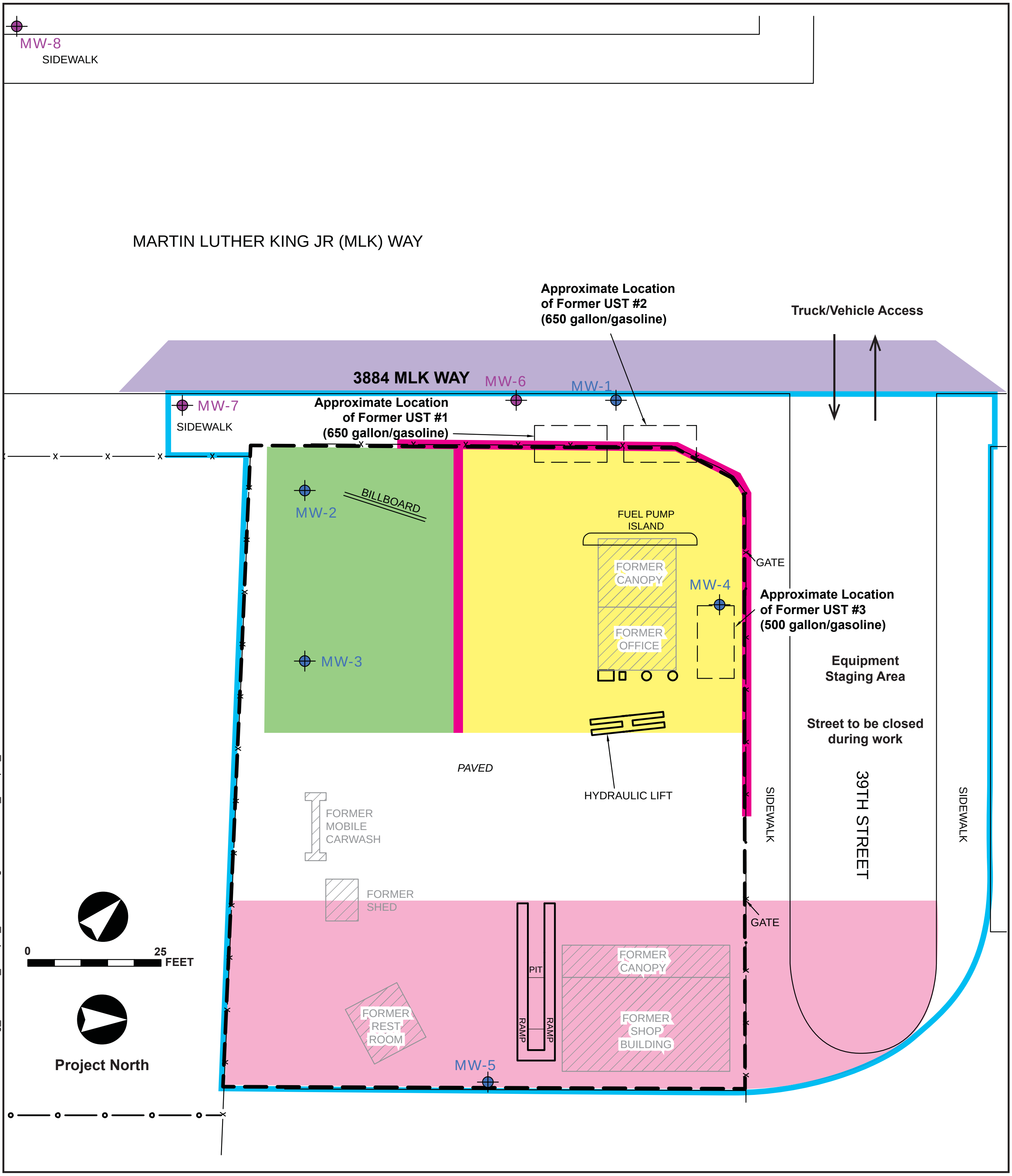
# AREAS OF CONCERN (AOCs) AND PROPOSED PERFORMANCE MONITORING WELL LOCATIONS

September 2014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

FIGURE 12




09/02/14 hk T:\3884 MLK\Aug_2014\GW_Sample_Results Aug14 Folder\GW_Sample_Results.indd

| | | | |
|---|---|---|---|
| MW-1 | Monitoring Well | | Site Boundary |
| MW-6 | Proposed Performance Monitoring Well | x | Chain Link Fence |
| | AOC-2 | o | Wood Fence |
| | Overburden Stockpile Area | | Proposed Work Limits |
| | Remedial Excavation Soil Stockpile Area | | Shoring |
| | Temporary Pedestrian Pathway | | |

**SITE LAYOUT**

September 2014
28068161

3884 Martin Luther King, Jr. Way
Oakland, California

URS

**FIGURE 13**