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By Alameda County Environmental Health at 12:03 pm, Apr 22, 2013

Mr. Mark Detterman
Alameda County Environmental Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: Former Olympic Service Station
1436 Grant Avenue
San Lorenzo, California
ACEHD Case No. RO0000373, GeoTacker No. T0600102256

Dear Mr. Detterman:

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

Sincerely,
George and Frida Jaber 1989 Family Trust

Philip Jaber, Trustee

STRATUS
ENVIRONMENTAL, INC.

3330 Cameron Park Drive, Ste 550
Cameron Park, California 95682
(530) 676-6004 ~ Fax: (530) 676-6005

April 19, 2013
Project No. 2115-1436-01

Mr. Mark Detterman
Alameda County Environmental Health Department
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: Response to letter dated March 5, 2013

Dear Mr. Detterman:

Stratus Environmental, Inc. (Stratus), on behalf of Mr. Phillip Jaber and the George and Frida Jaber 1989 Family Trust, has prepared this letter in response to Alameda County Environmental Health Department's (ACEHD) letter of March 5, 2013, that requested specific changes to Stratus' Corrective Action Plan (CAP, dated September 30, 2012.

Stratus has revised the CAP with modifications requested by ACEHD (attached). Groundwater monitoring and chemical analytical data from the fourth quarter 2012 and first quarter 2013 monitoring and sampling events, performed subsequent to submittal of the original CAP, have also been incorporated into the revised CAP. Specific topics identified in the ACEHD letter are referenced below, along with a discussion of how each topic is addressed in the revised CAP.

1. Request for Revised Draft Corrective Action Plan (RCAP)

   ACEHD was in general agreement with the corrective action approach proposed in the CAP, but requested modifications, including:

   a. ACEHD judged that the number of proposed monitoring wells were excessive, and requested that only three monitoring wells be installed at this time. Stratus originally proposed a total of five monitoring wells, believing this to be most appropriate to further constrain the dissolved plume downgradient of the site, and to more accurately evaluate the dissolved hydrocarbon mass. In compliance with ACEHD's request, Stratus has reduced the number of proposed monitoring well locations to three. These proposed locations (MW-5, MW-6, and MW-7) are shown on Figure 9 of the RCAP.

   b. ACEHD requested that the screened intervals of the proposed monitoring wells be limited to 5 feet or less, unless subsurface conditions dictate otherwise. Based on our understanding of the subsurface conditions at this time, we do not anticipate that subsurface conditions meet ACEHD criteria for longer screen intervals. Stratus originally proposed 15-foot screen intervals for the monitoring wells to match the screens in existing monitoring wells MW-1 through MW-3. Stratus will accommodate ACEHD's request for the limited screen intervals in the proposed monitoring wells by installing well clusters at locations MW-5, MW-6, and MW-7. Stratus believes the clusters are appropriate to evaluate groundwater conditions both at the water table interface, and deeper in the saturated zone. Details of the proposed monitoring well construction are discussed in Task 3 of the RCAP (page 20).

ACEHD suggested that multi-chamber wells may be appropriate. It has been our experience that multi-chamber wells often provide less than optimal results because these wells cannot be effectively developed. The inability to develop the well can lead to poor communication with the aquifer, and an inability to rehabilitate the well if the sandpack becomes clogged with fines. For this reason, Stratus is proposing well clusters over multi-chamber wells.

The proposed extraction wells will be installed with 15 feet of screen. These longer screens are necessary for effective soil vapor extraction from the vadose zone during dual phase extraction (DPE) after the water levels have been depressed. Extraction well construction is discussed in Task 3 of the RCAP (page 20).

c. Site Remediation Goals. The ACEHD letter indicated that the LTCP goals are appropriate for site remediation goals. The CAP was modified to explicitly incorporate the LTCP criteria. These criteria are discussed starting on page 10 of the RCAP

2. Request for Draft Fact Sheet and List of Recipients

Stratus submitted a draft fact sheet to ACEHD via email on March 19, 2013. A list of the names and address for the tenants of the adjacent Arroyo center was submitted to ACEHD via email on March 21, 2013.

3. LTCP Review

ACEHD included a copy of their Data Gap Identification Tool (DGIT), which found that the site does not meet LTCP criteria. Stratus concurs that the site currently does not meet the LTCP criteria. As requested, Stratus will prepare a work plan (due May 17, 2013) to address areas identified in the DGIT as needing additional work to meet LTCP closure criteria.

April 19, 2013

4. Path to Closure Schedule

Stratus will prepare and submit the requested pathway to closure schedule by the May 17, 2013 deadline.

If you have any questions regarding this letter or the enclosed Revised Draft Corrective Action Plan, please contact Steve Carter at (530) 676-6008 or Gowri Kowtha at (530) 676-6001.

Sincerely,

STRATUS ENVIRONMENTAL, INC.

PROFESSIONAL GEOLOGIST
Stephen J. Carter
No. 5577
STATE OF CALIFORNIA

Stephen J. Carter, P.G.
Project Manager

Gowri S. Kowtha, P.E.
Principal Engineer

Attachment: Revised Draft Corrective Action Plan

cc: Mr. Phillip Jaber, Property Owner
Ms. Cherie McCaulou, RWQCB

STRATUS
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April 19, 2013
Project No. 2115-1436-01

Mr. Mark Detterman
Alameda County Environmental Health Department
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: **Revised Draft Corrective Action Plan**
Former Olympic Service Station
1436 Grant Avenue, San Lorenzo, California
LOP Case #RO0000373

Dear Mr. Detterman:

Stratus Environmental, Inc. (Stratus), on behalf of Mr. Philip Jaber and the George and Frida Jaber 1989 Family Trust, has prepared this *Revised Draft Corrective Action Plan* (CAP) for the Former Olympic Service Station located at 1436 Grant Avenue in San Lorenzo, California (the site, Figure 1). This document was requested by Alameda County Environmental Health Department (ACEHD) in a letter dated March 5, 2013. This revised draft CAP supersedes the *Corrective Action Plan* dated September 30, 2012.

This CAP provides a comprehensive site conceptual model (SCM) that presents an integrated evaluation of historical hydrogeologic and chemical analytical data gathered by Stratus and others, and Stratus' understanding of the geology, hydrogeology, and known sensitive receptors. This SCM includes an evaluation of the extent of petroleum hydrocarbon impact to soil and groundwater beneath the site, and a summary of feasibility pilot testing performed in 2011. Finally, this revised draft CAP proposes to install a dual phase extraction (DPE) remediation system, along with additional remediation and monitoring wells, to fully address the extent of hydrocarbon impact beneath the site, and includes a schedule for system installation and startup, a monitoring and reporting plan for the remediation and post-remediation periods, and a schedule for remediation implementation and site closure.

SITE DESCRIPTION

The subject site is located on the southern corner of the intersection of Grant Avenue and Channel Street in San Lorenzo, California. The site previously operated as an Olympic service station; it is currently operated as San Lorenzo Auto Repair. The current and former station facilities are shown on Figure 2.

The adjoining property to the southwest and south is developed as the Arroyo Center strip mall. Properties to the north and northwest (across Grant Avenue) are developed as single family detached residences, and the property to the east and northeast (across Channel Street) has been developed as multi-family housing units (apartments or condominiums). A parking lot and athletic fields for Arroyo High School are situated on property north of Grant Avenue, across the intersection.

SITE BACKGROUND

Historical Site Assessment Activities

Descriptions of historical site assessment activities presented below were developed from reports prepared by Reese Construction, Aqua Science Engineers, Inc. (ASE), and Conestoga-Rovers & Associates (CRA), and work performed by Stratus.

The former underground storage tanks (USTs) and associated product dispensers were removed in 1998. Four groundwater monitoring wells (MW-1 through MW-4), five soil vapor sampling points (SV-1 through SV-5), three extraction wells (EX-1 through EX-3), two ozone injection wells (IW-1 and IW-2), and nineteen exploratory soil borings (BH-A through BH-C, B-1 through B-13, and B-13A through B-13C) were installed between 1999 and 2011. Locations of the wells, vapor sampling points, and soil borings are shown on Figure 2. Drilling and well construction details are summarized in Table 1.

Chemicals of concern (COCs) at this site include gasoline-range organics (GRO), benzene, toluene, ethylbenzene, and xylenes (BTEX), and the gasoline additive methyl tertiary butyl ether (MTBE). Historically, GRO has also been reported as Total Petroleum Hydrocarbons as gasoline (TPHg). In this document GRO will refer to compounds originally reported as TPHg or GRO.

Groundwater samples have historically been analyzed for diesel-range organics (DRO) and the fuel additives di-isopropyl ether (DIPE), tertiary amyl butyl ether (TAME), ethyl tertiary butyl ether (ETBE), tertiary butyl alcohol (TBA), 1,2-dichlorethane (1,2-DCA), 1,2-dibromoethane (EDB), and ethanol. These analytes are not currently included in the groundwater analytical suite.

Historical groundwater monitoring and analytical data are summarized in Table 2. Soil analytical data are summarized in Table 3. Soil vapor analytical data are summarized in Table 4.

Underground Storage Tank Removal and Over-Excavation

Two gasoline USTs (10,000 gallons and 8,000 gallons) and one diesel UST (5,000 gallons) were located in a common excavation between the station building and Channel Street. One waste oil UST (250 gallons) was located behind the station building. Six fuel dispensers were situated on two dispenser islands located adjacent to Grant Avenue. The USTs, dispensers, and associated product piping were removed on July 10, 1998, by Reese Construction.[1] A total of eleven compliance soil samples were collected from the UST pits, the product piping trenches, and beneath the dispensers. Groundwater was encountered in the gasoline UST pit, and on September 8, 1998, approximately 5,000 gallons of groundwater were pumped from the pit and transported off-site for disposal.[2] Soil and backfill material excavated during UST removal were sampled, and with approval of ACEHD, this material was utilized to backfill the excavations.[3]

Based on analytical results from samples collected during UST removal activities, additional excavation was performed at the waste oil UST pit and the southern dispenser island on December 18, 1998. The waste oil UST pit was deepened from 8 to 12 feet below ground surface (bgs), and the dispenser excavation was deepened to 3.5 feet bgs. A confirmation soil sample was collected from the base of each excavation; hydrocarbons were reported in the sample from the base of the waste oil UST pit.[4]

Site Assessment

Wells MW-1 through MW-3 were installed by ASE on September 24, 1999.[5] One soil sample from approximately 10 feet bgs in each boring was submitted for analysis, and petroleum hydrocarbon impact was reported in all soil samples. Groundwater in the wells was measured at approximately 8 feet bgs. The wells were first sampled on October 6, 1999, and petroleum hydrocarbon impact was reported in all three wells.

To assess the downgradient extent of petroleum hydrocarbon impact to soil and groundwater, ASE advanced three exploratory soil borings (BH-A through BH-C) on April 30, 2002.[6] The borings were advanced to 20 feet bgs, and were situated southwest of the subject site, on the adjacent strip mall property. One soil sample from 11.5 feet bgs and a groundwater sample from each boring were submitted for analysis. Petroleum hydrocarbon impact was reported in each of the soil and groundwater samples.

To provide additional characterization of the downgradient and lateral extent of petroleum hydrocarbon impact, and to evaluate if preferential pathways were influencing hydrocarbon migration, CRA advanced three exploratory soil borings on the subject property (B-1, B-2, and B-4), four additional soil borings on the strip mall property (B-3 and B-5 through B-7), and one boring in the sidewalk along Grant Avenue (B-8) on

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[1] *Tank Closure Report*, Reese Construction, dated September 14, 1998.
[2] *Report of Excavation Dewatering Activities*, Foss Environmental Services, dated September 21, 1998.
[3] *Stockpiled Soil Sampling Results*, Aqua Science Engineers, Inc., dated November 24, 1998.
[4] *Report Detailing Former Waste-Oil UST Overexcavation Activities*, Aqua Science Engineers, Inc., dated January 7, 1999.
[5] *Report of Soil and Groundwater Assessment*, Aqua Science Engineers, Inc., dated November 12, 1999.
[6] *Report of Soil and Groundwater Assessment*, Aqua Science Engineers, Inc., dated May 31, 2002.

February 25 and 26, 2008.[7] CRA concluded that additional assessment was required to further characterize petroleum hydrocarbon impact east of the former UST pit (in Channel Street) and to the southwest, downgradient of the site (in Grant Avenue). This phase of site assessment also included a well search, and CRA concluded that it was unlikely that any of the identified wells would be impacted by petroleum hydrocarbons from the site. Finally, this phase of the investigation also included an evaluation of subsurface utilities in the site vicinity, and CRA concluded that the sanitary sewer lines in Grant Avenue and the storm drain in Channel Street were potential preferential pathways for hydrocarbon migration.

CRA completed additional site assessment work in 2010.[8] Five exploratory soil borings (B-9 through B-13) were installed in Grant Avenue to evaluate hydrocarbon concentrations in backfill material around the sanitary sewer lines, and to assess if these sewer lines were acting as preferential petroleum hydrocarbon migration pathways. An additional groundwater monitoring well (MW-4) was installed adjacent to the northern dispenser island to assess the groundwater impact identified previously in boring B-1. Four soil vapor sampling probes (SV-1 through SV-4) were installed to assess the petroleum hydrocarbon concentrations in soil vapors. CRA concluded that the sanitary sewer lines in Grant Avenue are acting as a preferential migration pathway for petroleum hydrocarbons dissolved in groundwater, that petroleum hydrocarbon concentrations in the soil vapor samples exceed applicable Environmental Screening Levels (ESLs),[9] and that the lateral and vertical extent of soil impact that exceeds applicable ESLs is limited.

<u>Feasibility Pilot Studies</u>

Stratus installed extraction wells EX-1 through EX-3, ozone injection wells IW-1 and IW-2, and soil vapor point SV-5 in May 2011.[10] Wells EX-1 through EX-3 were installed to facilitate DPE pilot testing, wells IW-1 and IW-2 were installed to facilitate ozone injection pilot testing, and soil vapor sampling point SV-5 was installed to evaluate soil vapor concentrations in the vicinity of the subsurface water pipe that transects the area impacted by petroleum hydrocarbons.

Stratus conducted a DPE pilot test in June 2011.[10] Soil vapor and groundwater were extracted from wells EX-1 through EX-3 for a period of 4 days at an average applied vacuum of 15.8 inches mercury and an average influent soil vapor flow rate of 95 cubic feet per minute (cfm). Approximately 25,395 gallons of water were extracted during the

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[7] *Site Investigation, Preferential Pathway, and Workplan Report*, Conestoga-Rovers & Associates, dated April 29, 2008.
[8] *Additional Site Investigation Report*, Conestoga-Rovers & Associates, dated June 14, 2010.
[9] From *Table E, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Final-November 2007*, San Francisco Bay Regional Water Quality Control Board, revised May 2008.
[10] *Dual Phase Extraction Pilot Test Report*, Stratus Environmental, Inc., dated November 3, 2011.

93.3 hour combined well DPE test. A radius of influence (ROI) between 25 and 35 feet developed around each of the extraction wells. The test achieved GRO extraction rates up to 64 pounds (lb)/day in soil vapor, and 94 lb/day in groundwater. During the course of the test, approximately 441 lb of GRO, 6.4 lb of MTBE, and 1.2 lb of benzene were removed, demonstrating that DPE is a viable remedial option for the site conditions.

Stratus conducted an ozone injection pilot test in September and October 2011.[11] Ozone-enriched air was injected into wells IW-1 and IW-2 for a period of 32 days using equipment capable of generating up to 2.75 lb/day of ozone at a concentration of 6% by weight, with injection flow rates up to 12 standard cubic feet per hour at 12 pounds per square inch. An ROI up to 20 feet developed around each of the injection wells. Ozone injection appeared to effect generally decreasing trends in dissolved hydrocarbon concentrations without significantly altering the groundwater geochemical environment, demonstrating that ozone injection might be an effective technology to reduce dissolved and adsorbed petroleum hydrocarbons beneath the site.

SUBSURFACE CONDITIONS

Geology

The subject site is situated on the East Bay Plain approximately 1 ¼ miles northeast of San Francisco Bay. As described by Helley and others,[12] the site vicinity is underlain by unconsolidated Holocene-age alluvium consisting of moderately to poorly sorted silt and clay up to 10 feet thick, overlying well bedded, moderately sorted fine sand, silt, and clayey silt with occasional thin beds of coarse sand.

These general conditions are reflected in the boring logs prepared by ASE, CRA, and Stratus, and reflected in cross-sections A-A′ and B-B′ (Figures 3 and 4, respectfully). The shallow sedimentary material beneath the site consists predominantly of a sandy stratum to depths between approximately 2 and 7 feet bgs, overlying a stratum of fine-grained sediment, overlying a second sandy stratum, generally encountered at approximately 15 to 25 feet bgs. The upper sandy stratum is interpreted to be fill, and consists predominantly of fine to coarse sand, with up to 35% silt, and locally up to 55% gravel. The fine-grained stratum consists of apparently interfingered layers of silt, clay, clayey silt, and silty clay in varying proportions, sometimes with fine to medium sand (up to 35%). The lower sandy stratum appears to consist predominantly of fine to medium sand with 10% to 40% silt. The lower sandy stratum is encountered in some, but not all, of the borings advanced at the site, at depths between 16 and 24 feet bgs. Based on the

[11] *Ozone Injection Pilot Test Report*, Stratus Environmental, Inc., dated February 21, 2012.
[12] *Flatland Deposits of the San Francisco Bay Region, California-Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning*, E.J. Helley, K.R. LaJoie, W.E. Spangle and M.L. Blair, US Geological Survey Professional Paper 943, 1979.

borings advanced to date, the lateral and vertical extent of the lower sandy stratum has not been characterized.

Hydrogeology

The site is situated within the East Bay Plain Groundwater Sub Basin.[13] The nearest surface water is San Lorenzo Creek, which flows in a concrete-lined channel approximately 1,050 feet northwest of the site. Twenty-eight groundwater monitoring events were performed between the fourth quarter 1999 and first quarter 2013. During this time, groundwater was measured between 5.25 and 8.35 feet bgs (Table 2). Historically, groundwater flow has been predominantly to the west-southwest and southwest (Figure 5).

Based on the shallow groundwater conditions and our understanding of general construction practices, it is likely that the electrical, communications, water service, and natural gas service lines installed in the vicinity were not installed deep enough to intersect groundwater. Storm drain and sanitary sewer line trenches, however, are likely installed deep enough to intersect groundwater, and these piping excavations can locally affect groundwater flow. Sewer lines installed in Grant Avenue do intersect the water table, and the sewer lateral behind the Arroyo Center building is also likely installed deep enough to intersect the water table. As discussed above, CRA interpreted the grab groundwater analytical data from borings B-9 through B-13C as demonstrating that the sanitary sewer trenches in Grant Avenue were acting as preferential pathways for dissolved petroleum hydrocarbon migration.

Hydrocarbon Impact to Soil

Historical soil analytical data are presented in Table 3. DRO, GRO, benzene, and MTBE concentrations from on-site soil samples are summarized in Figure 6; concentrations from off-site soil samples are summarized in Figure 7. GRO, benzene and MTBE isoconcentration contour maps are included in Appendix A.

Source Area Impact

Residual petroleum hydrocarbons remain in the vicinity of the former USTs and dispenser islands. High concentrations were reported for sample T-3E at 7 feet bgs in the northern corner of the former fuel UST pit (3,800 milligrams per kilogram [mg/Kg] GRO, 30 mg/Kg benzene, and 27 mg/Kg MTBE); this area does not appear to have been excavated further. Low concentrations of petroleum hydrocarbons were also reported in the three other UST pit samples. Petroleum hydrocarbons were also reported in the sample from the base of the waste oil UST pit at 7.5 feet bgs (4,300 mg/Kg oil and grease, 1,300 mg/Kg DRO, and 200 mg/kg GRO). Concentrations reported in the sample

[13] California Department of Water Resources Bulletin 118, dated 2004.

collected from the base of the waste oil UST pit after it was excavated to 12 feet bgs were significantly lower.

High GRO concentrations were reported beneath the western end of the southern dispenser island at 1.5 feet bgs (5,700 mg/Kg). This area was overexcavated, and a sample from the base of the excavation (3.5 feet bgs) did not contain residual petroleum hydrocarbons. Petroleum hydrocarbon concentrations reported at the product line and other dispenser sample locations are relatively low.

In borings drilled in the source area (MW-1, MW-4, B-1, and B-4), the highest concentrations of DRO (1,800 mg/Kg) and GRO (360 mg/Kg) were reported in boring MW-4, the highest concentration of benzene (0.42 mg/Kg) was reported in borings MW-1 and B-1, and the highest MTBE concentration (1.8 mg/Kg) was reported in boring B-4.

<u>Extent of Impact</u>

Residual petroleum hydrocarbons in soil have been reported at depths up to 24.5 feet bgs from borings advanced during site assessment activities implemented subsequent to UST and dispenser removal. The highest concentrations of DRO, GRO, benzene, and MTBE are generally found in samples collected at depths from approximately 7 to 12 feet bgs. Outside the source area, the highest DRO concentration (320 mg/Kg) was reported in boring BH-B, the highest GRO concentrations (340 mg/Kg) were reported in borings EX-2 and EX-3, the highest benzene concentration (2.2 mg/Kg) was reported in boring BH-B, and the highest MTBE concentration (1.7 mg/Kg) was reported in boring EX-2. The presence of hydrocarbons in soil away from the source areas is attributed to transport by groundwater. The approximate extent of soil with residual GRO, benzene, or MTBE concentrations greater than ESLs is shown on Figures 3, 4, 6, and 7. Additional assessment of the lateral or vertical extent of soil impact does not appear warranted at this time.

Hydrocarbon Impact to Groundwater

Historical groundwater analytical data from the UST pit, the exploratory soil borings, and the monitoring well network are included in Table 2. First quarter 2013 GRO, benzene, and MTBE results are summarized in Figure 8. GRO, benzene, and MTBE isoconcentration contour maps from March 15, 2012 for groundwater analytical data are included in Appendix A.

During the first quarter 2013 sampling event (February 27, 2013), GRO was reported in wells MW-1, MW-4, EX-2, and EX-3, benzene was reported in wells MW-4, EX-1, and EX-2, and MTBE was reported in all sampled wells (MW-1 through MW-4 and EX-1 through EX-3). The highest concentrations of GRO (2,400 micrograms/liter [μg/L]), benzene (160 μg/L), and MTBE (1,400 μg/L) were reported in well MW-4.

Historical analytical data, including data from the wells and grab groundwater samples collected from the exploratory soil borings, indicate the dissolved hydrocarbon plume has migrated off-site to the southwest (beneath the adjacent Arroyo Center property) and west (beneath Grant Avenue). CRA concluded that the sanitary sewer lines in Grant Avenue are acting as a preferential pathway for dissolved petroleum hydrocarbon migration. Figures in Appendix A (A-1 through A-3) illustrate our interpretation of GRO, benzene, and MTBE distribution in groundwater (based on the first quarter 2012 monitoring data and grab groundwater samples collected in 2010). Analytical data from 2002 and 2008 grab groundwater samples collected at boring BH-A, BH-B, BH-C, B-5, and B-6 indicate hydrocarbons have migrated southwest beneath the Arroyo center, but the lack of recent groundwater data from this area makes evaluation of the plume configuration in this direction problematic.

While the lateral extent of the dissolved benzene and MTBE plumes are not completely characterized, data collected to date suggest that without some remedial effort, dissolved hydrocarbons will continue to migrate off-site into the backfill of the sanitary sewer pipe trench. Additional monitoring wells appear warranted to further constrain the lateral extent of dissolved hydrocarbons, and to monitor dissolved plume stability.

Potential Upgradient Hydrocarbon Source

A review of GeoTracker records indicates two former UST sites are situated upgradient (northeast) of the former Olympic site. Available records from GeoTracker and ACEHD were evaluated to assess if these sites might be contributing dissolved hydrocarbons to the dissolved plume beneath the Olympic site. The locations of these two sites are shown on Figure 1. These sites include:

- Arroyo High School, 15701 Lorenzo Avenue (Figure 1, map location A; approximately 1,500 feet northeast of the Olympic site). One diesel and one gasoline USTs were removed from the northeast corner of campus in January 1991. Low levels of DRO and BTEX compounds were reported in samples from groundwater wells. This site was closed by a letter from ACEHD dated January 18, 2000.

- Former Chevron #9-5630, 997 Grant Avenue (Figure 1, map location B; approximately 1,800 feet east northeast of the subject site). Three gasoline and one waste oil USTs were removed from this site in 1991. Monitoring data on file with Alameda County indicate GRO, BTEX, and MTBE were reported in groundwater samples from this site. This site was closed by a letter from ACEHD dated September 19, 1997. Analytical data from soil samples collected in 2011 during a limited environmental site assessment[14] indicated only low concentrations of petroleum hydrocarbons remain in soil beneath the site.

Based on the available groundwater elevation and analytical data for these sites and the distances of these sites from the Olympic site, it appears unlikely hydrocarbons from either of these sites contributed to the hydrocarbon plume beneath the Olympic site.

Extent of Hydrocarbon Impact to Soil Vapors

Soil vapor samples were collected from SV-1 through SV-4 on February 25, 2010. GRO (36,000,000 micrograms/cubic meter [$\mu g/m^3$] to 52,000,000 $\mu g/m^3$) and benzene (18,000 $\mu g/m^3$ to 160,000 $\mu g/m^3$) were reported in all samples. MTBE was reported only in the sample from SV-4 (5,400 $\mu g/m^3$). All reported GRO and benzene concentrations were above their respective current ESLs for commercial land use.[9] Due to the shallow groundwater, high soil vapor concentrations are likely to be found across the former Olympic station site and the portion of the adjoining property overlying the dissolved petroleum hydrocarbon plume.

Sensitive Receptor Survey

In 2008, CRA conducted a ½ mile-radius well survey for the site using data from the California Department of Water Resources (DWR) and Alameda County Public Works Agency (ACPWA).[7] Well locations identified in this search data are shown on Figure 1. Well details are summarized in Table 5. Two domestic wells, twelve irrigation wells, and one well of unspecified use were identified within the search radius. Stratus has not verified the current use and operational status of these wells.

The wells nearest the Olympic site are located at map location C (approximately 1,162 feet from the Olympic site) and map location D (approximately 1,109 feet from the Olympic site). Based on current and historical groundwater monitoring data from the Olympic well network, neither site appears situated downgradient of the hydrocarbon plume emanating from the Olympic site. Based on the well search information from CRA, there do not appear to be any wells downgradient of the Olympic site.

The San Lorenzo Creek flows to the southwest towards the San Francisco Bay in a concrete-lined channel approximately 1,050 feet northwest (hydraulically upgradient) of the Olympic site. No other surficial water bodies are located within 1 mile of the site. San Francisco Bay is located approximately 6,300 feet to the southwest.

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[14] *Limited Phase II Environmental Site Assessment Report, Pacific Gas and Electric Company L105N Property*, Stantec Consulting Corporation, dated June 27, 2011.

Conformance with Low-Threat Closure Criteria

This section reviews whether site conditions meet the general and media-specific criteria of the State Water Resources Control Board's (SWRCB) Low Threat Closure Criteria Policy (LTCP). Policy criteria are presented in bold italics, current site conditions for each criterion follow in plain text. At this time, the site conditions do not meet all criteria for closure consideration under the LTCP.

General Criteria

1. ***The unauthorized release is located within the service area of a public water system.*** Water service within the City of San Lorenzo is provided by the East Bay Municipal Utility District.

2. ***The unauthorized release consists only of petroleum.*** The release consisted of gasoline, diesel, and waste oil constituents.

3. ***The unauthorized release has been stopped.*** The USTs were removed in July 1998.

4. ***Free product has been removed to the maximum extent practicable.*** Free product has not been identified at this site.

5. ***A conceptual site model that assesses the nature, extent, and mobility of the release has been developed.*** The conceptualized site is presented in this document. As discussed above, work performed to date does not fully characterize the nature, extent, and mobility of the release, the lateral extent of dissolved benzene and MTBE impact off-site has not been fully characterized, and there are no data to evaluate the plume stability or configuration off-site.

6. ***Secondary source has been removed to the extent practicable.*** Secondary source removal has not been implemented at this site.

7. ***Soil and groundwater have been tested for MTBE and results reported in accordance with Health and Safety Code section 25296.15.*** Historical analytical data has included MTBE. Results are summarized in Tables 2 and 3, and have previously been reported to ACEHD and GeoTracker.

8. ***Nuisance as defined by Water Code section 13050 does not exist at the site.*** This site does not appear to present a nuisance as defined by Water Code section 13050.

Groundwater-Specific Criteria

Based on analytical data from monitoring wells and 2010 grab groundwater samples (there are no off-site monitoring wells), the site appears to meet three of the groundwater-specific criteria for Scenario 2, as outlined below. However, additional plume characterization is needed to verify the off-site plume configuration. As of February 27, 2013, MTBE concentrations in well MW-4 exceed the maximum concentration allowed in Scenario 2, but implementation of the remedial activities proposed below will address this issue.

1. ***The contaminant plume that exceeds water quality objectives is less than 250 feet in length.*** Downgradient extent of plume is based on 2010 grab groundwater data. Refer to isoconcentration maps in Appendix A (Figures A-1, A-2, and A-3).

2. ***There is no free product.*** Free product is not present at the site.

3. ***The nearest existing water supply well or surface water body is greater than 1,000 feet from the defined plume boundary.*** The nearest identified supply well is approximately 1,100 feet from the site and from the assumed plume boundary.

4. ***The dissolved concentration of benzene is less than 3,000 micrograms per liter (µg/l), and the dissolved concentration of MTBE is less than 1,000 µg/l.*** On February 27, 2013, maximum concentrations of benzene (160 µg/l) and MTBE (1,400 µg/l) were reported in well MW-4.

Petroleum Vapor Intrusion to Indoor Air

Based on soil vapor analytical data collected in 2010, the site does not appear to meet the commercial vapor intrusion criteria established in the LTCP:

1. This site does not appear to have an adequate bioattenuation zone (oxygen concentrations were reported at 1.2% to 1.4% at 5 feet bgs).

2. Benzene concentrations in all four of the soil vapor samples exceed the limits established in Appendix 4 of the LTCP.

3. Ethylbenzene and naphthalene concentrations in soil vapor samples were below laboratory reporting limits, but the reporting limits were elevated due to the high concentrations of other target analytes in the samples. The ethylbenzene reporting limit for one of the soil vapor samples (SV-4) and the naphthalene reporting limits for all of the soil vapor samples were greater than the limits established in Appendix 4 of the LTCP.

Direct Contact and Outdoor Air Exposure

Based on available historical soil analytical data, the site does not meet the exposure risk criteria for commercial/industrial exposure risk via direct contact with impacted soil or via volatilization to outdoor air or potential utility worker criteria. None of the soil samples collected at a depth of 5 feet bgs or less contained benzene concentrations in excess of the allowable limit established in Table 1 of the LTCP, but one soil sample from the UST pit (T-3E at 7 feet bgs) exceeded the maximum allowable limit of 14 mg/Kg for samples collected between 5 and 10 feet bgs. None of the reported ethylbenzene concentrations in soil samples collected in these sample intervals exceeded allowable limits established in Table 1. None of the soil samples collected to date at the site were analyzed for naphthalene. Soil samples collected from the waste oil UST were not analyzed for polyaromatic hydrocarbons (PAHs).

FEASIBILITY STUDY

Stratus proposes to address hydrocarbon impact at this site by removing hydrocarbons in soil and groundwater beneath the site through an engineered approach, and allowing natural attenuation to reduce the off-site hydrocarbon impact. This feasibility study (FS) evaluates estimated costs to implement the two remedial approaches (DPE and ozone injection) that have been pilot-tested at this site, and includes an estimated cost to pilot test and implement a combined approach of groundwater extraction (GWE), soil vapor extraction (SVE), and air sparging (AS). Proposed cleanup goals and estimates of the hydrocarbon mass remaining in the groundwater and soil are also included in this FS.

Cleanup Goals

The LTCP establishes cleanup criteria for leaking petroleum UST sites. As discussed in the ACEHD letter of March 5, 2013, these cleanup criteria are appropriate for this site, and will serve as the site cleanup goals. Conformance of the site with these criteria was discussed above.

Groundwater Cleanup Goals: The extent of the dissolved contaminant plume, as currently understood, is less than 250 feet in length (Appendix A). For plumes of this length, the highest permissible benzene concentration is 3,000 μg/L, and the highest permissible MTBE concentration in 1,000 μg/L. Groundwater concentrations are currently below these limits.

As discussed above, the site currently appears to meet these criteria.

Soil Cleanup Goals: According to the LTCP, the following residual soil concentrations are applicable to this site:

	Commercial/Industrial Land Use		Utility Worker
	0 – 5 feet bgs (mg/Kg)	5 – 10 feet bgs (mg/Kg)	0 – 10 feet bgs (mg/Kg)
Benzene	8.2	12	14
Ethylbenzene	89	134	314
Naphthalene	45	45	219
Polynuclear Aromatic Hydrocarbons (PAH)	0.68	--	4.5

Although the site is located in a mixed residential and commercial neighborhood, the commercial/industrial land use scenario is appropriate based on the extent of soil and groundwater impact (beneath the site, the commercial property to the southwest, and the adjacent street), and the current and anticipated future use of the subject site and adjacent property.

As discussed above, the site does not currently meet these criteria.

Soil Vapor Cleanup Goals: Selection of the appropriate soil vapor levels under the LTCP requires data regarding the oxygen content of the soil vapors and residual hydrocarbon concentrations in soil in the vicinity of the building. Oxygen concentrations in soil vapor samples collected in 2010 ranged from 1.2% to 1.4% (Table 4). Soil samples have not been collected in the 0 to 5-foot interval from the immediate vicinity of the station building. Based on these factors, there is no bioattenuation zone beneath the building, and the following soil vapor limits from Scenario 4 of the LTCP are applicable to this site:

	Commercial Land Use (µg/m3)
Benzene	280
Ethylbenzene	3,600
Naphthalene	310

As discussed above, the site does not currently meet these criteria.

Estimated Hydrocarbon Mass

Based on recent groundwater analytical data, we estimate there is approximately 2.5 lbs of GRO, 0.13 lbs of benzene, and 0.98 lbs of MTBE dissolved in the groundwater beneath the subject site. Using historical soil analytical data, we estimate approximately 955 lbs of GRO, 5.32 lbs of benzene, and 8.71 lbs of MTBE remain in soil beneath the site. Calculations of estimated of hydrocarbon mass are included in Appendix A.

Estimated Cost to Implement DPE

Estimated Time to Reach WQOs

Based on groundwater and soil vapor mass removal rates observed during the DPE pilot test and the estimated mass of petroleum hydrocarbons in the soil and groundwater beneath the site, the theoretical time to remove the dissolved and sorbed mass beneath the site is 15 days. However, our experience has been that, due to heterogeneous subsurface conditions, DPE can take much longer than a direct comparison of estimated hydrocarbon mass and pilot test extraction rate estimates might suggest (sometimes by an order of magnitude). For this FS, we have assumed it will take approximately 6 months of continuous DPE operation to reach WQOs.

Estimated Installation and Operational Costs

During the DPE pilot test, an ROI between 25 and 35 feet developed around the extraction wells. Based on an ROI of 25 feet, four additional extraction wells will be required to address the soil and groundwater impact beneath the site. Conveyance piping installed on the ground surface and protected with temporary rubber speed bumps was successfully utilized during the DPE test; we assume this setup for cost estimating purposes to keep installation costs low. Given the estimated time period anticipated to reach WQOs, Stratus would rent the appropriate mobile equipment, and it would be installed within a temporary fenced compound. Extracted groundwater would be treated with activated carbon and discharged to the sanitary sewer, and treated soil vapor discharged to the atmosphere. The DPE equipment will require electrical and natural gas service from Pacific Gas and Electric (PG&E).

The estimated cost to implement DPE for 6 months at this site, provide quarterly groundwater sampling during DPE and for one year after, conduct post-remediation confirmation sampling, and properly destroy all wells after successful completion of remedial activities is $257,000.

Estimated Costs to Implement DPE (18 months)		
Task	**Description**	**Estimated Cost ($)**
Design & permitting	Obtain required building and air discharge permits, and apply for electrical and natural gas service	$15,000
Well installation	Install four additional DPE extraction wells and three additional groundwater monitoring well clusters.	$30,000
Equipment and installation	Rent DPE equipment for 6 months, utility service connections, sewer hookup, aqueous phase carbon, speed bumps, piping	$75,000
Operation and maintenance	Weekly technician visits, utility costs, sewer discharge costs, analytical for permit compliance verification, field	$64,000

	measurements, carbon changeout	
Groundwater monitoring	Monitor and sample nine wells on a quarterly basis, analytical, reporting	$18,000
Confirmation sampling	Confirmation soil and soil vapor sampling , reporting	$30,000
Well destruction	Destroy sixteen wells by pressure grouting and two by drill-out, restore surface paving, reporting	$25,000
Total Cost		**$257,000**

Estimated Cost to Implement Ozone Injection

Estimated Time to Reach WQOs

There are approximately 958 lbs of GRO in the soil and groundwater. By rule of thumb, approximately 4 lbs of ozone is required to oxidize 1 lb of GRO. Ozone injection at this site would use generation equipment capable of generating up to 5 lb/day of ozone at 6% by weight. Approximately 3,832 lbs of ozone would need to be injected to address the estimated hydrocarbon mass. At 5 lbs/day, it will take at least 766 days (approximately 2.1 years) to inject the required mass of ozone to reach WQOs. However, our experience has been that, due to heterogeneous subsurface conditions and injection well inefficiencies, ozone injection can often take longer than initial estimates to reach cleanup goals. For this FS we have used an estimated operational period of 3 years.

Estimated Installation and Operational Costs

During the ozone pilot test, a 20-foot ROI developed around the ozone injection wells. Based on an ROI of 20 feet, seven additional injection wells will be required to address the soil and groundwater impact beneath the site. Because of the extended time period (3 years) the system would be required to operate, conveyance piping would need to be installed in trenches. Given the period of time anticipated to reach WQOs by this method, Stratus would purchase the appropriate mobile equipment. The remediation equipment would be installed in a permanent fenced compound at the rear of the building. For cost saving purposes, we have assumed that we will be able to get adequate power from the panel in the existing site building.

The estimated cost to implement ozone injection for 3 years at this site, provide quarterly groundwater sampling during ozone injection and for one year after, conduct post-remediation confirmation sampling, and properly destroy all wells after successful completion of remedial activities, is $442,000.

Estimated Costs to Implement Ozone Injection (4 years)		
Task	**Description**	**Estimated Cost ($)**
Design & permitting	Obtain required building permit(s)	$5,000
Well installation	Install seven additional injection wells and five additional groundwater monitoring wells	$35,000
Equipment and installation	Purchase ozone generator and injection equipment, excavate trenches and install conveyance tubing	$150,000
Operation and maintenance	Twice-monthly technician visits, utility costs (paying tenant for electrical connection), field measurements	$144,000
Groundwater monitoring	Monitor and sample twelve wells on a quarterly basis, analytical, reporting	$48,000
Confirmation sampling	Confirmation soil and soil vapor sampling , reporting	$30,000
Well destruction	Destroy nine wells by drill-out and twelve wells by pressure grouting, restore surface paving, reporting	$30,000
Total Cost		**$442,000**

Estimated Cost to Implement GWE, SVE, and AS

<u>Estimated Time to Reach WQOs</u>

Under this approach, groundwater would be extracted using downhole pumps, soil vapors would be simultaneously extracted from separate wells, and atmospheric air would be injected using separate wells. GWE would remove dissolved hydrocarbon mass directly, and SVE would remove sorbed hydrocarbon mass from the vadose zone and dewatered portion of the saturated zone. AS would transport the volatile hydrocarbon fractions to the dewatered area to be removed by SVE, while also adding dissolved oxygen to the groundwater to stimulate natural attenuation processes.

This approach has not been pilot tested (required before system installation), so we have estimated mass extraction rates, influent groundwater and soil vapor flow rates, sparge injection rates, and effective ROIs. Because the vadose zone at this site is naturally only 5 to 8 feet thick (depending on groundwater fluctuation), an additional period of groundwater extraction on the front end would be required to lower the water table enough to allow SVE to function. AS operations would not start until the SVE system was operational. Considering the heterogeneous subsurface conditions and well inefficiencies, the additional groundwater extraction time required to lower the water table, and mass removal rates expected to be lower than DPE, we estimate an operational period of 2 years to reach WQOs.

Estimated Installation and Operational Costs

We assume an ROI of 25 feet for the GWE extraction wells, and an ROI of 20 feet for the SVE and AS wells. Four additional extraction wells will be required for groundwater extraction (which would also use the existing EX wells). Seven SVE and seven AS wells would also need to be installed. Due to the expected operational period, remedial equipment (blower, pumps, compressor) would be purchased and conveyance piping would need to be installed in trenches. Extracted groundwater would be treated with activated carbon and discharged to the sanitary sewer, and treated soil vapors discharged to the atmosphere. The GWE, SVE, and AS equipment will require electrical and natural gas service from PG&E.

The estimated cost to implement GWE, SVE, and AS for 2 years at this site, provide quarterly groundwater sampling during GWE, SVE, and AS, and for one year after, conduct post-remediation confirmation sampling, and properly destroy all wells after successful completion of remedial activities is $421,000.

Estimated Costs to Implement Combined GWE, SVE, and AS (3 years)		
Task	**Description**	**Estimated Cost ($)**
Pilot testing	Install 2 air sparge wells. Perform GWE, SVE, and AS pilot test using existing AS well and new AS wells.	$45,000
Design & permitting	Obtain required building and air discharge permits, and apply for electrical and natural gas service	$15,000
Well installation	Install four GWE, seven SVE, and five AS wells, and five additional groundwater monitoring wells	$40,000
Equipment and installation	Purchase required equipment, utility service connections, sewer hookup, aqueous phase carbon, speed bumps, piping	$100,000
Operation and maintenance	Twice-monthly technician visits, utility costs, sewer discharge costs, analytical costs, field measurements	$120,000
Groundwater monitoring	Monitor and sample nine wells on a quarterly basis, analytical, reporting	$36,000
Confirmation sampling	Confirmation soil and soil vapor sampling , reporting	$30,000
Well destruction	Destroy thirty wells by pressure grouting and two by drill-out, restore surface paving, reporting	$35,000
Total Cost		**$421,000**

Recommendation

DPE is the more aggressive of the two engineered remedial approaches pilot-tested at this site. Based on the estimated hydrocarbon mass in the soil and groundwater beneath the site, DPE is estimated to reach WQOs approximately 18 months faster than ozone injection, at a lower estimated implementation cost. DPE would also more effectively address the elevated soil vapor concentrations in the vadose zone. Based on these reasons, Stratus recommends implementation of DPE remedial measures at the subject site. This remedial approach is targeted at hydrocarbons in soil and groundwater beneath the site. As remediation progresses and hydrocarbon mass is no longer migrating off-site, natural attenuation is expected to reduce the size and extent of the off-site impact. A conceptual plan to implement DPE remediation across the site is presented below.

REMEDIATION SYSTEM CONCEPTUAL DESIGN

To implement DPE remediation, Stratus will install four additional 4-inch diameter extraction wells (EX-4 through EX-7). The remediation wells will be constructed similar to existing extraction wells EX-1 through EX-3. Based on data generated during the 2011 DPE pilot test, we anticipate an ROI of at least 25 feet around each of the extraction wells. Locations of the proposed extraction wells and the minimum anticipated ROI are shown on Figure 9.

Given the historical concentrations of petroleum hydrocarbons reported in soil and groundwater samples and the proposed remediation goals, Stratus will utilize a 250 cubic feet per minute (cfm) thermal oxidizer with a minimum of a 15-horsepower (hp) liquid ring pump to extract the groundwater and soil vapors from all seven extraction wells simultaneously. This equipment will be trailer-mounted, and will be situated inside a temporary chain-link fence enclosure. Granular activated carbon will be utilized (as necessary) to treat the extracted groundwater prior to sanitary sewer discharge. Abovegrade piping (protected with rubber speed bumps) will connect the treatment system equipment to the extraction wells and sanitary sewer. The proposed system location is shown on Figure 9.

Currently there are no off-site monitoring wells. Stratus proposes to install three 2-inch diameter off-site monitoring well clusters (MW-5A/B through MW-7A/B). The new monitoring wells will be used to monitor the stability of the dissolved hydrocarbon plume, to monitor DPE effectiveness in reducing off-site dissolved hydrocarbon concentrations, and to verify attainment of remediation goals. Proposed monitoring well locations are shown on Figure 9. Should additional monitoring wells be necessary to complete off-site plume delineation, an addendum to this revised CAP will be submitted to ACEHD for concurrence on location and construction details.

CORRECTIVE ACTION PLAN IMPLEMENTATION

Stratus has prepared the following scope of work to implement DPE remediation as outlined above. The proposed scope of work has been subdivided into six tasks. Details are provided for the activities associated with each task. All work will be conducted under the direct supervision of a State of California Professional Geologist or Civil Engineer, as appropriate (supervising Professional), and will be conducted in accordance with RWQCB and ACEHD guidelines. Stratus' general field practices and sample handling procedures are included in Appendix B.

Task 1: Design Drawings and Specification

Following approval of this CAP by ACEDH, Stratus will prepare engineering design drawings for the installation of the DPE and groundwater treatment system. The package will include location drawings for the proposed temporary treatment system compound, sewer discharge trench, and details of the electrical and natural gas connections required to provide power for the system. Specific construction details (trench details, wellhead details, instrumentation diagrams, etc.) will also be illustrated. These engineering drawings will be used to secure required construction permits.

A construction bid package will be prepared, including the design drawings, technical specifications, and general construction conditions to describe the type and extent of construction activities to be performed. The technical specifications will address details of the design not included in the design drawings, including the methods, engineering standards, and materials which must be used by the contractor during construction. The general conditions will present contractual language regarding the requirements.

Task 2: Permitting and Contracting

Following approval of this CAP by ACEDH, the following activities will be completed:

- Obtain an Authority to Construct from the Bay Area Air Quality Management District (BAAQMD) to install the DPE system and discharge treated soil vapors.
- Obtain a permit from the Oro Loma Sanitary District (OLSD) to discharge treated groundwater to the sanitary sewer.
- Obtain electrical and natural gas service from PG&E to operate the DPE system.
- Obtain construction permits (as required) from the City of San Lorenzo Community Development Department for installation of the treatment system and compound.
- Obtain well installation permits from ACPWA.
- Obtain an encroachment permit from the City of San Lorenzo to install one monitoring well cluster in Grant Avenue.
- Update the site-specific health and safety plan.
- Mark proposed borings and excavations, notify Underground Service Alert, and inspect proposed areas for conflicts with subgrade utilities.
- Retain and schedule an appropriately-licensed contractor to install the DPE system and subgrade piping.

- Retain and schedule a C-57 contractor to install the extraction and monitoring wells.

Task 3: Extraction and Monitoring Well Installation

Well Borings

A California-licensed C-57 water well driller will advance well borings at the seven locations shown on Figure 9 (EX-4 through EX-7 and MW-5A/B through MW-7A/B). The borings will be advanced to a depth of approximately 20 feet bgs using a truck-mounted drilling rig equipped with 8-inch or 10-inch diameter hollow stem augers. The initial 5 feet of each boring will be advanced using hand tools to reduce the possibility of damaging underground utilities. The actual locations of the boreholes will be based on accessibility and the locations of overhead and underground utilities. The actual depths of the well borings will be determined by the supervising Professional based on subsurface conditions encountered at the time of drilling. Soil samples will be collected from each boring at 5-foot intervals using a split-spoon sampler. A Stratus geologist will supervise drilling activities, prepare a log of the encountered material, and collect soil samples for possible chemical analysis.

Well Construction

Extraction wells will be constructed in borings EX-4 through EX-7 using 4-inch diameter Schedule 40 PVC with 0.020-inch screens. The screened interval will extend from approximately 5 to 20 feet bgs.

To comply with ACEHD's directive regarding well screen lengths, two-well clusters will be installed at locations MW-5 through MW-7. The shallow well at each location (MW-5A, MW-6A, and MW-7A) will be constructed using 2-inch diameter Schedule 40 PVC with 0.020-inch screens extending from approximately 5 to 10 feet bgs (similar to the construction of well MW-4). The deeper well at each location (MW-5B, MW-6B, and MW-7B) will be constructed using 2-inch diameter Schedule 40 PVC with 0.020-inch screens extending from approximately 15 to 20 feet bgs.

In each well, a sand filter-pack (#3 or equivalent) will be placed in the annular space around the well screen from the bottom of the well screen to approximately 1-foot above the top of the well screen. Prior to placing the well seal, the well may be surged and additional filter pack material added, as necessary. A minimum 1-foot thick bentonite transition seal will be placed over the filter-pack. After the transition seal has been fully hydrated, the remaining annular space will be backfilled with neat cement to approximately 6 inches bgs. A watertight locking cap will be placed over the top of the well casing, and a traffic rated vault box, installed flush with the ground surface, will protect the top of the well pending installation of the remediation conveyance piping.

Actual well construction details may be modified by the supervising Professional based on conditions encountered at the time of the investigation. The rationale for the proposed well construction specifications will be provided in a future document.

Well Development

The newly installed extraction and monitoring wells will be allowed to stand a minimum of 72 hours before being developed. Wells will be surged to flush accumulated sediment from the well screen and filter pack, followed by groundwater pumping or hand-bailing to remove approximately 10 casing volumes of water from the well. Water levels and water-quality parameters and discharged quantities will be recorded for each well. Additional surging, bailing, or pumping may be performed at the discretion of the supervising Professional.

Drilling Waste Management

Wastes generated during the drilling activities will be contained in US Department of Transportation (DOT)-approved 55-gallon steel drums. All containers will be appropriately labeled and stored at the site pending characterization and disposal. An appropriately-licensed contractor will transport the soil and wastewater to an appropriate disposal facility.

Site Surveying

A California-licensed land surveyor will be retained to survey the horizontal coordinates and elevations of the new wells to GeoTracker standards. Elevations will be surveyed to a 0.01-foot vertical accuracy. The elevations will be established relative to a known benchmark in feet mean sea level (MSL). Survey data will be uploaded, as required, to the GeoTracker database.

Soil Sample Chemical Analyses

We anticipate that four soil samples from each well boring will be submitted for chemical analysis as described below. The actual number of samples analyzed will be determined by the supervising Professional. All samples submitted for chemical analysis will be properly labeled and preserved as required for the analytical procedure and the sample media, and will be handled under strict chain-of-custody protocol. Analyses will be performed by a California-certified analytical laboratory.

Soil samples selected for chemical analysis will be analyzed for GRO (C5-C12) by USEPA Method 8015M, and for BTEX and MTBE by USEPA Method 8260B. Samples analyzed for waste characterization purposes will be analyzed for GRO, BTEX, and MTBE as described above, and for total lead by USEPA Method 6010. Additional analyses of the waste material may be required by the disposal facility.

Reporting

Following completion of the well installation activities described above, Stratus will prepare a report of the site assessment activities. All reports will be prepared under the direction of a supervising Professional, and will be submitted in an acceptable electronic format to ACEHD and GeoTracker.

Groundwater Monitoring and Sampling

The newly installed groundwater monitoring wells will be incorporated into the existing monitoring, sampling, and reporting program for the site. The new monitoring wells will be sampled quarterly during the remediation and post-remediation periods, then on a semiannual basis thereafter (as needed). Samples from these wells will be analyzed for the existing analytical suite (GRO by USEPA Method 8015M, and BTEX and MTBE by USEPA Method 8260B). The newly installed extraction wells will also be included in the monitoring, sampling, and reporting program if they are not being actively used for extraction. Monitoring and sampling reports will continue to be submitted by the end of the month following the end of the calendar quarter (April 30, July 31, October 31, and January 31).

Task 4: Construction and System Installation

The remediation system construction will commence following the installation of the extraction wells and procurement of all system components. Upon receipt of the required permits, a Stratus field construction supervisor will oversee field activities and ensure conformity with the construction requirements set forth in the plans and specifications. Stratus will supervise trenching for subgrade utilities (natural gas and sewer connections), backfill, compaction, and resurfacing, where necessary. All construction work will be performed by an appropriately licensed contractor.

The treatment equipment trailer will be situated behind the existing building in a location that minimizes impact on the auto shop operations and does not impede the traffic flow at the adjacent Arroyo Center. A temporary fenced enclosure will be installed to secure the equipment from the public, and to protect the system from vandalism. The proposed location for the treatment equipment is shown on Figure 9, but the actual location will be subject to permit approval, access to utilities, and the discretion of the supervising Professional. A Stratus field construction supervisor will supervise installation of the treatment equipment compound, connection of the equipment to electrical and natural gas lines, and connection to the sanitary sewer.

Soil excavated during installation of subgrade utilities will be stockpiled at the site. The stockpile will be placed on and covered with plastic sheeting. The stockpiled soil will be sampled for disposal characterization (as described in Task 3), and a properly licensed contractor will remove the soil for disposal at an appropriate facility. The utility trenches will be backfilled with clean engineered fill material.

Start-Up

Upon completion of system construction, the system will be operated to verify the correct operation of all equipment and controls and to troubleshoot and repair any component of the system not operating correctly. The start-up and source testing will be conducted during the first two days of system operation, or as required by permit conditions. The following parameters will be recorded on field data sheets during system startup:

- Vapor and groundwater extraction rates,
- Applied vacuum at each monitoring well,
- Influent soil vapor flow rate into the system,
- Photoionization detector (PID) measurements of organic vapors from the extraction wells, and
- Discharge rate of treated groundwater to the sanitary sewer.

During source testing, one set of influent and effluent vapor samples will be collected for verification of compliance with permit conditions. The effluent sample will be analyzed on a 24-hour turnaround basis for GRO by USEPA Method TO-3, and for BTEX and MTBE by USEPA Method TO-15. Analytical results will be forwarded to BAAQMD along with an evaluation of the system destruction efficiency and mass emission rates. A sample of the treated groundwater effluent will be collected and analyzed for GRO by USEPA Method 8015M, and for BTEX and MTBE by USEPA Method 8260B. These results will be forwarded to OLSD to verify compliance with permit discharge conditions.

Task 5: Operation and Maintenance

After the system start-up and system optimization, a Stratus technician will visit the site at least twice each month to monitor system operation and to perform maintenance on the DPE system. Data collection will include measurement of flow rate, extraction rate, discharge rate, field monitoring of organic vapors, and applied vacuum at each vapor extraction well and the well field manifold. Existing monitoring wells will be used as observation points, and data collected from these wells will include measurement of induced vacuum and depth to water.

Samples of influent and effluent soil vapor and groundwater will be collected on a monthly basis (at a minimum) to verify permit compliance, and to estimate petroleum hydrocarbon mass extraction rates. Samples will be analyzed as described above in Task 4. System operational data will be reported in the quarterly groundwater monitoring reports.

Task 6: Post-Remediation Monitoring and Verification

Groundwater, soil, and soil vapor samples will be collected after completion of the remediation phase, as described below. These data will be used to establish the effectiveness of the remediation effort and to verify compliance with the cleanup goals proposed above (or to establish data trends that demonstrate the remediation goals will be met in a reasonable timeframe).

- Groundwater samples will be collected from the monitoring and extraction wells on a quarterly basis. Samples will be analyzed and the results reported as described in Task 3. These data will be used to establish plume stability, dissolved concentration trends, and compliance with groundwater cleanup goals.

- Soil samples will be collected to verify compliance with the soil cleanup goals. Stratus will prepare a work plan proposing sample locations and depths. Soil samples will be analyzed as described in Task 3. This work plan will be implemented after approval of the proposed scope of work by ACEHD.

- Soil vapor samples will be collected from existing vapor monitoring points SV-1 through SV-5 near the end of the post-remediation monitoring period. Soil vapor samples will be collected and analyzed as proposed in the previously submitted work plan.[15]

SCHEDULE

Following the submittal of this CAP, we anticipate that ACEHD will require approximately one month to provide their comments and/or concurrence. Once ACEHD approval is received, Stratus will initiate the ACPWA, BAAQMD, and OLSD permit applications, and obtain an access agreement with the neighboring property owner and an encroachment permit from the City of San Lorenzo for installation of the proposed monitoring wells. Simultaneously, equipment will be procured, design drawings will be prepared, and contractors selected. System construction and installation, followed by system startup, is anticipated to be completed within four months. Operation of the system is expected to occur for a period of 6 months, followed by one year of quarterly groundwater monitoring to verify trends in residual impact to the off-site targeted remediation area. At the conclusion of post-remediation quarterly monitoring, regulatory case closure will be requested. Milepost dates are indicated in the table below.

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[15] *Soil Vapor Sampling Plan*, Stratus Environmental, Inc., dated April 9, 2012.

Milestone Date	Task/Activity Completed
April 19, 2013	• Revised draft CAP submitted to ACEHD.
June 1, 2013	• 60-day ACEHD review of revised draft CAP completed. • Revised CAP (final) submitted. • ACEHD initiates 30-day public participation period.
July 15, 2013	• Public participation period completed. • USTCF budget change order submitted (as necessary).
September 1, 2013	• System design drawings and contractor bidding packages completed, contractor selected and scheduled. • Requests for electricity and natural gas service initiated. • Remediation equipment rental or purchase agreements completed. • Permits from ACPWA, BAAQMD, OLSD, and City of San Leandro (encroachment and building) secured. • Access agreement for monitoring wells secured.
October 1, 2013	• Groundwater monitoring and extraction wells are installed. • Subgrade utility and treatment system compound installation completed. • Natural gas, electrical and sewer service connections completed. • DPE system and activated carbon vessels installed in the compound.
October 15, 2013	• System shakeout and source testing completed. • Full-time DPE operation commences (6 months duration).
April 15, 2014	• DPE operation suspended. • Assumes DPE operational data indicate sufficient drop in influent soil vapor and groundwater hydrocarbon concentrations. • Begin post-remediation groundwater monitoring. • Collect post-remediation groundwater, soil, and soil vapor samples at end of period.
April 15, 2015	• Request site closure. • Assumes post-remediation monitoring indicates plume stability and attainment of cleanup objectives in a reasonable timeframe.
June 15, 2015	• Closure request approved by ACEHD
August 1, 2015	• All monitoring and remediation wells properly abandoned.

LIMITATIONS

This document was prepared in general accordance with accepted standards of care that existed at the time this work was performed. No other warranty, expressed or implied, is made. Conclusions and recommendations are based on field observations and data obtained from this work and previous investigations. It should be recognized that definition and evaluation of geologic conditions is a difficult and somewhat inexact science. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the subsurface conditions present. More extensive studies may be performed to reduce uncertainties. This document is solely for the use and information of our client unless otherwise noted.

If you have any questions regarding this project, please contact Mr. Steve Carter by telephone at (530) 676-6008 or by email at scarter@stratusinc.net.

Sincerely,

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APPENDICES

Appendix A	Hydrocarbon Mass Estimates
Appendix B	Field Practices and Procedures

cc: Mr. Philip Jaber
Ms. Cherie McCaulou, RWQCB

TABLES

TABLE 1
DRILLING AND WELL CONSTRUCTION SUMMARY
Former Olympic Station
1436 Grant Avenue, San Lorenzo, California

Well I.D.	Date	Boring Depth (feet)	Boring Diameter (inches)	Well Diameter (inches)	Well Depth (feet)	Screen Interval (feet bgs)	Slot Size (inches)	Drilling Method	Consultant
BH-A	04/30/02	20	2	--	--	--	--	Direct Push	Aqua Science Engineers, Inc.
BH-B	04/30/02	20	2	--	--	--	--	Direct Push	Aqua Science Engineers, Inc.
BH-C	04/30/02	20	2	--	--	--	--	Direct Push	Aqua Science Engineers, Inc.
B-1	02/25/08	25	3.25	--	--	--	--	Direct Push	Conestoga-Rovers & Assoc.
B-2	02/25/08	25	3.25	--	--	--	--	Direct Push	Conestoga-Rovers & Assoc.
B-3	02/26/08	25	3.25	--	--	--	--	Direct Push	Conestoga-Rovers & Assoc.
B-4	02/25/08	25	3.25	--	--	--	--	Direct Push	Conestoga-Rovers & Assoc.
B-5	02/26/08	25	3.25	--	--	--	--	Direct Push	Conestoga-Rovers & Assoc.
B-6	02/26/08	25	3.25	--	--	--	--	Direct Push	Conestoga-Rovers & Assoc.
B-7	02/26/08	25	3.25	--	--	--	--	Direct Push	Conestoga-Rovers & Assoc.
B-8	02/25/08	25	3.25	--	--	--	--	Direct Push	Conestoga-Rovers & Assoc.
B-9	02/11/10	25	2.5	--	--	--	--	Direct Push	Conestoga-Rovers & Assoc.
B-10	02/11/10	25	2.5	--	--	--	--	Direct Push	Conestoga-Rovers & Assoc.
B-11	02/10/10	11	2.5	--	--	--	--	Hand Auger	Conestoga-Rovers & Assoc.
B-12	02/11/10	25	2.5	--	--	--	--	Hand Auger	Conestoga-Rovers & Assoc.
B-13	02/10/10	4	3.25	--	--	--	--	Hand Auger	Conestoga-Rovers & Assoc.
B-13A	02/10/10	8	3.25	--	--	--	--	Hand Auger	Conestoga-Rovers & Assoc.
B-13B	02/10/10	9	3.25	--	--	--	--	Hand Auger	Conestoga-Rovers & Assoc.
B-13C	02/12/10	12	3.25	--	--	--	--	Hand Auger	Conestoga-Rovers & Assoc.
MW-1	09/24/99	26.5	8	2	26.5	5 - 26.5	0.020	HSA	Aqua Science Engineers, Inc.
MW-2	09/24/99	20	8	2	20	5 - 20	0.020	HSA	Aqua Science Engineers, Inc.
MW-3	09/24/99	21.5	8	2	21	5 - 21	0.020	HSA	Aqua Science Engineers, Inc.
MW-4	02/09/10	10	10	4	10	5 - 10	0.010	HSA	Conestoga-Rovers & Assoc.
EX-1	05/19/11	20	10	4	20	5 -20	0.020	HSA	Stratus Environmental, Inc.
EX-2	05/19/11	20	10	4	20	5 -20	0.020	HSA	Stratus Environmental, Inc.
EX-3	05/19/11	20	10	4	20	5 -20	0.020	HSA	Stratus Environmental, Inc.
IW-1	05/20/11	11.5	8	0.75	11.5	9.5 - 11.5	micro[1]	HSA	Stratus Environmental, Inc.
IW-2	05/20/11	16	8	0.75	16	14 - 16	micro[1]	HSA	Stratus Environmental, Inc.
SV-1	02/12/10	5.5	3.25	0.375	5	5[2]	0.002[2]	Hand Auger	Conestoga-Rovers & Assoc.
SV-2	02/09/10	5.5	3.25	0.375	5	5[2]	0.002[2]	Hand Auger	Conestoga-Rovers & Assoc.
SV-3	02/09/10	5.5	3.25	0.375	5	5[2]	0.002[2]	Hand Auger	Conestoga-Rovers & Assoc.
SV-4	02/09/10	5.5	3.25	0.375	5	5[2]	0.002[2]	Hand Auger	Conestoga-Rovers & Assoc.
SV-5	05/20/11	5.5	3.25	0.375	5	5[3]	0.002[3]	Hand Auger	Stratus Environmental, Inc.

Explanation
HSA = hollow stem auger

1 = Wells were constructed with 3/4-inch casing attached to a 2" diameter x 24" long ceramic microsparge unit.
2 = Vapor points were constructed with a 3/8" diameter x 1" long 40- to 60-micron (0.002 inch) pore polyethylene vapor probe.
3 = Vapor point was constructed with a 3/8" diameter x 1/2" long 50-micron (0.002 inch) pore stainless-steel vapor probe.

TABLE 2
GROUNDWATER ELEVATION AND ANALYTICAL SUMMARY
Former Olympic Service Station, 1436 Grant Avenue, San Lorenzo, CA

Well ID	Date Collected	Depth to Water (feet)	Top of Casing Elevation (ft msl)	Grouwater Elevation (ft msl)	Oil & Grease (µg/L)	TPHmo (µg/L)	TPHd (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	ETBE (µg/L)	TBA (µg/L)	Ethanol (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)
Groundwater ESL[1]						100	100	100	1.0	40	30	20	5.0	NE	NE	NE	12	NE	0.05	0.5
Grab Groundwater Samples																				
Pit Water	09/13/98	--	--	--	--	--	2,100[+]	3,600	350	130	39	380	17,000	--	--	--	--	--	--	--
BH-A	04/30/02	17/8	--	--	--	<100	<100	180	<0.50	<0.50	8.8	<0.50	82	<0.50	<0.50	<0.50	<5.0	--	--	--
BH-B	04/30/02	16/8	--	--	--	<100	<200	2,300	120	11	60	150	2,000	<5.0	<5.0	<5.0	<50	--	--	--
BH-C	04/30/02	16/8	--	--	--	<100	<150	1,200	57	0.72	43	87	240	<0.50	1.0	<0.50	<5.0	--	--	--
B-1	02/25/08	3/3.95	--	--	--	--	260,000	4,600	330	<5.0	33	<5.0	370	<5.0	<5.0	<5.0	<20	<500	<5.0	<5.0
B-2	02/25/08	7.5/6.95	--	--	--	--	1,900	540	12	<2.5	<2.5	<2.5	220	<2.5	<2.5	<2.5	<10	<250	<2.5	<2.5
B-3	02/25/08	8/NA	--	--	--	--	<50	<50	<0.50	<0.50	<0.50	<0.50	4.0	<0.50	<0.50	<0.50	<2.0	<50	<0.50	<0.50
B-4	02/25/08	7.5/7.80	--	--	--	--	6,800	7,300	150	<50	150	<50	2,700	<50	<50	<50	1,700	<5,000	<50	<50
B-5	02/25/08	8/6.40	--	--	--	--	250	320	<10	<10	13	<10	630	<10	<10	<10	<40	<1,000	<10	<10
B-6	02/25/08	8/6.95	--	--	--	--	120	<50	<5.0	<5.0	<5.0	<5.0	240	<5.0	<5.0	<5.0	<20	<500	<5.0	<5.0
B-7	02/25/08	8/6.55	--	--	--	--	84	<50	<0.50	<0.50	<0.50	<0.50	27	<0.50	<0.50	<0.50	<2.0	<50	<0.50	<0.50
B-8	02/25/08	8/6.10	--	--	--	--	1,000	930	37	<2.5	64	23	160	<2.5	<2.5	<2.5	<10	<250	<2.5	<2.5
B-9	02/11/10	6.33	--	--	--	--	<50	<50	<2.5	<2.5	<2.5	<2.5	160	<2.5	<2.5	<2.5	<10	<250	<2.5	<2.5
B-10	02/11/10	6.89	--	--	--	--	<50	<50	<0.50	<0.50	<0.50	<0.50	5.1	<0.50	<0.50	<0.50	<2.0	<50	<0.50	<0.50
B-11	02/11/10	5.20	--	--	--	--	3,700	130	0.69	<0.50	<0.50	<0.50	25	<0.50	<0.50	<0.50	<2.0	<50	<0.50	<0.50
B-12	02/11/10	6.65	--	--	--	--	<50	<50	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	<0.50	<0.50	<2.0	<50	<0.50	<0.50
B-13C	02/11/10	8.97	--	--	--	--	3,400	2,300	<2.5	<2.5	<2.5	<2.5	92	<2.5	<2.5	<2.5	<10	<250	<2.5	<2.5
Well Samples																				
MW-1	10/06/99	8.35	15.00	6.65	--	--	84**	3,900*	<25	<25	<25	<25	3,500	--	--	--	--	--	--	--
	01/13/00	7.90		7.10	--	--	<50	<1,300	18	<13	<13	<13	1,700	--	--	--	--	--	--	--
	04/12/00	7.08		7.92	--	--	56***	<1,000	66	<10	<10	<10	1,600	--	--	--	--	--	--	--
	07/19/00	7.66		7.34	--	--	52**	<1,000	<10	<10	<10	<10	1,200	--	--	--	--	--	--	--
	10/25/00	7.91		7.09	--	--	76***	4,100*	120	<25	<25	<25	6,100	--	--	--	--	--	--	--
	02/16/07	6.32		8.68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/01/07	5.88		9.12	--	<250	<50	<50	<1.2	<1.2	<1.2	<1.2	78	<1.2	<1.2	<1.2	<12	<120	<1.2	<1.2
	05/01/07	7.24	15.71	8.47	--	<250	<50	<50	<5.0	<5.0	<5.0	<5.0	250	<5.0	<5.0	<5.0	<50	<500	<5.0	<5.0
	08/01/07	7.77		7.94	--	--	<50	<50	<25	<25	<25	<25	520	<25	<25	<25	<250	<2,500	<25	<25
	11/01/07	7.71		8.00	--	--	<50	<50	<12	<12	<12	<12	460	<12	<12	<12	<120	<1,200	<12	<12
	02/01/08	5.71		10.00	--	--	<50	<50	<2.5	<2.5	<2.5	<2.5	110	<2.5	<2.5	<2.5	<10	<250	<2.5	<2.5
	05/02/08	7.52		8.19	--	<250	<50	<50	<5.0	<5.0	<5.0	<5.0	240	<5.0	<5.0	<5.0	<20	<500	<5.0	<5.0
	08/01/08	8.02		7.69	--	--	<50	<50	<10	<10	<10	<10	500	<10	<10	<10	<40	<1,000	<10	<10
	11/04/08	7.28		8.43	--	--	<50	<50	<5.0	<5.0	<5.0	<5.0	260	<5.0	<5.0	<5.0	26	<500	<5.0	<5.0
	08/11/09	8.08		7.63	--	--	<50	<50	<5.0	<5.0	<5.0	<5.0	270	<5.0	<5.0	<5.0	<20	<500	<5.0	<5.0
	02/03/10	6.14		9.57	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	39	--	--	--	--	--	--	--
	05/18/10	7.09		8.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/05/10	7.65		8.06	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	350	--	--	--	--	--	--	--
	02/04/11	7.20		8.51	--	--	--	<50	0.90	<0.5	<0.5	<0.5	62	--	--	--	--	--	--	--
	06/03/11	7.28	18.60	11.32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/02/11	7.47		11.13	--	--	--	120	<0.50	<0.50	<0.50	<0.50	160	--	--	--	--	--	--	--
	09/29/11	7.83		10.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/12/11	7.03		11.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/09/11	7.55		11.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/12/11	7.81		10.79	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/15/12	6.45		12.15	--	--	--	55	<0.50	<0.50	<0.50	<0.50	71	--	--	--	--	--	--	--
	08/28/12	7.81		10.79	--	--	--	120	<0.50	<0.50	<0.50	<0.50	240	--	--	--	--	--	--	--
	02/27/13	7.32		11.28	--	--	--	61	<0.50	<0.50	<0.50	<0.50	69	--	--	--	--	--	--	--

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Well ID	Date Collected	Depth to Water (feet)	Top of Casing Elevation (ft msl)	Grouwater Elevation (ft msl)	Oil & Grease (µg/L)	TPHmo (µg/L)	TPHd (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	ETBE (µg/L)	TBA (µg/L)	Ethanol (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)
MW-2	10/06/99	7.87	14.46	6.59	<1,000	500[3]	<50	70*	<0.5	<0.5	<0.5	<0.5	11	--	--	--	--	--	--	--
	01/13/00	7.46		7.00	<1,000	500[3]	<50	<50	<0.5	<0.5	<0.5	<0.5	6.2	--	--	--	--	--	--	--
	04/12/00	6.67		7.79	1,100	<500	<50	<50	<0.5	<0.5	<0.5	<0.5	39	--	--	--	--	--	--	--
	07/19/00	7.23		7.23	1,300	<500	<50	<1,000	<10	<10	<10	<10	990	--	--	--	--	--	--	--
	10/25/00	7.52		6.94	--	<500	<50	370	<2.5	<2.5	<2.5	<2.5	690	--	--	--	--	--	--	--
	02/16/07	5.89		8.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/01/07	5.45		9.01	--	<250	<50	<50	<0.5	<0.5	<0.5	<0.5	9.8	<0.5	<0.5	<0.5	<5.0	<50	<0.5	<0.5
	05/01/07	6.83	15.17	8.34	--	<250	<50	<50	<5.0	<5.0	<5.0	<5.0	120	<5.0	<5.0	<5.0	<50	<500	<5.0	<5.0
	08/01/07	7.35		7.82	--	--	<50	<50	<5.0	<5.0	<5.0	<5.0	130	<5.0	<5.0	<5.0	<50	<500	<5.0	<5.0
	11/01/07	7.27		7.90	--	--	<50	<50	<0.5	<0.5	<0.5	<0.5	19	<0.5	<0.5	<0.5	<5.0	<50	<0.5	<0.5
	02/01/08	5.25		9.92	--	--	<50	<50	<0.5	<0.5	<0.5	<0.5	3.3	<0.5	<0.5	<0.5	<2.0	<50	<0.5	<0.5
	05/02/08	7.12		8.05	--	--	<50	<50	<2.5	<2.5	<2.5	<2.5	83	<2.5	<2.5	<2.5	<10	<250	<2.5	<2.5
	08/01/08	7.59		7.58	--	--	<50	<50	<1.0	<1.0	<1.0	<1.0	52	<1.0	<1.0	<1.0	<4.0	<100	<1.0	<1.0
	11/04/08	6.84		8.33	--	--	80	<50	<0.5	<0.5	<0.5	<0.5	5.9	<0.5	<0.5	<0.5	<2.0	<50	<0.5	<0.5
	08/11/09	7.65		7.52	--	--	<50	<50	<0.5	<0.5	<0.5	<0.5	9.4	<0.5	<0.5	<0.5	<2.0	<50	<0.5	<0.5
	02/03/10	5.75		9.42	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	0.86	--	--	--	--	--	--	--
	05/18/10	6.67		8.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/05/10	7.25		7.92	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	57	--	--	--	--	--	--	--
	02/04/11	6.79		8.38	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	4.4	--	--	--	--	--	--	--
	06/03/11	6.82	18.00	11.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/02/11	7.06		10.94	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	46	--	--	--	--	--	--	--
	09/29/11	7.39		10.61	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	41	<1.0	<1.0	<1.0	<10	--	--	<1.0
	10/12/11	6.62		11.38	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	37	<1.0	<1.0	<1.0	<10	--	--	<1.0
	11/09/11	7.11		10.89	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	33	<1.0	<1.0	<1.0	<10	--	--	<1.0
	12/12/11	7.35		10.65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/15/12	5.98		12.02	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	4.3	--	--	--	--	--	--	--
	08/28/12	7.39		10.61	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	35	--	--	--	--	--	--	--
	02/27/13	6.91		11.09	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	12	--	--	--	--	--	--	--

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Well ID	Date Collected	Depth to Water (feet)	Top of Casing Elevation (ft msl)	Grouwater Elevation (ft msl)	Oil & Grease (µg/L)	TPHmo (µg/L)	TPHd (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	ETBE (µg/L)	TBA (µg/L)	Ethanol (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)
MW-3	10/06/99	7.90	14.41	6.51	--	--	300**	3,900	900	89	160	560	790	--	--	--	--	--	--	--
	01/13/00	7.50		6.91	--	--	210**	740	110	4.8	35	18	290	--	--	--	--	--	--	--
	04/12/00	6.61		7.80	--	--	640***	2,200	650	9.7	180	24	140	--	--	--	--	--	--	--
	07/19/00	7.24		7.17	--	--	270**	2,700*	420	<2.5	160	<2.5	99	--	--	--	--	--	--	--
	10/25/00	7.52		6.89	--	--	150	710*	180	<2.5	24	<2.5	71	--	--	--	--	--	--	--
	02/16/07	5.90		8.51	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/01/07	5.44		8.97	--	<250	<50	82	20	<1.7	<1.7	<1.7	100	<1.7	<1.7	<1.7	<17	<170	<1.7	<1.7
	05/01/07	6.87	15.13	8.26	--	<250	<50	<50	<5.0	<5.0	<5.0	<5.0	88	<5.0	<5.0	<5.0	<50	<500	<5.0	<5.0
	08/01/07	7.40		7.73	--	--	<50	130	12	<2.5	<2.5	<2.5	98	<2.5	<2.5	<2.5	<25	<250	<2.5	<2.5
	11/01/07	7.35		7.78	--	--	<50	77	<2.5	<2.5	<2.5	<2.5	68	<2.5	<2.5	<2.5	<25	<250	<2.5	<2.5
	02/01/08	5.28		9.85	--	--	<50	<50	<2.5	<2.5	<2.5	<2.5	97	<2.5	<2.5	<2.5	<10	<250	<2.5	<2.5
	05/02/08	7.15		7.98	--	--	<50	68	2.3	<1.7	<1.7	<1.7	86	<1.7	<1.7	<1.7	7.2	<170	<1.7	<1.7
	08/01/08	7.66		7.47	--	--	<50	85	3.5	<1.0	<1.0	<1.0	66	<1.0	<1.0	<1.0	7.2	<100	<1.0	<1.0
	11/04/08	6.96		8.17	--	--	<50	<50	<1.0	<1.0	<1.0	<1.0	40	<1.0	<1.0	<1.0	<4.0	<100	<1.0	<1.0
	08/11/09	7.72		7.41	--	--	<50	110	33	<0.50	<0.50	<0.50	28	<0.50	<0.50	<0.50	<2.0	<50	<0.50	<0.50
	02/03/10	5.72		9.41	--	--	--	<50	0.55	<0.50	<0.50	<0.50	25	--	--	--	--	--	--	--
	05/18/10	6.73		8.40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	08/05/10	7.31		7.82	--	--	--	450	110	2.2	0.76	0.64	32	--	--	--	--	--	--	--
	02/04/11	6.80		8.33	--	--	--	220[1]	64	1.6	<0.5	<0.5	36	--	--	--	--	--	--	--
	06/03/11	6.87	17.95	11.08	--	--	--	200	26	<0.50	<0.50	<0.50	34	--	--	--	--	--	--	--
	08/02/11	7.07		10.88	--	--	--	<50	2.5	<0.50	<0.50	<0.50	36	--	--	--	--	--	--	--
	09/29/11	7.43		10.52	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	28	<1.0	<1.0	<1.0	<10	--	--	<1.0
	10/12/11	6.67		11.28	--	--	--	<50	0.91	<0.50	<0.50	<0.50	32	<1.0	<1.0	<1.0	<10	--	--	<1.0
	11/09/11	7.16		10.79	--	--	--	<50	1.8	<0.50	<0.50	<0.50	31	<1.0	<1.0	<1.0	<10	--	--	<1.0
	12/12/11	7.42		10.53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	03/15/12	6.21		11.74	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	24	--	--	--	--	--	--	--
	08/28/12	7.44		10.51	--	--	--	<50	6.5	<0.50	<0.50	<0.50	24	--	--	--	--	--	--	--
	02/27/13	6.90		11.05	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	18	--	--	--	--	--	--	--
MW-4	05/18/10	6.68	15.15	8.47	--	--	--	13,000	620	36	170	12	1,200	--	--	--	--	--	--	--
	08/05/10	7.25		7.90	--	--	--	9,200	780	13	230	4.3	1,800	--	--	--	--	--	--	--
	02/04/11	6.71		8.44	--	--	--	4,800[1]	350	7.1	23	<2.5	440	--	--	--	--	--	--	--
	06/03/11	6.78	17.99	11.21	--	--	--	4,700	350	2.6	19	<2.5[2]	670	--	--	--	--	--	--	--
	08/02/11	7.01		10.98	--	--	--	4,700	290	<2.5[2]	12	<2.5[2]	970	--	--	--	--	--	--	--
	09/29/11	7.37		10.62	--	--	--	8,700	590	<5.0[2]	34	<5.0[2]	1,500	<10[2]	28	<10[2]	<100[2]	--	--	<10[2]
	10/12/11	6.61		11.38	--	--	--	1,500	160	<1.0[2]	1.8	<1.0[2]	1,300	<2.0[2]	8.6	<2.0[2]	42	--	--	<2.0[2]
	11/09/11	7.18		10.81	--	--	--	2,800	190	1.4	9.6	1.3	720	<2.0[2]	3.6	<2.0[2]	270	--	--	<2.0[2]
	12/12/11	7.36		10.63	--	--	--	3,800	300	2.4	11	2.5	1,200	--	--	--	--	--	--	--
	03/15/12	6.15		11.84	--	--	--	8,300	530	<5.0[2]	120	72	3,700	--	--	--	--	--	--	--
	08/28/12	7.40		10.59	--	--	--	2,400	250	<4.0[2]	14	<4.0[2]	1,400	--	--	--	--	--	--	--
	02/27/13	6.85		11.14	--	--	--	2,400	160	2.5	8.2	<2.0[2]	1,400	--	--	--	--	--	--	--

TABLE 2
GROUNDWATER ELEVATION AND ANALYTICAL SUMMARY
Former Olympic Service Station, 1436 Grant Avenue, San Lorenzo, CA

Well ID	Date Collected	Depth to Water (feet)	Top of Casing Elevation (ft msl)	Grouwater Elevation (ft msl)	Oil & Grease (µg/L)	TPHmo (µg/L)	TPHd (µg/L)	GRO (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DIPE (µg/L)	TAME (µg/L)	ETBE (µg/L)	TBA (µg/L)	Ethanol (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)
EX-1	06/03/11	6.96	18.14	11.18	--	--	--	76	8.3	<0.50	<0.50	0.99	37	--	--	--	--	--	--	--
	08/02/11	7.20		10.94	--	--	--	420	37	0.65	3.5	2.9	32	--	--	--	--	--	--	--
	09/29/11	7.53		10.61	--	--	--	150	13	<0.50	3.2	1.1	23	<1.0	1.2	<1.0	<10	--	--	<1.0
	10/12/11	6.63		11.51	--	--	--	180	23	0.51	2.8	0.97	27	<1.0	1.0	<1.0	<10	--	--	<1.0
	11/09/11	7.28		10.86	--	--	--	<50	4.3	<0.50	<0.50	<0.50	34	<1.0	<1.0	<1.0	<10	--	--	<1.0
	12/12/11	7.50		10.64	--	--	--	520	32	1.3	13	5.58	20	--	--	--	--	--	--	--
	03/15/12	6.19		11.95	--	--	--	<50	2.6	<0.50	<0.50	<0.50	8.4	--	--	--	--	--	--	--
	08/28/12	7.53		10.61	--	--	--	410	88	1.2	36	1.4	42	--	--	--	--	--	--	--
	02/27/13	7.02		11.12	--	--	--	<50	0.75	<0.50	<0.50	<0.50	14	--	--	--	--	--	--	--
EX-2	06/03/11	6.81	18.14	11.33	--	--	--	760	<1.5[2]	<1.5[2]	<1.5[2]	<1.5[2]	1,100	--	--	--	--	--	--	--
	08/02/11	7.03		11.11	--	--	--	920	8.7	<1.0[2]	<1.0[2]	<1.0[2]	920	--	--	--	--	--	--	--
	09/29/11	7.37		10.77	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/12/11	6.65		11.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/09/11	7.08		11.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/12/11	7.35		10.79	--	--	--	590	5.6	<1.0[2]	<1.0[2]	<1.0[2]	920	--	--	--	--	--	--	--
	03/15/12	6.58		11.56	--	--	--	100	<0.50	<0.50	<0.50	<0.50	130	--	--	--	--	--	--	--
	08/28/12	7.35		10.79	--	--	--	<300[2]	2.5	<1.5[2]	<1.5[2]	<1.5[2]	540	--	--	--	--	--	--	--
	02/27/13	6.82		11.32	--	--	--	320	0.51	<0.50	<0.50	<0.50	420	--	--	--	--	--	--	--
EX-3	06/03/11	6.55	17.63	11.08	--	--	--	95	0.93	<0.50	<0.50	<0.50	78	--	--	--	--	--	--	--
	08/02/11	6.82		10.81	--	--	--	130	1.5	<0.50	<0.50	<0.50	150	--	--	--	--	--	--	--
	09/29/11	7.15		10.48	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	10/12/11	6.37		11.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/19/11	6.89		10.74	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	12/12/11	7.12		10.51	--	--	--	100	2.4	<0.50	<0.50	<0.50	84	--	--	--	--	--	--	--
	03/15/12	5.70		11.93	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	30	--	--	--	--	--	--	--
	08/28/12	7.15		10.48	--	--	--	100	<0.50	<0.50	<0.50	<0.50	190	--	--	--	--	--	--	--
	02/27/13	6.63		11.00	--	--	--	84	<0.50	<0.50	<0.50	<0.50	93	--	--	--	--	--	--	--

Legend/Key:

ft msl = feet above mean sea level
µg/L = micrograms per liter
NM = Not measured

TPH - mo = total petroleum hydrocarbons as motor oil
TPHd = total petroleum hydrocarbons as diesel
GRO = gasoline range organics C6-C12

MTBE - methyl tertiary butyl ether
DIPE = di isopropyl ether
ETBE = ethyl tertiary butyl ether

TAME = tert amyl methyl ether
TBA = tert butyl ether
EDB = 1,2-dibromoethane
1,2-DCA = 1,2-dichloroethane

Analytical Methods:
GRO analyzed by EPA Method SW8015B/SW8260B, all other analytes analyzed by SW8260B.

+ = Oil range compounds are significant; diesel range compounds are significant; no recognizable pattern.
* = Hydrocarbon reported in the gasoline range does not match the gasoline standard.
** = Hydrocarbon reported is in the early diesel range and does not match the diesel standard.
*** = Hydrocarbon reported does not match the pattern of the diesel standard.

Analytical methods prior to February 2011, are available in various reports on the Alameda County Environmental Health Department files.

1 = *Table A. Environmental Screening Levels (ESLs). Shallow Soil (≤ 3m). Groundwater is Current or Potential Source of Drinking Water, in Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater - Interim Final*, San Francisco Bay Regional Water Quality Control Board, dated November 2007 (updated May 2008). Commercial scenario assumed.

[1] Weakly modified or unmodified gasoline is significant.
[2] = Reporting limits were increased due to high concentrations of target analytes.
[3] = Sample also analyzed for halogenated volatile organic compounds (EPA Method 8010) and semivolatile organic compounds (EPA Method 8270A); all analytes reported as none detected.

Analytical data for samples collected prior to 2011 are obtained from documents avaiable in the Alameda County Environmental Health Department files.

Well elevations and locations surveyed by Morrow Surveying on June 15, 2011.

TABLE 3
SOIL ANALYTICAL SUMMARY
Former Olympic Station
1436 Grant Avenue, San Lorenzo, California

Sample Location	Sample Depth (feet bgs)	Date Collected	Oil and Grease (mg/kg)	TPH-mo (mg/kg)	DRO (mg/kg)	GRO (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl-benzene (mg/Kg)	Total Xylenes (mg/Kg)	MTBE (mg/Kg)	TBA (mg/Kg)	DIPE (mg/Kg)	ETBE (mg/Kg)	TAME (mg/Kg)	1,2-DCA (mg/Kg)	EDB (mg/Kg)	Ethanol (mg/kg)	Naphthalene (mg/kg)
Shallow Soil (≤10 feet bgs) ESL[1]			NE	2,500	83	83	0.044	2.9	3.3	2.3	0.023	0.075	NE	NE	NE	0.48	0.00033	NE	2.8
1998 UST Removal (Reese Construction)																			
WO-1	7.5	7/10/1998	4,300	--	1,300	200	1.5	11	3.6	20	1.4	--	--	--	--	<0.025	--	--	--
T-1E	7.5	7/10/1998	--	--	--	180	<0.01	0.94	4.6	0.56	<0.2	--	--	--	--	--	--	--	--
T-2E	8	7/10/1998	--	--	--	82	<0.01	0.39	2.9	0.28	0.45	--	--	--	--	--	--	--	--
T-3E	7	7/10/1998	--	--	--	3,800	30	180	93	430	27	--	--	--	--	--	--	--	--
T-3W	10	7/10/1998	--	--	--	170	<0.02	0.71	5.3	6.6	<0.4	--	--	--	--	--	--	--	--
D-1G	1.5	7/10/1998	--	--	--	5,700	<0.25	14	54	280	<5	--	--	--	--	--	--	--	--
D-2G	2	7/10/1998	--	--	--	460	<0.02	0.26	0.61	5.0	<0.4	--	--	--	--	--	--	--	--
D-1D	2	7/10/1998	--	--	5.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--
D-2D	2	7/10/1998	--	--	39	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PL-1	1.5	7/10/1998	--	--	2.8	5.8	0.062	0.062	0.33	0.14	<0.05	--	--	--	--	--	--	--	--
PL-2	2	7/10/1998	--	--	1.3	5.9	0.10	0.56	0.19	0.42	0.75	--	--	--	--	--	--	--	--
1998 Overexcavation (Aqua Science Engineers, Inc.)																			
WO-OEX-12	12	12/18/1998	570	940	250	<1.3	<0.0050	0.024	0.057	0.24	<0.0050	--	--	--	--	<0.0050	--	--	--
D1G-OEX-3.5	3.5	12/18/1998	--	<50	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	--	--	--	--	--
1999 Assessment (Aqua Science Engineers, Inc.)																			
MW-1	10.5	9/24/1999	--	--	250	6.5	0.42	0.18	0.065	0.027	1.7	--	--	--	--	--	--	--	--
MW-2	10	9/24/1999	700	2,400	1,000	2.9	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	--	--	--	--	--
MW-3	10	9/24/1999	--	--	26	11	0.63	0.18	0.31	1.1	<0.0050	--	--	--	--	--	--	--	--
2002 Assessment (Aqua Science Engineers, Inc.)																			
BH-A	11.5	4/30/2002	--	180	270	150	<0.025	0.027	1.9	0.28	<0.025	<0.25	<0.025	<0.025	<0.025	--	--	--	--
BH-B	11.5	4/30/2002	--	<10	320	290	2.2	0.49	5.0	12	<0.050	<0.25	<0.050	<0.050	<0.050	--	--	--	--
BH-C	11.5	4/30/2002	--	12	280	240	1.7	0.016	4.3	5.1	0.014	<0.050	<0.0050	<0.0050	<0.0050	--	--	--	--
2008 Assessment (Conestoga-Rovers & Associates)																			
B-1	3	2/25/2008	--	--	8.3	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	7	2/25/2008	--	--	1,700	290	0.25	<0.20	<0.20	<0.20	<0.20	<2.0	<0.20	<0.20	<0.20	<0.16	<0.16	<10	--
	10.5	2/25/2008	--	--	120	140	0.31	0.089	0.11	<0.050	1.0	<0.50	<0.050	<0.050	<0.050	<0.040	<0.040	<2.5	--
	19.5	2/25/2008	--	--	120	85	0.42	<0.050	0.91	<0.050	1.7	<0.50	<0.050	<0.050	<0.050	<0.040	<0.040	<2.5	--

TABLE 3
SOIL ANALYTICAL SUMMARY
Former Olympic Station
1436 Grant Avenue, San Lorenzo, California

Sample Location	Sample Depth (feet bgs)	Date Collected	Oil and Grease (mg/kg)	TPH-mo (mg/kg)	DRO (mg/kg)	GRO (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl-benzene (mg/Kg)	Total Xylenes (mg/Kg)	MTBE (mg/Kg)	TBA (mg/Kg)	DIPE (mg/Kg)	ETBE (mg/Kg)	TAME (mg/Kg)	1,2-DCA (mg/Kg)	EDB (mg/Kg)	Ethanol (mg/kg)	Naphthalene (mg/kg)
Shallow Soil (≤10 feet bgs) ESL[1]			NE	2,500	83	83	0.044	2.9	3.3	2.3	0.023	0.075	NE	NE	NE	0.48	0.00033	NE	2.8
B-2	7	2/25/2008	--	--	14	30	0.016	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	11.5	2/25/2008	--	--	41	86	0.12	<0.005	0.020	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	15	2/25/2008	--	--	2.2	4.9	0.018	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	24.5	2/25/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	0.033	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
B-3	7	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	15	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	0.0084	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	24.5	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
B-4	7	2/25/2008	--	--	260	250	0.016	<0.010	0.037	<0.010	0.28	0.34	<0.010	<0.010	<0.010	<0.0080	<0.0080	<0.50	--
	11.5	2/25/2008	--	--	12	110	0.28	<0.050	1.1	<0.050	1.8	<0.50	<0.050	<0.050	<0.050	<0.040	<0.040	<2.5	--
	15	2/25/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	0.045	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	24.5	2/25/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
B-5	7	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	11.5	2/26/2008	--	--	7.2	49	<0.005	<0.005	0.15	<0.005	0.0056	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	15	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	0.019	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	24.5	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	0.022	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
B-6	7	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	11.5	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	15.5	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	24.5	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	0.020	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
B-7	7	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	11.5	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	15.5	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	24.5	2/26/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
B-8	6.5	2/25/2008	--	--	4.3	5.8	0.015	<0.005	0.0075	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	11.5	2/25/2008	--	--	16	270	0.72	<0.20	2.5	0.99	<0.20	<2.0	<0.20	<0.20	<0.20	<0.16	<0.16	<10	--
	15	2/25/2008	--	--	1.5	4.9	<0.005	<0.005	0.014	<0.005	0.027	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--
	24.5	2/25/2008	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.25	--

TABLE 3
SOIL ANALYTICAL SUMMARY
Former Olympic Station
1436 Grant Avenue, San Lorenzo, California

Sample Location	Sample Depth (feet bgs)	Date Collected	Oil and Grease (mg/kg)	TPH-mo (mg/kg)	DRO (mg/kg)	GRO (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl-benzene (mg/Kg)	Total Xylenes (mg/Kg)	MTBE (mg/Kg)	TBA (mg/Kg)	DIPE (mg/Kg)	ETBE (mg/Kg)	TAME (mg/Kg)	1,2-DCA (mg/Kg)	EDB (mg/Kg)	Ethanol (mg/kg)	Naphthalene (mg/kg)
Shallow Soil (≤10 feet bgs) ESL[1]			NE	2,500	83	83	0.044	2.9	3.3	2.3	0.023	0.075	NE	NE	NE	0.48	0.00033	NE	2.8
2010 Assessment (Conestoga-Rovers & Associates)																			
MW-4	3	2/9/2010	--	--	530	160	<0.050	<0.050	<0.050	<0.050	<0.050	<0.50	<0.050	<0.050	<0.050	<0.040	<0.040	<5.0	1.3
	5	2/9/2010	--	--	1,800	360	<0.10	<0.10	<0.10	<0.10	<0.10	<1.0	<0.10	<0.10	<0.10	<0.080	<0.080	<10	3.1
	8	2/9/2010	--	--	50	270	<0.050	<0.050	0.70	<0.050	0.20	<0.50	<0.050	<0.050	<0.050	<0.040	<0.040	<5.0	1.1
B-9	3	2/11/2010	--	--	1.9	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	5	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	10	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	15	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	20	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	24.5	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.5	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
B-10	3	2/11/2010	--	--	2.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	5	2/11/2010	--	--	1.5	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	9.5	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	15	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	20	2/11/2010	--	--	1.5	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	24.5	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
B-11	3	2/10/2010	--	--	2.1	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	5	2/10/2010	--	--	2.9	<1.0	<0.005	<0.005	<0.005	0.0078	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	8	2/10/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	10	2/10/2010	--	--	2.7	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
B-12	3	2/11/2010	--	--	1.8	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	5	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	10	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	15	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	20	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	24.5	2/11/2010	--	--	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
B-13A	3	2/10/2010	--	--	6.1	<1.0	0.023	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	5	2/10/2010	--	--	1.2	<1.0	0.0060	<0.005	0.010	0.011	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
	7	2/10/2010	--	--	2.8	3.3	<0.005	<0.005	0.016	0.021	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005

TABLE 3
SOIL ANALYTICAL SUMMARY
Former Olympic Station
1436 Grant Avenue, San Lorenzo, California

Sample Location	Sample Depth (feet bgs)	Date Collected	Oil and Grease (mg/kg)	TPH-mo (mg/kg)	DRO (mg/kg)	GRO (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl-benzene (mg/Kg)	Total Xylenes (mg/Kg)	MTBE (mg/Kg)	TBA (mg/Kg)	DIPE (mg/Kg)	ETBE (mg/Kg)	TAME (mg/Kg)	1,2-DCA (mg/Kg)	EDB (mg/Kg)	Ethanol (mg/kg)	Naphthalene (mg/kg)
Shallow Soil (≤10 feet bgs) ESL[1]			NE	2,500	83	83	0.044	2.9	3.3	2.3	0.023	0.075	NE	NE	NE	0.48	0.00033	NE	2.8
B-13C	11.5	2/12/2010	--	--	8.0	15	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.005	<0.005	<0.004	<0.004	<0.5	<0.005
Remediation Well Installation 2011 (Stratus Environmental, Inc.)																			
EX-1	6	5/19/2011	--	--	--	83	0.15	<0.020	1.3	0.041	0.076	--	--	--	--	--	--	--	--
	11	5/19/2011	--	--	--	110	1.5	0.19	1.7	3.5	0.21	--	--	--	--	--	--	--	--
	16	5/19/2011	--	--	--	<1.0	<0.005	<0.005	<0.005	<0.005	0.046	--	--	--	--	--	--	--	--
	21	5/19/2011	--	--	--	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--
EX-2	11	5/19/2011	--	--	--	340	0.19	<0.10	0.31	<0.10	1.7	--	--	--	--	--	--	--	--
	16	5/19/2011	--	--	--	1.6	<0.005	<0.005	<0.005	<0.005	1.2	--	--	--	--	--	--	--	--
	21	5/19/2011	--	--	--	2.3	<0.005	<0.005	<0.005	<0.005	0.098	--	--	--	--	--	--	--	--
EX-3	6	5/19/2011	--	--	--	41	0.023	<0.010	<0.010	<0.010	<0.010	--	--	--	--	--	--	--	--
	11	5/19/2011	--	--	--	340	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	--	--	--	--	--	--
	16	5/19/2011	--	--	--	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--
IW-1	6	5/20/2011	--	--	--	220	<0.050	<0.050	0.49	0.40	0.054	--	--	--	--	--	--	--	--
	11	5/20/2011	--	--	--	170	0.17	0.11	1.9	1.8	0.070	--	--	--	--	--	--	--	--
IW-2	6	5/20/2011	--	--	--	140	0.39	<0.050	2.9	0.17	<0.050	--	--	--	--	--	--	--	--
	11	5/20/2011	--	--	--	160	0.89	0.18	2.4	3.8	<0.050	--	--	--	--	--	--	--	--
	16.5	5/20/2011	--	--	--	<1.0	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--

TABLE 3
SOIL ANALYTICAL SUMMARY
Former Olympic Station
1436 Grant Avenue, San Lorenzo, California

Sample Location	Sample Depth (feet bgs)	Date Collected	Oil and Grease (mg/kg)	TPH-mo (mg/kg)	DRO (mg/kg)	GRO (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl-benzene (mg/Kg)	Total Xylenes (mg/Kg)	MTBE (mg/Kg)	TBA (mg/Kg)	DIPE (mg/Kg)	ETBE (mg/Kg)	TAME (mg/Kg)	1,2-DCA (mg/Kg)	EDB (mg/Kg)	Ethanol (mg/kg)	Naphthalene (mg/kg)
Shallow Soil (≤10 feet bgs) ESL[1]			NE	2,500	83	83	0.044	2.9	3.3	2.3	0.023	0.075	NE	NE	NE	0.48	0.00033	NE	2.8

Explanation
TPH-mo = Total purgeable hydrocarbons as motor oil
DRO = Diesel range organics
GRO = Gasoline range organics (C4 - C13)
BTEX = Benzene, toluene, ethylbenzene, and xylenes
MTBE = Methyl tertiary butyl ether
TBA=Tertiary butyl alcohol
DIPE =Di-isopropyl ether
ETBE = Ethyl tertiary butyl ether
TAME = Tertiary amyl methyl ether
1,2-DCA=1,2-Dichloroethane
EDB = 1,2-Dibromoethane
mg/Kg = milligrams per kilogram
NE = not established

Analytical Methods
Oil and grease analyzed using EPA Method 5520 E&F
TPH-mo, DRO, and GRO analyzed using EPA Method SW8015B/DHS LUFT Manual
BTEX and MTBE analyzed prior to 2002 using EPA Method 8020
BTEX, MTBE, TBA, DIPE, ETBE, TAME, 1,2-DCA, and EDB analyzed using EPA Method SW8260B

All data reported prior to 2011 provided by Conestoga-Rovers & Associates.

[1] = *Table A. Environmental Screening Levels (ESLs), Shallow Soil (≤ 3m), Groundwater is Current or Potential Source of Drinking Water*, in *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater - Interim Final*, San Francisco Bay Regional Water Quality Control Board, dated November 2007 (updated May 2008). Commercial scenario assumed.

Table 4
Soil Vapor Analytical Summary
Former Olympic Station
1436 Grant Avenue, San Lorenzo, California

Sample ID	Sample Date	Depth (feet bgs)	TPHg (μg/m³)	Benzene (μg/m³)	Toluene (μg/m³)	Ethylbenzene (μg/m³)	m,p-Xylenes (μg/m³)	o-Xylenes (μg/m³)	MTBE (μg/m³)	Naphthalene (μg/m³)	Helium (%)	Oxygen (%)	Methane (%)	Carbon Dioxide (%)
Soil Vapor ESL[1]			29,000	280	180,000	3,300	58,000 (total xylenes)		31,000	240	--	--	--	--
SV-1	02/25/10	5	36,000,000	18,000	<2,100	<2,500	<2,500	<2,500	<2,000	<12,000	<0.11	1.4	35	8.5
SV-2	02/25/10	5	44,000,000	160,000	<2,500	<2,900	<2,900	<2,900	<2,400	<14,000	<0.13	1.2	13	9.0
SV-3	02/25/10	5	52,000,000	52,000	<2,200	<2,500	<2,500	<2,500	<2,100	<12,000	<0.12	1.2	18	5.8
SV-4	02/25/10	5	41,000,000	120,000	<4,400	<5,000	<5,000	<5,000	5,400	<24,000	<0.12	1.2	5.2	9.5
Duplicate Sample														
SV-2-D	02/25/10	5	43,000,000	160,000	<2,400	<2,800	<2,800	<2,800	<2,300	<13,000	<0.13	1.1	13	8.9

Explanation

TPHg = Total Petroleum Hydrocarbons as gasoline
<x = not detected above laboratory detection limit, x.
μg/m³ = micrograms per cubic meter
% = percent
feet bgs = feet below ground surface
NE = not established

SV-5 was installed 5/20/11, but has not been sampled.

[1] = *Table E. Environmental Screening Levels (ESLs), Indoor Air and Soil Gas (Vapor Intrusion Concerns)*, in *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater - Interim Final*, San Francisco Bay Regional Water Quality Control Board, dated November 2007 (updated May 2008). Commercial scenario assumed.

Table 5
Well Search Summary
Former Olympic Station
1436 Grant Avenue, San Lorenzo, California

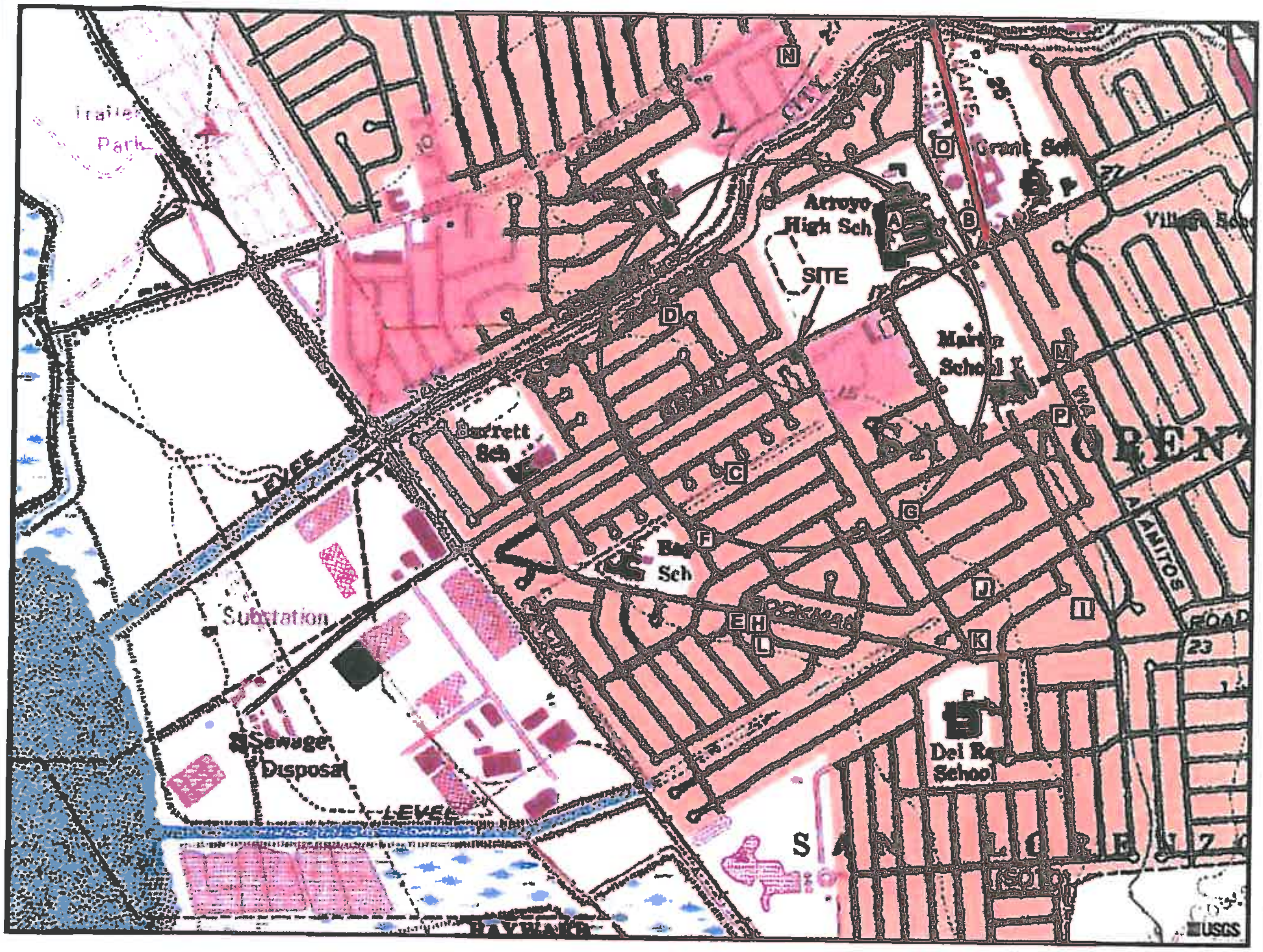
Map ID	State Well Number	Installation Date	Well Use	Well Depth (feet bgs)	Screen Interval (feet bgs)	Seal Interval (feet bgs)	Distance from USTs (feet)
C	3S/3W-13C1	5/30/77	Irrigation	21	10-21	0-10	1,162
D	3S/3W-13D1	4/17/77	Irrigation	30	11-30	0-10.5	1,109
E	3S/3W-13F1	7/21/77	Irrigation	28	10-28	0-10	2,270
F	3S/3W-12F2	7/15/77	Irrigation	20	10-20	0-10	1,848
G	3S/3W-13G1	8/14/56	Irrigation	30	15-30	--	1,742
H	3S/3W-13G2	7/9/77	Irrigation	29	10-29	0-10	2,323
I	3S/3W-13H2	5/16/88	Domestic	32	21-32	0-21	3,115
J	3S/3W-13H1	8/12/77	Irrigation	40.5	11-39.5	0-10	2,376
K	3S/3W-13J4	6/24/77	Irrigation	28	17-27	0-8	2,851
L	S3S/3W-13K3	6/19/77	Irrigation	23.5	10-20	0-10	2,482
M	3S/3W-13A5	7/19/90	Irrigation	100	50-90	0-25	2,429
N	3S/3W-12K4	1977	Irrigation	30	--	--	2,429
	3S/3W-12N1	--	Domestic	--	--	--	2,693
O	3S/3W-12R2	--	--	--	--	--	2,218
P	3S/3W-13A1	7/1/77	Irrigation	30	--	--	2,323

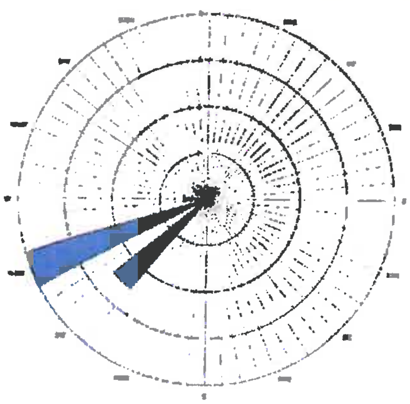
Notes and Explanation

Well data from CA Department of Water Resources and Alameda County Public Works Agency
Map ID - refers to well location shown on Figure 1
-- = not available
feet bgs = feet below ground surface

Information in this table originally reported in *Site Investigation, Preferential Pathway, and Workplan Report*, Conestoga-Rovers & Associates, dated April 29, 2008.

FIGURES





Ⓐ FORMER UST SITE

Ⓒ WELL LOCATION

WELL LOCATION DATA FROM CONASTOGA-ROVERS AND ASSOCIATES.
REFER TO TABLE 5 FOR WELL CONSTRUCTION DETAILS.

N

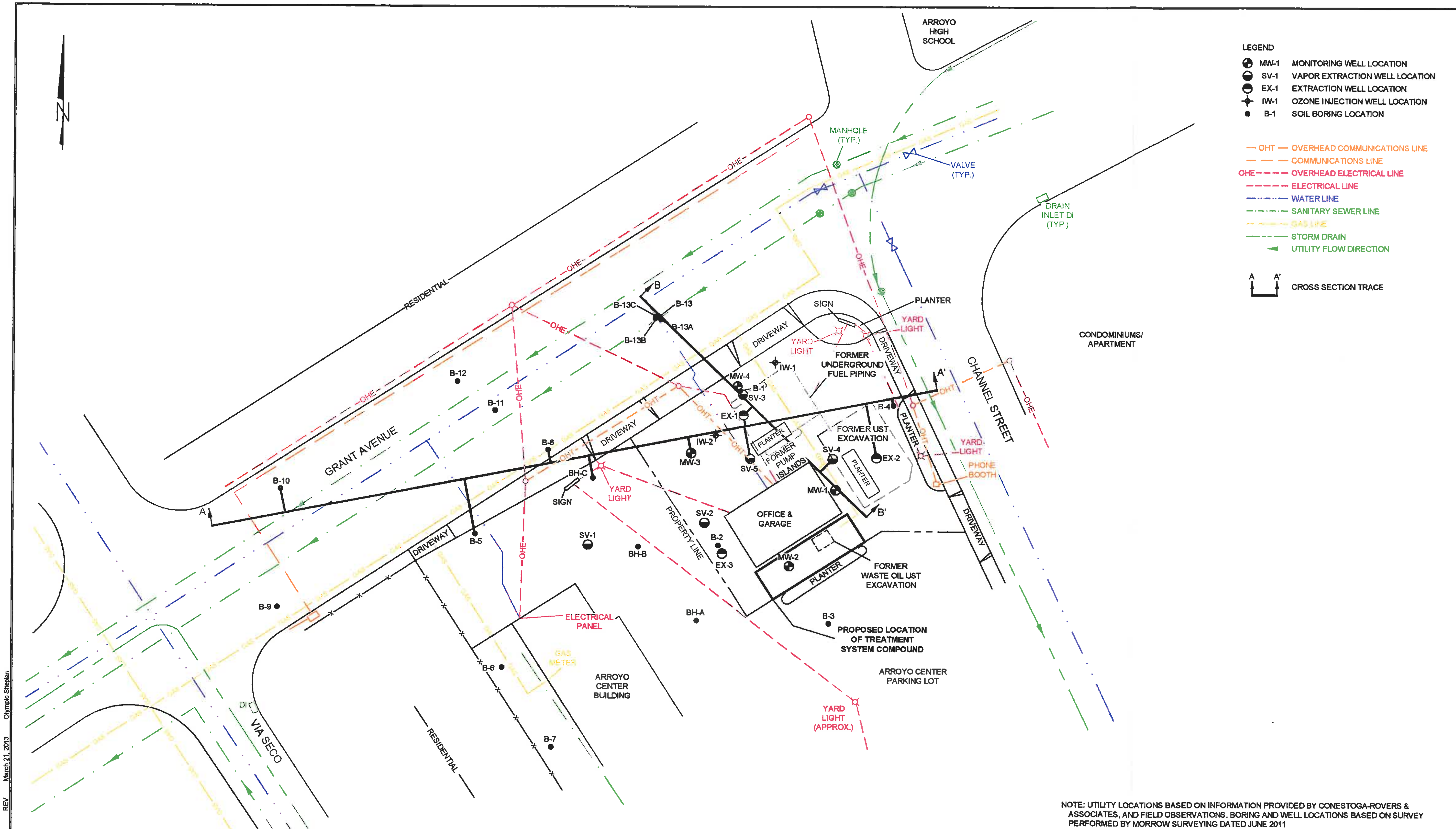
0 1800 FT

APPROXIMATE SCALE

GENERAL NOTES:
BASE MAP FROM U.S.G.S.
SAN LORENZO, CA.
7.5 MINUTE TOPOGRAPHIC
PHOTOREVISED 1978

QUADRANGLE LOCATION

STRATUS ENVIRONMENTAL, INC.	FORMER OLYMPIC SERVICE STATION 1436 GRANT AVENUE SAN LORENZO, CALIFORNIA SITE LOCATION MAP	FIGURE 1 PROJECT NO. 2115-1436-01



Olympic\RAP JMP REV March 21, 2013 Olympic Siteplan

STRATUS ENVIRONMENTAL, INC.

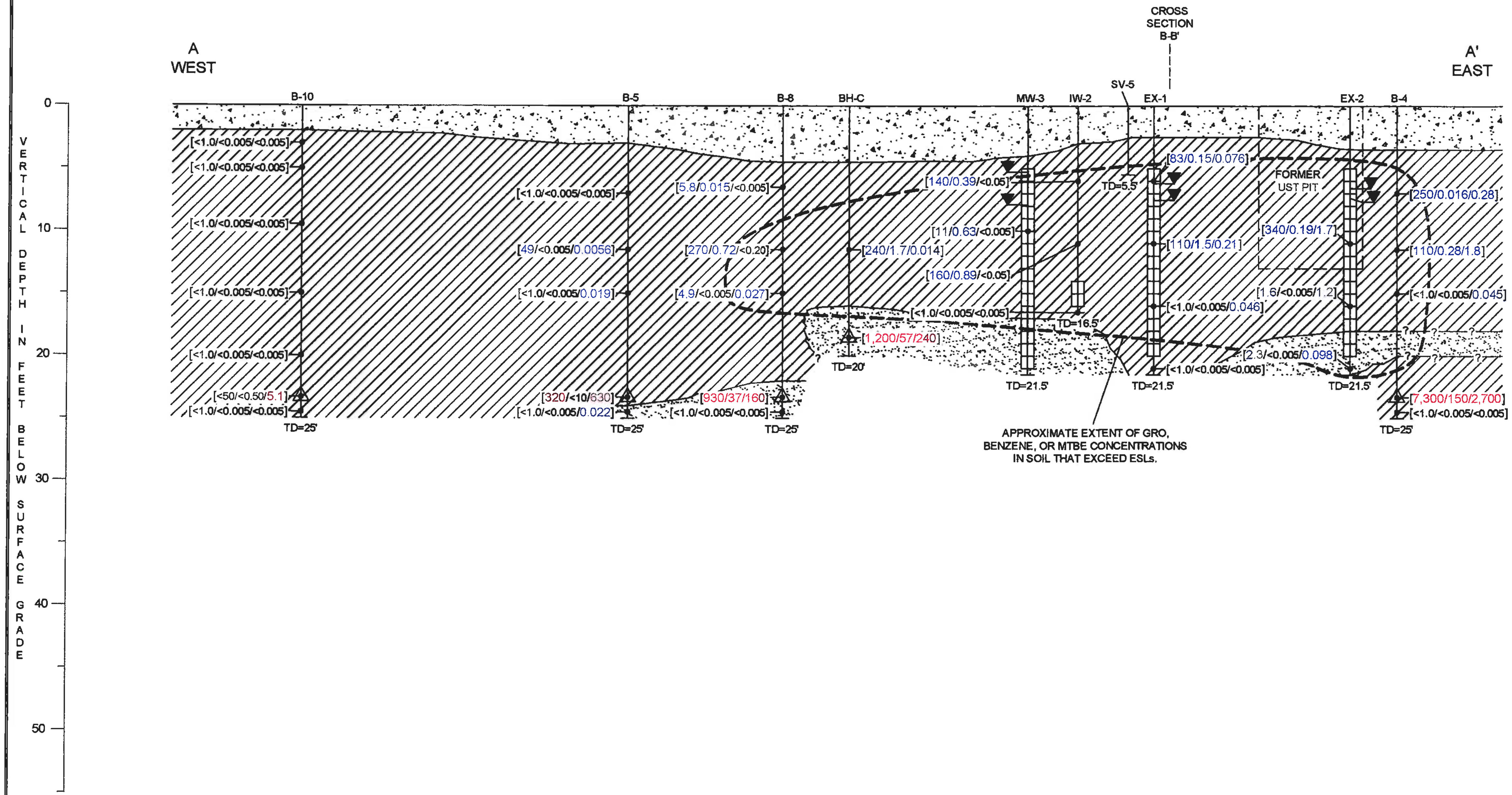
0 40 FT
APPROXIMATE SCALE

FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

SITE PLAN

FIGURE
2

PROJECT NO.
2115-1436-01



LEGEND:

APPROXIMATE CONTACT BETWEEN SOIL TYPES

SOIL SAMPLE LOCATION [<1.0/<0.005/<0.005] TOTAL PETROLEUM HYDROCARBONS AS GASOLINE, BENZENE, METHYL TERTIARY BUTYL ETHER CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/Kg)

GRAB WATER SAMPLE LOCATION [930/37/160] TOTAL PETROLEUM HYDROCARBONS AS GASOLINE, BENZENE, METHYL TERTIARY BUTYL ETHER CONCENTRATION IN MICROGRAMS PER LITER (µg/L)

DEPTH TO GROUNDWATER RANGE (1999 - 2012)

SCREENED INTERVAL OF WELL

TD=20' TOTAL DEPTH OF BORING IN FEET BELOW SURFACE GRADE

NOTE: GRAB WATER SAMPLES COLLECTED FROM TEMPORARY WELL CASINGS

FINE GRAINED SEDIMENTS (ML, MH, CL, & CH

COARSE GRAIN SEDIMENTS (SP, SP-SM, SM, & SC)

FILL MATERIAL (SW, SW-SM, SW-SC, & ML)

GRAVEL FILL

VERT. SCALE 0 – 10 FT

HORZ. SCALE 0 – 30 FT

Olympic Cross Sections March 21, 2013 REV JMP OlympicRAP

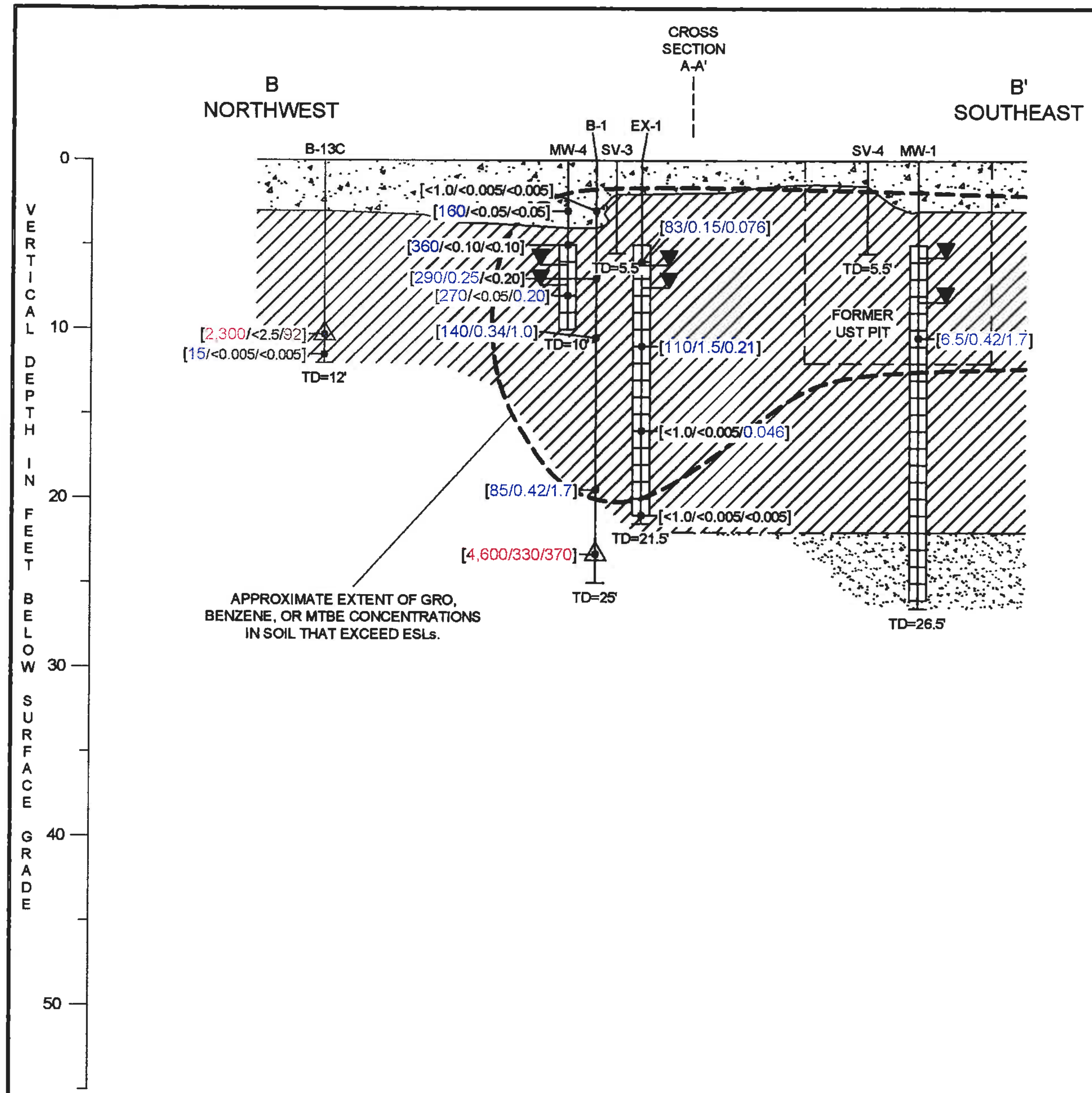
STRATUS ENVIRONMENTAL, INC.

FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

GEOLOGIC CROSS SECTION A-A'

FIGURE 3

PROJECT NO. 2115-1436-01



LEGEND:

APPROXIMATE CONTACT BETWEEN SOIL TYPES

[<1.0/<0.005/<0.005] SOIL SAMPLE LOCATION
TOTAL PETROLEUM HYDROCARBONS AS GASOLINE, BENZENE, METHYL TERTIARY BUTYL ETHER CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/Kg)

[4,600/330/370] GRAB WATER SAMPLE LOCATION
TOTAL PETROLEUM HYDROCARBONS AS GASOLINE, BENZENE, METHYL TERTIARY BUTYL ETHER CONCENTRATION IN MICROGRAMS PER LITER (µg/L)

DEPTH TO GROUNDWATER RANGE (1999 - 2012)

SCREENED INTERVAL OF WELL

TD=21.5' TOTAL DEPTH OF BORING IN FEET BELOW SURFACE GRADE

NOTE: GRAB WATER SAMPLES COLLECTED FROM TEMPORARY WELL CASINGS

FINE GRAINED SEDIMENTS (ML, MH, CL, & CH

COARSE GRAIN SEDIMENTS (SP, SP-SM, SM, & SC)

FILL MATERIAL (SW, SW-SM, SW-SC, & ML)

VERT. SCALE 0 – 10 FT

HORZ. SCALE 0 – 30 FT

OlympicIRAP JMP REV March 21, 2013 Olympic Cross Sections

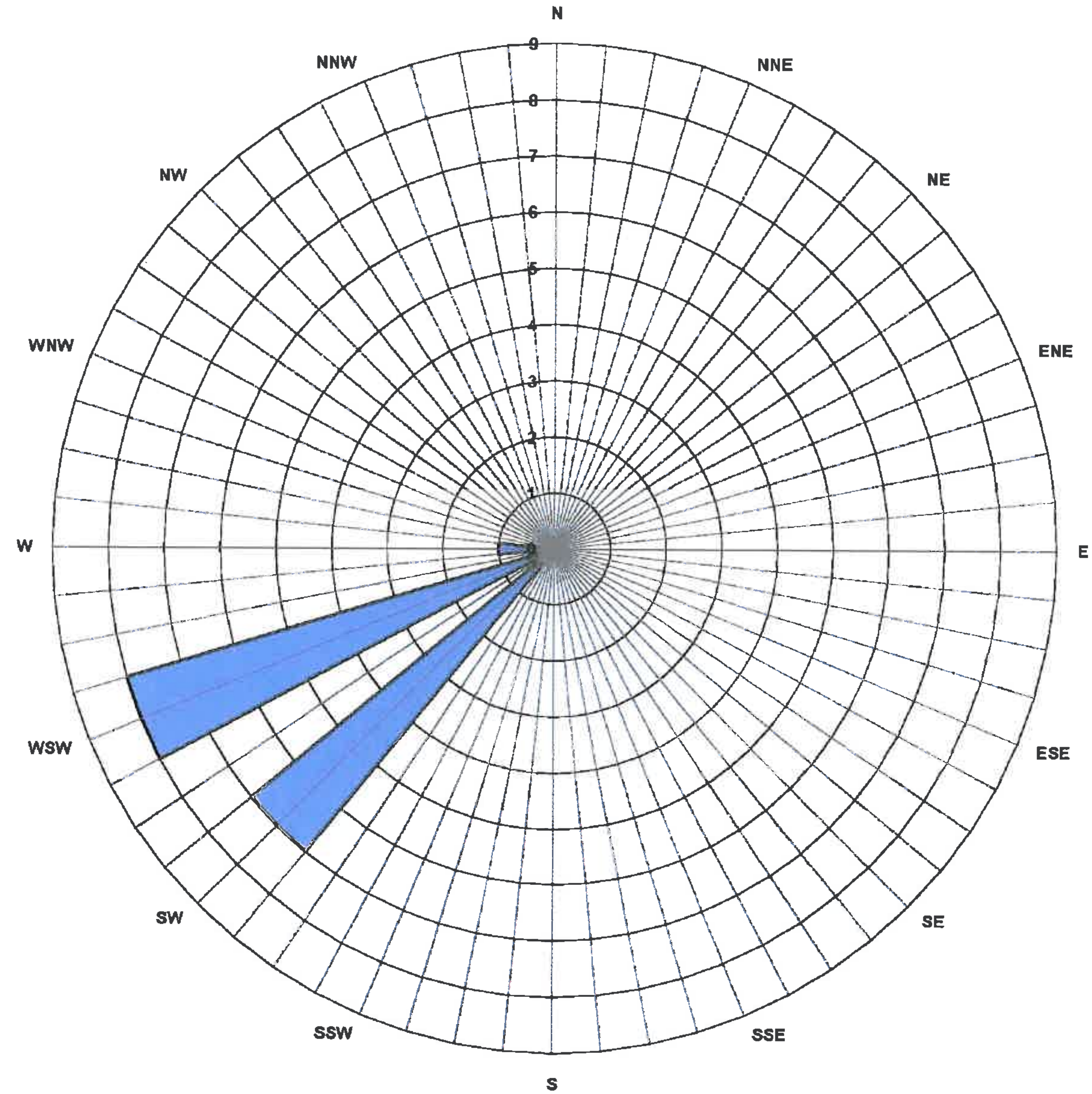
STRATUS ENVIRONMENTAL, INC.

FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

GEOLOGIC CROSS SECTION B-B'

FIGURE 4

PROJECT NO. 2115-1436-01



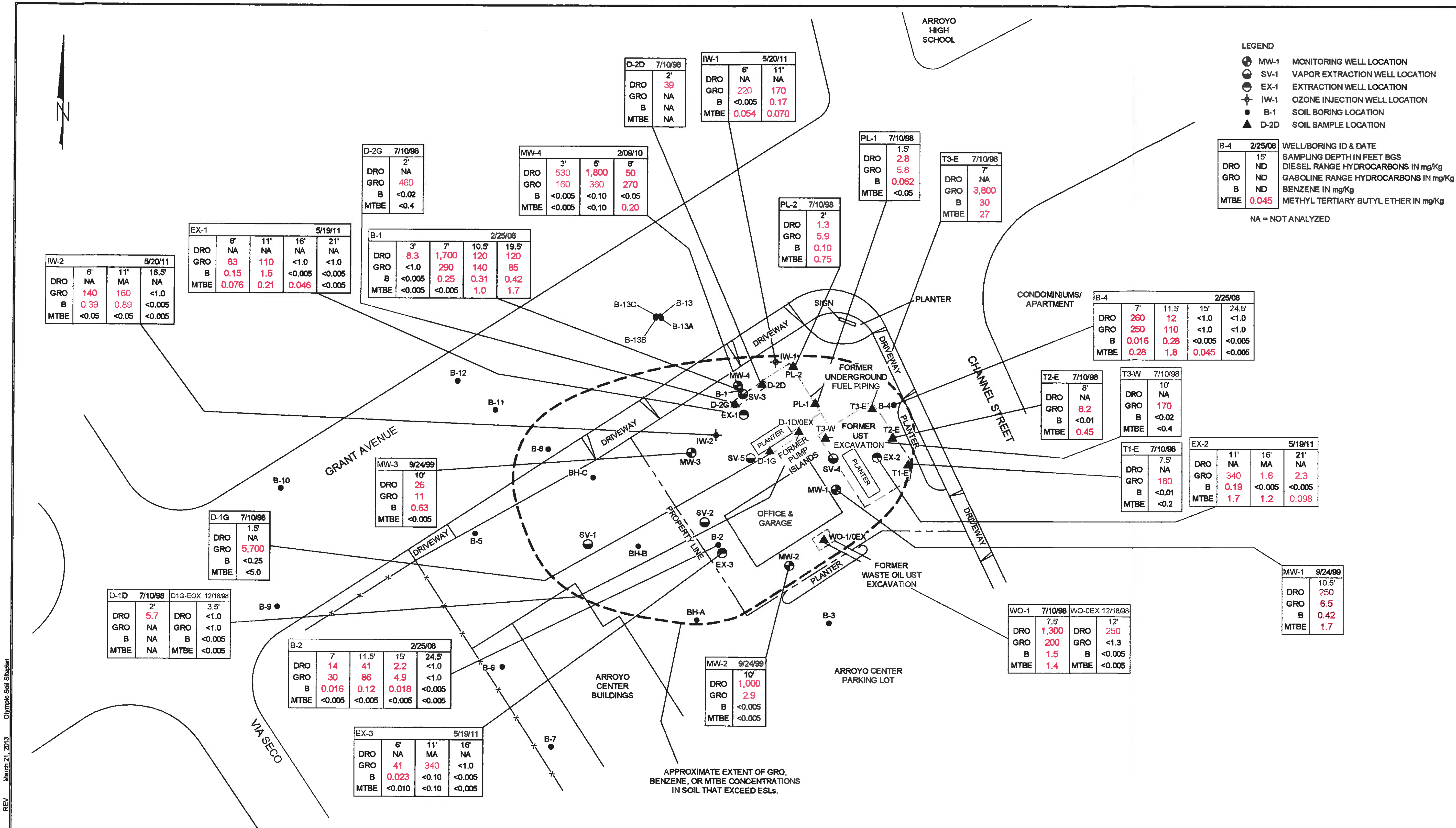
STRATUS ENVIRONMENTAL, INC.

FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

ROSE DIAGRAM

FIGURE
5

PROJECT NO.
2115-1436-01



STRATUS ENVIRONMENTAL, INC.

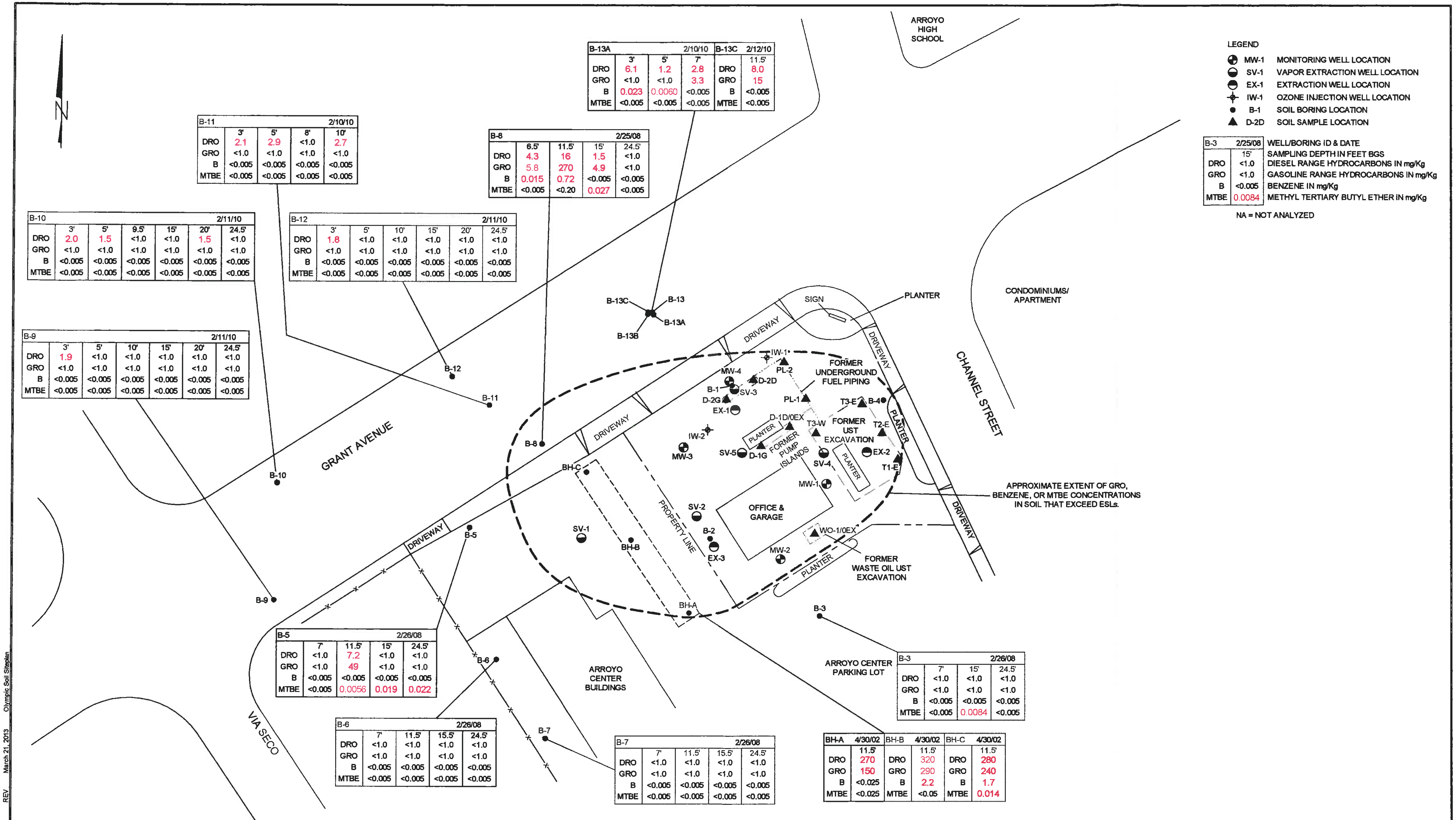
FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

ON-SITE SOIL ANALYTICAL SUMMARY MAP

FIGURE 6

PROJECT NO. 2115-1436-01

Olympic/GRAP JMP REV March 21, 2013 Olympic Soil Siteplan



LEGEND

- MW-1 MONITORING WELL LOCATION
- SV-1 VAPOR EXTRACTION WELL LOCATION
- EX-1 EXTRACTION WELL LOCATION
- IW-1 OZONE INJECTION WELL LOCATION
- B-1 SOIL BORING LOCATION
- D-2D SOIL SAMPLE LOCATION

B-3	2/25/08	WELL/BORING ID & DATE
	15'	SAMPLING DEPTH IN FEET BGS
DRO	<1.0	DIESEL RANGE HYDROCARBONS IN mg/Kg
GRO	<1.0	GASOLINE RANGE HYDROCARBONS IN mg/Kg
B	<0.005	BENZENE IN mg/Kg
MTBE	0.0084	METHYL TERTIARY BUTYL ETHER IN mg/Kg

NA = NOT ANALYZED

B-13A 2/10/10	3'	5'	7'
DRO	6.1	1.2	2.8
GRO	<1.0	<1.0	3.3
B	0.023	0.0060	<0.005
MTBE	<0.005	<0.005	<0.005

B-13C 2/12/10	11.5'
DRO	8.0
GRO	15
B	<0.005
MTBE	<0.005

B-11 2/10/10	3'	5'	8'	10'
DRO	2.1	2.9	<1.0	2.7
GRO	<1.0	<1.0	<1.0	<1.0
B	<0.005	<0.005	<0.005	<0.005
MTBE	<0.005	<0.005	<0.005	<0.005

B-8 2/25/08	6.5'	11.5'	15'	24.5'
DRO	4.3	16	1.5	<1.0
GRO	5.8	270	4.9	<1.0
B	0.015	0.72	<0.005	<0.005
MTBE	<0.005	<0.20	0.027	<0.005

B-10 2/11/10	3'	5'	9.5'	15'	20'	24.5'
DRO	2.0	1.5	<1.0	<1.0	1.5	<1.0
GRO	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

B-12 2/11/10	3'	5'	10'	15'	20'	24.5'
DRO	1.8	<1.0	<1.0	<1.0	<1.0	<1.0
GRO	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

B-9 2/11/10	3'	5'	10'	15'	20'	24.5'
DRO	1.9	<1.0	<1.0	<1.0	<1.0	<1.0
GRO	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MTBE	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

B-5 2/26/08	7'	11.5'	15'	24.5'
DRO	<1.0	7.2	<1.0	<1.0
GRO	<1.0	49	<1.0	<1.0
B	<0.005	<0.005	<0.005	<0.005
MTBE	<0.005	0.0056	0.019	0.022

B-6 2/26/08	7'	11.5'	15.5'	24.5'
DRO	<1.0	<1.0	<1.0	<1.0
GRO	<1.0	<1.0	<1.0	<1.0
B	<0.005	<0.005	<0.005	<0.005
MTBE	<0.005	<0.005	<0.005	<0.005

B-7 2/26/08	7'	11.5'	15.5'	24.5'
DRO	<1.0	<1.0	<1.0	<1.0
GRO	<1.0	<1.0	<1.0	<1.0
B	<0.005	<0.005	<0.005	<0.005
MTBE	<0.005	<0.005	<0.005	<0.005

B-3 2/26/08	7'	15'	24.5'
DRO	<1.0	<1.0	<1.0
GRO	<1.0	<1.0	<1.0
B	<0.005	<0.005	<0.005
MTBE	<0.005	0.0084	<0.005

BH-A 4/30/02	11.5'	BH-B 4/30/02	11.5'	BH-C 4/30/02	11.5'
DRO	270	DRO	320	DRO	280
GRO	150	GRO	290	GRO	240
B	<0.025	B	2.2	B	1.7
MTBE	<0.025	MTBE	<0.05	MTBE	0.014

STRATUS ENVIRONMENTAL, INC.

0 40 FT
APPROXIMATE SCALE

FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

OFF-SITE SOIL ANALYTICAL SUMMARY MAP

FIGURE
7

PROJECT NO.
2115-1436-01

Olympic/IRAP JMP REV March 21, 2013 Olympic Soil Stepdan

LEGEND

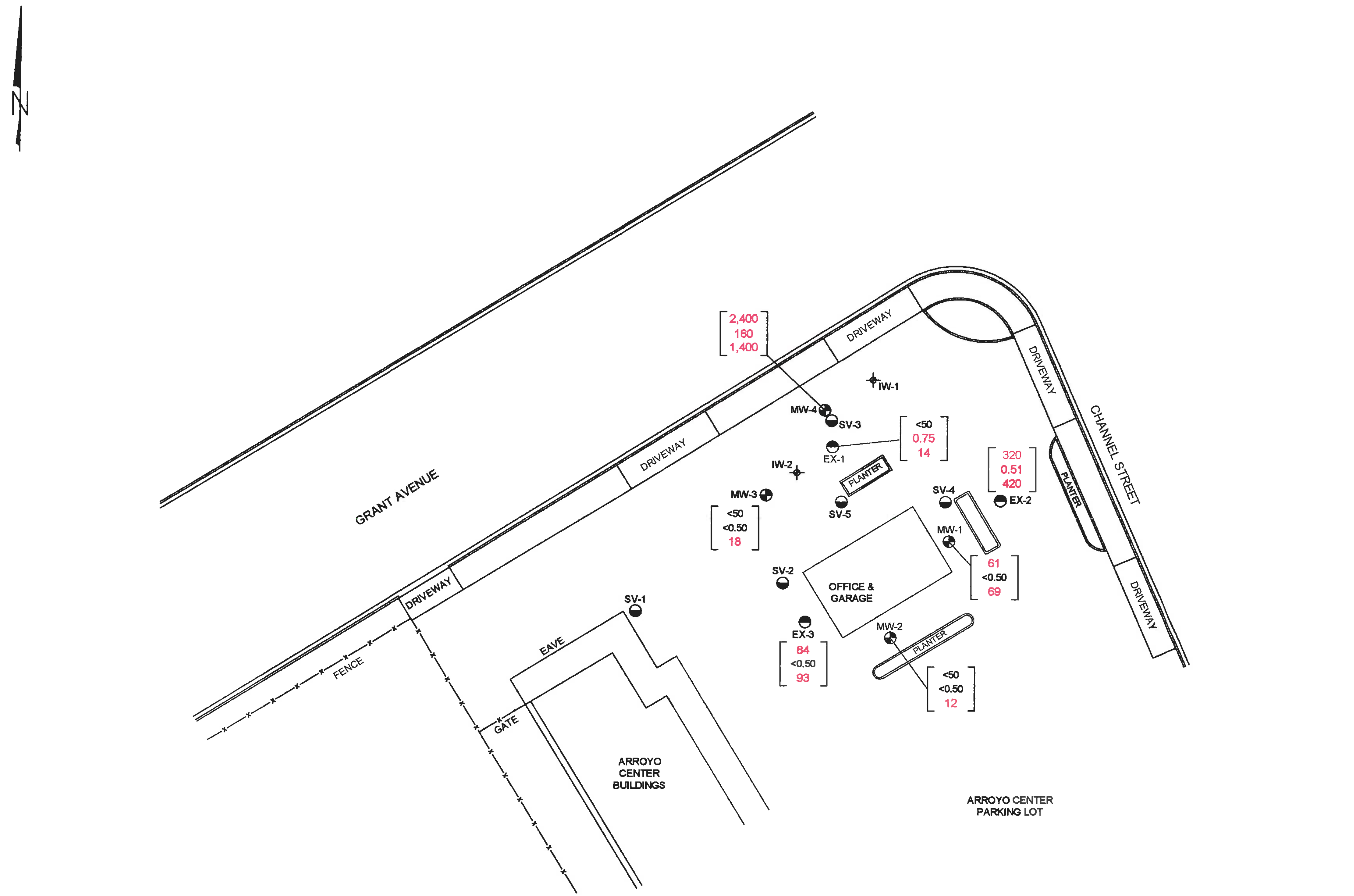
- MW-1 MONITORING WELL LOCATION
- SV-1 VAPOR EXTRACTION WELL LOCATION
- EX-1 EXTRACTION WELL LOCATION
- IW-1 OZONE INJECTION WELL LOCATION

61	GASOLINE RANGE ORGANICS (GRO) CONCENTRATION IN µg/L
<0.50	BENZENE CONCENTRATION IN µg/L
69	METHYL TERTIARY BUTYL ETHER (MTBE) IN µg/L

WELLS SAMPLED ON 2/27/13

GRO ANALYZED BY EPA METHOD SW8015B/SW8260B

MTBE & BENZENE ANALYZED BY EPA METHOD SW8260B



BASED ON SURVEY PREPARED BY MORROW SURVEYING 6/15/11

STRATUS ENVIRONMENTAL, INC.

0 40 FT

SCALE

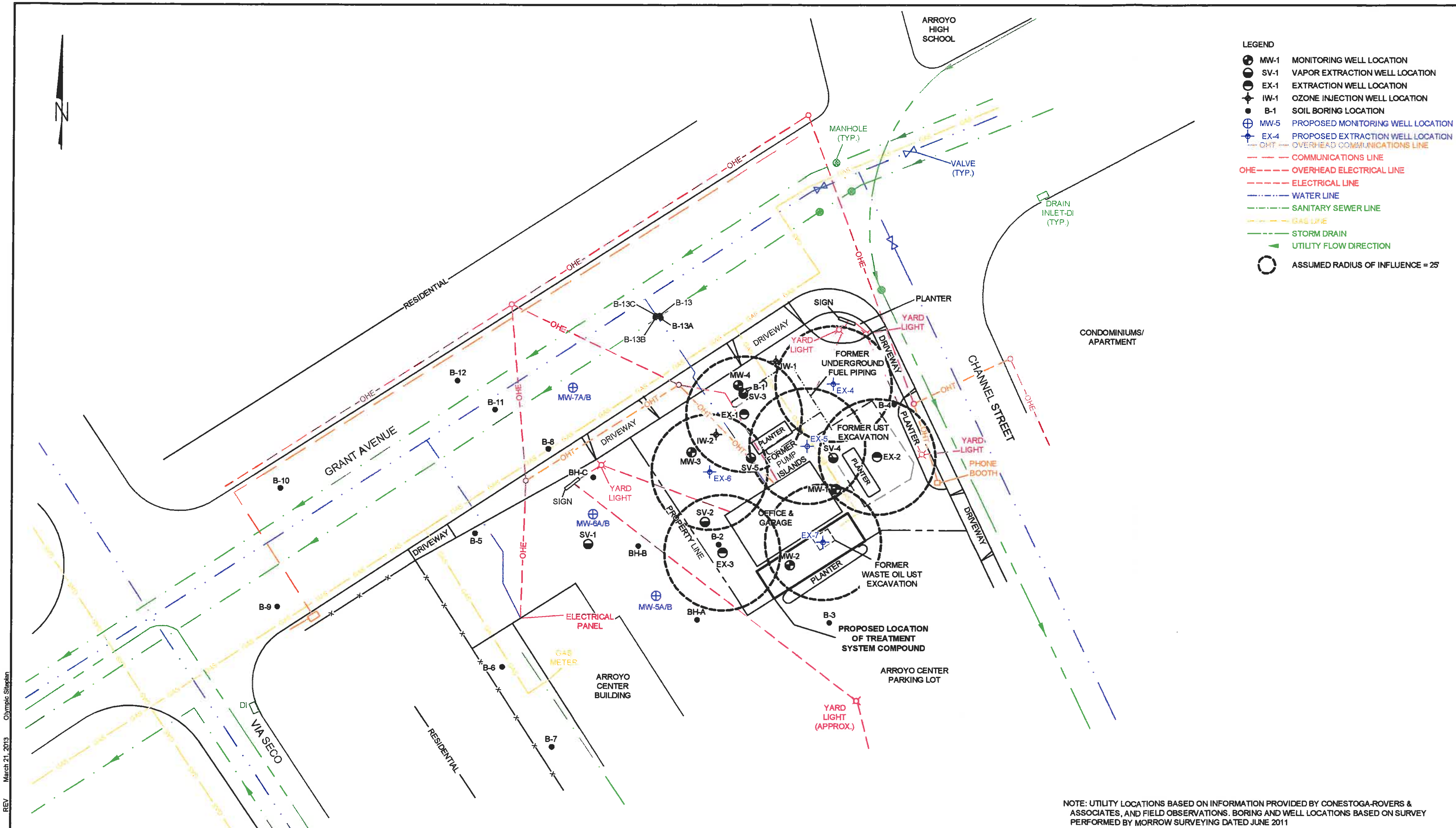
FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

GROUNDWATER ANALYTICAL SUMMARY
1st QUARTER 2013

FIGURE
8

PROJECT NO.
2115-1436-01

OlympicQuarterly JMP REV March 21, 2013 Olympic Quarterly Figures



NOTE: UTILITY LOCATIONS BASED ON INFORMATION PROVIDED BY CONESTOGA-ROVERS & ASSOCIATES, AND FIELD OBSERVATIONS. BORING AND WELL LOCATIONS BASED ON SURVEY PERFORMED BY MORROW SURVEYING DATED JUNE 2011

STRATUS ENVIRONMENTAL, INC.

0 40 FT
APPROXIMATE SCALE

FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

PROPOSED MONITORING AND REMEDIATION WELL LOCATIONS

FIGURE
9

PROJECT NO.
2115-1436-01

OlympicIRAP JMP REV March 21, 2013 Olympic Stapten

APPENDIX A

HYDROCARBON MASS ESTIMATES

Table A1 - Estimated Hydrocarbon Mass in Groundwater

Former Olympic Service Station
1436 Grant Avenue
SanLorenzo, California

Basis	Area ID	Area (ft^2)	Thickness (ft)	Average Concentration (µg/L)	Total Volume (ft^3)	Groundwater Volume (ft^3)	Groundwater Volume (L)	Mass (g)
GRO Mass Figure A1	A	1,570.51	15	4,400	23,558	8,245	233,477	**1,027**
	B	2,814.46	15	275	42,217	14,776	418,407	**115**
							Mass of GRO in Groundwater (g) =	**1,142**
							Mass of GRO in Groundwater (lbs) =	**2.5**
Benzene Mass Figure A2	A	528.13	15	515	7,922	2,773	78,514	**40**
	B	357.61	15	275	5,364	1,877	53,164	**15**
	C	392.88	15	27.5	5,893	2,063	58,407	**1.61**
	D	1,161.59	15	2.75	17,424	6,098	172,686	**0.47**
							Mass of Benzene in Groundwater (g) =	**57**
							Mass of Benzene in Groundwater (lbs) =	**0.13**
MTBE Mass Figure A3	A	1,043.68	15	2,100	15,655	5,479	155,157	**326**
	B	2,427.46	15	275	36,412	12,744	360,875	**99**
	C	4,349.00	15	27.5	65,235	22,832	646,537	**18**
	D	1,660.46	15	2.75	24,907	8,717	246,850	**0.68**
							Mass of MTBE in Groundwater (g) =	**444**
							Mass of MTBE in Groundwater (lbs) =	**0.98**

Explanation:

ft = feet
ft^2 = square feet
ft^3 = cubic feet
µg/L = micrograms/liter
g = gram
lbs = pounds
GRO = Gasoline Range Organics
MTBE = methyl tert butyl ether

Notes:

1. The average concentration is assumed to be uniform within the water column.
2. Average concentrations calculated as arithmetic mean between values of adjacent contours (eg. [10+100]/2=55). For areas of highest concentration, average concentration calculated as arithmetic mean between contour value and highest reported concentration.
3. Soils are predominantly silty sand, and the porosity is assumed to be 35%.
5. Mass (g) = [Groundwater volume (L) * Average Concentration (µg/L)]/1,000,000.

Table A2 - Estimated GRO Mass in Soil

Former Olympic Service Station
1436 Grant Avenue
San Lorenzo, California

Basis	Area ID	Area (ft^2)	Thickness (ft)	GRO Avg Conc (mg/kg)	Soil Volume (ft^3)	Soil Density (Kg/ft^3)	Soil Mass (Kg)	GRO Mass (Kg)
Figure A4	A	364.37	5	2,400	1,821.85	36.25	66,042.06	**159**
	B	330.90	5	550	1,654.50	36.25	59,975.63	**33**
							Mass of GRO from 5 - 10 feet bgs (Kg) =	**191**
Figure A5	A	5,515.62	5	220	27,578.10	36.25	999,706.13	**220**
							Mass of GRO from 10 - 15 feet bgs (Kg) =	**220**
Figure A6	A	1,207.39	5	100	6,036.95	36.25	218,839.44	**22**
							Mass of GRO from 15 - 20. feet bgs (Kg) =	**22**
							Total Estimated Mass of GRO (Kg) =	**433**
							Total Estimated Mass of GRO (pounds) =	**955**

Explanation:

ft = feet
ft^2 = square feet
ft^3 = cubic feet
mg = milligrams
Kg = Kilogram
bgs = below ground surface
GRO = Gasoline Range Organics

Notes:

1. The average concentration is assumed to be uniform throughout the interval.
2. Average concentrations calculated as arithmetic mean between values of adjacent contours (eg. [10+100]/2=55). For areas of highest concentration, average concentration calculated as arithmetic mean between contour value and highest reported concentration.
3. Soils are predominantly silty sand; average soil density is assumed be to 36.25 Kg/ft^3 (1.28 g/cm^3).
4. Soil Mass = Soil Density * Soil Volume
5. GRO Mass = Soil Mass * Average Concentration/1,000,000.

Table A3 - Estimated Benzene Mass in Soil
Former Olympic Service Station
1436 Grant Avenue
San Lorenzo, California

Basis	Area ID	Area (ft^2)	Thickness (ft)	Benzene Avg Conc (mg/Kg)	Soil Volume (ft^3)	Soil Density (Kg/ft^3)	Soil Mass (Kg)	Benzene Mass (Kg)
Figure A7	A	169.35	5	17.5	846.75	36.25	30,694.69	**0.54**
	B	2,382.61	5	2.8	11,913.05	36.25	431,848.06	**1.19**
	C	1,749.47	5	0.28	8,747.35	36.25	317,091.44	**0.09**
	D	2,147.91	5	0.028	10,739.55	36.25	389,308.69	**0.011**
					Mass of Benzene from 5 - 10 feet bgs (Kg) =			**1.82**
Figure A8	A	1,747.71	5	1.00	8,738.55	36.25	316,772.44	**0.32**
	B	4,305.20	5	0.28	21,526.00	36.25	780,317.50	**0.21**
	C	2,557.37	5	0.028	12,786.85	36.25	463,523.31	**0.013**
					Mass of Benzene from 10 - 15 feet bgs (Kg) =			**0.54**
Figure A9	A	598.76	5	0.24	2,993.80	36.25	108,525.25	**0.026**
	B	4,474.50	5	0.028	22,372.50	36.25	811,003.13	**0.022**
					Mass of Benzene from 15 - 20 feet bgs (Kg) =			**0.048**
					Total Estimated Mass of Benzene in the Subsurface (Kg) =			**2.41**
					Total Estimated Mass of Benzene in the Subsurface (pounds) =			**5.32**

Explanation:

ft = feet
ft^2 = square feet
ft^3 = cubic feet
mg = milligrams
Kg = Kilogram
bgs = below ground surface

Notes:

1. The average concentration is assumed to be uniform across the chosen depth of soil profile
2. Average concentrations calculated as arithmetic mean between values of adjacent contours (eg. [10+100]/2=55). For areas of highest concentration, average concentration calculated as arithmetic mean between contour value and highest reported concentration.
3. Soils are predominantly silty sand; average soil density is assumed be to 36.25 Kg/ft^3 (1.28 g/cm^3).
4. Soil Mass = Soil Density * Soil Volume
5. Benzene Mass = Soil Mass * Average Concentration/1,000,000.

Table A4 - Estimated MTBE Mass in Soil

American Food Store
5682 Main Avenue
Orangevale, California

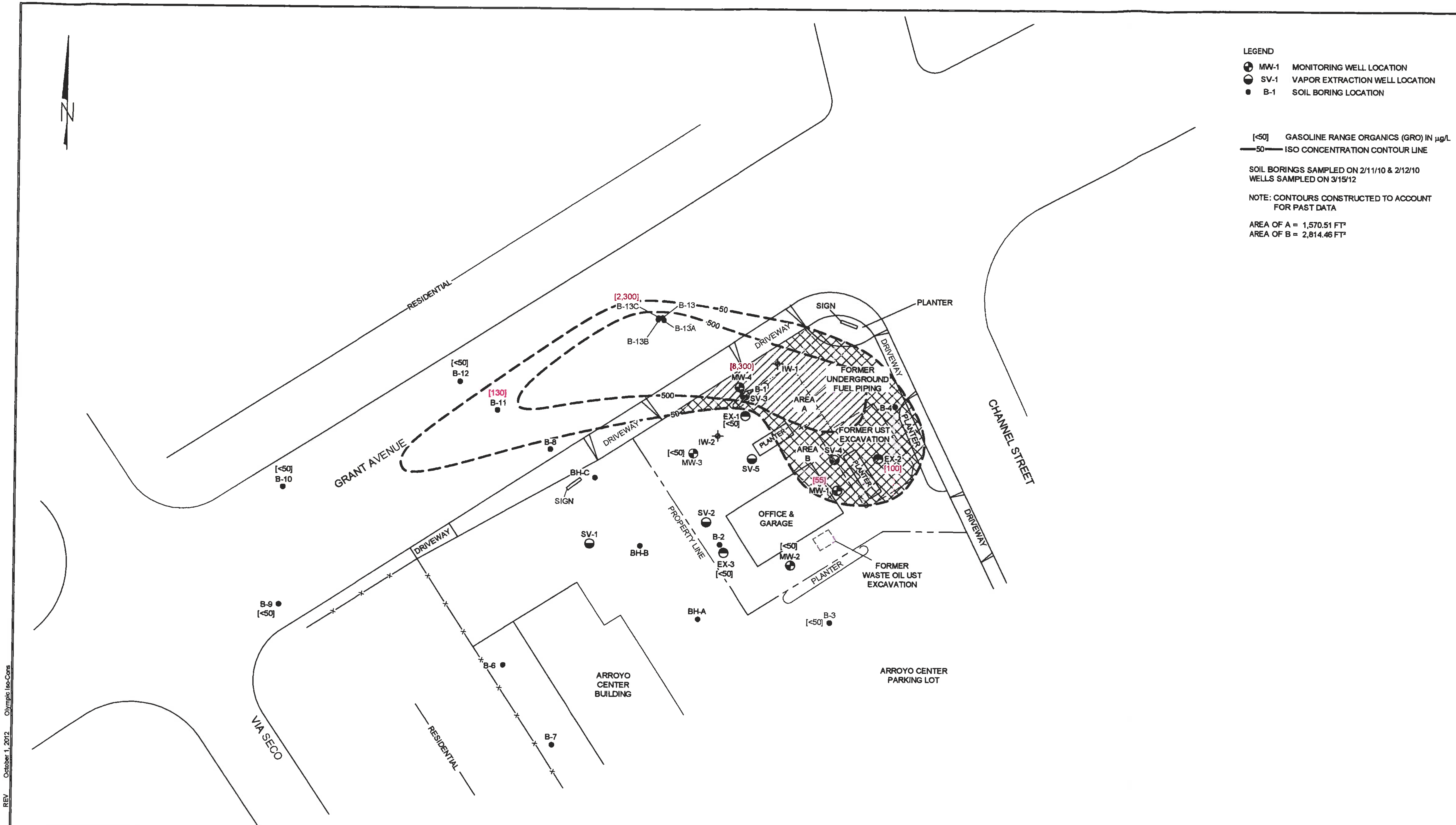
Basis	Area ID	Area (ft^2)	Thickness (ft)	MTBE Avg Conc (mg/kg)	Soil Volume (ft^3)	Soil Density (Kg/ft^3)	Soil Mass (Kg)	MTBE Mass (Kg)
Figure A10	A	629.07	5	16	3,145.35	36.25	114,018.94	**1.82**
	B	2,211.18	5	2.75	11,055.90	36.25	400,776.38	**1.10**
	C	1,860.03	5	0.28	9,300.15	36.25	337,130.44	**0.093**
							Mass of MTBE from 5 - 10 feet bgs (Kg) =	**3.02**
Figure A11	A	2,292.21	5	1.15	11,461.05	36.25	415,463.06	**0.48**
	B	1,377.52	5	0.28	6,887.60	36.25	249,675.50	**0.070**
	C	1,332.14	5	0.028	6,660.70	36.25	241,450.38	**0.0068**
							Mass of MTBE from 10 - 15 feet bgs (Kg) =	**0.55**
Figure A12	A	1,672.64	5	1.1	8,363.20	36.25	303,166.00	**0.33**
	B	750.04	5	0.28	3,750.20	36.25	135,944.75	**0.038**
	C	1,305.16	5	0.028	6,525.80	36.25	236,560.25	**0.0066**
							Mass of MTBE from 15 - 20 feet bgs (Kg) =	**0.38**
							Total Estimated Mass of MTBE (Kg) =	**3.95**
							Total Estimated Mass of MTBE (pounds) =	**8.71**

Explanation:

ft = feet
ft^2 = square feet
ft^3 = cubic feet
mg = milligrams
Kg = Kilogram
bgs = below ground surface
GRO = Gasoline Range Organics

Notes:

1. The average concentration is assumed to be uniform across the chosen depth of soil profile
2. Average concentrations calculated as arithmetic mean between values of adjacent contours (eg. [10+100]/2=55). For areas of highest concentration, average concentration calculated as arithmetic mean between contour value and highest reported concentration.
3. Soils are predominantly silty sand; average soil density is assumed be to 36.25 Kg/ft^3 (1.28 g/cm^3).
4. Soil Mass = Soil Density * Soil Volume
5. GRO Mass = Soil Mass * Average Concentration/1,000,000.



STRATUS ENVIRONMENTAL, INC.

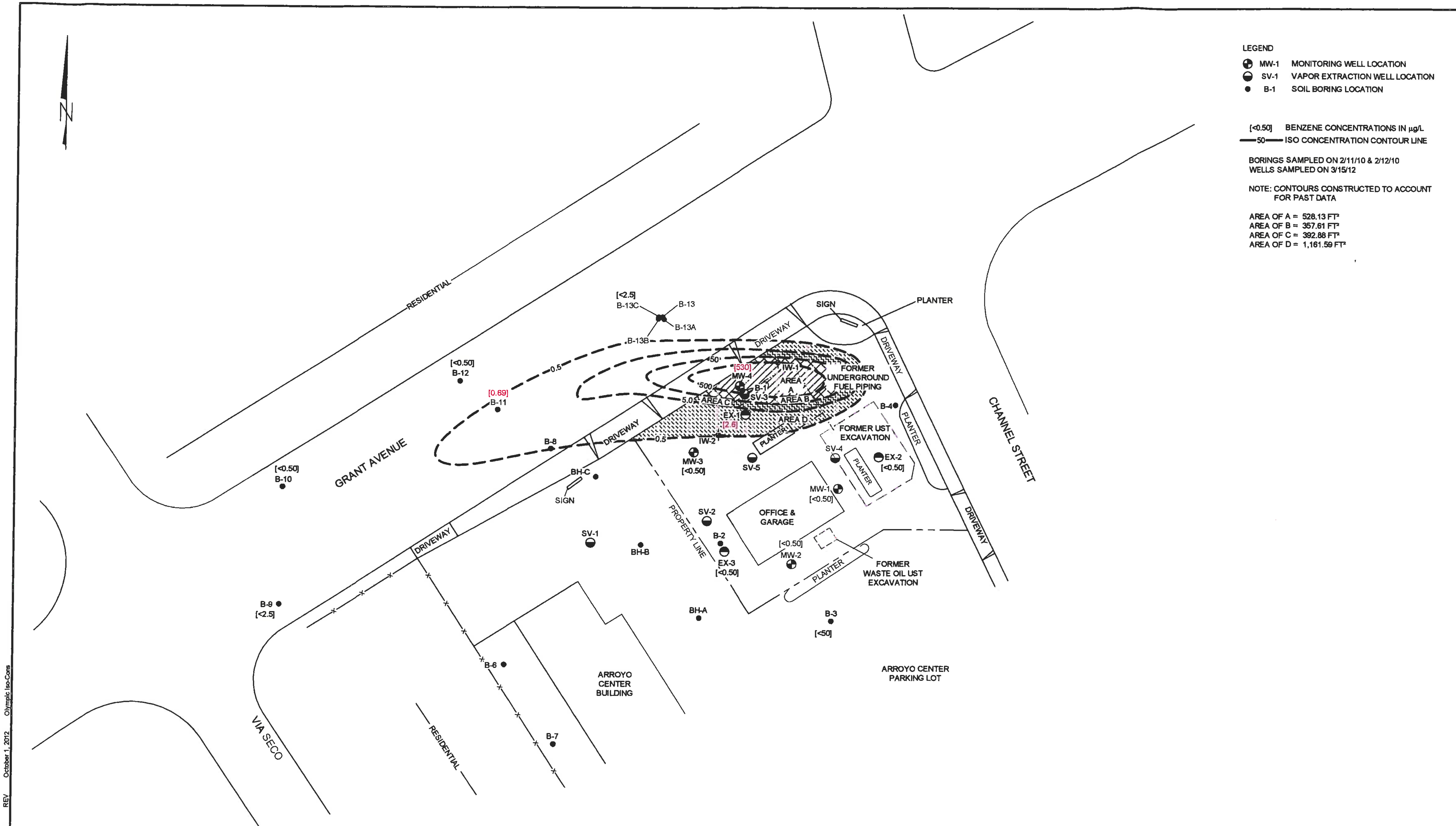
FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

GRO GROUNDWATER ISO-CONCENTRATION CONTOUR MAP (2010-2012)

FIGURE A1

PROJECT NO. 2115-1436-01

OlympicCAP JMP REV October 1, 2012 Olympic Iso-Cons



JMP REV October 1, 2012 Olympic Iso-Cons OlympicCAP

STRATUS ENVIRONMENTAL, INC.

0 40 FT

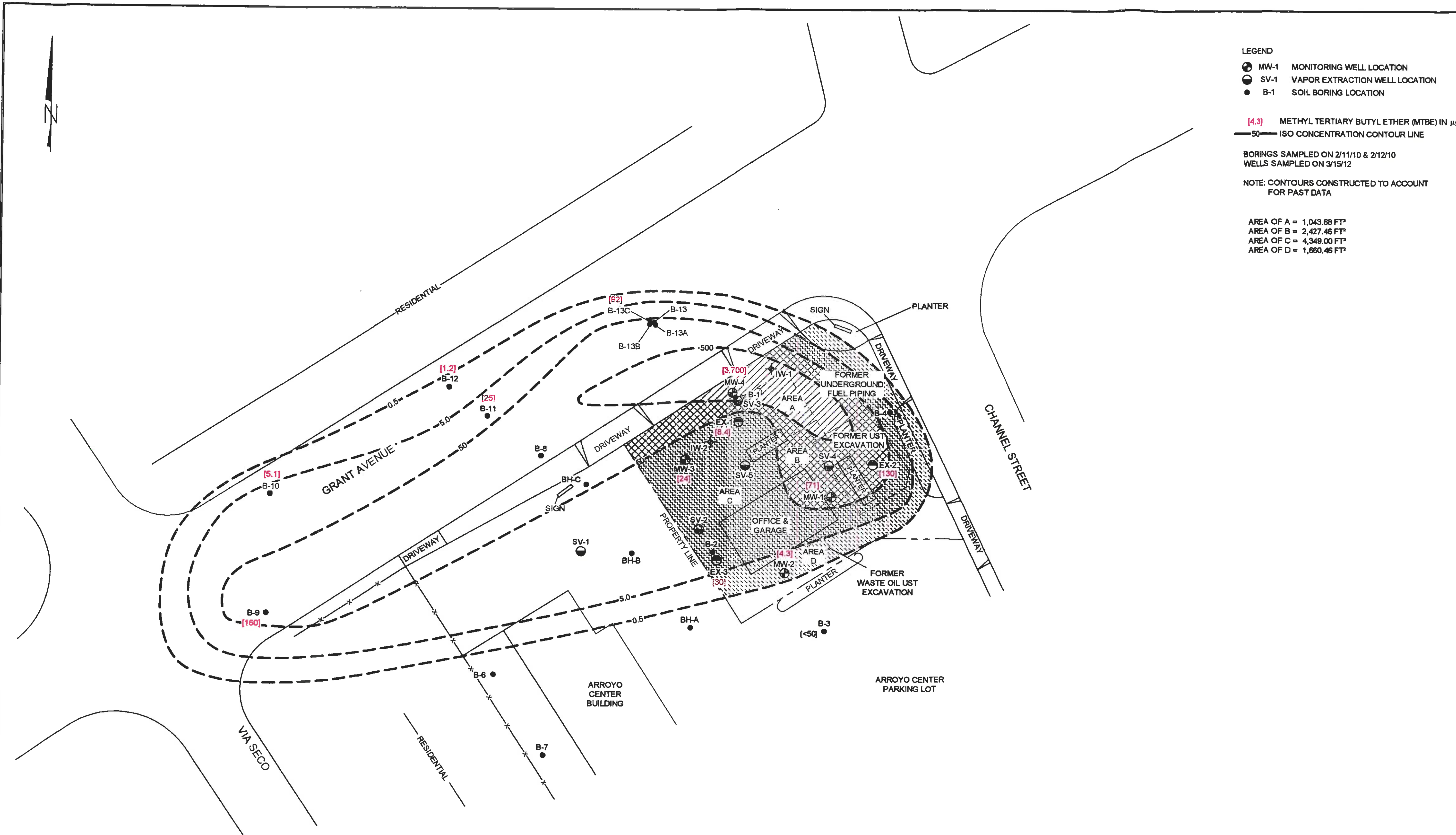
APPROXIMATE SCALE

FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

BENZENE GROUNDWATER ISO-CONCENTRATION CONTOUR MAP (2010-2012)

FIGURE
A2

PROJECT NO.
2115-1436-01



STRATUS ENVIRONMENTAL, INC.

0 — 40 FT
APPROXIMATE SCALE

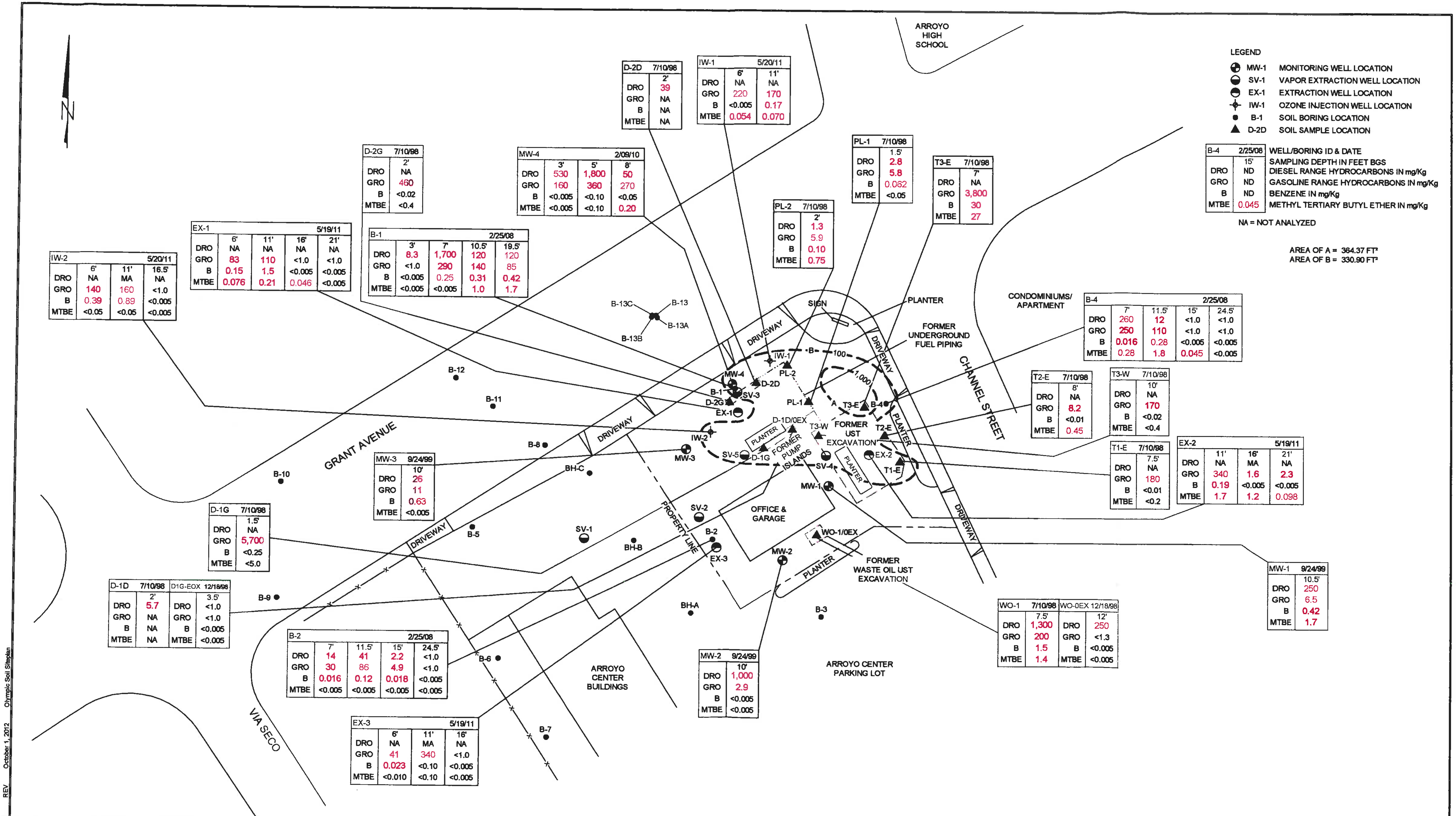
FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

MTBE ISO-CONCENTRATION CONTOUR MAP (2010-2012)

FIGURE A3

PROJECT NO. 2115-1436-01

OlympicCAP JMP REV October 1, 2012 Olympic Iso-Cons



STRATUS ENVIRONMENTAL, INC.

0 — 40 FT
APPROXIMATE SCALE

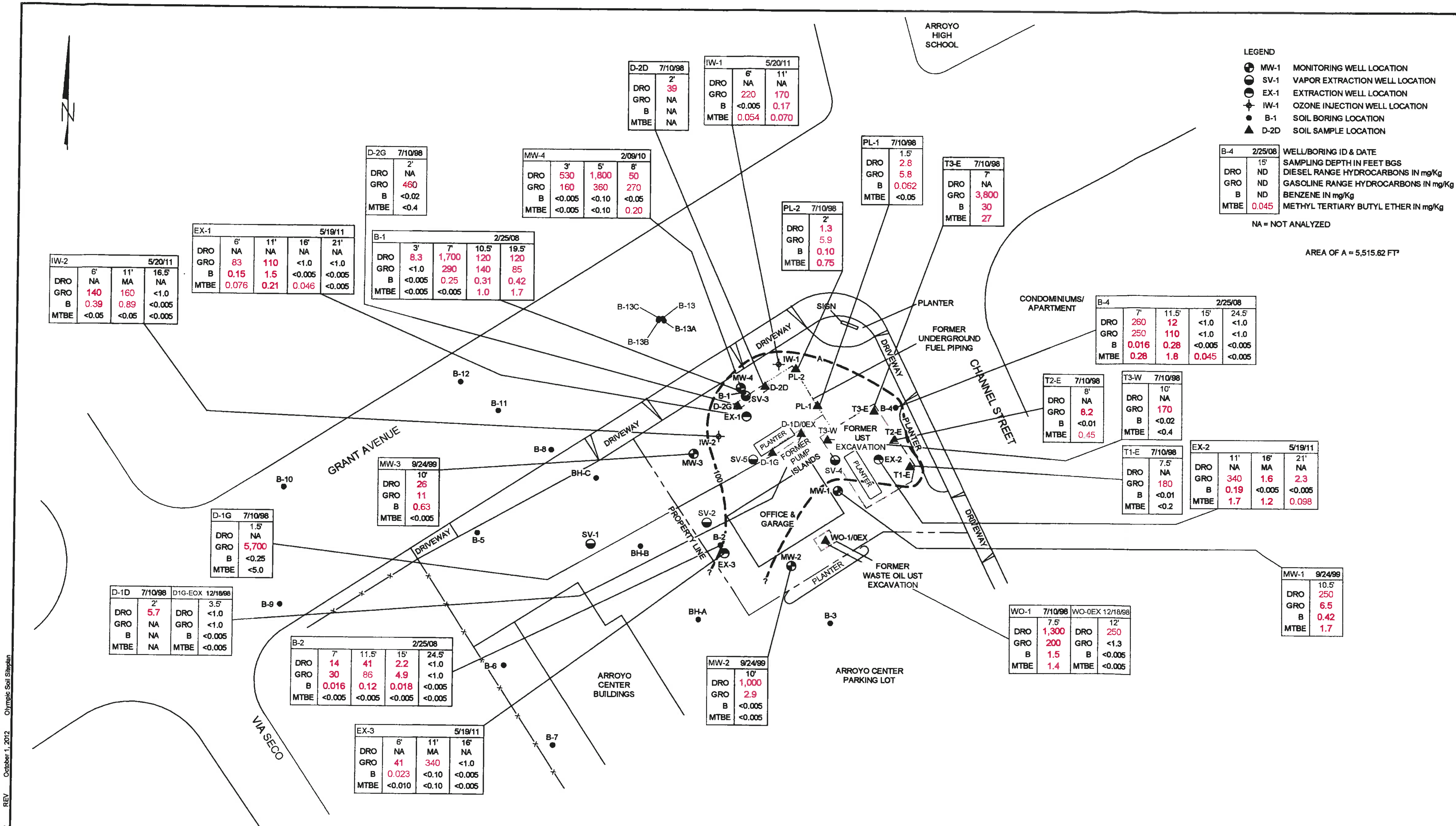
FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

GRO ISO-CONCENTRATION CONTOUR MAP
FOR SOIL BETWEEN 5' - 10' bgs

FIGURE
A4

PROJECT NO.
2115-1436-01

OlympicCAP JMP REV October 1, 2012 Olympic Soil Siteplan



STRATUS ENVIRONMENTAL, INC.

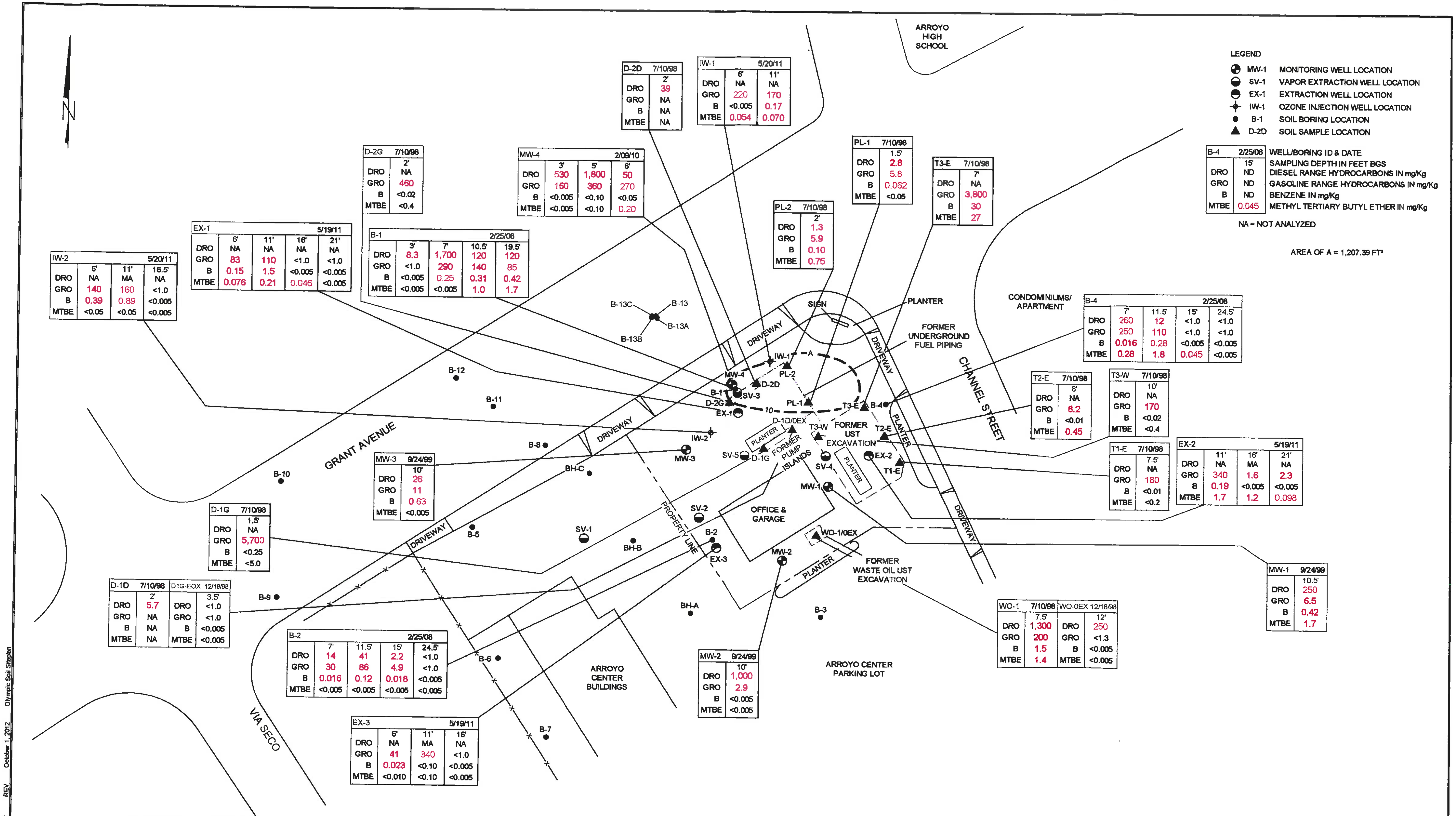
Olympic CAP JMP REV October 1, 2012 Olympic Soil Siteplan

0 40 FT
APPROXIMATE SCALE

FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

GRO ISO-CONCENTRATION CONTOUR MAP
FOR SOIL BETWEEN 10' - 15' bgs

FIGURE
A5
PROJECT NO.
2115-1436-01



STRATUS ENVIRONMENTAL, INC.

0 — 40 FT
APPROXIMATE SCALE

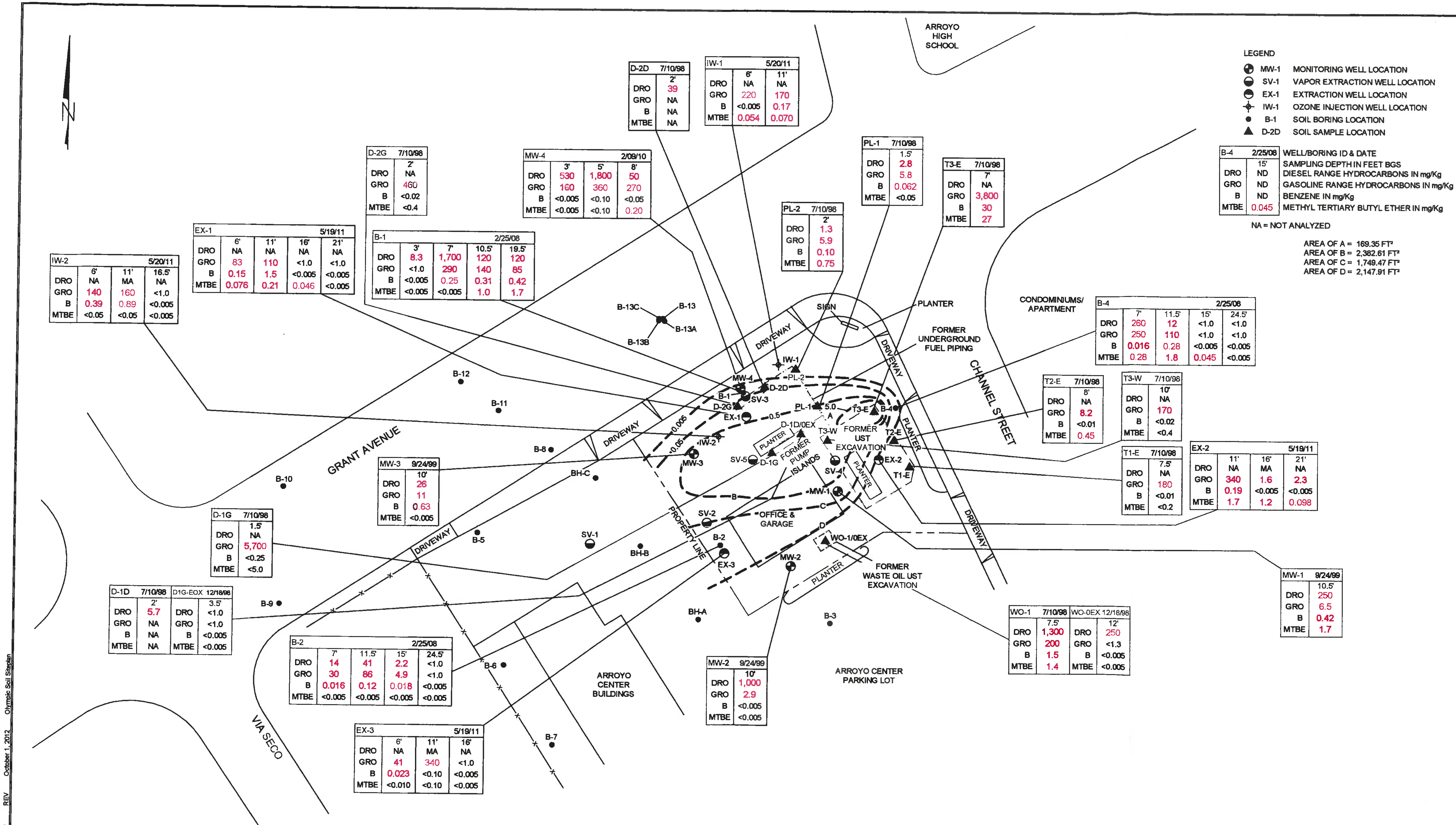
FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

GRO ISO-CONCENTRATION CONTOUR MAP
FOR SOIL BETWEEN 15' - 20' bgs

FIGURE
A6

PROJECT NO.
2115-1436-01

OlympicCAP JMP REV October 1, 2012 Olympic Soil Siteplan



STRATUS ENVIRONMENTAL, INC.

0 40 FT
APPROXIMATE SCALE

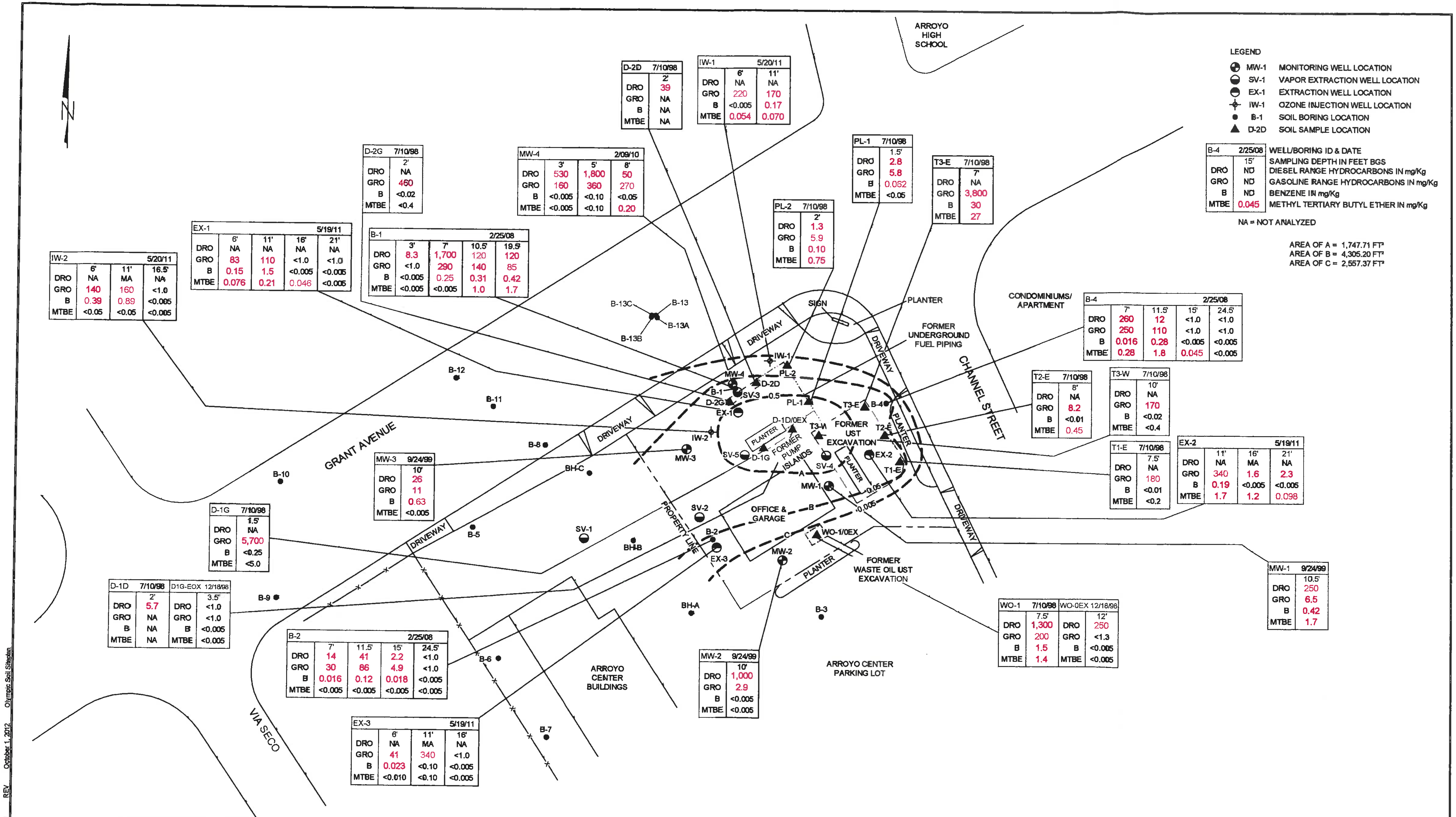
FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

BENZENE ISO-CONCENTRATION CONTOUR MAP FOR SOIL BETWEEN 5' - 10' bgs

FIGURE A7

PROJECT NO. 2115-1436-01

OlympicCAP JMP REV October 1, 2012 Olympic Soil Siteplan



STRATUS ENVIRONMENTAL, INC.

0 — 40 FT
APPROXIMATE SCALE

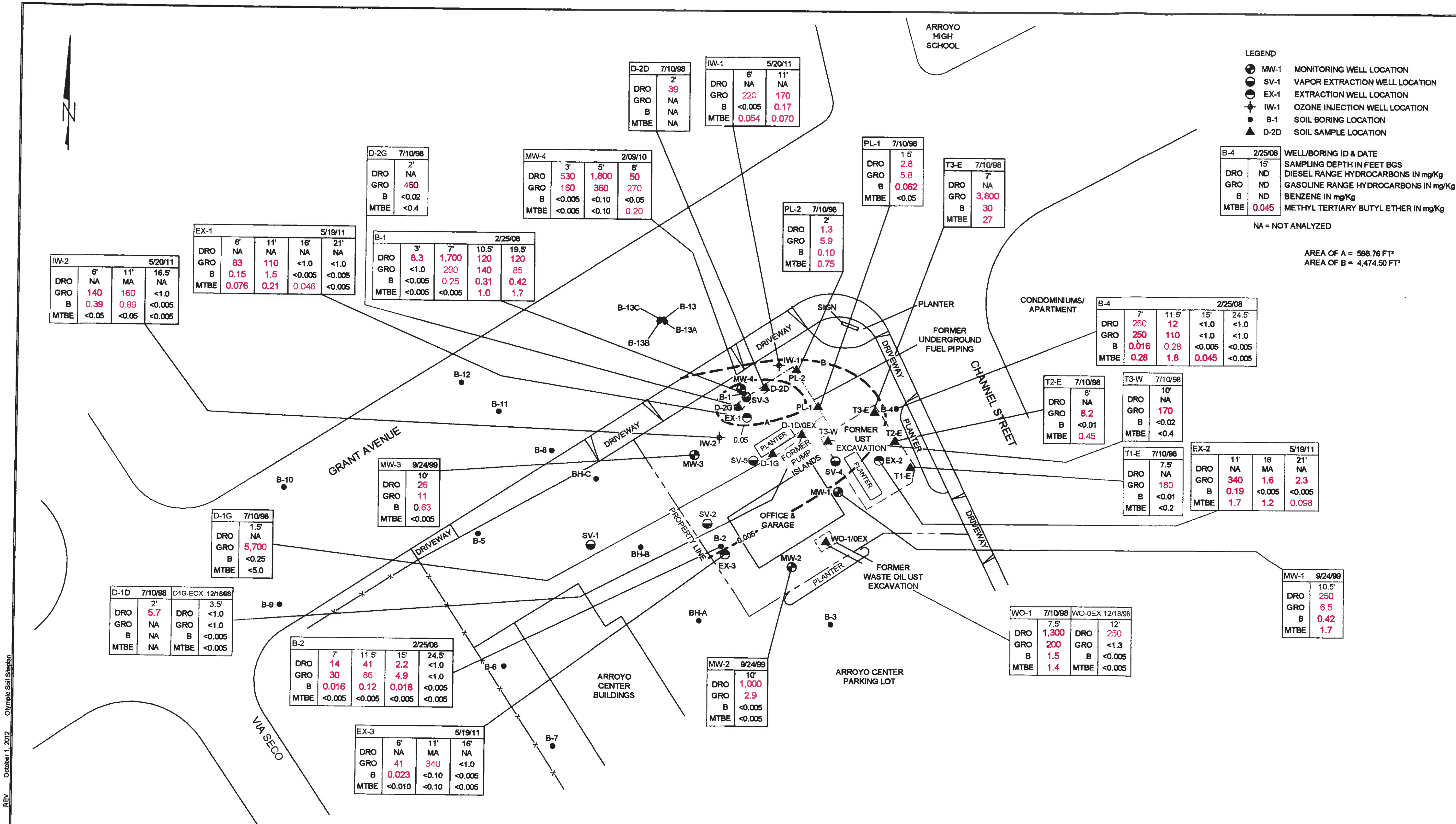
FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

BENZENE ISO-CONCENTRATION CONTOUR MAP FOR SOIL BETWEEN 10' - 15' bgs

FIGURE A8

PROJECT NO. 2115-1436-01

OlympicCAP JMP REV October 1, 2012 Olympic Soil Siteplan



STRATUS ENVIRONMENTAL, INC.

0 40 FT
APPROXIMATE SCALE

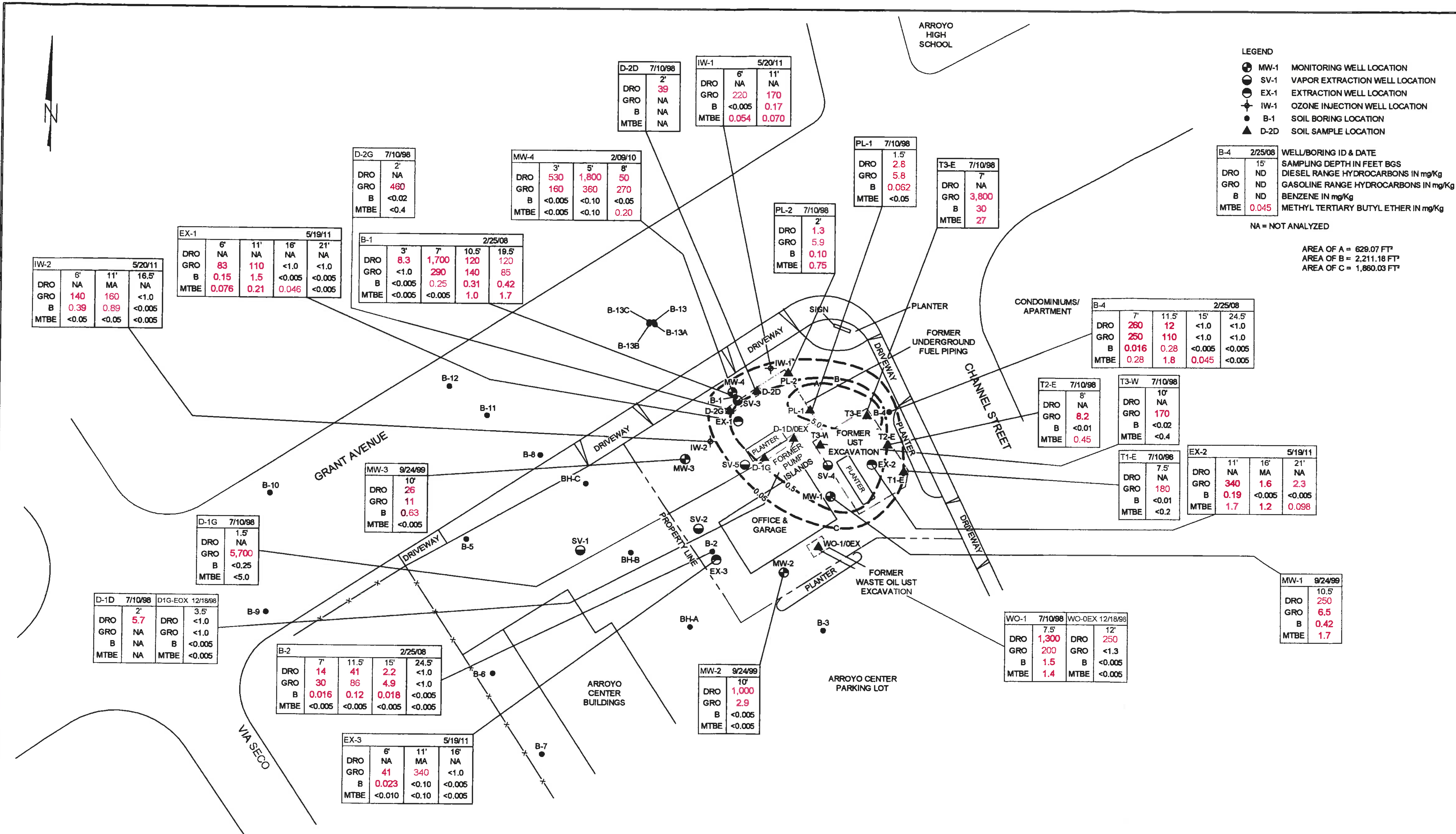
FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

BENZENE ISO-CONCENTRATION CONTOUR MAP FOR SOIL BETWEEN 15' - 20' bgs

FIGURE A9

PROJECT NO. 2115-1436-01

OlympicCAP JMP REV October 1, 2012 Olympic Soil Sitepla



STRATUS ENVIRONMENTAL, INC.

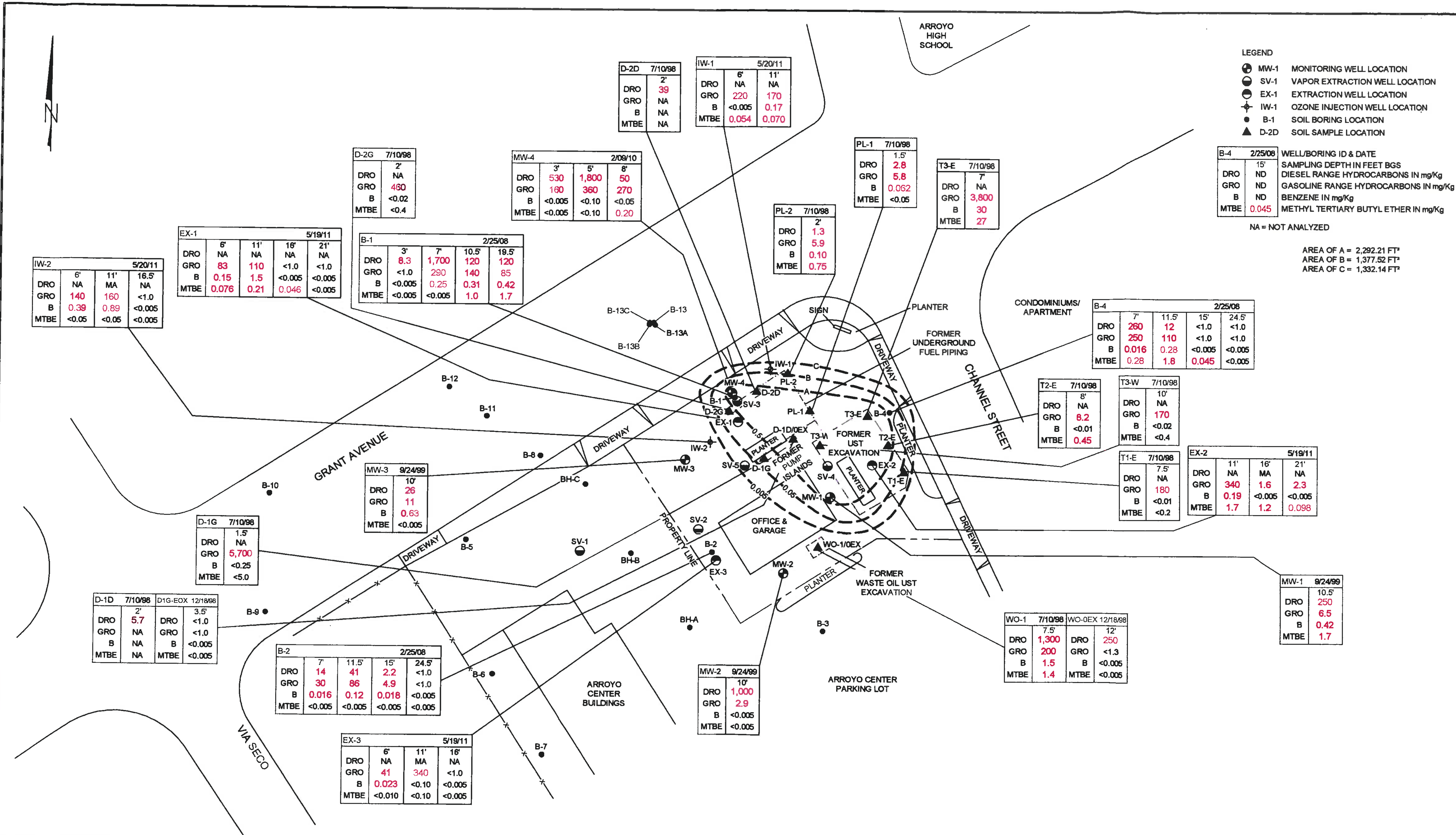
0 40 FT
APPROXIMATE SCALE

FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

MTBE ISO-CONCENTRATION CONTOUR MAP FOR SOIL BETWEEN 5' - 10' bgs

FIGURE A10

PROJECT NO. 2115-1436-01



STRATUS ENVIRONMENTAL, INC.

0 40 FT
APPROXIMATE SCALE

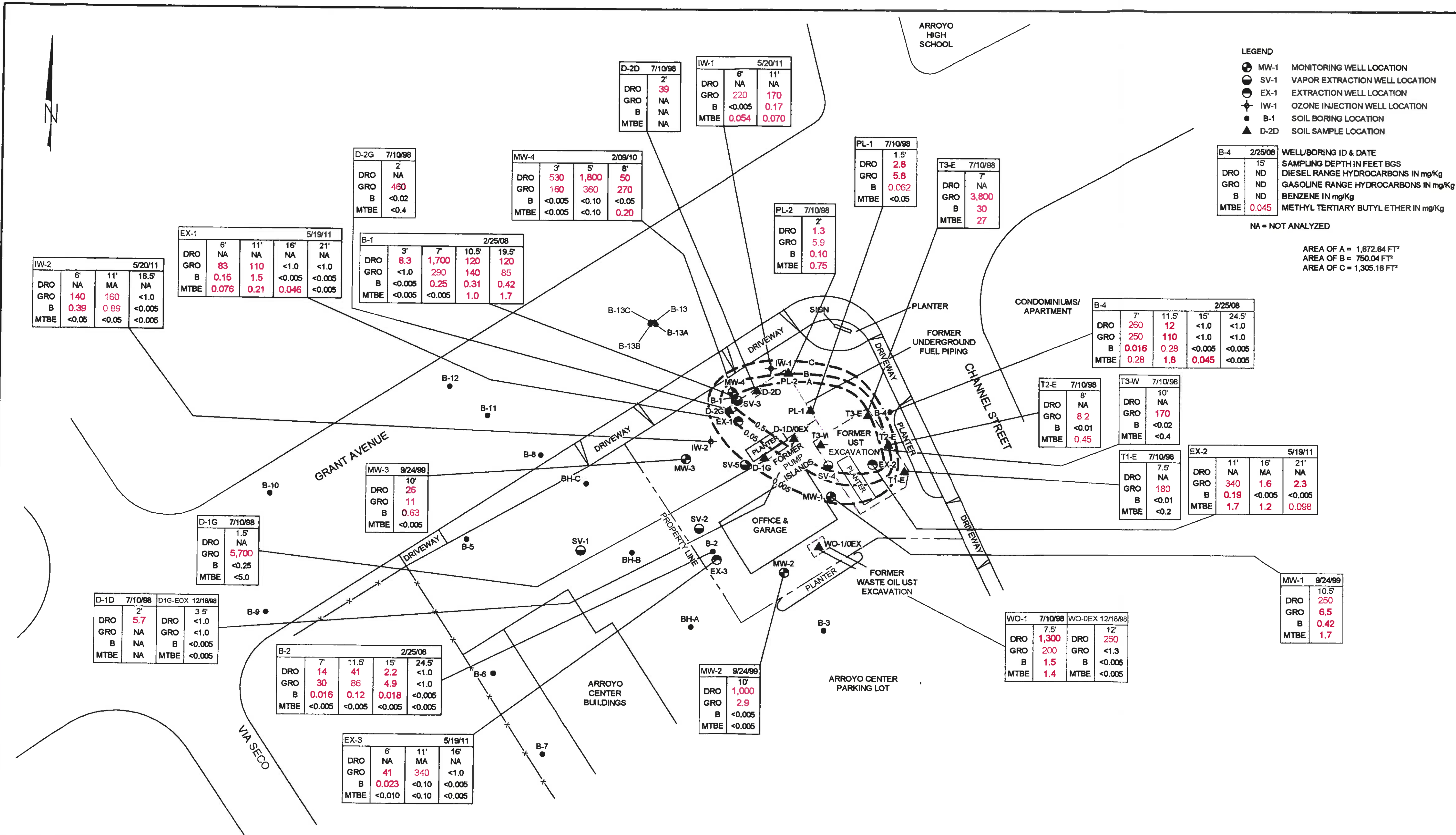
FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

MTBE ISO-CONCENTRATION CONTOUR MAP FOR SOIL BETWEEN 10' - 15' bgs

FIGURE
A11

PROJECT NO.
2115-1436-01

OlympicCAP JMP REV October 1, 2012 Olympic Soil Siteplan



OlympicCAP JMP REV October 1, 2012 Olympic Soil Siteplan

STRATUS ENVIRONMENTAL, INC.

FORMER OLYMPIC SERVICE STATION
1436 GRANT AVENUE
SAN LORENZO, CALIFORNIA

MTBE ISO-CONCENTRATION CONTOUR MAP FOR SOIL BETWEEN 15' - 20' bgs

FIGURE A12

PROJECT NO. 2115-1436-01

APPENDIX B

FIELD PRACTICES AND PROCEDURES

FIELD PRACTICES AND PROCEDURES

General procedures used by Stratus in site assessments for drilling exploratory borings, collecting samples, and installing monitoring wells are described herein. These general procedures are used to provide consistent and reproducible results; however, some procedure may be modified based on site conditions. A California state-registered geologist supervises the following procedures.

PRE-FIELD WORK ACTIVITIES

Health and Safety Plan

Field work performed by Stratus at the site is conducted according to guidelines established in a Site Health and Safety Plan (SHSP). The SHSP is a document which describes the hazards that may be encountered in the field and specifies protective equipment, work procedures, and emergency information. A copy of the SHSP is at the site and available for reference by appropriate parties during work at the site.

Locating Underground Utilities

Prior to commencement of any work that is to be below surface grade, the location of the excavation, boring, etc., is marked with white paint as required by law. An underground locating service such as Underground Service Alert (USA) is contacted. The locating company contacts the owners of the various utilities in the vicinity of the site to mark the locations of their underground utilities. Any invasive work is preceded by hand augering to a minimum depth of five feet below surface grade to avoid contact with underground utilities.

FIELD METHODS AND PROCEDURES

Exploratory Soil Borings

Soil borings will be drilled using a truck-mounted, hollow stem auger drill rig. Soil samples for logging will be obtained from auger-return materials and by advancing a modified California split-spoon sampler equipped with brass or stainless steel liners into undisturbed soil beyond the tip of the auger. Soils will be logged by a geologist according to the Unified Soil Classification System and standard geological techniques. Drill cuttings well be screened using a portable photoionization detector (PID) or a flame ionization detector (FID). Exploratory soil borings not used for monitoring well installation will be backfilled to the surface with a bentonite-cement slurry pumped into the boring through a tremie pipe.

Soil sampling equipment will be cleaned with a detergent water solution, rinsed with clean water, and equipped with clean liners between sampling intervals. Augers and samplers will be steam cleaned between each boring to reduce the possibility of cross contamination. Steam cleaning effluent will be contained in 55-gallon drums and temporarily stored on site. The disposal of the effluent will be the responsibility of the client.

Drill cuttings generated during the drilling procedure will be stockpiled on site. Stockpiled drill cuttings will be placed on and covered with plastic sheeting. The stockpiled soil is typically characterized by collecting and analyzing composite samples from the stockpile. Stratus Environmental will recommend an appropriate method for disposition of the cuttings based on the analytical results. The client will be responsible for disposal of the drill cuttings.

Soil Sample Collection

During drilling, soil samples will be collected in cleaned brass, two by six inch tubes. The tubes will be set in an 18-inch-long split-barrel sampler. The sampler will be conveyed to bottom of the borehole attached to a wire-line hammer device on the drill rig. When possible, the split-barrel sampler will be driven its entire length, either hydraulically or by repeated pounding a 140-pound hammer using a 30-inch drop. The number of drops (blows) used to drive the sampler will be recorded on the boring log. The sampler will be extracted from the borehole, and the tubes containing the soil samples will be removed. Upon removal, the ends of the lowermost tube will be sealed with Teflon sheets and plastic caps. Soil samples for chemical analysis will be labeled, placed on ice, and delivered to a state-certified analytical laboratory, along with the appropriate chain-of-custody documentation.

Soil Classification

As the samples are obtained in the field, they will be classified by the field geologist in accordance with the Unified Soil Classification System. Representative portions of the samples will be retained for further examination and for verification of the field classification. Logs of the borings indicating the depth and identification of the various strata and pertinent information regarding the method of maintaining and advancing the borehole will be prepared.

Soil Sample Screening

Soil samples selected for chemical analysis will be determined from a head-space analysis using a PID or an FID. The soil will be placed in a Ziploc® bag, sealed, and allowed to reach ambient temperature, at which time the PID probe will be inserted into the Ziploc® bag. The total volatile hydrocarbons present are detected by the PID and reported in parts per million by volume (ppmv). The PID will be calibrated to an isobutylene standard.

Generally two soil samples from each soil boring will be submitted for chemical analysis unless otherwise specified in the scope of work. Soil samples selected for analysis typically represent the highest PID reading recorded for each soil boring and the sample just above first-encountered groundwater.

Stockpiled Drill Cuttings and Soil Sampling

Soil generated during drilling operations will be stockpiled on-site. The stockpile will be set on and covered by plastic sheeting in a manner to prevent rain water from coming in contact with the soil. Prior to collecting soil samples, Stratus personnel will calculate the approximate volume of soil in the stockpile. The stockpile will then divided into sections, if warranted, containing the predetermined volume sampling interval. Soil samples will be collected at 0.5 to 2 feet below the surface of the stockpile. Four soil samples will be collected from the stockpile and composited into one sample by the laboratory prior to analysis. The soil samples will be collected in cleaned brass, two by six inch tubes using a hand driven sampling device. To reduce the potential for cross-contanlination between samples, the sampler will be cleaned between each sampling event. Upon recovery, the sample container will be sealed at each end with Teflon sheeting and plastic caps to minimize the potential of volatilization and cross-contanlination prior to chemical analysis. The soil sample will be labe1ed, placed on ice, and delivered to a state-certified analytical laboratory, along with the appropriate chain-of-custody documentation.

Direct Push Technology, Soil Sampling

GeoProbe™ is a drilling method of advancing small diameter borings without generating soil cuttings. The GeoProbe™ system consists of a 2-inch diameter, 5-feet long, stainless steel soil sampling tool that is hydraulically advanced into subsurface soils by a small, truck-mounted rig. The sampling tool is designed similar to a California-modified split-spoon sampler, and lined with a 5-foot long, clear acrylic sample tube that enables continuous core sampling.

To collect soil samples, the sampler is advanced to the desired sampling depth. The mouth of the sampling tool is plugged to prevent soil from entering the sampler. Upon reaching the desired sampling depth, the plug at the mouth of the sample tool is disengaged and retracted, the sampler is advanced, and the sampler is filled with soil. The sample tool is then retrieved from the boring, and the acrylic sample tube removed. The sample tool is then cleaned, a new acrylic tube is placed inside and the sampling equipment is advanced back down the borehole to the next sample interval.

The Stratus geologist describes the entire interval of soil visible in the acrylic tube. The bottom-most 6-inch long section is cut off and retained for possible chemical analysis. The ends of the chemical sample are lined with Teflon™ sheets, capped, labeled, and placed in an ice-chilled cooler for transport to California Department of Health Services-certified analytical laboratory under chain-of-custody.

Direct Push Technology, Water Sampling

A well known example of direct push technology for water sampling is the Hydropunch®. For the purpose of this field method the term hydropunch will be used instead of direct push technology for water sampling.

The hydropunch is typically used with a drill rig. A boring is drilled with hollow stem-augers to just above the sampling zone. In some soil conditions the drill rig can push directly from the surface to the sampling interval. The hydropunch is conveyed to the bottom of the boring using drill rods. Once on bottom the hydropunch is driven a maximum of five feet. The tool is then opened by lifting up the drill rod no more than four feet. Once the tool is opened, water enters and a sample can be collected with a bailer or tubing utilizing a peristaltic pump. Soil particles larger than silt are prevented from entering the tool by a screen within the tool. The water sample is collected, labeled, and handled according to the Quality Assurance Plan.

Monitoring Well Installation

Monitoring wells will be completed by installing 2 to 6 inch-diameter Schedule 40 polyvinyl chloride (PVC) casing. The borehole diameter for a monitoring well will be a minimum of four inches larger than the outside diameter of the casing. The 2-inch-diameter flush-threaded casing is generally used for wells dedicated for groundwater monitoring purposes.

A monitoring well is typically cased with threaded, factory-perforated and blank Schedule 40 PVC. The perforated interval consists of slotted casing, generally with 0.01 or 0.02 inch-wide by 1.5-inch-long slots, with 42 slots per foot. The screened sections of casing are factory machine slotted and will be installed approximately 5 feet above and 10 feet below first-encountered water level. The screened interval will allow for seasonal fluctuation in water level and for monitoring floating product. A threaded or slip PVC cap is secured to the bottom of the casing. The slip cap can be secured with stainless steel screws or friction; no solvents or cements are used. Centering devices may be fastened to the casing to ensure even distribution of filter material and grout within the borehole annulus. The well casing is thoroughly washed and/or steam cleaned, or may be purchased as pre-cleaned, prior to completion.

A filter pack of graded sand will be placed in the annular space between the PVC casing and the borehole wall. Sand will be added to the borehole through the hollow stem of the augers to provide a uniform filter pack around the casing and to stabilize the borehole. The sand pack will be placed to a maximum of 2 feet above the screens, followed by a minimum 1-foot seal consisting of bentonite pellets.

Cement grout containing 5 percent bentonite or concrete will be placed above the bentonite seal to the ground surface. A concrete traffic-rated vault box will be installed over the monitoring well(s). A watertight locking cap will be installed over the top of the well casing. Reference elevations for each monitoring well will be surveyed when more than two wells will be located on site. Monitoring well elevations will be surveyed by a California licensed surveyor to the nearest 0.01-foot relative to mean sea level (MSL). Horizontal coordinates of the wells will be measured at the same time.

Exploratory boring logs and well construction details will be prepared for the final written report.