GROUNDWATER FEASIBILITY STUDY

FORMER SANTA ROSA MGP SITE

Santa Rosa, California

January 28, 2015

prepared for

Pacific Gas and Electric Company
3401 Crow Canyon Rd
San Ramon, CA 94583

prepared by

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction
13900 Alton Parkway, Suite 122
Irvine, California 92618

Project No. PGE-1015-100

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

13900 ALTON PARKWAY, SUITE 122, IRVINE, CALIFORNIA, 92618
PHONE (949) 297-4444• FAX (949) 297-3625

January 28, 2015

Ms. Beth Lamb, CEG
North Coast Regional Water Quality Control Board
5550 Skylane Boulevard
Santa Rosa, California 95403

RE: Groundwater Feasibility Study
Former Santa Rosa Manufactured Gas Plant
111 Santa Rosa Avenue
Santa Rosa, California

Dear Ms. Lamb:

On behalf of Pacific Gas and Electric Company, enclosed is a copy of the Groundwater Feasibility Study for the Former Santa Rosa Manufactured Gas Plant Site.

The purpose of this report is to re-evaluate the remedy selected in the 2012 Supplemental Feasibility Study, and evaluate alternate remedies that are protective of the Santa Rosa Creek, but that can be implemented with less disruption to the creek and surrounding community.

If you have any questions or comments, please do not hesitate to call me at (760) 213-5782 or Ms. Sally Goodin, Pacific Gas and Electric Company, at (510) 301-2261.

Respectfully submitted,

Terra Pacific Group Incorporated

Murray Wunderly, PG, CHG
Principal Hydrogeologist

Enclosure: Groundwater Feasibility Study

cc: Chief Tony Gossner, Santa Rosa Fire Dept., Santa Rosa Fire Department, 2373 Circadian Way, Santa Rosa, CA 95407
Mr. Richard I. Colombini, P.O. Box 14454, Santa Rosa, CA 95402 (six copies)
Mr. Scott Kirk, Law Office, 290 B Street, Suite 200, Santa Rosa, CA 95401
Mr. Korky Creek, PG&E, 3401 Crow Canyon Road, Rm 175B, San Ramon, CA 94583
Ms. Margaret Pietrasz, PG&E, P.O. Box 7442, San Francisco, CA 94120
Ms. Sally Goodin, 981 Euclid Avenues, Berkeley, CA 94708

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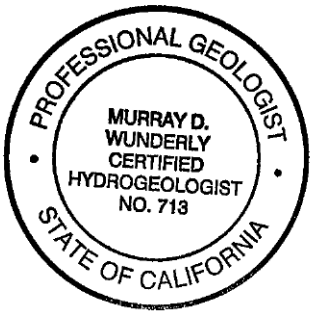
GROUNDWATER FEASIBILITY STUDY

Former Santa Rosa MGP Site
Santa Rosa, California

ACKNOWLEDGEMENT AND SIGNATURE PAGE

This Groundwater Feasibility Study was prepared on behalf of the Pacific Gas and Electric Company (PG&E) for the former Manufactured Gas Plant in Santa Rosa, California.



Murray Wunderly, PG, CHG
Principal Hydrogeologist, Project Manager

1-28-15
Date

Max Reyhani, P.E.
Principal Engineer, Program Manager

1-28-15
Date

1.0 INTRODUCTION

This Groundwater Feasibility Study (FS) was prepared by Terra Pacific Group Incorporated (TPG) on behalf of the Pacific Gas and Electric Company (PG&E) for the Former Santa Rosa Manufactured Gas Plant (MGP) Site (Site) located at 111 Santa Rosa Avenue in Santa Rosa, California (Figure 1).

In June 2006, a Corrective Action Plan (CAP) was prepared for the Site (TPG, 2006). The CAP included an assessment of onsite and offsite impacts to soil, groundwater, and surface water. The CAP also contained a Feasibility Study (2006 FS) that evaluated remedial alternatives for impacted soil and groundwater at the Site. The groundwater portion of the 2006 FS was preliminary in nature because the scope and scale of the selected groundwater remedial alternative would ultimately be dependent on the nature and extent of residual soil impacts following implementation of the selected soil remedy at the Site. The 2006 FS stated that following implementation of the selected soil remedy at the Site, groundwater alternatives would be re-evaluated and an appropriate final groundwater remedy selection would be made, consistent with the remedial action goals established for the Site.

In 2010, the Draft Supplemental Feasibility Study (Supplemental FS) was completed for the Site to fulfill the requirements set forth in Cleanup and Abatement Order (CAO) No. R1-2006-0033, revised by the North Coast Regional Water Quality Control Board (RWQCB) on March 27, 2006; this Supplemental Feasibility Study was finalized with RWQCB comments in 2012 (TPG, 2012b). The Supplemental FS evaluated soil and groundwater remedial alternatives for the Site based on additional information collected since the 2006 FS was completed. The remedial alternatives selected for soil and groundwater, in conjunction with previous remedial actions conducted at the Site, would achieve the remedial action goals established for the Site. These remedial action goals are: 1) to ensure that concentrations of chemicals remaining in soil and groundwater at the Site are protective of human health and the environment to the extent practicable, and 2) to protect and restore the current and potential beneficial uses of ground and surface water to the extent feasible and practicable.

As discussed in depth in the Supplemental FS, remedial activities at the Site are challenged by numerous restrictions including underground and overhead high power electrical lines, setbacks from onsite utility towers, and other structures in and around the Site, such as the 4-story commercial building, and the adjacent Prince Memorial Greenway (PMG) retaining wall and associated tie-backs. Additionally, the presence of residual petroleum non-aqueous phase liquid (NAPL) at the Site makes it unlikely that water quality objectives could be met at all locations, regardless of the soil and groundwater remedy implemented. These factors were taken into account in the development of the soil and groundwater remedies evaluated in the Supplemental FS. The overall Site remedy selected to meet the remedial action goals in the Supplemental FS included the following:

- Removal of the former USTs in the parking lot west of the building entrance
- Remediation of the Redwood Gas Holder
- Removal of the existing onsite UST
- Targeted excavations to remove heavily impacted soils in the vicinity of the former and existing USTs, and shallow soils in the area south of the underground parking entrance

- Funnel and gate to establish a containment area that would prevent groundwater from migrating offsite prior to treatment within the gate, if necessary
- Long-term groundwater monitoring
- Maintaining current Site cap
- Deed restrictions

Since the Supplemental FS was submitted, several of the elements outlined in the selected remedy above have already been implemented. Remediation of the shallow impacted soils immediately south of the underground parking entrance was completed in October, 2011 (TPG, 2012a). Remediation of the Redwood Gas Holder, replacement of shallow soil from planter areas of the Site, and Site restoration activities were completed in 2013 (TPG 2013a; 2013b). Site restoration activities included repaving and/or slurry coating the parking lot, reconstruction of damaged sidewalks, and new landscaping in the planter areas at the Site. Currently the Site is capped and groundwater at the Site is not being used as a water supply.

As discussed in the RWQCB comments to the Supplemental FS and the responses to those comments, PG&E will continue to search for a suitable method to remove the existing steel UST that would allow for removal of the UST and its contents without causing a nuisance condition for the building tenants or the community. Removal of the existing steel UST, as well as targeted soil excavation beneath the existing UST and the two former USTs located in front of the building entrance (removed in June 2006), have been placed on hold pending land use circumstances that will allow for additional significant land use disruption. The timing is unknown but this work remains an agreed upon PGE commitment.

The groundwater remedy selected in the Supplemental FS involved construction of a Funnel and Gate system within the creek and adjoining property. While the Funnel and Gate groundwater remedy would provide an effective barrier between the creek and impacted soils at the Site and prevent potentially impacted groundwater from migrating towards the creek should that occur in the future, construction of the Funnel and Gate system would require up to three construction seasons in the creek to complete and would result in a significant disruption to the creek and surrounding community. Since the Supplemental FS was written, a significant amount of remediation has been conducted at the Site which reduces the potential for future mobilization of Site contaminants. Additionally, historic and recent groundwater data collected from the Site indicates that current groundwater impacts are limited to areas where residual MGP impacts are known to be present and there is no indication that Site contaminants are migrating to the creek. In light of the groundwater data collected from the Site and the completion of several key remediation activities, the benefits of installing the Funnel and Gate remedy may not outweigh the impacts to the creek and surrounding community associated with installation of the Funnel and Gate.

A Draft Creek Barrier Supplemental Feasibility Study (CBSFS) was submitted to the RWQCB on September 3, 2013. The purpose of the study was to re-evaluate the Funnel and Gate remedy selected in the Supplemental FS, and to identify and evaluate alternate remedies that were protective of the Santa Rosa Creek, but that could be implemented with less disruption to the creek and surrounding

community. The Draft CBSFS proposed a smaller underground barrier between Santa Rosa Creek and the Site which would expand the existing barrier system previously installed during remediation work conducted in the creek in 2004. The expanded barrier would further reduce the potential for future migration of contaminants to the creek. Remedial actions, taken in 2004, removed MGP-related waste beneath and adjacent to the creek bed. In addition to removal of impacted soil in the bank and bed of Santa Rosa Creek, sheet pile and slurry curtains were installed at various locations along the bank of the creek. These barriers, in conjunction with the creek bed lining, restrict groundwater flow within the shallow soil adjacent to the creek, reducing the potential for residual contaminants present at the Site to migrate towards the creek. The expansion of the existing barriers proposed in the Draft CBSFS would still involve the destruction and rebuilding of a section of the PMG as well as work in the creek and would require closure of the PMG for at least one year.

The RWQCB commented on the Draft CBSFS in letters dated April 25, 2014, and August 13, 2014 (Appendix A). The RWQCB noted that the recent remediation efforts have reduced the mass of mobile contaminants in soil and groundwater and that continued groundwater monitoring has provided additional data to evaluate whether migration of contamination in groundwater is a significant threat to the creek. The RWQCB stated that the remaining contamination near the creek, both above and within the groundwater table, has low potential mobility in groundwater and does not necessarily present a significant threat to the creek. The RWQCB further requested that the Draft CBSFS be revised to evaluate the reduced threat to the creek from the remaining groundwater and soil contamination and to consider if a no-barrier option would now be feasible. A no-barrier option would include long-term monitoring and Site controls, but would not require construction within the Santa Rosa Creek, significantly reducing the disruption to the creek, the PMG, and surrounding community during implementation.

1.1 Purpose and Organization

This report is divided into six major sections, as described below.

Section 1: Presents an introduction along with a summary of Site conditions and the environmental setting.
Section 2: Defines the nature and extent of groundwater contamination at the Site.
Section 3: Identifies and screens technologies and process options.
Section 4: Summarizes the development and screening of remedial alternatives.
Section 5: Summary and conclusions.
Section 6: Lists references.

1.2 Site Location and Description

The Site is located in the City of Santa Rosa California located between First Street and Santa Rosa Creek, and B Street and Santa Rosa Avenue (Figures 1 and 2). The Site was formerly the location of an MGP constructed by the Santa Rosa Gas Light Company in 1876 and 1877 (PG&E, 1986). The MGP eventually became part of the PG&E system and PG&E sold a portion of the property to the City of Santa Rosa in 1978, and the remaining portion to the 137 Santa Rosa Group Partnership in

1987. The commercial office building overlies four separate parcels; the two most eastern parcels were not part of the MGP and were never owned by PG&E.[1]

1.3 Site History

In 1876 and 1877, an MGP was constructed at the Site. The MGP was constructed by the Santa Rosa Gas Light Company and originally used coal as a feedstock. The plant was converted to use oil feedstock by about 1904 and was acquired by PG&E in 1908. The manufacturing of gas ceased in 1924 and all above ground gas manufacturing structures and equipment were removed. Following closure of the MGP, PG&E constructed a new facility for natural gas distribution that was in operation until at least 1969. In 1987, the Site was vacant when the 137 Santa Rosa Group Partnership acquired it from PG&E and constructed the existing commercial building at 111 Santa Rosa Avenue. The majority of the MGP operations were conducted in the area presently covered by the parking lot of the commercial building (Figure 2).

1.4 Environmental Setting

The general environmental setting of the Site is described in the following sections.

1.4.1 Topography

The Site area is relatively flat with a mild slope toward the west-southwest. The floor of the adjacent creek bed slopes gently toward the southwest at a gradient of approximately one percent. The creek banks descend approximately 25 feet into the creek bed. The creek banks are partly supported by recently constructed retaining walls.

1.4.2 Geologic Setting

The Site is located in the Santa Rosa Plain, a northwest trending alluvial valley. The Site is directly underlain by anthropogenic fill material that rests on Recent-age alluvial sediments composed of variable mixtures of clay, silt, sand, and gravel. The alluvial sediments overlie the Plio-Pleistocene Huichica and Glen Ellen Formations. These older formations are composed of poorly consolidated, interbedded silty clay, sand, poorly cemented conglomerate and gravel of fluvial origin. The lower part of the Glen Ellen Formation is tuffaceous (volcanic) in part (Cardwell, 1958). The Glen Ellen Formation overlies the Tertiary Sonoma Volcanics. The Sonoma Volcanics consist of lava flows, tuffs, agglomerates and intercalated sediments of volcanic debris (Cardwell, 1958). The Franciscan Complex forms the basement of the region. The Franciscan Complex consists dominantly of sandstone and shale with minor greenstone, blueschist, limestone, and chert. The Franciscan is pervasively sheared and broken from tectonic activity (Cardwell, 1958).

[1] The Site is identified by assessor parcel numbers (APNs) 010068017 and 010068018. APN 010068018 is the portion of the Site that was sold to the City of Santa Rosa in 1978. The remaining APN, 010068017 was later split into two parcels, 010068021 and 010068022. The commercial office building overlies four separate parcels including APNs 010068018 and 010068021, formerly part of the MGP, and APNs 010068010 and 010068020 which were not part of the MGP and were never owned by PG&E.

At the Site, the thickness of fill material thins significantly northward from the creek. Coarser grained alluvial material is most prevalent near the creek with finer grained material becoming more prevalent northward from the creek.

1.4.3 Occurrence of Groundwater

The Santa Rosa Plain is an approximately 96 square mile basin drained by Santa Rosa Creek and its tributaries (Department of Water Resources [DWR], 1975). The RWQCB has identified the Site as part of the Santa Rosa Creek Hydrologic Subarea of the Russian River Hydrologic Unit. Santa Rosa Creek, the nearest surface water feature, is located on the southern boundary of the Site. Santa Rosa Creek flows in a westerly direction until it reaches the Laguna de Santa Rosa and then to the Russian River.

Cardwell describes the hydrogeology beneath the Site vicinity as dominated by the alluvium associated with Santa Rosa Creek. Regional groundwater flow is generally west-southwesterly towards the Laguna de Santa Rosa (Cardwell, 1958).

Groundwater at the Site occurs at approximately 20 feet below ground surface (bgs), with a general south to southwesterly gradient towards Santa Rosa Creek. Groundwater levels generally respond to seasonal variations in precipitation and may vary as much as a few feet seasonally. As part of the PMG restoration project, an approximately 350-foot-long section of the creek bed, west of the Santa Rosa Avenue Bridge, was lined with riprap and grout. This low permeability lining in the creek bed would limit groundwater discharge to the creek to the south of the Site and would cause groundwater beneath the creek to flow west beyond the end of the creek bed lining prior to discharging to the creek.

2.0 NATURE AND EXTENT OF CONTAMINATION

The chemicals typically associated with former MGP sites include polycyclic aromatic hydrocarbons (PAHs), select inorganics (e.g., some trace metals), benzene, toluene, ethylbenzene, and xylenes (BTEX), and total petroleum hydrocarbon (TPH). The PAHs from lampblack and tars generated from gas manufacturing processes are the typical indicator chemicals used to direct the investigation and remediation of MGP sites. The nature and extent of soil contamination at the Site has been previously described in the 2012 Supplemental FS prepared for the Site (TPG, 2012b). Figures from the 2012 Supplemental FS showing the distribution of select contaminants in soil are included in Appendix B.

Primary source areas previously targeted for remediation in the Supplemental FS included: shallow impacted soils immediately south of the underground parking entrance, soil beneath the former USTs located west of the main building entrance, and the existing UST in the southern portion of the Site (Appendix B, Figure 15). In addition to these source areas, MGP impacts have been observed at the Redwood Gas Holder in the northwest portion of the Site, and sporadically in soils at various locations as MGP residues and petroleum NAPL. The shallow soil south of the underground parking entrance and the Redwood Gas Holder have been remediated.

2.1 NATURE AND EXTENT OF GROUNDWATER CONTAMINATION

Groundwater monitoring wells were first installed at the Site in 1987. Since then, additional wells have been installed and several wells have been destroyed during various Site investigations. Existing groundwater monitoring wells include MW-1, MW-2, MW-7 through MW-23, and EBAMW-1 and EBAMW-2. Monitoring well MW-6 was never drilled. Monitoring wells MW-3, MW-4, and MW-5 were destroyed and are no longer available for monitoring. Nine of the existing wells, MW-10 through MW-18, were installed during the Supplemental Groundwater Investigation conducted in March of 2005 (ENV America, 2005). These wells were installed to further evaluate potential groundwater impacts and monitor water levels at the Site in areas where groundwater levels had not historically been monitored. Monitoring well MW-19 was installed in November 2006 downgradient of the former redwood gas holder area, and was replaced in June 2009 with shallow and deep completion wells MW-19S and MW-19D. Monitoring well MW-20 was installed in the Prince Memorial Greenway to the southwest of the 111 Santa Rosa Avenue property to monitor groundwater conditions downgradient of the Site. An additional monitoring well, MW-21, was installed in March 2008 to monitor groundwater conditions adjacent to the Santa Rosa Creek immediately south of the Site. Monitoring wells EBAMW-1 and EBAMW-2 were installed in November 2008 to assess impacts to groundwater related to two former USTs in the parking area adjacent to the building. Well MW-22 was drilled in June 2009 as a monitoring point downgradient of well MW-14, which has historically had a thin layer of light non-aqueous phase liquid (LNAPL) floating on water in the well. Well MW-23 was installed in August 2009 to serve as a monitoring point between MW-19S/D and MW-20. Monitor well MW-18, located in Santa Rosa Avenue, had been damaged prior to the September 2011 monitoring event. This well was an upgradient well that was not impacted by MGP residuals. The well was properly destroyed in March, 2012. Semiannual groundwater monitoring has been conducted at the Site since April 2007 (TPG 2007; 2008a; 2008b; 2009, 2010, 2011, 2013c, 2013d, 2014a, 2014b).

In addition to the groundwater monitoring wells described above, a series of wells were installed during remediation at the redwood gas holder (ERH-MW1 through ERH-MW4, RW-1 through RW-

5) to monitor and/or extract groundwater during remediation activities. At the time these extraction wells were installed, a series of six additional possible extraction wells (PM-1 through PM-6) were installed along the PMG.

As remediation in the vicinity of the redwood gas holder progressed, additional monitoring wells were destroyed. Monitoring well ERH-MW-2 was destroyed in August, 2009. Monitoring wells ERH-MW-1, ERH-MW-3, ERH-MW4, and RW-2 through RW-5 were destroyed between March and April 2012, prior to the final remediation phase at the redwood gas holder because the wells were located within the area where the proposed in situ soil stabilization remedy was planned. Two new extraction wells, RW-2R and RW-3R were installed downgradient of the redwood gas holder, outside of the treatment area as replacement wells. In April, 2013, well RW-1 was destroyed to accommodate site restoration activities in that area of the Site. During remediation activities conducted at the redwood gas holder, a groundwater extraction and treatment system was installed and operated to contain groundwater in the vicinity of the redwood gas holder. The groundwater extraction system was turned off on May 27, 2014 in accordance with the GWET Shutdown Test Workplan (TPG, 2014c).

The most recent published semiannual groundwater monitoring results from March 2014 are summarized in Figure 3 (TPG, 2014b). Historical groundwater data are provided in Appendix C. The results from the March, 2014 sampling event are summarized below.

2.1.1 Polycyclic Aromatic Hydrocarbons in Groundwater (March 2014)

PAHs were only detected in two monitoring wells during the March 2014 sampling event. Acenaphthene, and fluorene were detected in monitoring well EBAMW-2 at concentrations of 0.11 and 0.17 micrograms per liter (µg/L), respectively. Acenaphthene was also detected in well MW-22 at a concentration of 0.32 µg/L. PAHs were not detected in any of the other monitoring wells during this sampling event.

2.1.2 Total Petroleum Hydrocarbons (March 2014)

TPHg was not detected in monitoring wells during the March 2014 sampling event.

TPHd was detected in monitoring wells MW-2, MW-7, and MW-22 at concentrations of 110, 79, and 100 µg/L, respectively. TPHd was not detected in any of the other monitoring during this sampling event.

TPHmo was only detected in one monitoring well (MW-7) at a concentration of 230 µg/L. TPHmo was not detected in any of the other monitoring during this sampling event.

2.1.3 Benzene, Toluene, Ethylbenzene, Xylenes (March 2014))

BTEX compounds were not detected in Site monitoring wells during the March 2014 event.

2.1.4 Summary Groundwater Conditions

Groundwater monitoring at the Site began in 1987, and has been conducted semiannually since 2007. The results indicate that there are only limited impacts to groundwater in areas immediately adjacent

to known source areas. There is no indication that contaminated groundwater is migrating or discharging to the Santa Rosa Creek.

2.2 DISTRIBUTION OF NAPL

Petroleum NAPL has been historically observed at several locations at the Site. Figure 4 shows boring and/or well locations at the Site and the locations where NAPL has been observed. NAPL observed in soil at the Site generally consists of residual phase NAPL trapped between the grains of soil or within fractures in clay at or near the water table. Although NAPL has been observed in soil at several locations across the Site, it has only been observed floating on the water table in two wells, MW-14 and PM-1.

Due to the presence of residual NAPL at the Site, it is unlikely that water quality objectives can be met at all locations, regardless of the soil and groundwater remedy implemented. However, groundwater data collected from the Site indicates that current groundwater impacts are limited to areas where residual MGP impacts, such as NAPL, are known to be present and there is no indication that Site contaminants are migrating to the creek.

For a finite (without an ongoing source) NAPL release, the mobility of the NAPL decreases over time due to a variety of naturally occurring processes. At this Site, these processes have been occurring for many decades since the NAPL release likely occurred approximately 100 years ago. Observations and data collected from the Site indicate that the NAPL has very limited mobility, consistent with the suspected age of the release. A general discussion of the NAPL mobility is presented in the following sections.

2.2.1 Mobility of NAPL

Several factors govern the mobility of NAPL in the subsurface including the properties of the NAPL such as density, viscosity, and interfacial tension, in addition to properties related to subsurface conditions such as hydraulic conductivity, NAPL saturation, and the hydraulic gradient. Data have been collected from the Site to evaluate the potential mobility of the NAPL under existing site conditions.

As a NAPL body migrates through the subsurface, a significant portion of the NAPL is retained in the porous media trailing the NAPL body, thereby depleting and eventually exhausting the mobile NAPL body (Cohen and Mercer, 1993). Below the water table, residual saturation of NAPL is the saturation at which NAPL is immobilized (trapped) by capillary forces as discontinuous ganglia under ambient groundwater flow conditions (Cohen and Mercer, 1993). As a result, a NAPL body that does not have an infinite supply of NAPL can only migrate a limited distance before the saturation of NAPL is reduced to its residual saturation and it is no longer mobile. For reference, published values of residual saturation for crude oil in sandstone, or petroleum reservoirs, ranges from approximately 16 to 50 percent (Cohen and Mercer, 1993).

The residual saturation of the NAPL defines the point at which the NAPL is no longer able to move under ambient conditions; however, the mobility of the NAPL in the groundwater zone is largely a function of the saturation of the NAPL in the porous media. When more than one fluid exists in a porous medium, the fluids compete for pore space. The result is that the mobility of each of the fluids

is reduced (Cohen and Mercer, 1993). If one fluid has a high saturation, then a higher percentage of the pore space is available for that liquid to flow through. Conversely, the lower the saturation of a particular fluid, the less pore space is available for the fluid to flow through. In general, the mobility of NAPL in the groundwater zone decreases exponentially as the saturation of NAPL decreases.

Although the exact source of the NAPL at the Site is not known, if the source were related to MGP operations previously conducted at the Site, then the NAPL would be on the order of 100 years old. The fact that the NAPL is still present at the Site after decades, demonstrates the limited mobility of the NAPL. Additionally, the NAPL is likely less mobile now than it was when it was released since moving through the subsurface causes a trail of residual NAPL to remain behind the NAPL body, thus reducing the saturation of the NAPL and reducing the NAPL mobility as discussed previously. Over time, the NAPL is also subject to a number of naturally occurring processes which tend to preferentially remove the lighter fractions in the NAPL. As a result, the heavier, less mobile fraction of the NAPL remains in the subsurface and is less mobile than the original source.

2.2.2 NAPL Mobility Testing

Intact core samples from three borings drilled during the 2005 Supplemental Groundwater Investigation were sent to PTS laboratories for NAPL mobility testing (ENV America, 2005). The samples were selected from the depth interval in each boring which had the greatest visible amount of NAPL present and therefore likely represent the depth ranges where NAPL is most mobile at each of these boring locations.

The first test was a free product mobility test that was conducted by taking the intact core samples and spinning them in a centrifuge to subject them to a force of 1,000 times that of gravity for one hour. The volume of fluids drained from the core was measured and the water and NAPL fluid saturations in the sample were recorded before and after centrifuging the sample. The testing indicated that NAPL could not be liberated from the soil even when centrifuging the sample under extreme conditions. This test result indicated that the NAPL in the core samples was below residual saturation levels.

The second test performed was a NAPL saturation capacity test. While the first test evaluated whether the levels of NAPL in the core samples were below residual NAPL saturation levels, this test was performed to evaluate what the residual NAPL saturation value was. The test involved first taking the centrifuged cores from the previous test and saturating them with NAPL. The saturated cores were then spun in a centrifuge, as in the first test, to drain the samples. The results indicated that the residual NAPL saturation of all samples after saturating and centrifuging was slightly higher in all samples than the NAPL saturation observed in the original samples, confirming that the NAPL in the original field samples was below the residual NAPL saturation. At these saturation levels, the NAPL would be essentially immobile under current Site conditions.

These tests were all run under very conservative conditions. Centrifuging the samples at a force of 1,000 times that of gravity to drain the NAPL is an extreme situation that could not realistically occur in the subsurface.

2.2.3 Summary of NAPL Distribution and Mobility

NAPL has been observed in borings at several locations in the soils near the water table both onsite and on the adjacent property. The NAPL occurs as discontinuous globules within the pores of the soil and/or in fractures in clay. In wells completed at the Site, several within the area known to be impacted by NAPL, it has only been observed floating on water in two wells. Mobility testing conducted on representative cores from NAPL-impacted areas of the Site indicated that the NAPL saturation at these locations was below residual levels indicating that the NAPL is essentially immobile under current Site conditions. These results are consistent with the observed distribution of NAPL in the subsurface and the suspected age of the NAPL release.

3.0 IDENTIFICATION AND PRELIMINARY SCREENING OF TECHNOLOGIES AND PROCESS OPTIONS

The purpose of this section of the FS is to generate a list of applicable treatment technologies and process options to use in developing remedial alternatives to meet the remedial action goals discussed below.

3.1 REMEDIAL ACTION GOALS

The remedial action goals proposed are: 1) to ensure that concentrations of chemicals remaining in soil and groundwater at the Site are protective of human health and the environment to the extent practicable, and 2) to protect and restore the current and potential beneficial uses of ground and surface water to the extent feasible and practicable. Beneficial uses of groundwater include domestic, irrigation, and industrial supply as described in CAO No. R1-2006-0033.

3.2 SCREENING PROCESS OF REMEDIATION TECHNOLOGIES

This section describes the screening process used to evaluate remediation technologies for groundwater at the Site. First, general response actions were developed based on the remedial action goals discussed above. Applicable technology types and process options were then identified for each general response action. For the purposes of this study, the term technology type refers to a general category of technologies, such as barrier walls, groundwater pumping, and in situ treatment. The term process option refers to the material, equipment, or methodology used to implement a technology. All preliminary response actions, technology types and process options considered in this FS are summarized in Table 1.

3.2.1 General Response Actions

General Response actions are media specific actions that may achieve the objectives established for the Site. Protectiveness can be achieved by reducing exposure or exposure routes, such as restricting access to groundwater. Protectiveness can also be achieved by reducing the mass of contaminants in the subsurface to reduce the potential for future migration and/or future exposure.

3.2.1.1 General Response Actions for Groundwater

The following six general response actions were identified as potentially being capable of achieving the remedial action objectives for the groundwater at the Site:

No Action**.** Under this action, no groundwater remediation or monitoring would be conducted at the Site. This option serves as a baseline against which other groundwater remedial options can be compared.

Institutional Actions. Under institutional actions, restrictions are established (i.e., deed restriction) and implemented to limit the Site land use and/or to maintain certain Site controls, to limit potential migration to groundwater. Deed restrictions may also prohibit the installation of groundwater production wells on the Site.

Long-term Groundwater Monitoring. Groundwater monitoring could be conducted to verify that groundwater conditions are stable. A network of groundwater monitoring wells could be established and periodically sampled to evaluate contaminant concentrations in groundwater over time.

Containment. Containment involves leaving contaminants in place and utilizing natural or engineered methods to minimize their migration. Methods include subsurface barrier walls and groundwater pumping (hydraulic controls).

Collection of NAPL. Under this action, mobile NAPL is removed from the ground using trenches, wells, or during excavation of contaminated soil, and either recycled or shipped to a disposal facility.

Collection of Groundwater. Under this action, groundwater is collected by either pumping from wells or from the pit created during soil excavation. Extracted groundwater would be treated prior to disposal.

Treatment of Groundwater. This action involves either *in situ* or *ex situ* treatment of groundwater using biological, chemical, or physical processes to reduce the toxicity, mobility, and or volume of contaminants in groundwater.

Disposal of NAPL. Under this action, NAPL is shipped to either an offsite disposal or recycling facility.

Disposal of Groundwater. Under this action, treated groundwater would be discharged under permit to the storm drain system or to the public sanitary sewer system, or injected back into groundwater.

3.3 Identification and Preliminary Screening of Remedial Technologies and Process Options for Groundwater

The preliminary screening of remedial technologies and process options is accomplished by using information regarding the contaminant type and concentrations, as well as the Site characteristics. The current and future land uses of the Site are important factors in choosing the most appropriate remedial technology. Technology types and process options may be rejected due to one or more of the following:

- Option is not practical for the estimated volume or area of contaminated material;
- Option is not feasible and/or effective due to Site conditions such as location, size, surrounding land use, geology, soil, hydrogeology, and contaminant characteristics;
- Option cannot be effectively administered;
- Option is not proven to be effective for the type of Site contaminants or contaminated media; and,
- Option is significantly higher in cost compared to other technologies.

A list of process options is reviewed for each of the remedial technology types identified and a preliminary evaluation performed in accordance with the above screening criteria. The process options that have not proven to be effective for the type of Site contaminants or contaminated media

are eliminated by the preliminary screening process, as discussed in subsequent sections. Based on this preliminary screening, process options are either retained for further evaluation or rejected.

In the following sections, remedial technologies are identified and described. Following a description of each remedial technology, one or more process options, which could be used to implement the remedial technology, are identified and discussed.

3.3.1 No Action

Under this option, no groundwater remediation or monitoring would be conducted at the Site. This option serves as a baseline against which other groundwater remedial options can be compared and will therefore be retained. This option offers no reduction in exposure levels and there is no cost involved with this option.

3.3.2 Access restrictions

Access restrictions are a form of institutional action that can reduce or eliminate potential exposure to hazardous materials and maintain compatible site use. Access restrictions in the form of deed restrictions are the most appropriate form of institutional actions for groundwater at the Site.

3.3.2.1 Deed Restrictions

Deed restrictions identify specific required or restricted activities that are recorded on the property deed. Deed restrictions are used to institutionally control the type of construction, business, or activities that could take place at the Site. Deed restrictions can set certain conditions (such as maintenance of a cap) and/or limit future use (for example, no drilling of groundwater production wells, etc.) for the Site. This option is retained for further consideration.

3.3.3 Long-term Groundwater Monitoring

One process option is available for this remedial technology type and is discussed below.

3.3.3.1 Groundwater Monitoring

Under this process option, a groundwater monitoring well network would be established and groundwater samples periodically collected from the monitoring wells and analyzed to verify the stability of residual contaminants in groundwater.

3.3.4 Barrier Walls

Two process options were evaluated for this technology. Each is discussed in the following sections.

3.3.4.1 Sheet Pile Cutoff Walls

This process option is constructed by driving interlocking steel piles into the ground. Leakage can be reduced by utilizing proven sealing techniques that fill the joints between the sheet piles.

Difficulties associated with installing a sheet pile cutoff wall at the Site include the limited access for equipment and the presence of subsurface utilities and debris. However, sheet piling has been previously installed at the Site and therefore this process option will be retained for further evaluation.

3.3.4.2 Grout or Slurry Barriers

Grout or slurry barriers can be used to control the migration of groundwater by creating a low permeability zone which impedes the movement of groundwater. A grout or slurry barrier can be constructed using several different techniques. Jet grouting can be used to inject grout at high pressure into the subsurface, large diameter augers can be used to mix soil with a grout in situ, and trenching/excavating can be used to excavate material which is subsequently backfilled with grout or slurry that provides a low permeability barrier. Typical grouting fluids include cement, bentonite, or specialty fluids like silicate grouts. Typical slurry mixes include a mixture of sand and cement.

As with sheet pile cutoff walls, difficulties associated with installing grout or slurry barriers at the Site include the presence of subsurface utilities and debris, cobbles, limited access for equipment, and depth to groundwater of approximately 20 feet. However, because slurry barriers have been installed previously at the Site during remediation of the creek, this process option will be retained for further evaluation.

3.3.5 NAPL Collection from Pit during Soil Excavation

One process option was identified for this remedial technology type and is discussed below.

3.3.5.1 Pumping from Soil Excavation

Under this process option, NAPL and contaminated groundwater would be removed from the impacted areas of the shallow aquifer by pumping the liquids from the excavation created during the removal of contaminated soil. The extracted liquids would be stored in an onsite aboveground tank. The stored liquids would be treated onsite or transported to an appropriate offsite facility for treatment and disposal. Following the removal of NAPL during soil excavation, the excavation would be backfilled with clean engineered fill material. This option will be retained for further evaluation.

3.3.6 Groundwater Collection from Pit during Soil Excavation

One process option was identified for this remedial technology type and is discussed below.

3.3.6.1 Pumping Groundwater from Soil Excavation

Under this process option, contaminated groundwater would be removed from the impacted areas of the shallow aquifer by pumping the liquids from the excavation created during the removal of contaminated soil. The extracted liquids would be stored in an onsite aboveground tank. The stored liquids would be either treated onsite and discharged to the sanitary sewer under permit or transported to an appropriate offsite facility for treatment and disposal.

Following the removal of contaminated groundwater during soil excavation, the excavation would be backfilled with clean fill. This option will be retained for further evaluation.

3.3.7 Groundwater Extraction Wells

One process option was identified for this remedial technology type and is discussed below.

3.3.7.1 Pumping Groundwater from Wells

Groundwater extraction from pumping wells would be performed to remove contaminated groundwater from the subsurface. Extracted groundwater would require treatment prior to discharge.

This process option has been used extensively to extract groundwater from contaminated sites. While the technology is effective at removing contaminated groundwater, the rate at which the overall mass of contaminants can be removed from the subsurface is limited by the low solubility and low dissolution rate of many of the Site contaminants. Non-aqueous phase liquid and other contaminants in soil have likely been present in the subsurface at the Site for many decades. The fact that these contaminants have not dissolved in groundwater and migrated offsite, after many decades of exposure to groundwater, indicates that dissolution into groundwater is a relatively ineffective mass removal method for this Site. Although this process option has limited effectiveness on removing mass from the subsurface, it is generally effective at collecting or containing contaminated groundwater. Therefore, it will be retained for further evaluation as a containment technology type for the Site.

3.3.8 Onsite Ex Situ Treatment

One process option was identified for this remedial technology type and is discussed below.

3.3.8.1 Onsite Groundwater Treatment System

Under this process option, contaminated groundwater extracted by pumping from wells at the Site would be treated in an onsite treatment system prior to discharge under a permit. Onsite groundwater treatment systems are commonly used to treat extracted groundwater, therefore this option will be retained for further evaluation.

3.3.9 In Situ Treatment

Five process options were identified for this remedial technology type and are discussed in the following sections.

3.3.9.1 Air Sparging

Air sparging involves the injection of air into groundwater. Air sparging removes contaminants through stripping of the volatile contaminants from the groundwater and by increasing the concentration of dissolved oxygen in groundwater that, in turn, stimulates biodegradation. Contaminants volatilized are removed by soil vapor extraction in the vadose zone and treated *ex situ*.

As discussed previously, the volatility of the contaminants at the Site is relatively low. Additionally, the heterogeneous nature of the subsurface at the Site would limit the ability to evenly apply this technology. Preferential pathways would likely form and as a result only limited portions of the subsurface would receive treatment. Therefore, this process option is not retained for further evaluation

3.3.9.2 Ozone Sparging

Ozone sparging is similar to air sparging except that ozone is mixed with ambient air and introduced into the contaminated aquifer via a microporous diffusion apparatus. Contaminants are stripped from

the groundwater and some chemical oxidation occurs from the presence of the ozone. Additionally, the increased dissolved oxygen levels enhance biological activity. This technology is subject to the same limitations at the Site as air sparging and is therefore not retained for further evaluation

3.3.9.3 Reactive Wall

Reactive walls are typically installed to intercept contaminant plumes. Due to seasonally fluctuating groundwater flow directions, reactive walls often require additional barrier walls to direct groundwater flow towards the reactive wall. This configuration is commonly known as a Funnel and Gate system.

A reactive wall could be located downgradient of source areas such that if dissolved contaminants were to become mobile in the future, they would be treated. Based on recent groundwater levels measured at the Site, the groundwater flow direction at the Site is generally to the southwest towards the creek. A barrier wall could be installed adjacent to the creek to divert groundwater flow westward parallel to the creek towards the reactive wall. A reactive wall could be placed at the downgradient end of the barrier wall such that diverted groundwater is directed through the reactive barrier prior to leaving the Site or entering the creek.

Additional pre-design evaluations would need to be conducted to properly design the Funnel and Gate system. These pre-design evaluations would include aquifer tests to determine the aquifer properties and numerical flow modeling to evaluate the effect of the Funnel and Gate on the groundwater system. Models could also be developed to predict mass loading rate estimates and groundwater residence times within the reactive wall to determine the most effective reactive materials for the wall.

Due to the presence of subsurface utilities, nearby retaining wall structures and buried debris at the Site, the installation of barrier walls as discussed previously would be challenging. Additionally, there is currently no indication that site contaminants in groundwater are migrating to the creek requiring treatment. However, this process option is retained for further evaluation.

3.3.9.4 In Situ Biodegradation

This process option includes injection of nutrients and/or oxygen to the saturated zone to stimulate and enhance breakdown of hydrocarbons through biological activities. Although both oxygen and nutrients can be injected to enhance biological activities and breakdown of hydrocarbons, oxygen is typically the limiting factor in aerobic bioremediation. Addition of oxygen can be accomplished by injection of air, hydrogen peroxide, or oxygen releasing compounds. Monitoring of the groundwater is needed to assess the degree of enhanced biodegradation.

This process option is most effective at treating dissolved phase contaminants and would have little effect on areas impacted by NAPL. Groundwater impacts at the Site are limited to areas in the immediate vicinity of known source areas; these locations are typically in areas where NAPL has been observed. Therefore this process option would have limited effectiveness at these locations and this process option is not retained for further evaluation.

3.3.9.5 In Situ Chemical Oxidation

Chemical oxidation can be used to oxidize contaminants *in situ*. The process is achieved by injecting a dilute oxidant directly into the contaminated groundwater locations. The oxidant, once injected, will react with most organic molecules and cause the contaminants to degrade into carbon dioxide, water, and non-toxic end products. In heterogeneous conditions, oxidation compounds are likely to channel through the coarser portions of the subsurface and bypass the finer grained material where much of the contaminant mass may reside.

In situ chemical oxidation is not suitable for all of the contaminants present at the Site. Additionally, the heterogeneous nature of the subsurface at the Site would limit the ability to control the migration of injected oxidants and preferential pathways would likely result in only limited treatment of the subsurface. Based on these limitations, this process option is not retained for further evaluation.

3.3.10 Offsite NAPL Disposal

One process option has been identified for this remedial technology type and is discussed below.

3.3.10.1 Offsite Disposal

Offsite disposal involves the transportation of recovered NAPL to permitted landfills or recycling facilities for final disposal. Offsite disposal is an effective and tenable management option, and therefore, will be retained for further consideration.

3.3.11 Onsite Discharge of Treated Groundwater

Two process options have been identified for this remedial technology type and are discussed below.

3.3.11.1 Discharge to Storm Drains

Under this process option, treated groundwater would be discharged to the local storm drain system. Appropriate discharge permits would need to be acquired and ongoing monitoring would be required. This process option is retained for further consideration.

3.3.11.2 Subsurface Injection

Under this process option, treated groundwater would be injected into the subsurface at the Site. Injected water could be utilized to aid in the control of hydraulic gradients and the Site to enhance the capture of groundwater by extraction wells. Appropriate discharge permits would be needed and ongoing monitoring would be required. This process option is retained for further consideration.

3.3.12 Offsite Discharge of Treated Groundwater

One process option has been identified for this remedial technology type and is discussed below.

3.3.12.1 Discharge to Sanitary Sewer

Under this process option, treated groundwater would be discharged to the Santa Rosa Sanitary Sewer system. Appropriate discharge permits would need to be acquired and ongoing monitoring would be required. Based on discussions with the City of Santa Rosa, continuous large volumes of wastewater

discharge would not be allowed due to concerns about the ability of the existing infrastructure to handle the additional volume, especially during rain events. However for smaller volumes of water and discharges during the non-rainy season, this process option is retained for further consideration.

4.0 DEVELOPMENT OF REMEDIAL ALTERNATIVES

This section describes the rationale for combining the options retained from the above preliminary screening into preliminary remedial alternatives. The groundwater remedial alternatives, in conjunction with the previously selected soil remedy, were developed as potential remedies capable of achieving the remedial action goals for the Site.

4.1 REMEDIAL ALTERNATIVES FOR GROUNDWATER

The following four alternatives (including the No Action alternative) have been developed by combining compatible and complimentary options into remedial action scenarios that would address the groundwater contamination at the Site. The objective is to consider options that would adequately accomplish the remedial action goals and would be technically feasible. Each of the four alternatives considered would be implemented in conjunction with the previously selected soil remedy (cap and deed restrictions and targeted soil excavations) to provide an overall remedy for the Site. The assembled groundwater alternatives are discussed below in more detail.

4.1.1 Groundwater Alternative No 1: No Action

Under this action, no groundwater remediation or monitoring would be conducted at the Site. This alternative serves as a baseline against which other groundwater remedial options can be compared. There are no costs associated with this alternative.

4.1.2 Groundwater Alternative No 2: Long-term Groundwater Monitoring

Under this remedial alternative, a groundwater monitoring well network would be established and semiannual groundwater sampling would be conducted to verify that the concentration of contaminants in groundwater are stable. Semiannual groundwater monitoring is currently being conducted at the Site and it is anticipated that a subset of the existing monitoring wells could be used for long-term groundwater monitoring. The specific wells to be utilized in the monitoring network would be established during the design phase for the final Site remedy.

If the monitoring results indicate that groundwater conditions are changing and no longer stable, additional monitoring, investigation, or other remedial actions could be implemented as appropriate. Every five years, the frequency and location of monitoring, as well as the parameters monitored, could be reviewed to assess whether the monitoring program is still appropriate.

4.1.3 Groundwater Alternative No 3: Grout or Slurry Barrier

Groundwater at the Site typically flows in a southwesterly direction towards the Santa Rosa Creek. To reduce the potential for contaminants from the Site to migrate towards the creek, a grout or slurry barrier would be constructed along the northern bank of the creek. This remedial alternative would create a low permeability barrier between the creek and residual impacts in soil along the southern portion of the Site.

4.1.4 Groundwater Alternative No 4: Funnel and Gate

The presence of a Barrier Wall along the northern bank of the Santa Rosa Creek would divert the flow of groundwater and prevent potentially contaminated groundwater from flowing into the creek. In addition to the barrier along the northern bank of the creek, a segment of the barrier would extend northward, starting from the western end of the barrier. A reactive wall would be placed at, or near the intersection of the two barriers. Groundwater diverted along the barrier wall would be directed through the reactive wall, to treat contaminants, if any, dissolved in groundwater. This Funnel and Gate system would ensure that if site constituents were to become mobile they would be treated prior to reaching Santa Rosa Creek.

4.2 EVALUATION CRITERIA FOR SCREENING OF REMEDIAL ALTERNATIVES

The remedial alternatives described in Section 4.1 are screened using three criteria: effectiveness, implementability, and comparative cost to identify the most appropriate alternative for effective remediation of the Site. These are similar to criteria used for the preliminary screening evaluation of technologies and process options. However, this screening differs in that the alternatives are evaluated with reference to their Site-specific potential for protecting human health and the environment, and not just their effectiveness as a process or technology. A brief description of each criterion is presented below.

Effectiveness. Each alternative is evaluated based on how effective the alternative is in protecting and restoring water quality, and in reaching the remedial action goals established for the Site. When evaluating the effectiveness of each of the remedial alternatives to achieve the remedial action goals for the Site, it is understood that the remedial alternative would be implemented in conjunction with the previously selected soil remedy for the Site.

Implementability. Implementability is a measure of technical and administrative feasibility of constructing, operating, and maintaining a remedial action alternative. Implementability is used to evaluate the combination of process options comprising the alternative with respect to conditions at the Site. Technical feasibility refers to the ability to construct, reliably operate, and meet technology-specific regulations for process options until a remedial action is complete. It also includes operation, maintenance, replacement, and monitoring of technical components of an alternative, if required, after the remedial action is complete. Administrative feasibility refers to the ability to obtain approvals from regulatory agencies, the availability of treatment, storage, and disposal services, and the requirements for, and availability of, specific equipment and technical specialists.

Cost. Preliminary cost estimates are developed for each alternative to provide a relative comparison to other alternatives. Both capital and operation and maintenance (O&M) costs are considered. Estimates are based on sources that include cost estimating guides, generic unit costs, vendor information, prior estimates, experience at similar sites, and engineering judgment. A preliminary cost estimate has been prepared for each alternative for screening purposes.

4.3 DESCRIPTION AND EVALUATION OF ALTERNATIVES

Detailed evaluations of the alternatives for groundwater are presented below. The evaluation is based on the criteria discussed above. Table 2 summarizes the retained alternatives and the rationale for their selection.

4.3.1 Detailed Evaluation of Groundwater Remedial Alternatives

A detailed evaluation of each of the four groundwater alternatives is presented below.

4.3.1.1 Groundwater Alternative No. 1: No Action

The No Action alternative serves as a baseline against which the other remedial action alternatives can be evaluated.

Assessment of Alternative

There would be no remedial action under the No Action alternative and the contaminants would be left in-place.

Effectiveness. There would be no additional short-term risk posed to the community or the environment because no remedial action would be performed under this alternative. Without any form of remediation under the No Action alternative, the remedial action goals would not be met if contaminants were to become mobile in the future.

Implementability. The implementability criterion is not applicable for the No Action alternative.

Cost. There are no remedial costs associated with this alternative.

4.3.1.2 Groundwater Alternative No. 2: Long-term Groundwater Monitoring

Under this remedial alternative, the concentration of contaminants in groundwater would be monitored periodically. The data would be used to verify that groundwater conditions are stable. If the monitoring results indicate that groundwater conditions are changing and no longer stable, additional monitoring, investigation, or other remedial actions could be implemented as appropriate. Every five years, the frequency and location of monitoring, as well as the parameters monitored, could be reviewed to assess whether the monitoring program is still appropriate.

Remedial actions, taken in 2004, removed MGP-related waste beneath and adjacent to the creek bed. In addition to removal of impacted soil in the bank and bed of Santa Rosa Creek, sheet pile and slurry curtains were installed at various locations along the bank of the creek. These barriers, in conjunction with the creek bed lining, restrict groundwater flow within the shallow soil adjacent to the creek, reducing the potential for residual contaminants present at the Site to migrate towards the creek. The extent of the previously installed barriers is shown in Figure 5.

To implement this remedial alternative, the following representative technology would be utilized:

Long-term Groundwater Monitoring. A groundwater monitoring well network would be established and semiannual groundwater monitoring would be conducted to verify that the concentration of

contaminants in groundwater are stable. Semiannual groundwater monitoring is currently being conducted at the Site and it is anticipated that a similar subset of the existing monitoring wells would be used for long-term groundwater monitoring.

Assessment of Alternative

Long-term Groundwater Monitoring would verify that groundwater conditions at the Site are stable. Should conditions change in the future, additional measures could be implemented to address the changes.

Effectiveness. There would be little additional short-term risk posed to the community or the environment by semiannual groundwater monitoring conducted at the Site. The localized groundwater impacts observed at the Site would continue to degrade naturally and the monitoring would be effective at verifying that groundwater conditions are stable and at identifying any changes in groundwater conditions at the Site. Although it is not anticipated that groundwater conditions at the Site will change in the future, if conditions were to change, additional monitoring, investigation, and/or remedial actions could be implemented as appropriate.

Existing barriers and creek bed lining installed in 2004, as part of the creek remediation work, will remain in place and will continue to reduce the potential for residual contaminants present at the Site to migrate towards the creek.

Implementability. The monitoring of groundwater wells would be relatively easy to implement. The existing barriers and creek bed lining are already present within the creek.

Cost. The total cost of this alternative is estimated to be approximately $2,081,000 (Table 3). Direct costs would include field monitoring, laboratory analyses, and data assessment and reporting.

4.3.1.3 Groundwater Alternative No. 3: Grout or Slurry Barrier

This remedial alternative would extend the slurry barriers previously installed during the 2004 creek remediation work to further reduce the potential for future migration of contaminants to the creek. Remedial actions, taken in 2004, removed MGP-related waste beneath the creek bed. In addition to removal of impacted soil in the bank and bed of Santa Rosa Creek, sheet pile and slurry curtains were installed at various locations along the bank of the creek. These barriers, in conjunction with the creek bed lining, restrict groundwater flow within the shallow soil adjacent to the creek, reducing the potential for residual contaminants present at the Site to migrate towards the creek. The extent of the previously installed barriers, and the extent of the additional barriers proposed as part of this remedial alternative are shown in Figure 5.

The barrier would be installed by excavating soil from the creek bank and replacing the excavated soil material with low permeability grout or sand-cement slurry. In general, the barrier would be installed to a depth several feet below the base of the creek similar to the previously constructed grout barriers. The precise depth of the barrier would be developed as part of the detailed design and permitting process. Because this barrier can be constructed using conventional construction equipment, and since existing barriers are already in place over a portion of the proposed barrier location, it is anticipated that this remedy could be constructed within one construction season.

The final grout barrier would extend along the northern bank of the creek approximately as shown in Figure 5. The precise alignment and dimensions of the barrier would be developed as part of the design and permitting process. Several constraints at the Site present challenges to the installation of the grout barrier. Installation of the barrier would need to be conducted from within the creek and therefore permitting challenges are likely to be significant. In addition, the storm drain west of the Site, overhead high voltage electric lines, and potential subsurface obstacles and debris would create significant engineering challenges to the design and implementation of this remedial alternative. Ongoing long-term groundwater monitoring would be required in conjunction with the barrier, with reviews of Site conditions and the monitoring program every five years.

To implement this remedial alternative, the following representative technologies would be utilized:

Grout or Slurry Barriers. Low permeability materials would be installed along the north bank of the Santa Rosa creek to create a low permeability barrier that would impede the movement of groundwater between shallow soils and the creek. The barrier would be constructed by excavating soil along the creek bank and subsequently replacing the excavated soil with low permeability grout or sand-cement slurry. The ultimate design and construction techniques would be evaluated in detail during the remedial design and permitting phase of the project.

Pumping from Soil Excavation. Because the barrier would extend down below the groundwater table, groundwater would be pumped from excavations during construction of the grout barrier. The extracted groundwater may require treatment prior to discharge.

Onsite Groundwater Treatment during Soil Excavation. Groundwater pumped from the excavations during construction of the grout barrier would be treated onsite using a temporary Granular Activated Carbon (GAC) treatment system prior to discharge. This treatment option is assumed for the purpose of the FS but would be confirmed during the design phase of the project.

Discharge of Treated Water to Sanitary Sewer. Treated groundwater extracted from the excavations during construction of the grout barrier, would be discharged to the sanitary sewer under a permit from the City of Santa Rosa.

Assessment of Alternative

As described above, this alternative would entail extension of the existing grout barrier along the northern bank of Santa Rosa Creek. This barrier would impede the movement of groundwater between shallow soils and the creek, reducing the potential for residual contaminants present in groundwater at the Site to migrate to the creek should they become mobile.

Effectiveness. The implementation of this alternative would impede the movement of groundwater between shallow soils and the creek, reducing the potential for residual contaminants present at the Site to migrate to the creek should they become mobile. The localized groundwater impacts observed at the Site would continue to degrade naturally and groundwater monitoring would be implemented to verify that groundwater conditions remain stable. The long-term effectiveness of this remedial alternative is dependent on successful construction of the barrier and the stability of Site conditions.

Implementability. The barrier installation would need to be conducted from within the creek and therefore permitting challenges are likely to be significant. In addition, the storm drain west of the Site, overhead high power lines, and potential subsurface obstacles and debris would create significant engineering challenges to the design and implementation of this remedial alternative.

It is anticipated that the barrier could be installed within one construction season. We anticipate that the allowable construction season permitted within the creek will be no longer than four months to prevent significant adverse effects on the fish populations within the creek. Barrier construction would require closure of the PMG, diversion of the creek at the beginning of the construction season, mobilization of construction equipment into the creek, installation of the barrier, and demobilization and restoration of the creek at the end of the four month construction season. This process would be very disruptive to the creek, the PMG, and the community during implementation.

Cost. The cost of the grout or slurry barrier is estimated to be approximately $7,609,000 (Table 3). Direct costs would include installation of the grout or slurry barrier and groundwater monitoring.

4.3.1.4 Groundwater Alternative No. 4: Funnel and Gate

This alternative involves installation of a sheet pile hydraulic barrier along the creek bank, as well as through the 438 First Street property to the west of the former MGP, to further reduce the potential for future migration of contaminants to the creek should they become mobile (Figure 6). Placement of the barrier would be subject to obtaining the required permits and access agreements from the various property owners. The hydraulic barrier would serve to funnel groundwater through a gate where treatment via active or passive methods can be implemented. Existing wells located along the PMG could be utilized as sentry monitoring wells to evaluate groundwater conditions along the downgradient end of the barrier, upgradient of the gate. Potential gate treatment options include:

- GAC reactive wall;
- Enhanced biodegradation via air/ozone or other amendments;
- Pumping and treating groundwater extracted from the gate; or,
- Monitored Natural Attenuation – no gate treatment.

This alternative would entail installation of a sheet pile hydraulic barrier along the northern bank of Santa Rosa Creek and north onto the 438 First Street Property. This alternative would not rely on the barriers previously installed in the creek; however, the potential to utilize existing barriers would be evaluated during the design phase of the project. The barrier installation would need to be conducted from within the creek and therefore permitting challenges are likely to be significant. In addition, the presence of the utility bridge, the storm drain west of the Site, tiebacks from existing sheet pile retaining walls, overhead high power lines, and potential subsurface obstacles and debris would create significant engineering challenges to the design and implementation of this remedial alternative. Due to these Site constraints, this remedial alternative may require a combination of different types of subsurface barriers (sheet pile, slurry, and/or grout) to successfully install a continuous barrier. However, for the purpose of this FS, sheet pile walls will be selected as the representative process option that would be utilized to implement this remedial alternative and to provide a basis for estimating a cost to implement this remedial alternative.

A reactive wall (gate) would be utilized for this remedial alternative to treat groundwater, if necessary. For the purpose of this FS, it is assumed that groundwater would be treated using carbon within the gate. This treatment option would be confirmed during the remedial design phase.

To implement this remedial alternative, the following representative technologies would be utilized:

Sheet Pile Cutoff Wall. Sheet piles would be driven into the subsurface to the underlying clay layer to create an impermeable barrier to divert groundwater and prevent it from flowing and discharging to the creek directly downgradient of the Site. The sheet pile joints would be sealed to minimize the bulk permeability of the sheet pile wall.

Reactive Wall. A reactive wall installed using a Funnel and Gate design would be located downgradient from source areas and used to treat impacted groundwater, if it ever reached the gate, prior to migration past the gate or discharge to Santa Rosa Creek. A barrier wall (sheet pile cutoff wall) would be installed in the bank of Santa Rosa Creek to divert groundwater flow parallel to the creek (funnel) and prevent groundwater from migrating to the creek. A reactive wall (gate) installed at the downgradient end of the barrier would treat groundwater, if necessary, before it reaches the creek. An additional barrier wall extending north onto the 438 First Street property would be utilized to direct groundwater flow through the reactive wall (gate).

Assessment of Alternative

As described above, this alternative would entail installation of a Funnel and Gate design reactive wall to direct, capture, and treat groundwater migrating from the Site.

Effectiveness. The installation of a barrier along the northern bank of the Santa Rosa Creek would divert groundwater flowing southwest across the Site and prevent it from migrating to the creek. The localized groundwater impacts observed at the Site would continue to degrade naturally and groundwater monitoring would be implemented to verify that groundwater conditions remain stable. In the event that Site conditions changed and MGP impacts in groundwater were to become mobile, the long-term effectiveness of this remedial alternative would be dependent on maintaining the reactive wall. If site contaminants were to migrate to the reactive wall in the future, the effectiveness of the reactive wall would decline over time as reactive materials in the wall are depleted. Routine maintenance of the wall and monitoring of downgradient groundwater conditions would be required to ensure long-term effectiveness of this remedial alternative.

Implementability. The barrier installation would need to be conducted from within the creek and therefore permitting challenges are likely to be significant. In addition, the presence of the utility bridge, the storm drain west of the Site, tiebacks from existing sheet pile retaining walls, overhead high power lines, and potential subsurface obstacles and debris would create significant engineering challenges to the design and implementation of this remedial alternative.

It is anticipated that the allowable construction season permitted within the creek will be no longer than four months in any given year to prevent significant adverse effects on the fish populations within the creek. Due to this limited construction window, it is anticipated that construction of this alternative would take up to three construction seasons to complete. This approach would require

closure of the PMG, diversion of the creek at the beginning of each construction season, mobilization of construction equipment into the creek, implementation of the proposed work for the season, and demobilization and restoration of the creek at the end of the four month construction season. This process would be repeated each year until the construction of the Funnel and Gate within the creek has been completed. This process would be very disruptive to the creek, the PMG, and the community during implementation.

This remedial alternative also involves installation of a portion of the funnel on the 438 First Street property to the west of the former MGP. This remedial alternative would cause disruption to the parking at the 438 First Street and thus the tenants of the 438 property. Access agreements would be required with the owners of the 438 First St. property to allow installation of the required infrastructure on their property. Additionally, two major city storm drains are present on this property and placement of the barrier in the vicinity of these storm drains would be challenging. Engineering solutions could address these issues and would be appropriately evaluated in the final design report.

Ongoing downgradient monitoring would be required to ensure continued effectiveness of the Funnel and Gate remedy.

Cost. The total cost of this alternative is estimated to be approximately $19,427,000 (Table 3). Direct costs would consist of installation of the Funnel and Gate reactive wall, routine maintenance to the wall, and groundwater monitoring.

4.4 COMPARISON AND SELECTION OF FINAL GROUNDWATER ALTERNATIVES

4.4.1 Comparison of Final Groundwater Alternatives

The four groundwater alternatives were compared with respect to short-term and long-term effectiveness, implementability, and cost. The results of the comparison are discussed below.

Short-Term Effectiveness

Short-term effectiveness is defined as the ability of each alternative to protect human health and the environment during construction and remedial action implementation. Of the four alternatives, Alternative 1 provides the best short-term protection because it involves no handling of contaminated soil or groundwater. Of the remaining Alternatives, Alternative 2 provides the best short-term protection because the field effort to implement this alternative would only involve monitoring of wells and no work in the creek would be required. Alternative 3 would require significantly more field work than Alternative 2, including one season of construction within the creek. Alternative 4 would require significantly more construction activity than Alternative 3, requiring up to three construction seasons in the creek, as well as construction on the neighboring 438 First Street property.

In sum, the short-term effectiveness of the four alternatives can be characterized as follows:

Alternative No.	Description	Short-Term Effectiveness
1	No Action	Very Good

2	Long-term Groundwater Monitoring	Good
3	Grout or Slurry Barrier Along Creek	Poor
4	Funnel and Gate	Very Poor

Long-Term Effectiveness

Long-term effectiveness is defined as the ability of each alternative to protect human health and the environment by reducing the toxicity, volume, and mobility of contaminants. The effectiveness of the groundwater remedial alternatives is evaluated in conjunction with implementation of the previously selected soil remedy. Alternative 1 provides poor long-term effectiveness because it does not actively reduce the toxicity, volume, or mobility of contaminants and no monitoring would be conducted to verify whether contaminants are stable or migrating. Alternative 2 provides moderate benefits by monitoring groundwater to verify that groundwater conditions are stable. Alternative 3 provides additional benefits over Alternative 2 by reducing the ability of contaminants to migrate to the creek, however there is no indication that contaminants are currently migrating to the creek and therefore the Alternative may have a limited additional effectiveness over Alternative 2 under current Site conditions. Alternative 4 provides similar long-term effectiveness to Alternative 3, but would also have the ability to treat contaminants if they were to mobilize in the future.

In sum, the long-term effectiveness of the four alternatives can be characterized as follows:

Alternative No.	Description	Long-Term Effectiveness
1	No Action	Poor
2	Long-term Groundwater Monitoring	Moderate
3	Grout or Slurry Barrier Along Creek	Moderate to Good
4	Funnel and Gate	Good

Implementability

Alternative 1 is easily implementable. Alternative 2 would be relatively easy to implement since it only requires groundwater monitoring. The grout or slurry barrier for Alternative 3 would be passive once installed, but would require work within the creek and would be challenged by numerous Site constraints and permitting challenges. Alternative 3 could be constructed within one construction season, however it would require closure of the PMG and diversion of the creek.

Alternative 4 has significantly more implementability challenges than Alternative 3 for the creek segment of the barrier since it would likely require up to three construction seasons to construct as opposed to one season for Alternative 3. In addition to the increased length of time to construct Alternative 4 within the creek, there are additional challenges associated with the 438 First Street property portion of the barrier.

In sum, the implementability of the four alternatives can be characterized as follows:

Alternative No.	Description	Implementability
1	No Action	Very Good
2	Long-term Groundwater Monitoring	Good
3	Grout or Slurry Barrier Along Creek	Poor
4	Funnel and Gate	Very Poor

Cost

Costs for each of the groundwater alternatives are outlined in Table 3. The groundwater alternatives, listed in order of increasing present worth cost, are as follows: Alternative 1, Alternative 2, Alternative 3, and Alternative 4.

In sum, the cost of the four alternatives can be summarized as follows:

Alternative No.	Description	Cost
1	No Action	$0
2	Long-term Groundwater Monitoring	$2,081,000
3	Grout or Slurry Barrier Along Creek	$7,609,000
4	Funnel and Gate	$19,427,000

4.4.2 Selection of the Most Appropriate Remedial Alternative for Groundwater

While the results of the comparison of alternatives indicate that Alternatives 2, 3, and 4 would satisfy the remedial action goals, Alternative 2 (Long-term Groundwater Monitoring) presents significantly less impacts to the creek, the PMG, and the surrounding community. Construction of Alternative 3 would require construction within the creek resulting in significant impacts to the creek, the PMG, and the surrounding community. Alternative 4 would require even more construction in the creek and also require construction activities on the 438 First Street property. Because Alternative 2 satisfies the remedial action goals and could be implemented with significantly less impact to the creek, the PMG, and the surrounding community, Alternative 2 is recommended as the preferred groundwater Alternative.

5.0 SUMMARY AND CONCLUSIONS

As part of this FS, four groundwater Alternatives were evaluated, including the previously selected Funnel and Gate Alternative. The Alternatives were evaluated based on their effectiveness, implementability, and cost. In conjunction with the previously selected soil Alternatives for the Site, three of the four groundwater Alternatives evaluated in this FS would achieve the remedial action goals established for the Site.

Based on the results of this FS, Alternative 2 (Long-term Groundwater Monitoring) is recommended as the preferred groundwater alternative because it achieves the project remedial action goals, and can be implemented with significantly less disruption to the creek, the PMG, and the surrounding community than the previously selected Funnel and Gate Alternative.

The overall proposed Site remedy will be modified accordingly to include the following components:

- Removal of the former USTs in the parking lot west of the building entrance (completed in June 2006)
- Remediation of the Redwood Gas Holder (completed in 2013)
- Removal of the existing onsite UST (as proposed in the 2012 Supplemental FS)
- Targeted excavations to remove heavily impacted soils in the vicinity of the former and existing USTs (as proposed in the 2012 Supplemental FS), and shallow soils in the area south of the underground driveway entrance (completed in 2011)
- Long-term groundwater monitoring (proposed in this FS)
- Maintaining current Site cap (as proposed in the 2012 Supplemental FS)
- Deed restrictions (as proposed in the 2012 Supplemental FS)

6.0 REFERENCES

California Department of Water Resources (DWR), 1975. California's Ground Water. Bulletin 118.

Cardwell, G.T., 1958. Geology and Ground Water in the Santa Rosa and Petaluma Valley Areas, Sonoma County, California, USGS Water-Supply Paper 1427.

Cohen, R. M., and J. W. Mercer, 1993. DNAPL Site Evaluation. Library of Congress Cataloging-in-Publication Data, C. K. Smoley.

ENV America, 2005. Data Assessment Report for Former Santa Rosa MGP Site, 111 Santa Rosa Avenue, Santa Rosa, California. April 25.

Pacific Gas and Electric Company (PG&E), 1986, Preliminary Assessment of the Former Manufactured Gas Plant Site in the City of Santa Rosa. December 1986.

Terra Pacific Group Incorporated, 2006. Corrective Action Plan, Former Santa Rosa MGP Site. June 22.

Terra Pacific Group Incorporated, 2007. Groundwater Monitoring Report – April 2007, Former Santa Rosa Manufactured Gas Plant. June 28.

Terra Pacific Group Incorporated, 2008a. Groundwater Monitoring Report – November 2007, Former Santa Rosa Manufactured Gas Plant. June 23.

Terra Pacific Group Incorporated, 2008b. Groundwater Monitoring Report – May 2008, Former Santa Rosa Manufactured Gas Plant. September 29.

Terra Pacific Group Incorporated, 2009. Groundwater Monitoring Report – December 2008, Former Santa Rosa Manufactured Gas Plant. May 11.

Terra Pacific Group Incorporated, 2010. Groundwater Monitoring Report – March and November 2009, Former Santa Rosa Manufactured Gas Plant. May 28.

Terra Pacific Group Incorporated, 2011. Groundwater Monitoring Report – April and September 2010, Former Santa Rosa Manufactured Gas Plant. June 15.

Terra Pacific Group Incorporated, 2012a. Targeted Soil Excavation Completion Report, Former Santa Rosa Manufactured Gas Plant. April 20.

Terra Pacific Group Incorporated, 2012b. Supplemental Feasibility Study Report, Former Santa Rosa MGP Site, Santa Rosa, California. April 25.

Terra Pacific Group Incorporated, 2013a. Redwood Gas Holder Closure Report, Former Santa Rosa Manufactured Gas Plant. April 23.

Terra Pacific Group Incorporated, 2013b. Planter Area Soil Excavation Completion Report, Former Santa Rosa Manufactured Gas Plant. November 1.

Terra Pacific Group Incorporated, 2013c. Groundwater Monitoring Report - March and September 2011 and March and September 2012, Former Santa Rosa Manufactured Gas Plant. June 15.

Terra Pacific Group Incorporated, 2013d. Groundwater Monitoring Report – March 2013, Former Santa Rosa Manufactured Gas Plant. November 18.

Terra Pacific Group Incorporated, 2014a. Groundwater Monitoring Report – September 2013, Former Santa Rosa Manufactured Gas Plant. March 13.

Terra Pacific Group Incorporated, 2014b. Groundwater Monitoring Report, March 2014, Former Santa Rosa Manufactured Gas Plant. November 19.

Terra Pacific Group Incorporated, 2014c. GWET Shutdown Test Workplan, Former Santa Rosa Manufactured Gas Plant. March 31.

TABLES

Table 1
Preliminary Groundwater Process Options
Former Santa Rosa MGP Site
Santa Rosa, California

General Response Actions	Remedial Technology Types	Process Options
No action	No action	None
Institutional actions	Access restrictions	Deed restrictions
Long-term Groundwater Monitoring	Long-term Groundwater Monitoring	Groundwater Monitoring
Containment	Barrier walls	Sheet pile cutoff wall
		Grout or slurry wall
	Groundwater pumping	Pumping from wells
Collection of NAPL	NAPL collection from pit during soil excavation	Pumping from soil excavation
Collection of groundwater	Groundwater collection from pit during soil excavation	Pumping groundwater from soil excavation
	Groundwater collection wells	Pumping groundwater from wells
Treatment of groundwater	Onsite *ex situ* treatment	On site groundwater treatment system
	In situ treatment	Air sparging
		Ozone sparging
		Reactive wall
		In situ biodegradation
		In situ chemical oxidation
Disposal of NAPL	Offsite NAPL disposal	Offsite disposal
Disposal of treated groundwater	Onsite discharge	Discharge to Storm Drain
		Subsurface injection of water
	Offsite discharge	Discharge to sanitary sewer

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Table 2
Remedial Alternatives Retained for Groundwater and Rationale for Selection
Former Santa Rosa MGP Site
Santa Rosa, California

Alternative Number	Description	Rationale for Selection
1	**No Action**	Serves as a baseline reference for the other retained alternatives.
2	**Long-term Groundwater Monitoring** Monitoring of groundwater conducted periodically. The data collected would be used to confirm that groundwater conditions at the Site are stable.	Residual contamination remains in subsurface but ongoing monitoring is used to verify that groundwater conditions are stable. Alternative is easily implemented and does not require construction within the creek. Provides long-term effectiveness and is cost effective.
3	**Grout or Slurry Barrier** This alternative involves installation of a grout or slurry barrier along the creek bank to create a low permeability barrier between the creek and residual impacts in soil along the northern creek bank.	Effective at reducing the potential for Site contaminants to migrate towards the creek. The barrier would be installed along creek bank requiring construction work within the creek. Construction of the grout or slurry barrier within the creek could be completed within one construction season. Provides long-term effectiveness.
4	**Funnel and Gate** This alternative involves installation of a hydraulic barrier along the creek bank and through the 438 first street property. The hydraulic barrier will serve to funnel groundwater through a gate where treatment via active or passive methods can be implemented.	Effective at reducing the potential for Site contaminants to migrate towards the creek. A portion of the funnel would be installed along creek bank requiring construction within the creek. This approach provides a high level of control over groundwater flow from the Site under fluctuating groundwater conditions and focuses treatment, if necessary, to the gate area of the system.

Table 3
Groundwater Feasibility Study Cost Estimates
Groundwater Alternative 2
Long-term Groundwater Monitoring
Former Santa Rosa MGP

Alternative	Quantity	Unit	Rate ($)	Present Worth [a] Subtotal ($)	Present Worth Total ($)
Long-term Groundwater Monitoring					
Monitoring[b]					
Long-term groundwater monitoring	30	Est.	50,000	996,750	
Institutional Controls (30 years)	30	Est.	2,000	39,870	
Reporting[b]					
Annual rerporting	30	Each	25,000	498,375	
Five-year reviews	6	Each	50,000	199,350	
O&M Cost Subtotal with Markup					**1,734,345**
Contingency (20%)					**346,869**
TOTAL COST (Net Present Worth 2014 Dollars)					**2,081,214**

Notes:

(a) Present worth adjustments made for future costs on items labeled with Note (b). Assumed annual discount rate of 3.0%.
(b) Future costs adjusted for present worth [see Note (a)].
Assumes 30 years of monitoirng

Table 3
Groundwater Feasibility Study Cost Estimates
Groundwater Alternative 3
Grout or Slurry Barrier
Former Santa Rosa MGP

Alternative	Quantity	Unit	Rate ($)	Subtotal ($)	Total ($)	Present Worth [a] Subtotal ($)	Present Worth Total ($)
Slurry Barrier in Creek							
Remedial Design							
Geotechnical Investigation & Evaluation	1	Est.	250,324	250,324		250,324	
Remedial Design, ECMP & HASP	1	Est.	393,948	393,948		393,948	
Permitting							
Permitting, CEQA and Agency Interactions	1	Est.	298,673	298,673		298,673	
Remedial Activities							
Planning, coordination, background sampling	1	Est.	74,723	74,723		74,723	
Slurry Barrier Installation Activities	1	Est.	4,351,099	4,351,099		4,351,099	
Air Monitoring & Sampling	1	Est.	232,021	232,021		232,021	
Data Evaluation, Reports & As-Builts	1	Est.	273,857	273,857		273,857	
				Capital Cost Subtotal:	**5,874,645**		**5,874,645**
Monitoring and Reporting							
Monitoring & Institutional Controls	30	Year	52,000	1,560,000		1,036,620	
Annual Reporting	30	Year	25,000	750,000		498,375	
Five-Year Reviews	6	Each	50,000	300,000		199,350	
				Monitoirng and Reporting Subtotal:	**2,610,000**		**1,734,345**
				TOTAL COST:	**8,484,645**		**7,608,990**

Notes:
(a) Present worth adjustments made for future costs on items labeled with Note (b). Assumed annual discount rate of 3.0%.
(b) Future costs adjusted for present worth [see Note (a)].
Assumes 30 years of operation

Table 3
Groundwater Feasibility Study Cost Estimates
Groundwater Alternative 4
Funnel and Gate
Former Santa Rosa MGP

Alternative	Quantity	Unit	Rate ($)	Subtotal ($)	Total ($)	Present Worth [a] Subtotal ($)	Present Worth Total ($)
Funnel and Gate							
Remedial Design							
Geotechnical Investigation & Evaluation	1	Est.	350,000	350,000		350,000	
Remedial Design	1	Est.	650,000	650,000		650,000	
Flow modeling to evaluate funnel and gate	1	Est.	200,000	200,000		200,000	
Aquifer testing to obtain design parameters	1	Est.	250,000	250,000		250,000	
Permitting							
Permitting, CEQA and Agency Interactions	1	Est.	375,000	375,000		375,000	
Remedial Activities							
Planning, coordination, background sampling (each construction season)	3	Each	75,000	225,000		225,000	
Dam installation & removal (each construction season)	3	Each	450,000	1,350,000		1,350,000	
Creek dewatering & dam maintenance	48	Week	62,500	3,000,000		3,000,000	
Mob/Demob & Site Setup (Creek, upland staging & haul road)	3	Each	400,000	1,200,000		1,200,000	
Excavation of impacted soils south of barrier	1	Est.	475,000	475,000		475,000	
Demo/trenching	1	Est.	160,000	160,000		160,000	
Initial installatoin of ramp & PMG modifications each construction season (from 420 First St.)	3	Est.	150,000	450,000		450,000	
Barrier wall installation	620	LF	5,600	3,472,000		3,472,000	
Intallation of gate	1	Est.	450,000	450,000		450,000	
Installation of sentry wells	5	Est.	15,000	75,000		75,000	
Air Monitoring & Sampling	48	Week	12,500	600,000		600,000	
Construction Management, Sampling & Documentation	48	Week	30,000	1,440,000		1,440,000	
Geotechnical observation & testing	48	Week	7,500	360,000		360,000	
Site Restoration (end of each construction season)	3	Est.	275,000	825,000		825,000	
Reports & As-builts	1	Est.	300,000	300,000		300,000	
				Capitol Cost Subtotal:	**16,207,000**		**16,207,000**
Operations and Maintenance[b]							
Carbon usage	30	Yr.	6,500	195,000		129,578	
Carbon changeout costs	30	Yr.	15,000	450,000		299,025	
Sampling of treated water (monthly)	30	Yr.	18,000	540,000		358,830	
Project management	30	Yr.	40,000	1,200,000		797,400	
Monitoring[b]							
Long-term monitoring	30	Est.	45,000	1,350,000		897,075	
Institutional Controls (30 years)	30	Est.	2,000	60,000		39,870	
Reporting[b]							
Annual rerporting	30	Each	25,000	750,000		498,375	
Five-year reviews	6	Each	50,000	300,000		199,350	
				O&M Cost Subtotal:	**4,845,000**		**3,219,503**
				TOTAL COST:	**21,052,000**		**19,426,503**

Notes:

(a) Present worth adjustments made for future costs on items labeled with Note (b). Assumed annual discount rate of 3.0%.
(b) Future costs adjusted for present worth [see Note (a)].
Assumes 30 years of operation

FIGURES

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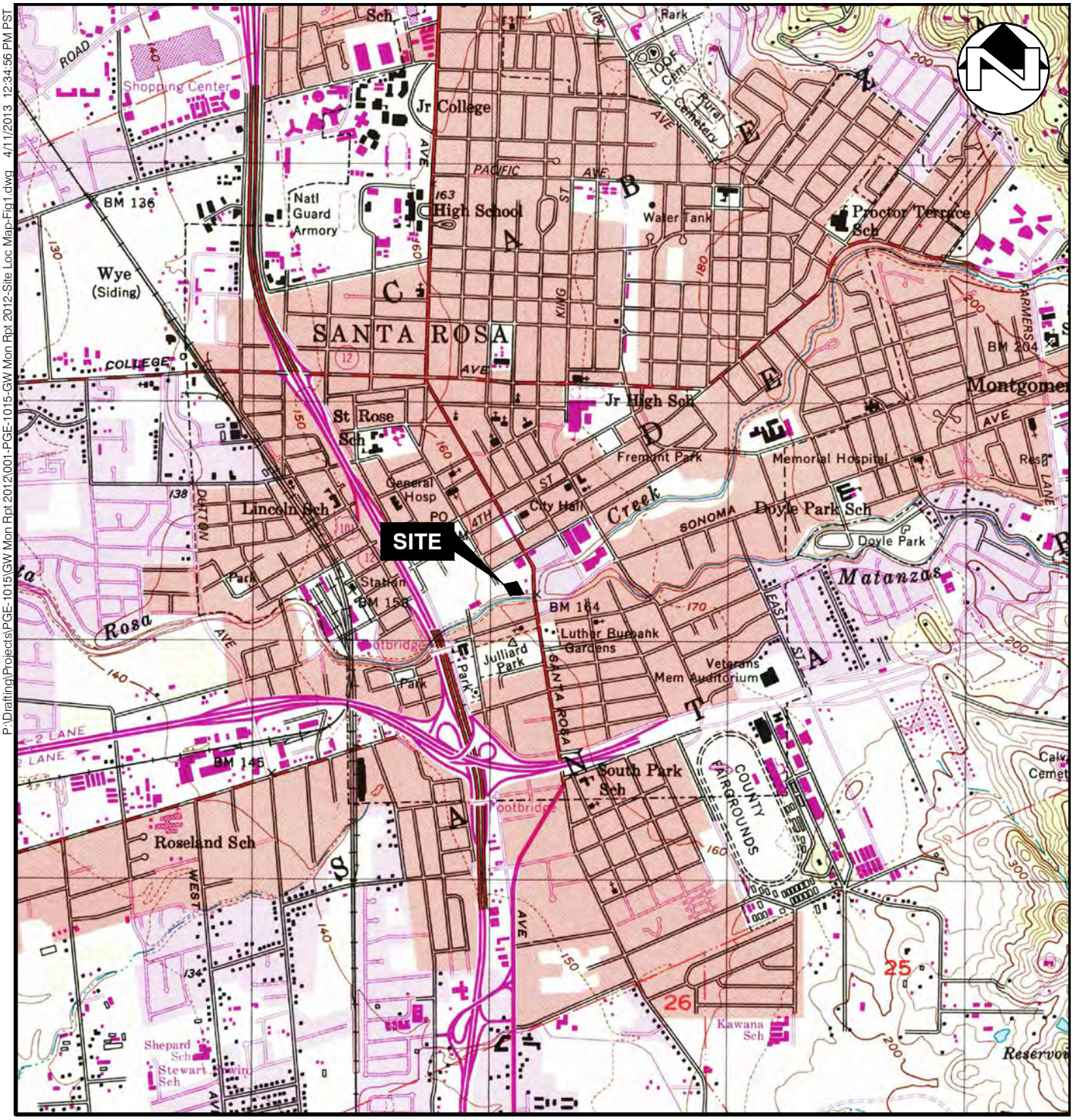

0 2,000 4,000 FEET

APPROXIMATE SCALE

FIGURE 1

SITE LOCATION MAP

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

REFERENCE:
7.5 MINUTE U.S.G.S. TOPOGRAPHIC MAP OF
SANTA ROSA, CALIFORNIA
DATED: 1994

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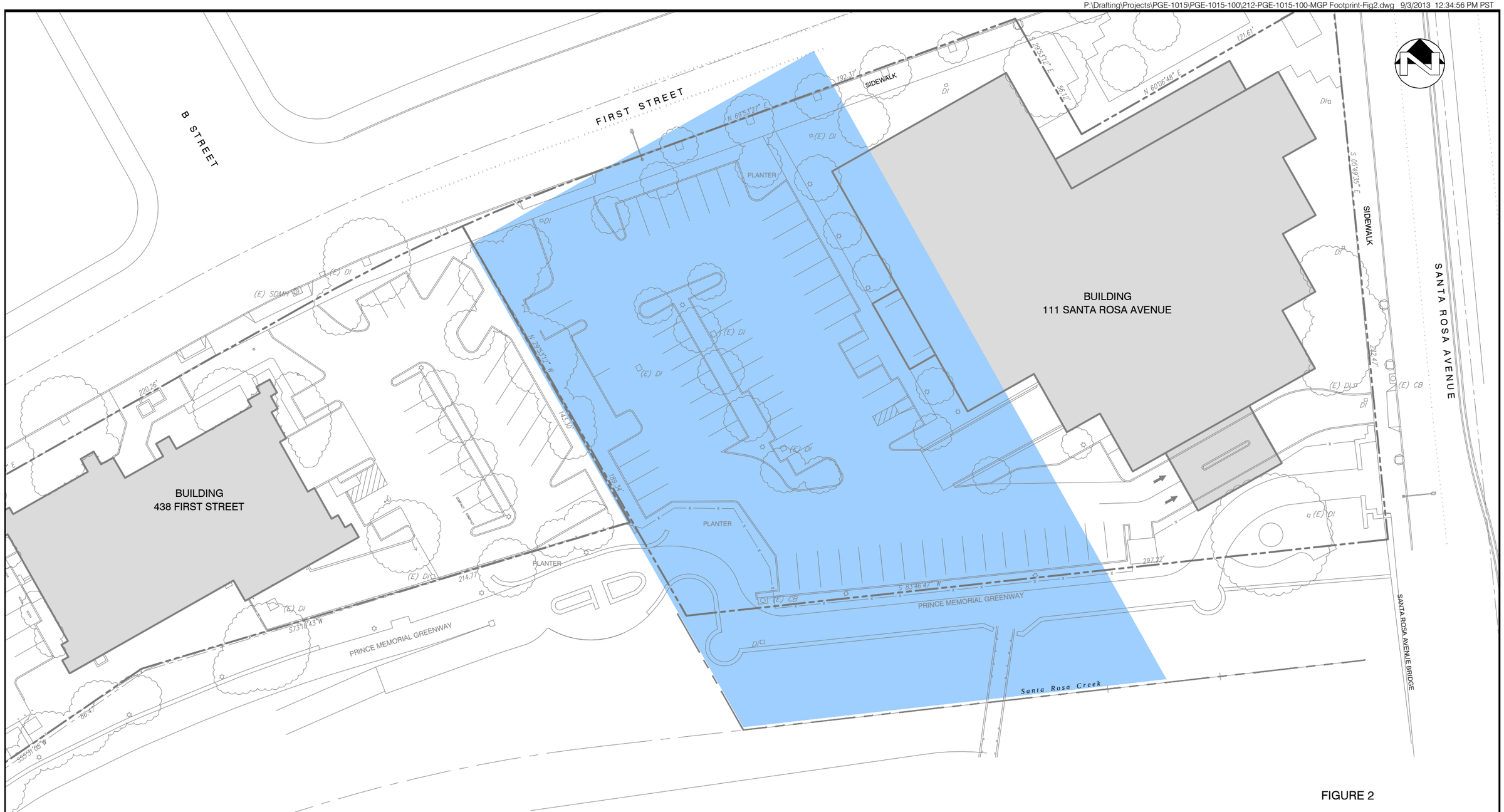

FIGURE 2

SITE PLAN
SHOWING MGP FOOTPRINT

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

EXPLANATION

FOOTPRINT OF FORMER MGP OPERATIONS

0 40 80 FEET
APPROXIMATE SCALE

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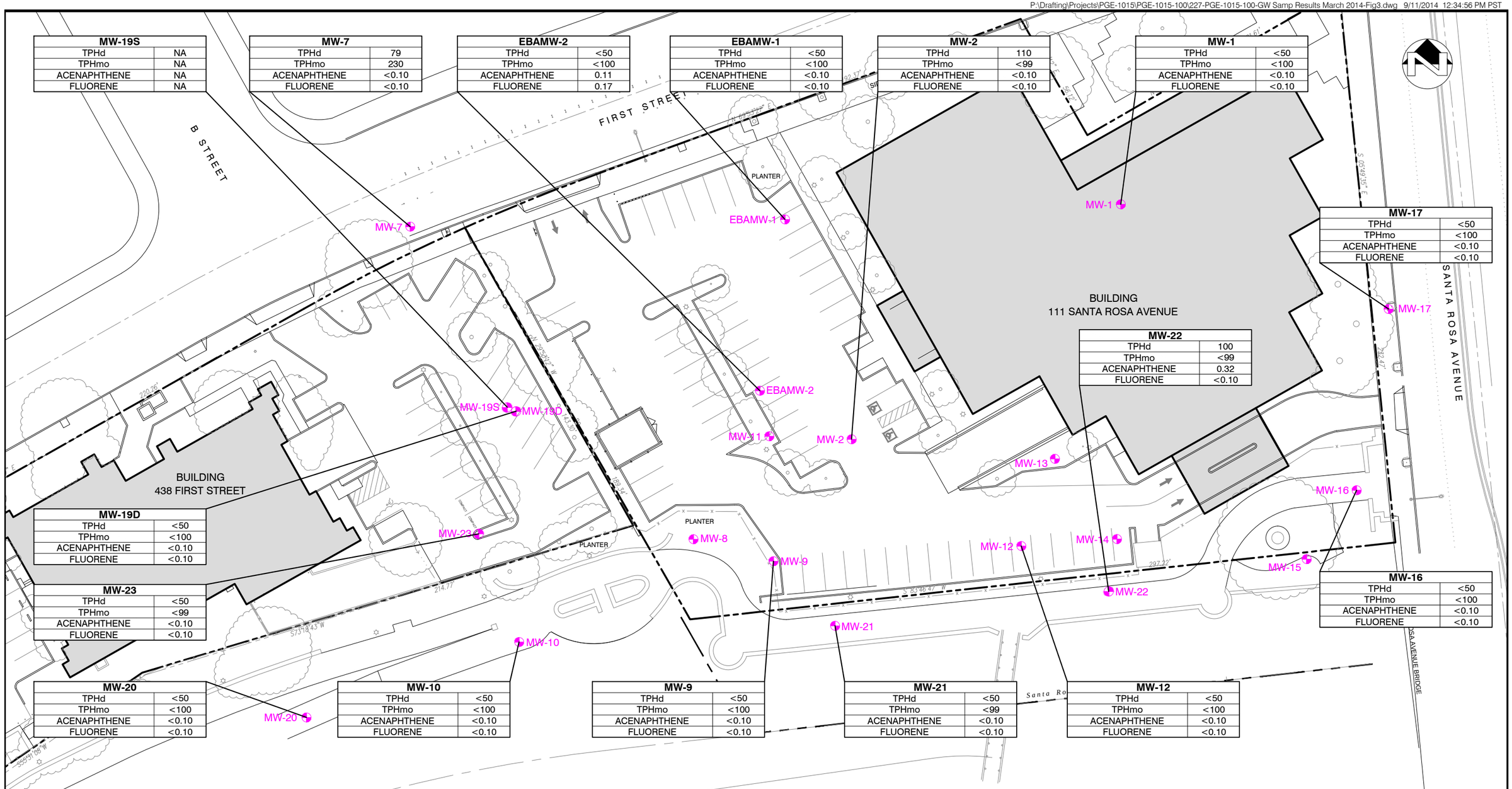

MW-19S	
TPHd	NA
TPHmo	NA
ACENAPHTHENE	NA
FLUORENE	NA

MW-7	
TPHd	79
TPHmo	230
ACENAPHTHENE	<0.10
FLUORENE	<0.10

EBAMW-2	
TPHd	<50
TPHmo	<100
ACENAPHTHENE	0.11
FLUORENE	0.17

EBAMW-1	
TPHd	<50
TPHmo	<100
ACENAPHTHENE	<0.10
FLUORENE	<0.10

MW-2	
TPHd	110
TPHmo	<99
ACENAPHTHENE	<0.10
FLUORENE	<0.10

MW-1	
TPHd	<50
TPHmo	<100
ACENAPHTHENE	<0.10
FLUORENE	<0.10

MW-17	
TPHd	<50
TPHmo	<100
ACENAPHTHENE	<0.10
FLUORENE	<0.10

MW-22	
TPHd	100
TPHmo	<99
ACENAPHTHENE	0.32
FLUORENE	<0.10

MW-19D	
TPHd	<50
TPHmo	<100
ACENAPHTHENE	<0.10
FLUORENE	<0.10

MW-23	
TPHd	<50
TPHmo	<99
ACENAPHTHENE	<0.10
FLUORENE	<0.10

MW-16	
TPHd	<50
TPHmo	<100
ACENAPHTHENE	<0.10
FLUORENE	<0.10

MW-20	
TPHd	<50
TPHmo	<100
ACENAPHTHENE	<0.10
FLUORENE	<0.10

MW-10	
TPHd	<50
TPHmo	<100
ACENAPHTHENE	<0.10
FLUORENE	<0.10

MW-9	
TPHd	<50
TPHmo	<100
ACENAPHTHENE	<0.10
FLUORENE	<0.10

MW-21	
TPHd	<50
TPHmo	<99
ACENAPHTHENE	<0.10
FLUORENE	<0.10

MW-12	
TPHd	<50
TPHmo	<100
ACENAPHTHENE	<0.10
FLUORENE	<0.10

EXPLANATION

EXISTING GROUNDWATER MONITORING WELL

BUILDING FOOTPRINT

WELL NAME — MW-23

TOTAL PETROLEUM HYDROCARBON (TPH) DIESEL — TPHd <50

TPH-MOTOR OIL — TPHmo <99

ACENAPHTHENE <0.10

FLUORENE <0.10

NOTES:
1. NA INDICATES NOT ANALYZED.
2. < INDICATES NOT DETECTED AT OR ABOVE LABORATORY DETECTION LIMIT SHOWN.
3. ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)

0 40 80 FEET

APPROXIMATE SCALE

FIGURE 3

SUMMARY OF GROUNDWATER SAMPLING RESULTS MARCH 2014

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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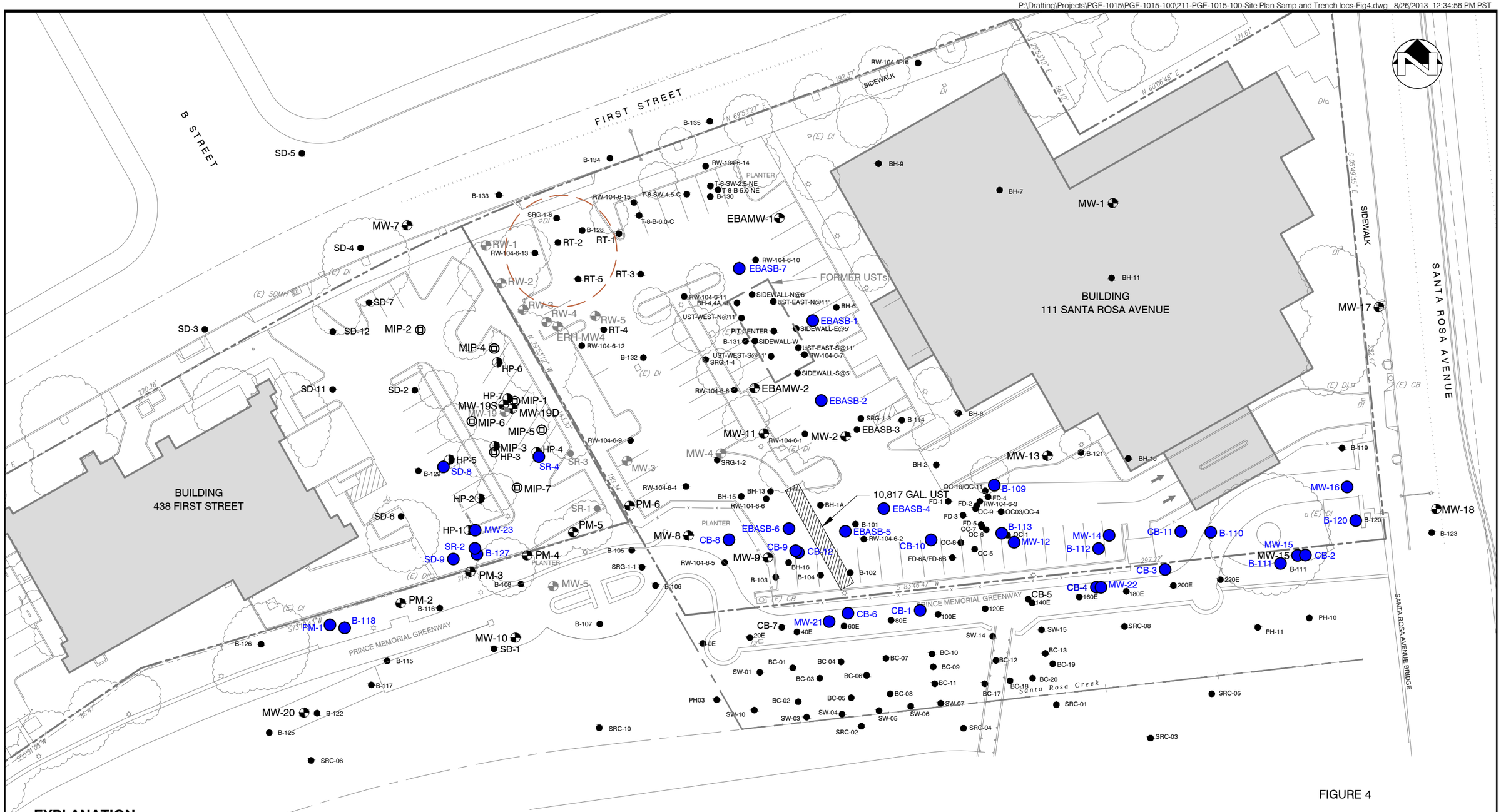

EXPLANATION

- OBSERVED PETROLEUM NON-AQUEOUS PHASE LIQUID (NAPL)
- GROUNDWATER EXTRACTION\MONITORING WELL
- CPT/MIP BORING
- HYDROPUNCH BORING
- SOIL BORING
- ABANDONED GROUNDWATER MONITORING WELL
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY
- FORMER USTs
- 10,817 gal EXISTING UST

FIGURE 4

OBSERVED NAPL LOCATIONS

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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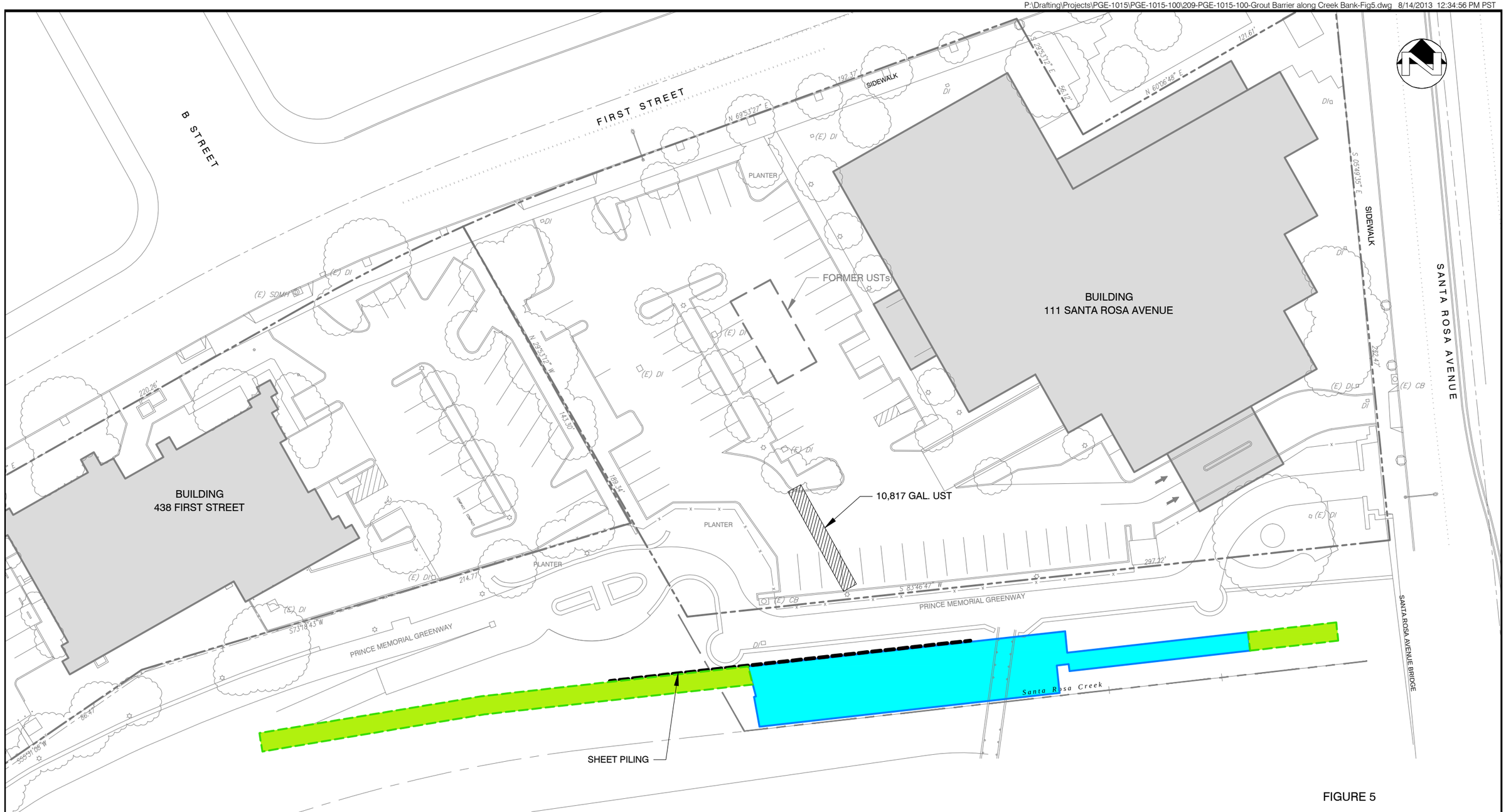


FIGURE 5

GROUT BARRIER ALONG CREEK BANK

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

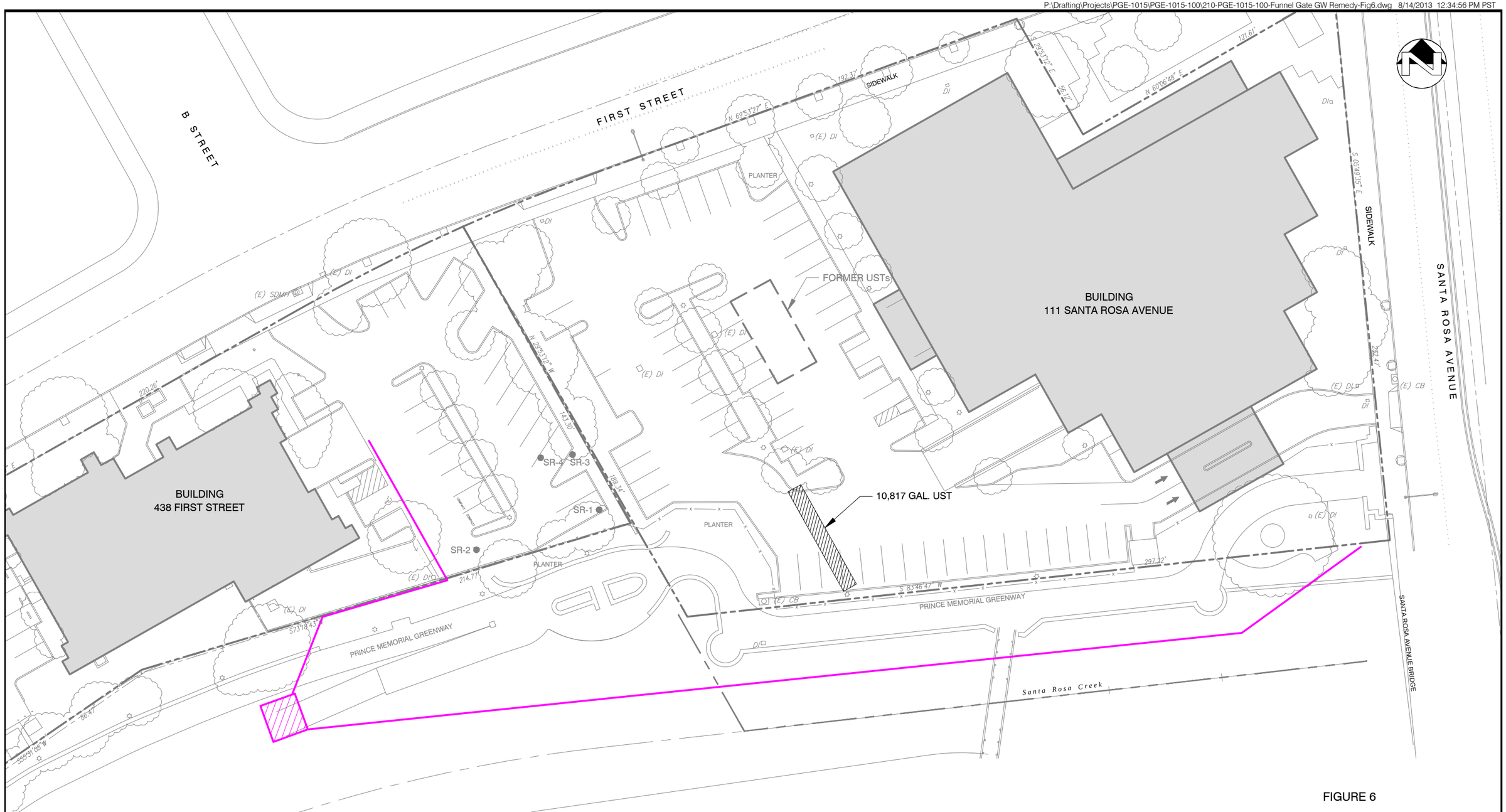
TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

EXPLANATION

- 2004 SHEET PILE
- FORMER USTs
- APPROXIMATE EXTENSION OF GROUT BARRIER ALONG CREEK
- 2004 GROUT BARRIER
- 10,817 gal EXISTING UST

0 40 80 FEET
APPROXIMATE SCALE

P:\Drafting\Projects\PGE-1015\PGE-1015-100\210-PGE-1015-100-Funnel Gate GW Remedy-Fig6.dwg 8/14/2013 12:34:56 PM PST



EXPLANATION

- HYDRAULIC BARRIER WITH FUNNEL AND GATE
- FORMER USTs
- 10,817 gal EXISTING UST

0 40 80 FEET
APPROXIMATE SCALE

FIGURE 6

FUNNEL AND GATE GROUNDWATER REMEDY

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

APPENDIX A

April 25, 2014 and August 31, 2014 Letters from RWQCB

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

North Coast Regional Water Quality Control Board

April 25, 2014

Mr. Darrell Klingman
Manager – Technical Advisor, MGP PMO
Environmental Remediation Department
Pacific Gas and Electric Company
3401 Crow Canyon Road, Room 177B
San Ramon, CA 94583

Mr. Paul Louie
Upway Properties
39134 State Street
Fremont, CA 94538-1436

Ms. Madeline M. Musco
137 Santa Rosa Group Partnership
5567 Carriage Lane
Santa Rosa, CA 95403-1390

Mr. Kenneth D. Coker
137 Santa Rosa Group Partnership
503 Buena Vista Drive
Santa Rosa, CA 95404-2105

Mr. Joel R. Desilva
137 Santa Rosa Group Partnership
814 Corte Azul
Rohnert Park, CA 94928-2003

Mr. Richard Colombini
137 Santa Rosa Group Partnership
631 Healdsburg Ave, Suite A
Santa Rosa, CA 95401-5149

Dear Ladies and Gentlemen:

Subject: Draft Creek Barrier Supplemental Feasibility Study

Site: PG&E Gas Plant – Musco, First and B Streets, Santa Rosa
Case No. 1NSR228; (201-5600)

Regional Water Board staff received and reviewed the September 2013 "Draft Creek Barrier Supplemental Feasibility Study," prepared by Terra Pacific Group for the former manufactured gas plant at the site referenced above.

The purpose of this new draft feasibility study was to re-evaluate the remedy selected in the May 28, 2010, "Supplemental Feasibility Study Report" prepared by Terra Pacific Group. The new draft feasibility study addresses only the chosen groundwater remedy. The previous selected groundwater remedy was a large funnel and gate system that would take multiple years to build. The construction of the funnel and gate system would close the adjacent part of the Prince Memorial Greenway during construction, involving destruction and rebuilding of parts of the Greenway.

The remediation efforts of the past four years reduced the mass of mobile contaminants in soil and groundwater. In addition, continued groundwater monitoring has provided additional data to evaluate whether contaminated groundwater migration is a significant threat to the creek. The remaining contamination near the creek, both above and within the groundwater table, has low potential mobility in groundwater and does not necessarily present a significant threat to the creek.

The new draft feasibility study proposes a smaller underground barrier between Santa Rosa Creek and the site. The proposed barrier would still involve the destruction and rebuilding of a section of the Greenway as well as in-stream work. It would close down Santa Rosa Creek and the Greenway in this area for at least one year. It is not clear, however, that the proposed barrier would be of significant benefit to the environment due to the low mobility of the remaining contamination.

Please revise the draft feasibility study to evaluate the reduced threat to the creek from the remaining groundwater and soil contamination and to consider if a no-barrier option would be feasible. A no-barrier option would have to involve long-term monitoring and site controls.

If you have any questions, please contact me at (707) 570-3767 or at Craig.Hunt@waterboards.ca.gov.

Sincerely

Original signed by:

Craig Hunt
Water Resource Control Engineer

140425_CSH_er_pgemusco

cc: Mr. Murray Wunderly, Terra Pacific Group, mwunderly@terrapg.com
Ms. Sally Goodin, PG&E, sgoodin@sbcglobal.net
Mr. Tony Gossner, Santa Rosa Fire Department, AGossner@srcity.org
Mr. Doug Bosco, 37 Old Courthouse Square, Santa Rosa, CA 95404
Mr. Dave Montague, Department of Public Works, Dmontague@srcity.org
Mr. Max Reyhani, Terra Pacific Group, mreyhani@terrapg.com
Mr. Scott Kirk, Spaulding McCullough & Tansil LLP, P.O. Box 1867, Santa Rosa, CA 95402
Mr. Paul Nelson, EBA Engineering, Pnelson@ebagroup.com
Ms. Margaret Pietrasz, Pacific Gas & Electric Company, P.O. Box 7442, San Francisco, CA 94120
Ms. Tracy Craig, Craig Communications, tracy@craig-communications.com
Mr. Kevin McCallum, Press Democrat, kevin.mccallum@pressdemocrat.com

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

North Coast Regional Water Quality Control Board

August 13, 2014

Mr. Korbin Creek
Manager – MGP PMO
Environmental Remediation Department
Pacific Gas and Electric Company
3401 Crow Canyon Road, Room 177B
San Ramon, CA 94583

Mr. Paul Louie
Upway Properties
39134 State Street
Fremont, CA 94538-1436

Ms. Madeline M. Musco
137 Santa Rosa Group Partnership
5567 Carriage Lane
Santa Rosa, CA 95403-1390

Mr. Kenneth D. Coker
137 Santa Rosa Group Partnership
503 Buena Vista Drive
Santa Rosa, CA 95404-2105

Mr. Joel R. Desilva
137 Santa Rosa Group Partnership
814 Corte Azul
Rohnert Park, CA 94928-2003

Mr. Richard Colombini
137 Santa Rosa Group Partnership
P.O. Box 14454
Santa Rosa, CA 95402

Dear Ladies and Gentlemen:

Subject: Redwood Gas Holder Closure Report

Site: PG&E Gas Plant – Musco, First and B Streets, Santa Rosa
Case No. 1NSR228; (201-5600)

North Coast Regional Water Quality Control Board (Regional Water Board) staff reviewed the "Redwood Gas Holder Closure Report" dated April 23, 2014, prepared by the Terra Pacific Group for the former manufactured gas plant at First and B Streets in Santa Rosa. The report documents remedial activities conducted in the vicinity of a former redwood gas holder tank. Soil in and around the tank was treated using electrical resistance heating recovering more than 55,000 gallons of coal tar.

On June 6, 2014, Regional Water Board staff met with PG&E project managers and their environmental consultant to discuss the site investigation and remedial strategies. As discussed at the meeting and in our letter dated April 25, 2014, it is appropriate at this juncture to revise the September 2013 "Draft Creek Barrier Supplemental Feasibility Study." Remaining contamination near the creek, both above and within the groundwater table, has low potential mobility in groundwater and does not necessarily present a significant threat to the creek. Therefore, a no-barrier option with long-term monitoring and site controls may now be more appropriate.

Please submit a revised Feasibility Study (FS) which evaluates remedial technologies to prevent chemicals of concern that remain in soil and groundwater from migrating to Santa Rosa Creek. The revised FS is due to this office December 1, 2014.

The Regional Water Board is implementing a paperless office system. Please do not send paper copies to this office; your reports and correspondence should be uploaded to GeoTracker. Please email me at Beth.Lamb@waterboards.ca.gov when they have been uploaded. If you have any questions please email me or call me at (707) 576-2669.

Sincerely,

Original signed by:

Beth Lamb, C.E.G.
Engineering Geologist

140813 BML_er_PG&Emusco ltr 1

cc: Ms. Sally Goodin, PG&E, sgoodin@sbcglobal.net
Ms. Margaret Pietrasz, PG&E, mapp@pge.com
Mr. Tony Gossner, Santa Rosa Fire Department, AGossner@srcity.org
Mr. Dave Montague, Department of Public Works, Dmontague@srcity.org
Mr. Max Reyhani, Terra Pacific Group, mreyhani@terrapg.com
Mr. Murray Wunderly, Terra Pacific Group, mwunderly@terrapg.com
Mr. C. Scott Kirk, C. Scott Kirk Law Office, scott@cscottkirk.com
Ms. Tracy Craig, Craig Communications, tracy@craig-communications.com
Mr. Kevin McCallum, Press Democrat, kevin.mccallum@pressdemocrat.com
Mr. Doug Bosco, 37 Old Courthouse Square, Santa Rosa, CA 95404

APPENDIX B

Selected Soil Investigation Results from the 2012 Supplemental FS (TPG, 2012b)

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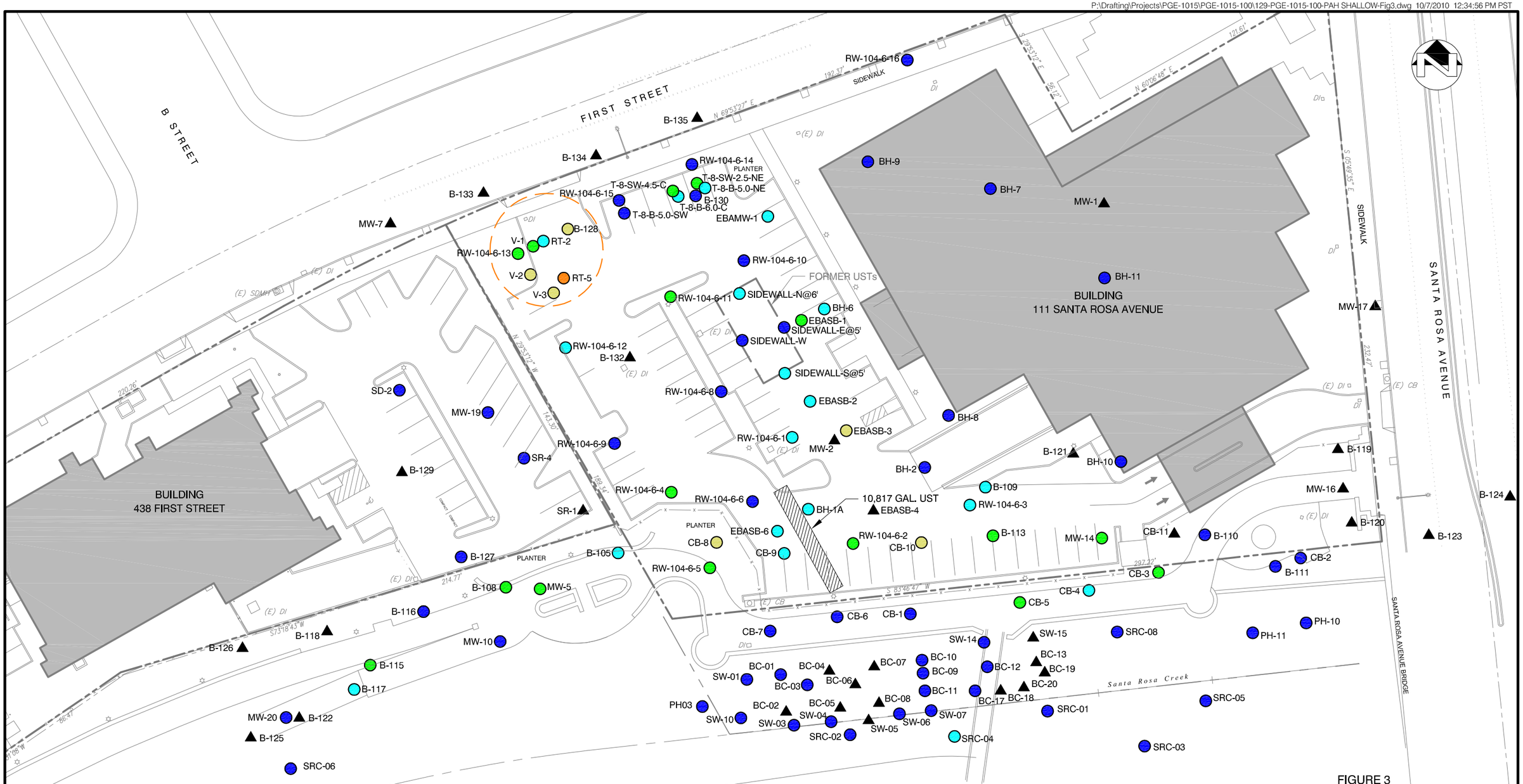

EXPLANATION

- NON DETECT
- 0 - 0.9 mg/kg
- 0.9 - 10 mg/kg
- 10 - 100 mg/kg
- 100 - 1,000 mg/kg
- 1,000 - 10,000 mg/kg
- >10,000 mg/kg
- FORMER USTs
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD TANK)
- 10,817 gal EXISTING UST

FIGURE 3

DISTRIBUTION OF PAHs IN SHALLOW SOIL (IN B(a)P EQUIVALENT) (0 TO 10 FEET BELOW GROUND SURFACE)

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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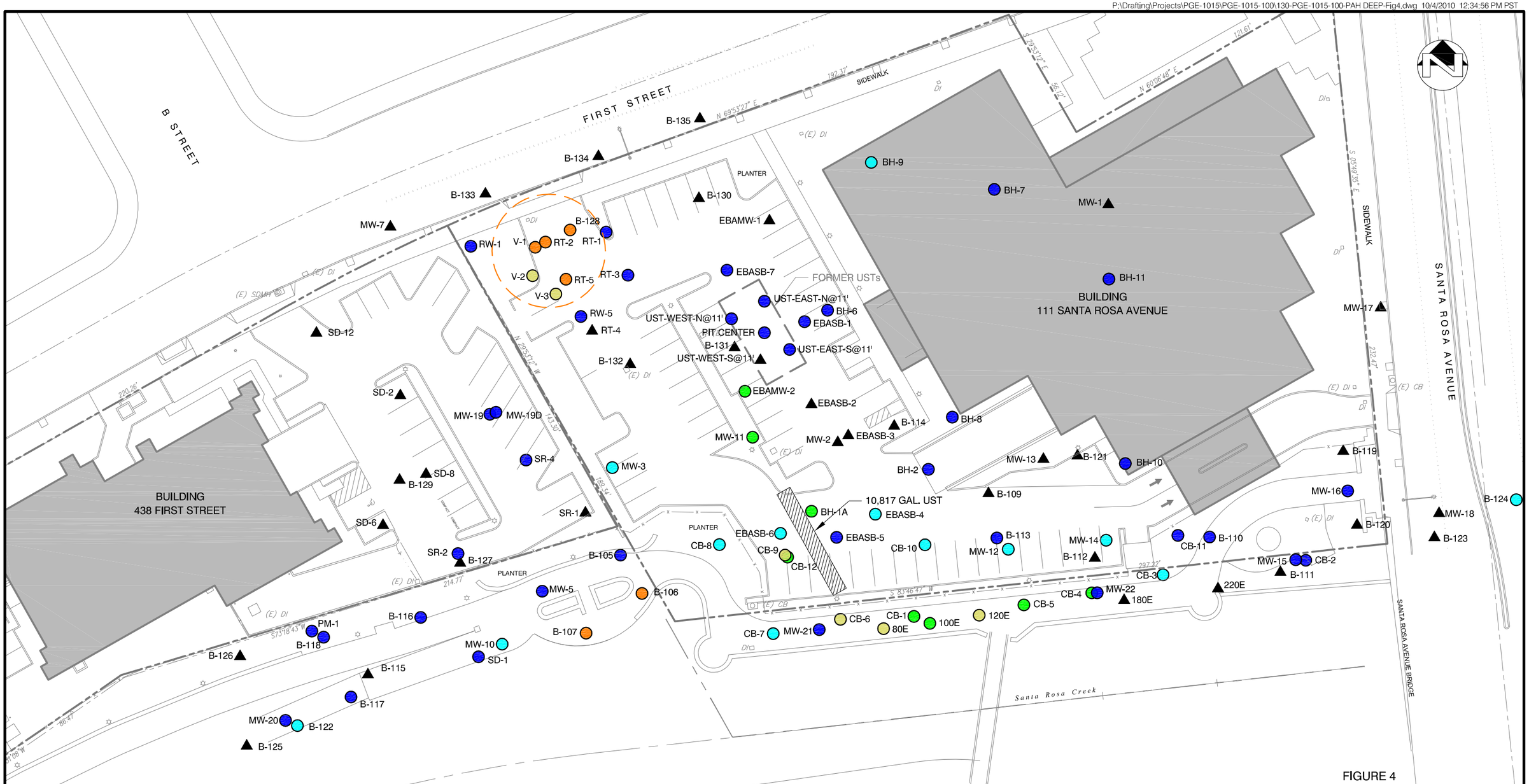

EXPLANATION

- NON DETECT
- 0 - 0.9 mg/kg
- 0.9 - 10 mg/kg
- 10 - 100 mg/kg
- 100 - 1,000 mg/kg
- 1,000 - 10,000 mg/kg
- >10,000 mg/kg
- FORMER USTs
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD TANK)
- 10,817 gal EXISTING UST

FIGURE 4

DISTRIBUTION OF PAHs IN DEEP SOIL (IN B(a)P EQUIVALENT) (GREATER THAN 10 FEET BELOW GROUND SURFACE)

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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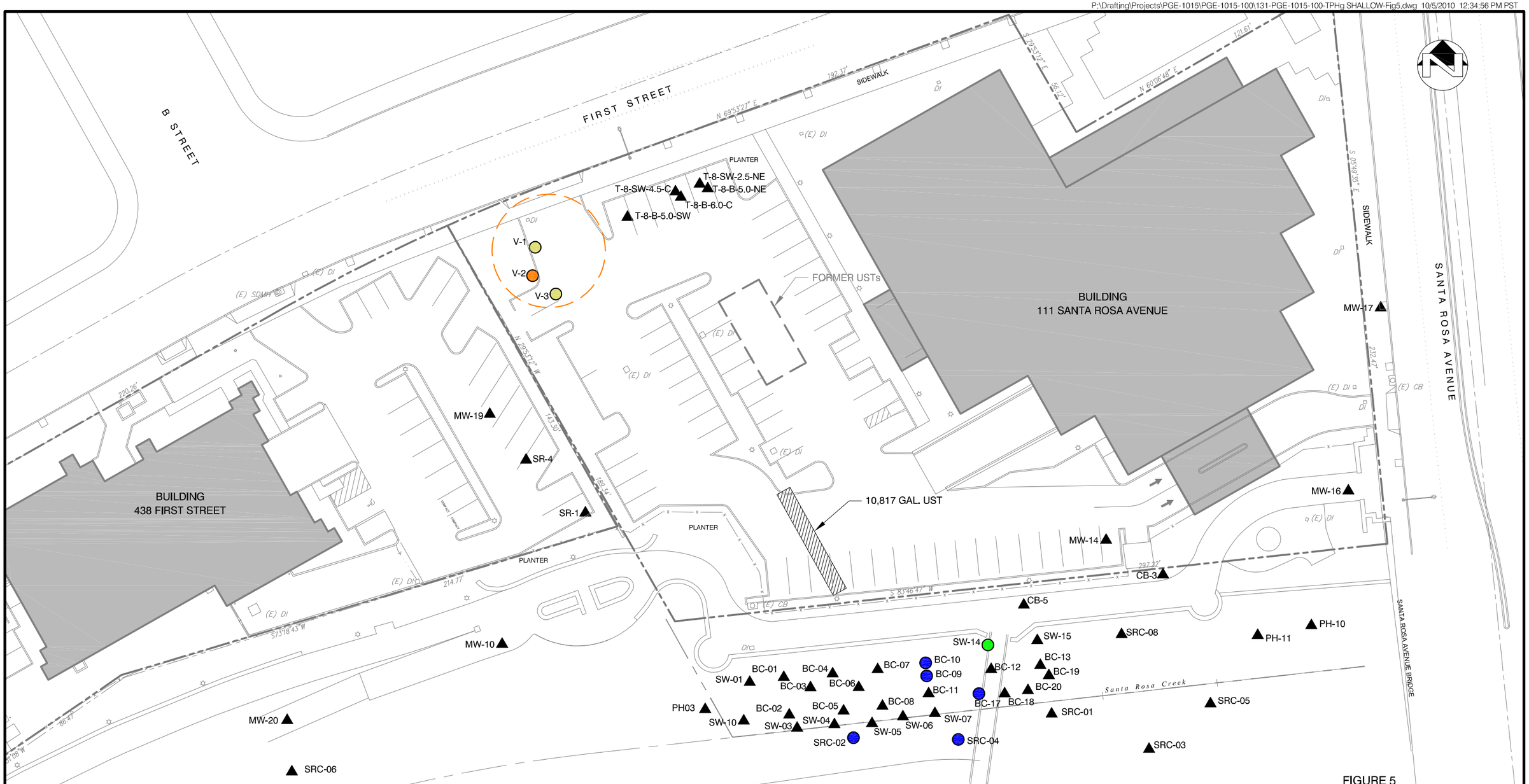

EXPLANATION

- NON DETECT
- 0 - 10 mg/kg
- 10 - 100 mg/kg
- 100 - 1,000 mg/kg
- 1,000 - 10,000 mg/kg
- 10,000 - 100,000 mg/kg
- >100,000 mg/kg
- FORMER USTs
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD TANK)
- 10,817 gal EXISTING UST

0 40 80 FEET
APPROXIMATE SCALE

FIGURE 5

DISTRIBUTION OF TPH-g IN SHALLOW SOIL (0 TO 10 FEET BELOW GROUND SURFACE)

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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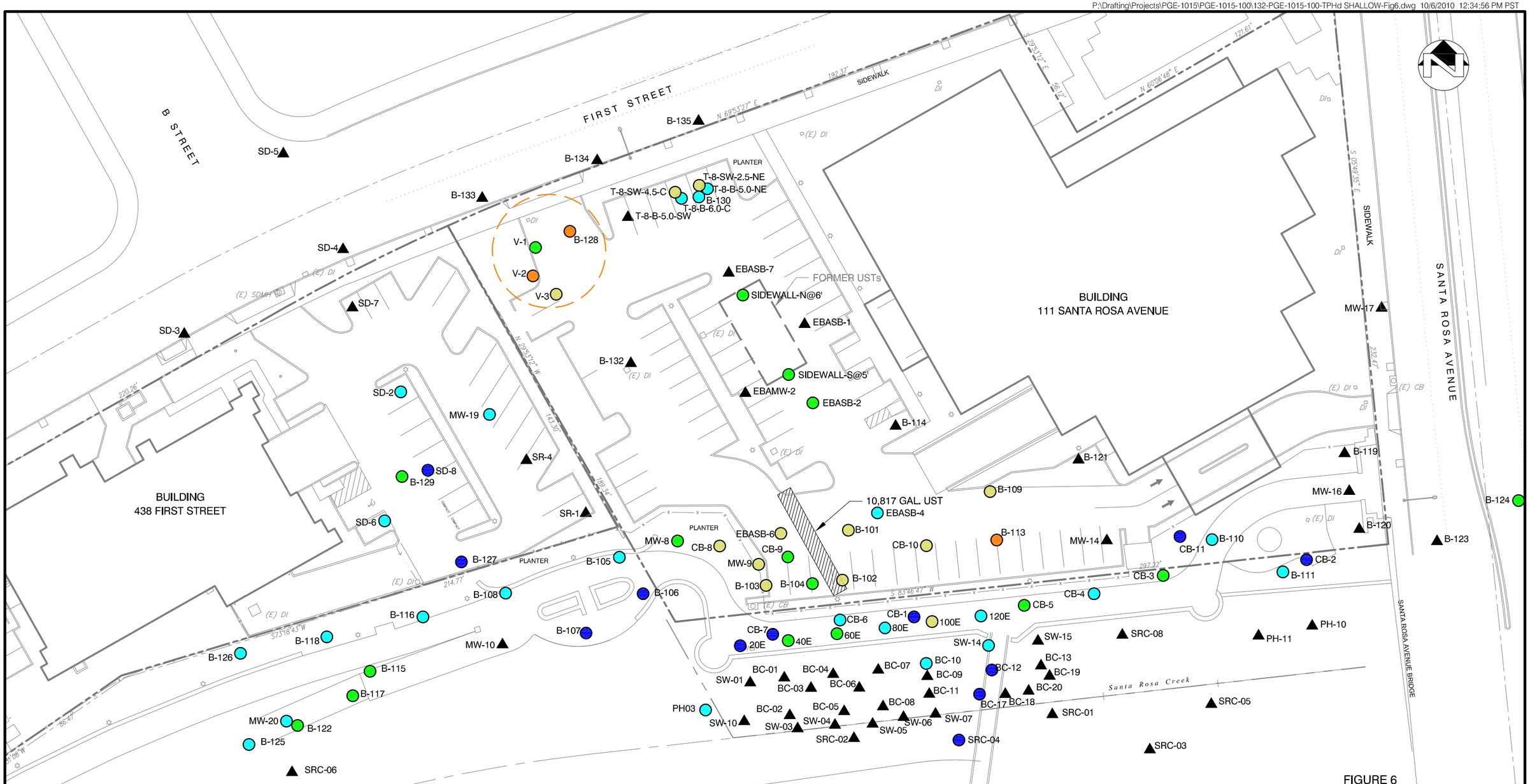

EXPLANATION

- NON DETECT
- 0 - 10 mg/kg
- 10 - 100 mg/kg
- 100 - 1,000 mg/kg
- 1,000 - 10,000 mg/kg
- 10,000 - 100,000 mg/kg
- >100,000 mg/kg
- FORMER USTs
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD TANK)
- 10,817 gal EXISTING UST

FIGURE 6

DISTRIBUTION OF TPH-d IN SHALLOW SOIL (0 TO 10 FEET BELOW GROUND SURFACE)

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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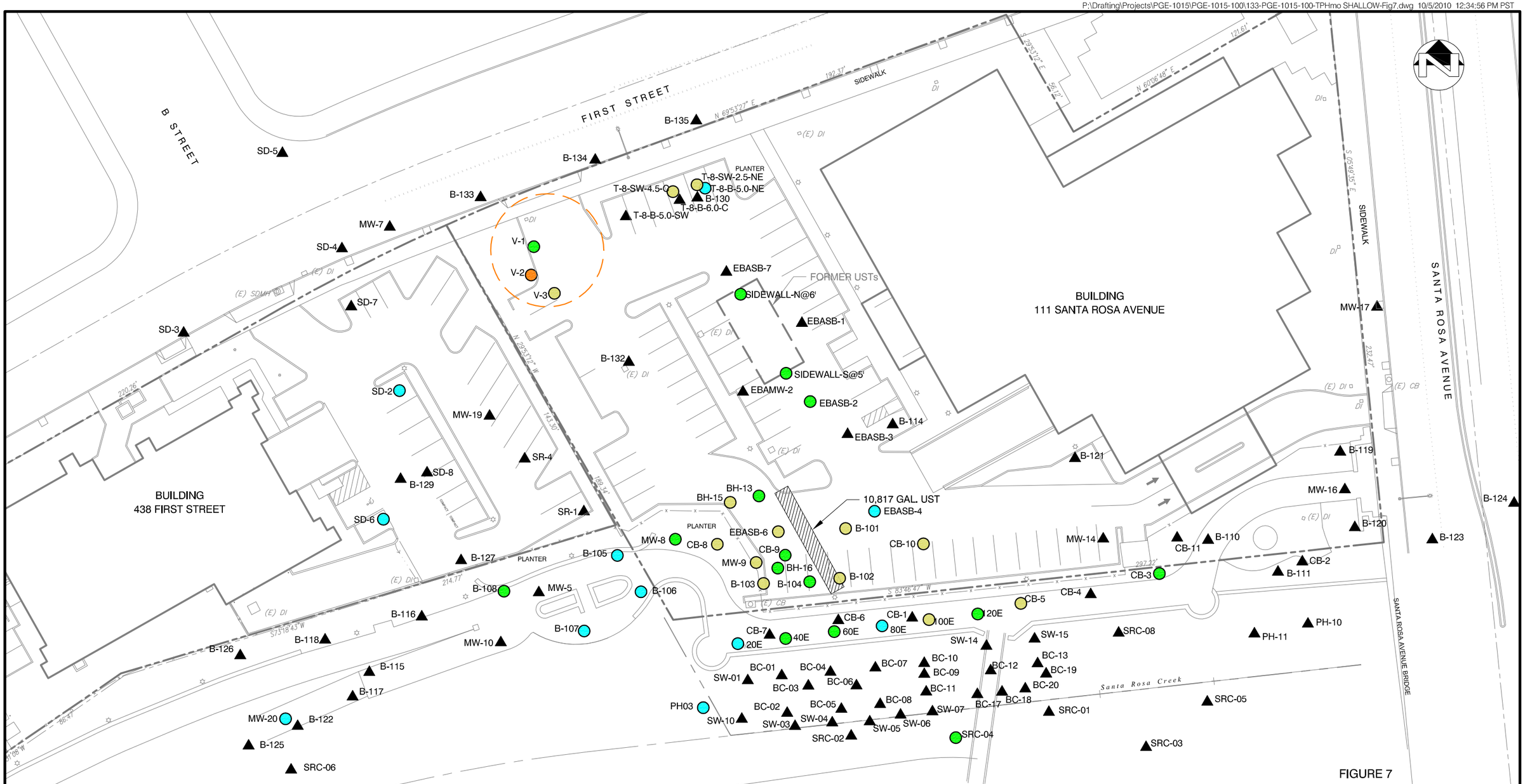

FIGURE 7

DISTRIBUTION OF TPHmo IN SHALLOW SOIL (0 TO 10 FEET BELOW GROUND SURFACE)

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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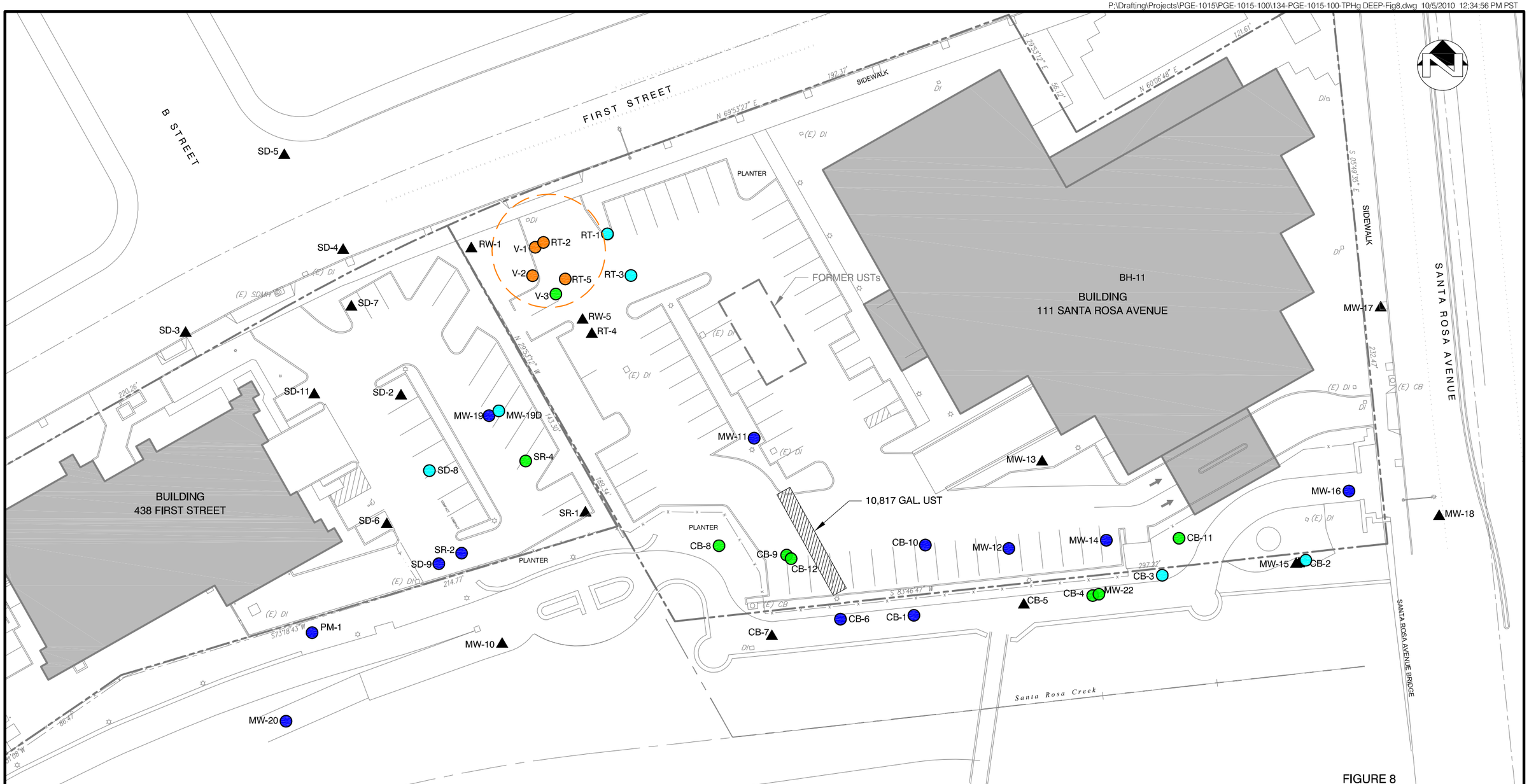

EXPLANATION

- NON DETECT
- 0 - 10 mg/kg
- 10 - 100 mg/kg
- 100 - 1,000 mg/kg
- 1,000 - 10,000 mg/kg
- 10,000 - 100,000 mg/kg
- >100,000 mg/kg
- FORMER USTs
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD TANK)
- 10,817 gal EXISTING UST

0 40 80 FEET
APPROXIMATE SCALE

FIGURE 8

DISTRIBUTION OF TPHg IN DEEP SOIL (GREATER THAN 10 FEET BELOW GROUND SURFACE)

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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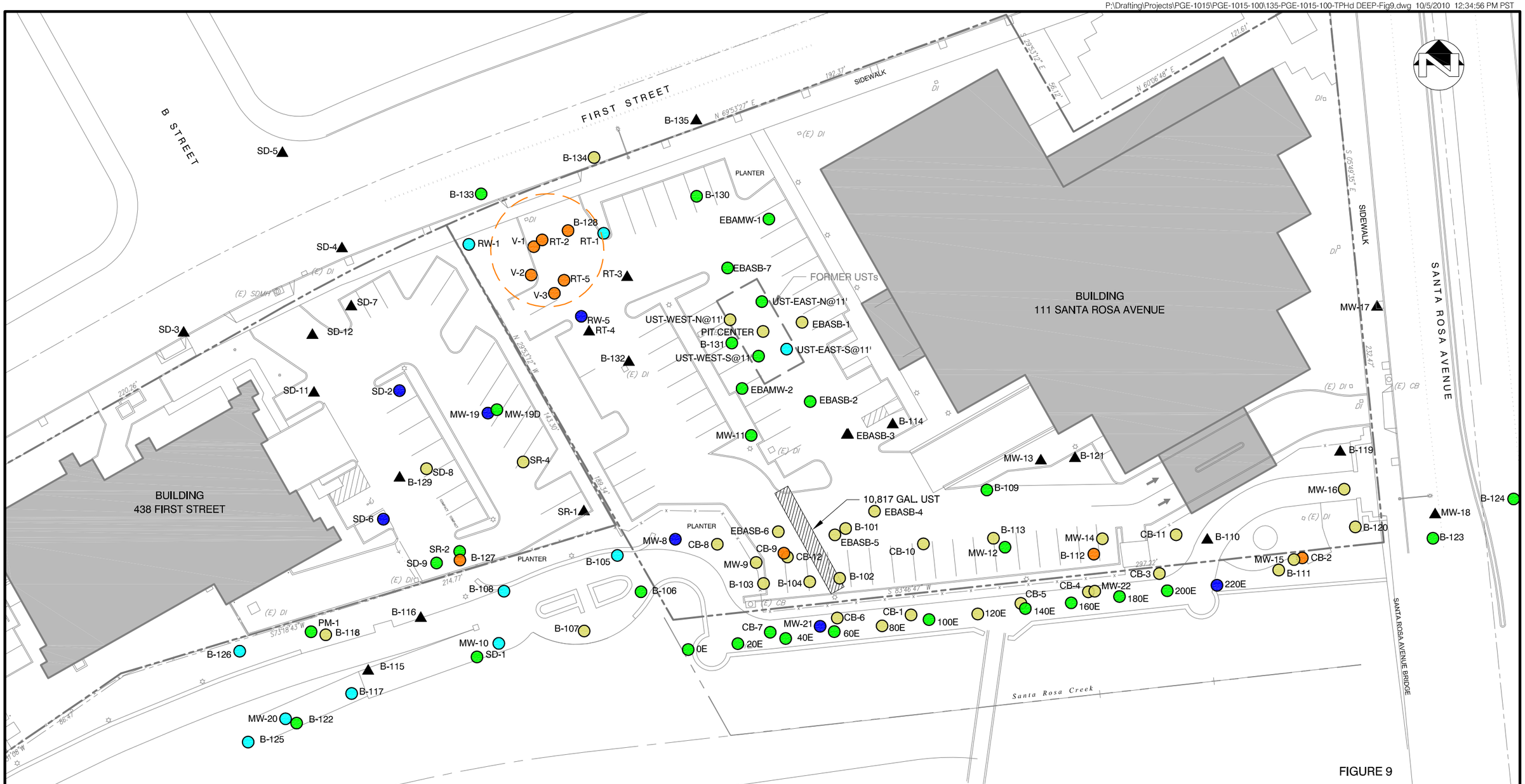

EXPLANATION

- NON DETECT
- 0 - 10 mg/kg
- 10 - 100 mg/kg
- 100 - 1,000 mg/kg
- 1,000 - 10,000 mg/kg
- 10,000 - 100,000 mg/kg
- >100,000 mg/kg
- FORMER USTs
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD TANK)
- 10,817 gal EXISTING UST

0 40 80 FEET
APPROXIMATE SCALE

FIGURE 9

DISTRIBUTION OF TPH-d IN DEEP SOIL (GREATER THAN 10 FEET BELOW GROUND SURFACE)

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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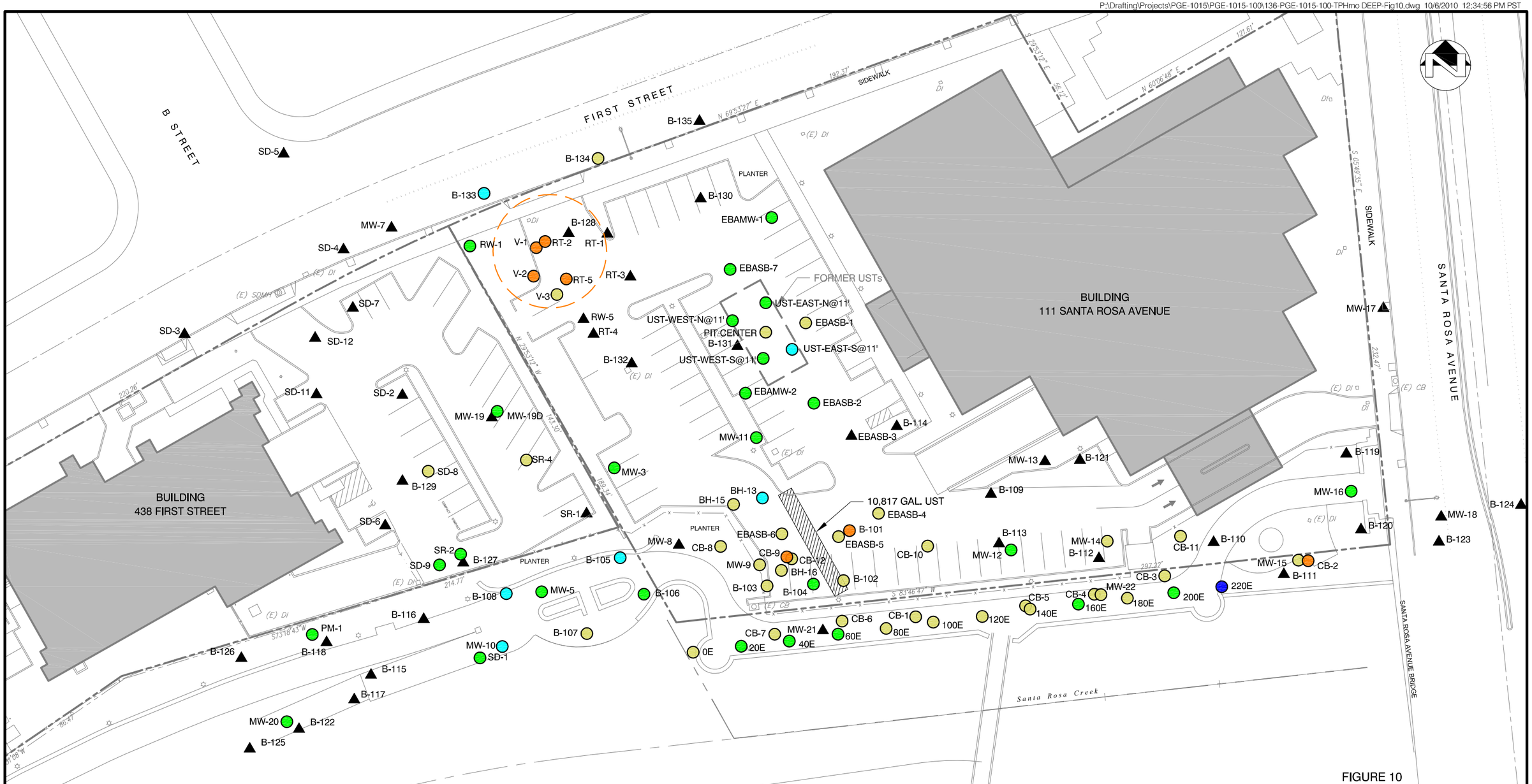


EXPLANATION

- NON DETECT
- 0 - 10 mg/kg
- 10 - 100 mg/kg
- 100 - 1,000 mg/kg
- 1,000 - 10,000 mg/kg
- 10,000 - 100,000 mg/kg
- >100,000 mg/kg
- FORMER USTs
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD TANK)
- 10,817 gal EXISTING UST

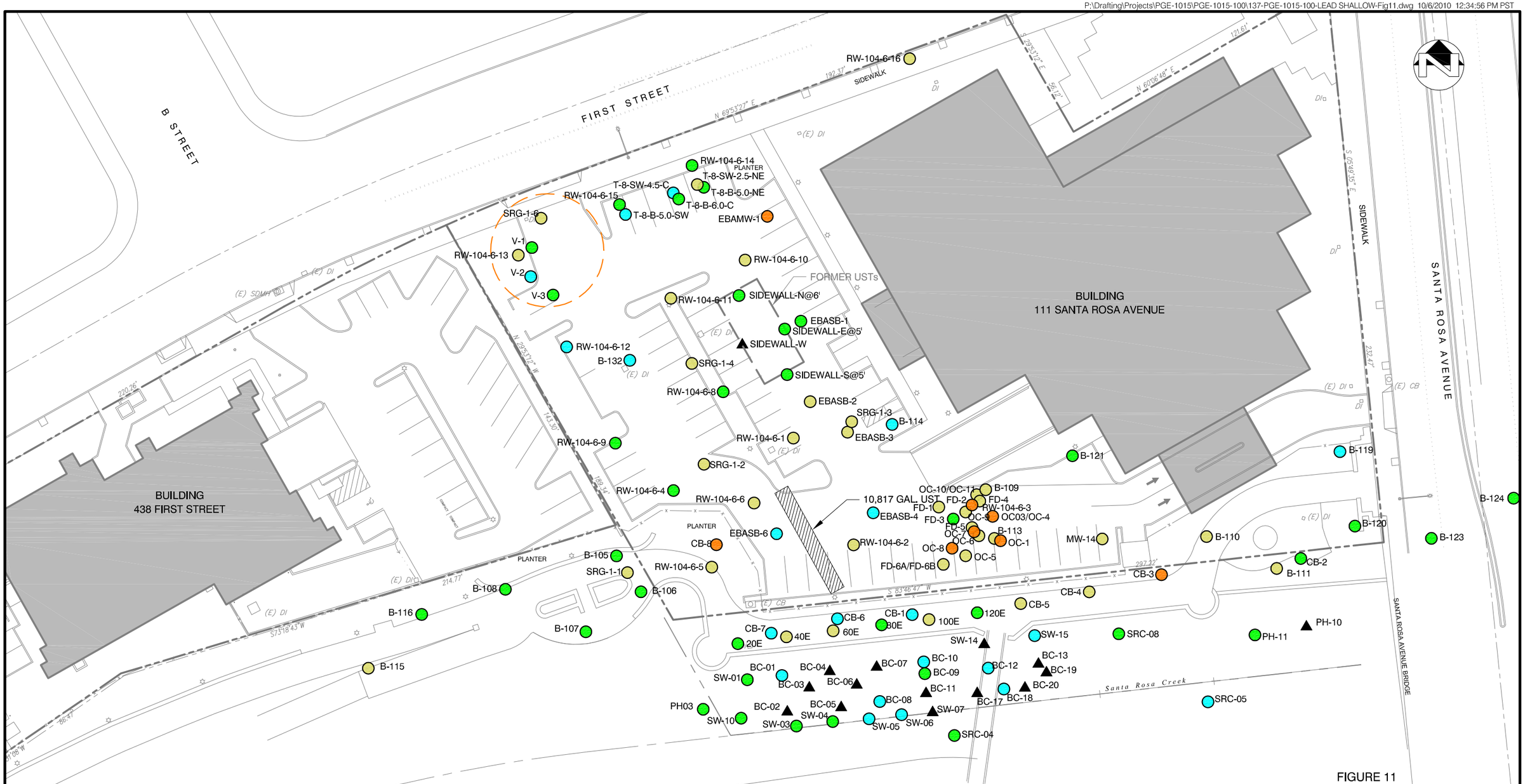
0 40 80 FEET
APPROXIMATE SCALE

FIGURE 10

DISTRIBUTION OF TPH-mo IN DEEP SOIL (GREATER THAN 10 FEET BELOW GROUND SURFACE)

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction



EXPLANATION

- NON DETECT
- 0 - 1 mg/kg
- 1 - 10 mg/kg
- 10 - 100 mg/kg
- 100 - 1,000 mg/kg
- 1,000 - 10,000 mg/kg
- >10,000 mg/kg
- FORMER USTs
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD TANK)
- 10,817 gal EXISTING UST

FIGURE 11

DISTRIBUTION OF LEAD IN SHALLOW SOIL (0 TO 10 FEET BELOW GROUND SURFACE)

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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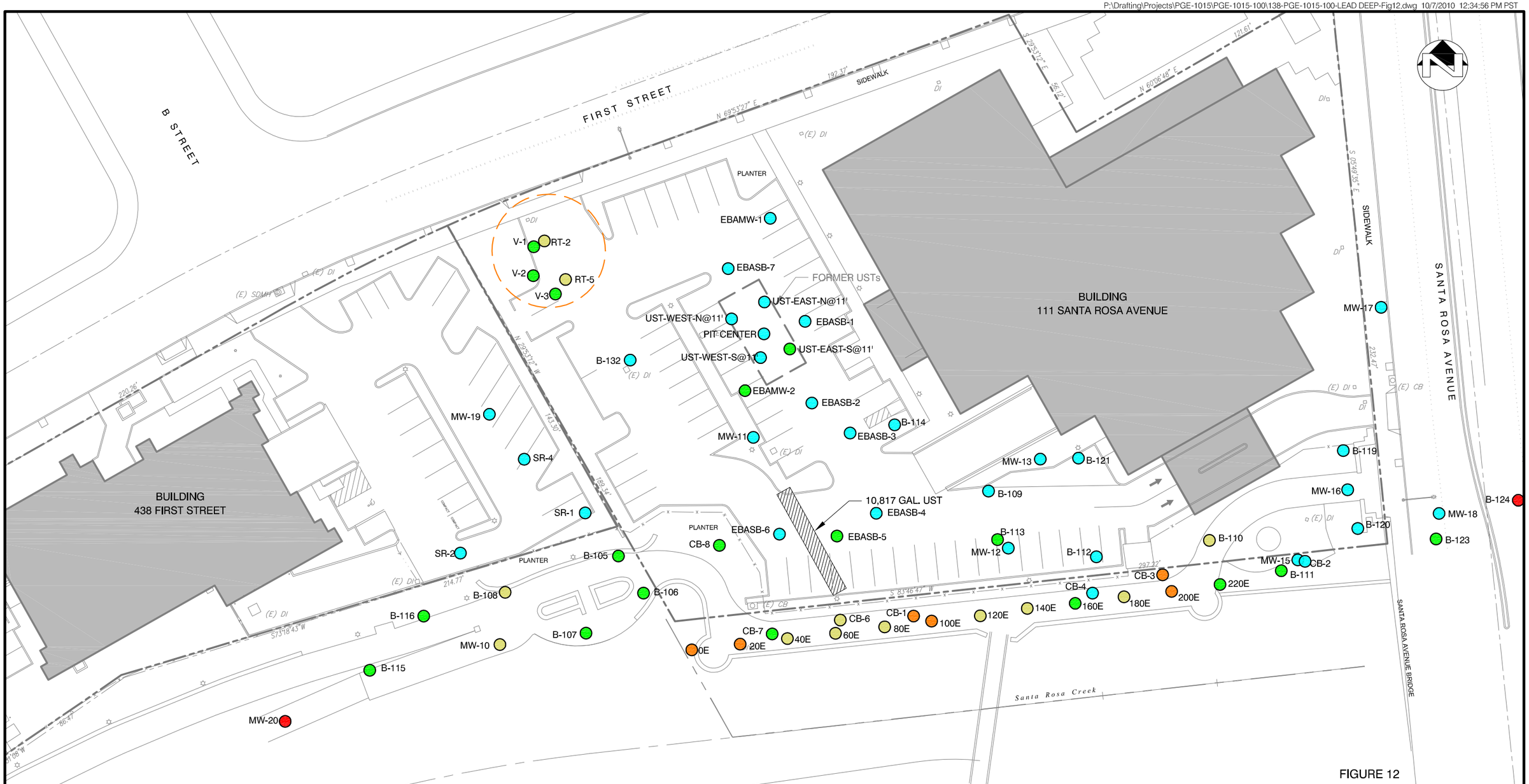

EXPLANATION

- NON DETECT
- 0 - 1 mg/kg
- 1 - 10 mg/kg
- 10 - 100 mg/kg
- 100 - 1,000 mg/kg
- 1,000 - 10,000 mg/kg
- >10,000 mg/kg
- FORMER USTs
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD TANK)
- 10,817 gal EXISTING UST

0 40 80 FEET
APPROXIMATE SCALE

FIGURE 12

DISTRIBUTION OF LEAD IN DEEP SOIL (GREATER THAN 10 FEET BELOW GROUND SURFACE)

FORMER SANTA ROSA MGP
PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

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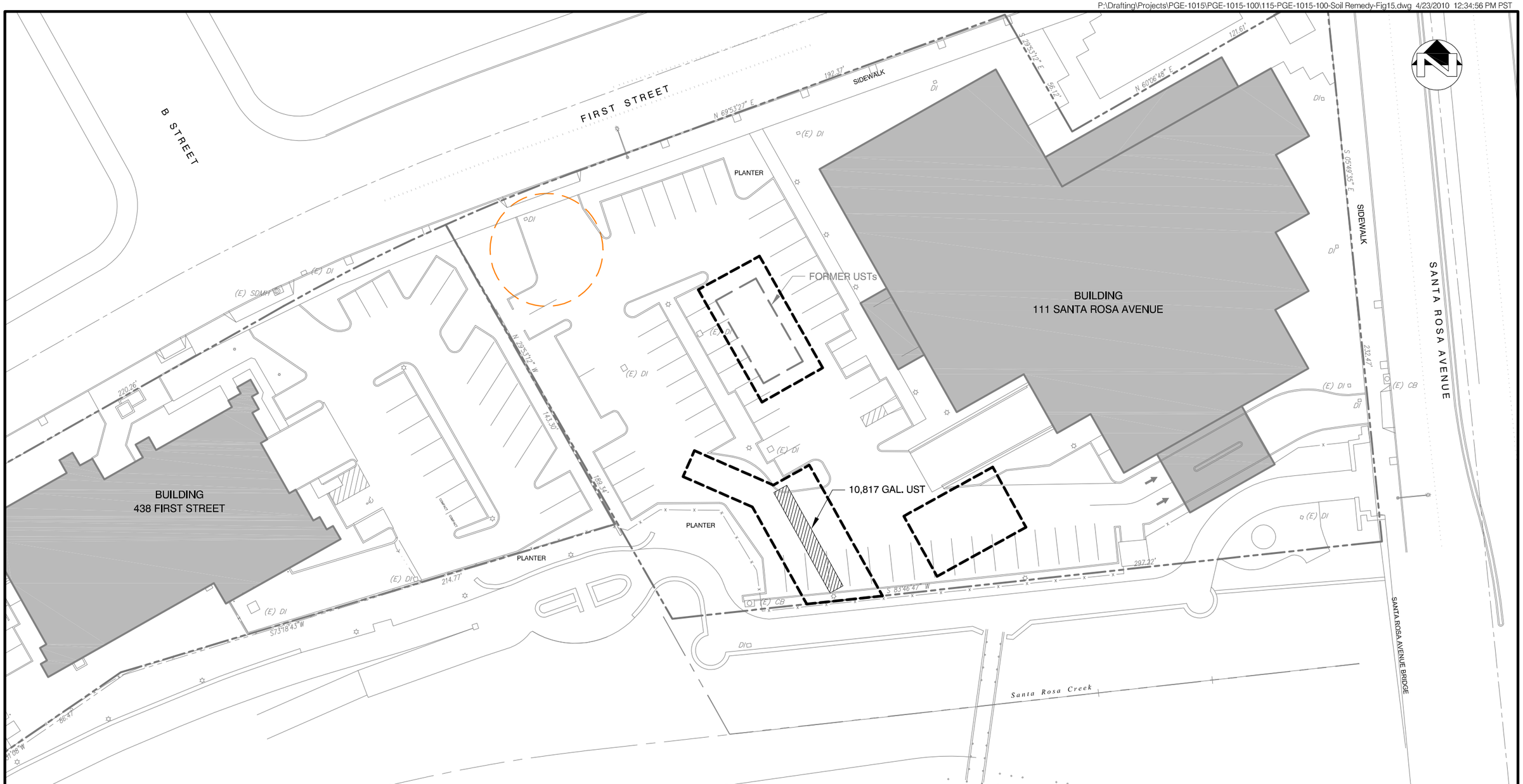

EXPLANATION

- FORMER USTs
- GAS HOLDER, PRESENT 1893; 35,000 cu ft CAPACITY (REDWOOD TANK)
- EXCAVATION AREAS (APPROXIMATE)
- 10,817 gal EXISTING UST

0 40 80 FEET
APPROXIMATE SCALE

FIGURE 15

OVERVIEW OF SELECTED SOIL REMEDY

PACIFIC GAS AND ELECTRIC COMPANY
SANTA ROSA, CALIFORNIA

TERRA PACIFIC GROUP
Environmental Engineering, Consulting, and Construction

APPENDIX C

Historical Groundwater Data (TPG, 2014b)

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-1	1/8/1988	3510/8015	---	---	<1000	---	---	---	---
	11/8/1988	8015(Modified)/3510	---	<50	---	<50	---	<50	---
	11/10/1988	8015	---	<50	---	<50	---	<50	---
	3/27/1989	3510/8015	---	<1000	---	---	---	---	---
	1/12/1996	8015	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	5/16/1996	8015 Modified	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	8/26/1996	8015M	---	<50	<50	---	---	<50	---
		8020/8015M	<50	---	---	---	---	---	---
	12/3/1996	8015/MOD	---	<50.0	<100	---	---	<50	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/5/1997	8015/MOD	---	<50	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	<50	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	4/18/2007	8015B (M)	<50	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	<50	<250	---	---	---	---
	11/29/2007	8260B	<50	---	---	---	---	---	---
	11/29/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	**61**	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	<50	<300	---	---	---	---
	12/2/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2009(2)	8015B	---	<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/11/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2011 (2)	8015B	---	<52	<100	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011 (2)	8015B	---	<50	<99	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<50	<100	---	---	---	---
	3/18/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/18/2013 (2)	8015B	---	<50	<99	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-1	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<53	<110	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	<50	<100	---	---	---	---
MW-2	12/10/1987	3510/8015	---	**13,000**	---	---	---	---	---
	1/8/1988	3510/8015	---	---	**6,000**	---	---	---	---
	3/4/1988	3510/8015	---	---	**2.2**	---	---	---	---
	11/8/1988	8015(Modified)/3510	---	<50	---	<50	---	<50	---
	11/10/1988	8015	---	<50	---	<50	---	<50	---
	3/9/1989	3510/8015	---	<1000	---	---	---	---	---
	1/12/1996	8015	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	5/16/1996	8015 Modified	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	8/26/1996	8015M	---	<50	<50	---	---	<50	---
		8020/8015M	<50	---	---	---	---	---	---
	12/3/1996	8015/MOD	---	**68**	**160**	---	---	<50	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/5/1997	8015/MOD	---	**77**	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	6/19/1997	8015	---	<50	<50	---	---	---	---
		8020/8015	<50	---	---	---	---	---	---
	2/19/1999	8015/MOD	---	<50	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	6/15/1999	8015M	---	<50	<100	---	---	---	---
		GCFID-5030A	<50	---	---	---	---	---	---
	8/11/1999	8015M	---	**61**	**120**	---	---	---	---
		GCFID-5030A	<50	---	---	---	---	---	---
	11/11/1999	8015M	---	**67**	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	2/15/2000	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	5/15/2000	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	8/15/2000	8015M	---	**140**	**580**	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	11/17/2000	8015M	---	**79**	**130**	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	2/14/2001	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	5/10/2001	8015DRO	---	**100**	**210**	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
	8/7/2001	8015DRO	---	**56**	<110	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
	11/5/2001	8015DRO	---	**61**	**140**	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
	2/15/2002	8015DRO	---	**61**	**160**	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-2	11/11/2002	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8020	<50	---	---	---	---	---	---
	2/10/2003	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8020	<50	---	---	---	---	---	---
	1/30/2004	3510/8015M	---	<50	<200	---	---	---	---
	12/21/2004	3510/8015	---	<50	<200	---	---	---	---
	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	4/18/2007	8015B (M)	<50	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	**220**	<250	---	---	---	---
	11/29/2007	8260B	<50	---	---	---	---	---	---
	11/29/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	**88**	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	<50	<300	---	---	---	---
	12/2/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2009(2)	8015B		**65**	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	**60**	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	**67**	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	**---**	---	---	---	---	---
	3/4/2011 (2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	**---**	---	---	---	---	---
	9/13/2011 (2)	8015B	---	<50	<99	---	---	---	---
	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	<50	<100	---	---	---	---
	9/5/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/5/2012 (2)	8015B	---	**62**	**280**	---	---	---	---
	3/20/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/20/2013(2)	8015B	---	**290**	**750**	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<50	**110**	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	**110**	<99	---	---	---	---
MW-3	12/1/1987	3510/8015M	---	**185,000** **168,000**	---	---	---	---	---
	12/10/1987	3510/8015	---	**25,000**	---	---	---	---	---
	1/8/1988	3510/8015	---	---	**43,000**	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
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Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-3	3/4/1988	3510/8015	---	---	<1.0	---	---	---	---
	11/8/1988	8015(Modified)/3510	---	<50	---	<50		<50	
	11/10/1988	8015	---	<50	---	<50		<50	
	3/9/1989	3510/8015	---	<1000	---	---	---	---	---
	12/3/1996	8015/MOD	---	**960**	**1,400**	---	**4,300**	<50	
	3/5/1997	8015/MOD	---	**730**	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	6/19/1997	8015	---	<50	<50	---	---	---	---
		8020/8015	<50	---	---	---	---	---	---
MW-4	5/20/1988	unknown	---	<50	<50	---	---	---	---
	3/9/1989	3510/8015	---	<1000	---	---	---	---	---
MW-5	5/20/1988	unknown	---	<50	<50	---	---	---	---
	11/8/1988	8015(Modified)/3510	---	<50	---	<50	---	<50	---
	11/10/1988	8015	---	<50	---	<50	---	<50	---
	3/9/1989	3510/8015	---	<1000	---	---	---	---	---
	1/12/1996	8015	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	5/16/1996	8015 Modified	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	8/26/1996	8015M	---	<50	<50	---	---	<50	---
		8020/8015M	<50	---	---	---	---	---	---
	12/3/1996	8015/MOD	---	<50.0	<100	---	---	<50	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/5/1997	8015/MOD	---	<50	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	6/19/1997	8015	---	<50	<50	---	---	---	---
		8020/8015	<50	---	---	---	---	---	---
	3/2/1999	8015/MOD	---	<50	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	6/15/1999	8015M	---	<50	<100	---	---	---	---
		GCFID-5030A	<50	---	---	---	---	---	---
	8/11/1999	GCFID-5030A	<50	---	---	---	---	---	---
	11/11/1999	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	2/15/2000	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	5/15/2000	8015M	---	**54**	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	8/15/2000	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	11/17/2000	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	2/14/2001	8015M	---	<50	<100	---	---	---	---
		GCFID/5030A	<50	---	---	---	---	---	---
	5/10/2001	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
	8/7/2001	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
	11/5/2001	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-5	2/15/2002	8015DRO	---	<50	<100	---	---	---	---
		8015GRO/8021B	<50	---	---	---	---	---	---
MW-7	5/20/1988	unknown	---	<50	<50	---	---	---	---
				<50	<50				
	11/8/1988	8015(Modified)/3510	---	<50	---	<50	---	<50	---
	11/10/1988	8015	---	<50	---	<50	---	<50	---
	3/27/1989	3510/8015	---	<1000	---	---	---	---	---
	1/12/1996	8015	---	<50	<50	---	---	<50	---
		8020/8015	69	---	---	---	---	---	---
	5/16/1996	8015 Modified	---	<50	<50	---	---	<50	---
		8020/8015	<50	---	---	---	---	---	---
	8/26/1996	8015M	---	<50	<50	---	---	<50	---
		8020/8015M	<50	---	---	---	---	---	---
	12/3/1996	8015/MOD	---	<50.0	<100	---	---	<50	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/5/1997	8015/MOD	---	<50	---	---	---	---	---
		GCFID/5030	<50.0	---	---	---	---	---	---
	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	**100**	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	4/19/2007	8015B (M)	<50	---	---	---	---	---	---
	4/19/2007(2)	8015B (M)	---	**80**	<250	---	---	---	---
	11/28/2007	8260B	<50	---	---	---	---	---	---
	11/28/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	**59**	<500	---	---	---	---
	12/1/2008	8260B	<50	---	---	---	---	---	---
	12/1/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	<50	<300	---	---	---	---
	12/1/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/1/2009(2)	8015B		<50	<300	---	---	---	---
	4/2/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/2/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011 (2)	8015B	---	**85**	**240**	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011 (2)	8015B	---	<50	<100	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/5/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-7	9/5/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<52	**160**	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	**79**	**230**	---	---	---	---
MW-8	2/19/1999	8015/MOD	---	**18,000**	**20,000**	---	---	---	---
	6/15/1999	8015M	---	**4,800**	**5,800**	---	---	---	---
	11/11/1999	8015M	---	**4,900**	**4,500**	---	---	---	---
	2/15/2000	8015	---	---	**1,900**	---	---	---	---
		8015M	---	**1,700**	---	---	---	---	---
	5/15/2000	8015M	---	**260**	**180**	---	---	---	---
	8/15/2000	8015M	---	**2,900**	**4,000**	---	---	---	---
	11/17/2000	8015M	---	**330**	**300**	---	---	---	---
	2/14/2001	8015M	---	**280**	**250**	---	---	---	---
	5/10/2001	8015DRO	---	**740**	**860**	---	---	---	---
	8/7/2001	8015DRO	---	**350**	**360**	---	---	---	---
	11/5/2001	8015DRO	---	**500**	**550**	---	---	---	---
	2/15/2002	8015DRO	---	**290**	**280**	---	---	---	---
	11/11/2002	8015DRO	---	**1,100**	**1,300**	---	---	---	---
	2/10/2003	8015DRO	---	**150**	**200**	---	---	---	---
	1/30/2004	3510/8015M	---	**94**	<200	---	---	---	---
		418.1m	---	---	---	---	---	---	<1000
	12/21/2004	3510/8015	---	**2,700**	<200	---	---	---	---
	3/10/2005	GC/MS COMB	<50	**230**	<100	---	---	---	---
	3/10/2005(2)	3630	---	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	**110**	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	**220**	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	**200**	<250	---	---	---	---
	11/30/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	11/30/2009(2)	8015B		<50	<300	---	---	---	---
	4/2/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/2/2010(2)	8015B		**53**	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
MW-9	2/19/1999	8015/MOD	---	**1,600**	**1,200**	---	---	---	---
	6/15/1999	8015M	---	**350**	**290**	---	---	---	---
	11/11/1999	8015M	---	**550**	**340**	---	---	---	---
	2/15/2000	8015M	---	**270**	**290**	---	---	---	---
	5/15/2000	8015M	---	**1,100**	**1,200**	---	---	---	---
	8/15/2000	8015M	---	**290**	**380**	---	---	---	---
	11/17/2000	8015M	---	**110**	<100	---	---	---	---
	2/14/2001	8015M	---	**170**	**140**	---	---	---	---
	5/10/2001	8015DRO	---	**200**	**260**	---	---	---	---

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Former Santa Rosa MGP
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-9	8/7/2001	8015DRO	---	**410**	**280**	---	---	---	---
	11/5/2001	8015DRO	---	**480**	**550**	---	---	---	---
	2/15/2002	8015DRO	---	**210**	**290**	---	---	---	---
	11/11/2002	8015DRO	---	**180**	**170**	---	---	---	---
	2/10/2003	8015DRO	---	**100**	<100	---	---	---	---
	1/30/2004	3510/8015M	---	<50	<200	---	---	---	---
		418.1m	---	---	---	---	---	---	<1000
	12/21/2004	3510/8015	---	<200	---	---	---	---	---
			---	**330**	---	---	---	---	---
	3/10/2005	GC/MS COMB	<50	**110**	<100	---	---	---	---
	3/10/2005(2)	3630	---	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	<50	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	**180**	<250	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	**150**	<250	---	---	---	---
	4/18/2007	8015B (M)	<50	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	**230**	350	---	---	---	---
	11/28/2007	8260B	<50	---	---	---	---	---	---
	11/28/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	**140**	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	**73**	<300	---	---	---	---
	12/1/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/1/2009(2)	8015B		<50	<300	---	---	---	---
	4/2/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/2/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	**77**	<300	---	---	---	---
	3/2/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/2/2011(2)	8015B	---	<49	<98	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<50	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/18/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/18/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<51	<100	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-9	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014 (2)	8015B	---	<50	<100	---	---	---	---
MW-10	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
			<50	<100	<100				
	6/28/2005	8015M/8020	<50	---	---	---	---	----	----
			<50						
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
				<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	4/18/2007	8015B (M)	**52**	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	<50	<250	---	---	---	---
	11/28/2007	8260B	<50	---	---	---	---	---	---
	11/28/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
			<50						
	12/2/2008(2)	8015B	---	**55**	<500	---	---	---	---
				<50	<500				
	3/9/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/9/2009(2)	8015B	---	<50	<300	---	---	---	---
	11/30/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	11/30/2009(2)	8015B		<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	----	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	<50	<99	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/10/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2014 (2)	8015B	---	<50	<100	---	---	---	---
MW-11	3/10/2005	GC/MS COMB	<50	**190**	<100	---	---	---	---
	3/10/2005(2)	3630	---	**100**	<100	---	---	---	---

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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-11	6/28/2005	8015M/8020	**99**	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	<50	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	**240**	<250	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	**370**	<250	---	---	---	---
MW-12	3/10/2005	GC/MS COMB	<50	**2,500**	**1,700**	---	---	---	---
	3/10/2005(2)	3630	---	**2,200**	**1,300**	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	<50	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	**51**	<250	---	---	---	---
	4/18/2007	8015B (M)	<50	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	<50	<250	---	---	---	---
	11/29/2007	8260B	<50	---	---	---	---	---	---
	11/29/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	<50	<300	---	---	---	---
	12/2/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2009(2)	8015B		<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	**350**	**540**	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	<50	<100	---	---	---	---
	9/5/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/5/2012 (2)	8015B	---	<50	<100	---	---	---	---
	3/20/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/20/2013(2)	8015B	---	**140**	**210**	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<50	<99	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014 (2)	8015B	---	<50	<100	---	---	---	---

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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-13	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	<50	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
MW-14	3/10/2005	GC/MS COMB	**57**	**3,300**	**2,000**	---	---	---	---
	3/10/2005(2)	3630	---	**2,800**	**1,700**	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/5/2006	5030B	**77** **56**	---	---	---	---	---	---
	7/5/2006(1)	DHS LUFT	---	**400** **430**	**340** **320**	---	---	---	---
	7/5/2006(2)	DHS LUFT	---	**430** **460**	**280** **330**	---	---	---	---
MW-15	3/10/2005	GC/MS COMB	<50	**1,600**	**920**	---	---	---	---
	3/10/2005(2)	3630	---	**790**	**500**	---	---	---	---
	6/28/2005	8015M/8020	**100**	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	**460**	**400**	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	**1,100**	<250	---	---	---	---
MW-16	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	**120**	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	**220**	<250	---	---	---	---
	4/18/2007	8015B (M)	<50	---	---	---	---	---	---
	4/18/2007(2)	8015B (M)	---	**260**	**400**	---	---	---	---
	11/28/2007	8260B	<50	---	---	---	---	---	---
	11/28/2007(2)	8015B (M)	---	**59 UN**	<500	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	**120**	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/9/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/9/2009(2)	8015B	---	<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	**2,100**	**2,700**	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	**200**	**300**	---	---	---	---

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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-16	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	**100**	---	---	---	---
	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	**68**	**100**	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014 (2)	8015B	---	<50	<100	---	---	---	---
MW-17	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<97	<190	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<51	<100	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014 (2)	8015B	---	<50	<100	---	---	---	---
MW-18	3/10/2005	GC/MS COMB	<50	<100	<100	---	---	---	---
	6/28/2005	8015M/8020	<50	---	---	---	---	---	---
	6/28/2005(1)	3510/8015M	---	<50	<200	---	---	---	---
	7/6/2006	5030B	<50	---	---	---	---	---	---
	7/6/2006(1)	DHS LUFT	---	<50	<250	---	---	---	---
	7/6/2006(2)	DHS LUFT	---	<50	<250	---	---	---	---
	4/19/2007	8015B (M)	<50	---	---	---	---	---	---
	4/19/2007(2)	8015B (M)	---	<50	<250	---	---	---	---
	11/28/2007	8260B/8015B (M)	---	---	---	---	---	---	---
	5/22/2008	8260B	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
	12/1/2008	8260B	<50	---	---	---	---	---	---
	12/1/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	<50	<300	---	---	---	---

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Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-18	12/1/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/1/2009(2)	8015B	---	<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
MW-19	4/18/2007	8015B (M)	**100**	---	---	---	---	---	---
			180						
	4/18/2007(2)	8015B (M)	---	**290**	<250	---	---	---	---
				250	**270**				
	11/28/2007	8260B	**30 J**	---	---	---	---	---	---
	11/28/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
	5/23/2008	8260B	<50	---	---	---	---	---	---
			<50						
	5/23/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
				53	<500				
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/10/2009	8260B	**590**	---	---	---	---	---	---
			620	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	**72**	<300	---	---	---	---
			---	**94**	<300	---	---	---	---
MW-19S	3/3/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/3/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/18/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
MW-19D	11/30/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	11/30/2009(2)	8015B	---	<50	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/3/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/3/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<100	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
			<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<50	<100	---	---	---	---
			---	<51	<100	---	---	---	---
	9/5/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
			<50	---	---	---	---	---	---
	9/5/2012 (2)	8015B	---	<51	<100	---	---	---	---
			---	<50	<100	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-19D	3/18/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
			<50	---	---	---	---	---	---
	3/18/2013(2)	8015B	---	<50	<99	---	---	---	---
			---	<50	<99	---	---	---	---
	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
			<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
			---	<51	<100	---	---	---	---
	3/10/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
			<50	---	---	---	---	---	---
	3/10/2014 (2)	8015B	---	<50	<100	---	---	---	---
			---	<50	<100	---	---	---	---
MW-20	4/19/2007	8015B (M)	<50	---	---	---	---	---	---
	4/19/2007(2)	8015B (M)	---	<50	<250	---	---	---	---
	11/28/2007	8015B (M)	<50	---	---	---	---	---	---
			<50						
	11/28/2007(2)	8015B (M)	---	<50	<500	---	---	---	---
				<50	**97 J**				
	5/22/2008	8015B (M)	<50	---	---	---	---	---	---
	5/22/2008(2)	8015B (M)	---	<50	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/9/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/9/2009(2)	8015B	---	<50	<300	---	---	---	---
	11/30/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	11/30/2009(2)	8015B	---	<51	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<100	---	---	---	---
	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<50	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/10/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2014 (2)	8015B	---	<50	<100	---	---	---	---
MW-21	5/30/2008	8015B (M)	<50	---	---	---	---	---	---
	5/30/2008(2)	8015B (M)	---	**70**	<500	---	---	---	---
	12/2/2008	8260B	<50	---	---	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-21	12/2/2008(2)	8015B	---	<50	<500	---	---	---	---
	3/9/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/9/2009(2)	8015B	---	<50	<300	---	---	---	---
	12/2/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2009(2)	8015B	---	<51	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	**330**	**610**	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<51	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	<51	<100	---	---	---	---
	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	<50	<99	---	---	---	---
MW-22	12/2/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2009(2)	8015B	---	**120**	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/16/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/16/2010(2)	8015B	---	**210**	<300	---	---	---	---
	3/11/2011	8260B/CA_LUFTMS	<50	**---**	---	---	---	---	---
	3/11/2011(2)	8015B	---	**220**	**250**	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	**---**	---	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/8/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/8/2012 (2)	8015B	---	**100**	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	**100**	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	**140**	**110**	---	---	---	---
	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	**100**	<99	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
MW-23	11/30/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	11/30/2009(2)	8015B	---	<51	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/3/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/3/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<51	<100	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	<50	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/18/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/18/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/9/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/9/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/10/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2014 (2)	8015B	---	<50	<99	---	---	---	---
EBAMW-1	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	**120**	<300	---	---	---	---
	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<51	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	**950**	**1,300**	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	**---**	**---**	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	**---**	**---**	---	---	---	---
	9/13/2011(2)	8015B	---	<50	<99	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	**160**	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<50	<100	---	---	---	---
	3/19/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/19/2013(2)	8015B	---	**72 HB**	**160 HB**	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<50	<100	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	<50	<100	---	---	---	---
EBAMW-2	12/2/2008	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/2/2008(2)	8015B	---	**52**	<500	---	---	---	---
	3/10/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/10/2009(2)	8015B	---	**280**	<300	---	---	---	---
	12/1/2009	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	12/1/2009(2)	8015B	---	**65**	<300	---	---	---	---

Table C-1
Historical Summary of TPH in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Total Petroleum Hydrocarbons						
			TPH-Gasoline	TPH-Diesel	TPH-Motor Oil	TPH Heavy - Other	TPH-Bunker Oil	TPH-Kerosene	TRPH
			Results in ug/L						
EBAMW-2	4/1/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	4/1/2010(2)	8015B	---	<50	<300	---	---	---	---
	9/15/2010	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/15/2010(2)	8015B	---	<50	<300	---	---	---	---
	3/4/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/4/2011(2)	8015B	---	<50	<99	---	---	---	---
	9/13/2011	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/13/2011(2)	8015B	---	<51	<100	---	---	---	---
	3/7/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/7/2012 (2)	8015B	---	**100**	<100	---	---	---	---
	9/4/2012	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/4/2012 (2)	8015B	---	<51	<100	---	---	---	---
	3/20/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/20/2013(2)	8015B	---	<50	<99	---	---	---	---
	9/10/2013	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	9/10/2013(2)	8015B	---	<51	<100	---	---	---	---
	3/11/2014	8260B/CA_LUFTMS	<50	---	---	---	---	---	---
	3/11/2014(2)	8015B	---	<50	<100	---	---	---	---

Notes:
(1) sample was filtered by the laboratory prior to analysis using 0.7 micron glass fiber filter
(2) sample extract was subjected to silica gel treatment prior to analysis
TPH = total petroleum hydrocarbons
TRPH = total recoverable petroleum hydrocarbons
ug/L = micrograms per liter
"<" = not detected at or above laboratory reporting limit
--- = not analyzed
B = compound was found in the blank and sample.
H = sample was prepped or analyzed beyond the specified holding time.
UN = compound was found in the blank and sample and result should be viewed as tentative non detection (i.e. suspect)
J = Result is less than the reporting limit (RL) but greater than or equal to the method detection limit (MDL) and the concentration is an approximate value

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-1	11/8/1988	602	<1	<1	<1	---	---	<1
	11/10/1988	602	<1	<1	<1	---	---	<1
	3/27/1989	8020	<0.5	<0.5	<0.5	---	---	<0.5
	1/12/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	5/16/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	8/26/1996	8020/8015M	<0.3	<0.3	<0.3	---	---	<0.3
	12/3/1996	602	<.300	<.300	<.500	---	---	<.500
	3/5/1997	602	<.300	<.300	<.500	---	---	<.500
	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/29/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/18/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-2	11/8/1988	602	<1	<1	<1	---	---	<1
	11/10/1988	602	<1	<1	<1	---	---	<1
	3/9/1989	8020	<0.2	<0.2	<0.2	---	---	<0.2
	1/12/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	5/16/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	8/26/1996	8020/8015M	<0.3	<0.3	<0.3	---	---	<0.3
	12/3/1996	602	<.300	<.300	<.500	---	---	<.500
	3/5/1997	602	<.300	<.300	<.500	---	---	<.500
	6/19/1997	8020/8015	<0.50	<0.50	<0.50	---	---	<0.50
	2/19/1999	602	**3.6**	**1.2**	**1.3**	---	---	**4**
	6/15/1999	8020	<0.30	<0.30	<0.50	---	---	<.50
	8/11/1999	8020	**1.8**	**0.52**	**0.61**	---	---	**1.8**
	11/11/1999	8020	<0.30	<0.30	<0.50	---	---	<0.50
	2/15/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	5/15/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	8/15/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	11/17/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	2/14/2001	8020	<0.30	<0.30	<0.50	---	---	<.50
	5/10/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	8/7/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	11/5/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	2/15/2002	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	11/11/2002	8015GRO/8020	**0.42**	<0.30	<0.50	---	---	<0.50
	2/10/2003	8015GRO/8020	<0.30	<0.30	<0.50	---	---	<0.50
	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/29/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-2	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/20/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-3	11/8/1988	602	<1	<1	<1	---	---	<1
	11/10/1988	602	<1	<1	<1	---	---	<1
	3/9/1989	8020	<0.2	<0.2	<0.2	---	---	<0.2
	3/5/1997	602	<.300	<.300	<.500	---	---	<.500
	6/19/1997	8020/8015	<0.50	<0.50	<0.50	---	---	<0.50
MW-4	3/9/1989	8020	<0.2	<0.2	<0.2	---	---	<0.2
MW-5	11/8/1988	602	<1	<1	<1	---	---	<1
	11/10/1988	602	<1	<1	<1	---	---	<1
	3/9/1989	8020	<0.2	<0.2	<0.2	---	---	<0.2
	1/12/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	5/16/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	8/26/1996	8020/8015M	<0.3	<0.3	<0.3	---	---	<0.3
	12/3/1996	602	<.300	<.300	<.500	---	---	<.500
	3/5/1997	602	<.300	<.300	<.500	---	---	<.500
	6/19/1997	8020/8015	<0.50	<0.50	<0.50	---	---	<0.50
	3/2/1999	602	<0.300	<0.300	<0.500	---	---	**0.69**
	6/15/1999	8020	<0.30	<0.30	<0.50	---	---	**0.58**
	8/11/1999	8020	<0.30	<0.30	<0.50	---	---	<0.50
	11/11/1999	8020	<0.30	<0.30	<0.50	---	---	<0.50
	2/15/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	5/15/2000	8020	<0.30	<0.30	<0.50	---	---	**0.6**
	8/15/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	11/17/2000	8020	<0.30	<0.30	<0.50	---	---	<0.50
	2/14/2001	8020	<0.30	<0.30	<0.50	---	---	<.50
	5/10/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	8/7/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	11/5/2001	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	<0.50
	2/15/2002	8015GRO/8021B	<0.30	<0.30	<0.50	---	---	**1.3**
MW-7	11/8/1988	602	<1	<1	<1	---	---	<1
	11/10/1988	602	<1	<1	<1	---	---	<1
	3/27/1989	8020	<0.5	<0.5	<0.5	---	---	<0.5
	1/12/1996	8020/8015	<0.3	<0.3	<0.3	---	---	**2.1**
	5/16/1996	8020/8015	<0.3	<0.3	<0.3	---	---	<0.3
	8/26/1996	8020/8015M	<0.3	<0.3	<0.3	---	---	<0.3
	12/3/1996	602	<.300	<.300	<.500	---	---	<.500
	3/5/1997	602	<.300	<.300	<.500	---	---	<.500
	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/19/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/28/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/1/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	**8.3**	<0.50	<0.50	---	---	<1.0
	12/1/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/2/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-7	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-8	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	11/30/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/2/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-9	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/28/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/1/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/2/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/2/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/18/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-10	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
			<0.5	<0.5	<0.5			<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
			<0.5	<0.5	<0.5			<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/28/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50			<1.0
	3/9/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	11/30/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-11	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
MW-12	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/29/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-12	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/20/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-13	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
MW-14	3/10/2005	8260	<0.5	**2.3**	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/5/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
			<0.50	<1.0	<1.0			<1.0
MW-15	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
MW-16	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/18/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/28/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/9/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-17	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-18	3/10/2005	8260	<0.5	<0.5	<0.5	---	---	<0.5
	6/28/2005	8015M/8020	<0.5	<0.5	<0.5	---	---	<1.5
	7/6/2006	8260B	<0.50	<1.0	<1.0	---	---	<1.0
	4/19/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/1/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/1/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/2/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-19	4/18/2007	8260B	**34**	<1.0	<1.0	<1.0	<1.0	---
			39	<1.0	<1.0	<1.0	<1.0	
	11/28/2007	8260B	**1.2**	<0.50	<0.50	---	---	<1.0
	5/23/2008	8260B	**0.79**	<0.50	<0.50	---	---	<1.0
			0.72	<0.50	<0.50			<1.0
	12/2/2008	8260B	**1.5**	<0.50	<0.50	---	---	<1.0
	3/10/2009	8260B/CA_LUFTMS	**460**	<5.0	<5.0	---	---	<10
			440	<5.0	<5.0			<10
MW-19S	3/3/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/18/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-19D	11/30/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/3/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50	---	---	<1.0
	3/18/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50	---	---	<1.0
MW-20	4/19/2007	8260B	<0.50	<1.0	<1.0	<1.0	<1.0	---
	11/28/2007	8260B	<0.50	<0.50	<0.50	---	---	<1.0
			<0.50	<0.50	<0.50			<1.0
	5/22/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/9/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	11/30/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/10/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-21	5/30/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2008	8260B	<0.50	<0.50	<0.50	---	---	<1.0
	3/9/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	12/2/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2112	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-22	12/2/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/16/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/4/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
MW-23	11/30/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	4/1/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/3/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/18/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/9/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0

Table C-2
Historical Summary of BTEX in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Volatile Organic Compounds					
			Benzene	Toluene	Ethylbenzene	o-Xylene	p/m-Xylene	Total Xylene
			Results in ug/L					
MW-23	3/10/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
EBAMW-1	3/10/2009	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1
	4/1/2010	8260B/CA_LUFTMS	**20**	<0.50	<0.50	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/7/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/19/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
EBAMW-2	12/2/2008	8260B	**4.1**	<0.5	**1.6**	---	---	<1
	3/10/2009	8260B/CA_LUFTMS	**9.3**	**0.6**	**3.7**	---	---	**2.2**
	12/1/2009	8260B/CA_LUFTMS	**5.7**	<0.5	**1.7**	---	---	<1
	4/1/2010	8260B/CA_LUFTMS	**3.9**	<0.50	**1.5**	---	---	<1.0
	9/15/2010	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/4/2011	8260B/CA_LUFTMS	**1.1**	<0.50	<0.50	---	---	<1.0
	9/13/2011	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/8/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/5/2012	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/20/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	9/10/2013	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0
	3/11/2014	8260B/CA_LUFTMS	<0.50	<0.50	<0.50	---	---	<1.0

Notes:
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
ug/L = micrograms per liter
"<" = not detected at or above laboratory reporting limit
--- = not analyzed

Table C-3
Historical Summary of Metals in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Inorganic Compounds																			
			Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
			Results (mg/L)																			
MW-1	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	61	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	<0.1		---	<0.01	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.33	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.03
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.6	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.18
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.123	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	0.00542	<0.0100
	7/5/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.117	<0.00100	<0.00500	0.00513	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00539	<0.0150	<0.00500	<0.0150	<0.00500	<0.0100
MW-2	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	64	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	<0.1		---	1.4	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.16	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	0.02	<0.05	<0.01	<0.05	<0.01	0.01
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.48	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.15
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.119	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.0125	<0.0150	<0.00500	<0.0150	0.0076	0.0302
	7/6/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.109	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.0132	<0.0150	<0.00500	<0.0150	<0.00500	<0.0100
MW-7	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	59	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	1.8		---	4.3	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.18	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.02
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.54	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.11
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.137	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	<0.0100
	7/6/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.134	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	<0.0100
MW-8	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	64	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	1.7	---	---	3.1	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.28	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.03
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.42	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.14
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.134	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.01
	7/6/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.118	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.022
MW-9	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	33	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	0.1	---	---	0.87	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.26	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.03
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.51	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.15
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.196	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.0172	<0.0150	<0.00500	<0.0150	<0.00500	0.0252
	7/5/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.189	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.0161	<0.0150	<0.00500	<0.0150	<0.00500	0.055
MW-10	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	97	---	---	---	---	---	---	---	---	---
			---	---	---	---	---	---	---	---	---	---	110		---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	<0.1	---	---	1.9	---	---	---	---	---	---	---	---
			---	---	---	---	---	---	---	---	<0.1		---	1.9	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.17	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.01
			<0.05	<0.05	0.17	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
			---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
			---	---	---	---	---	---	---	---			---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.44	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	<0.05
			<0.15	<0.20	0.36	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.091
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
			---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.172	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0309
	7/6/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.173	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0316
MW-11	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	150	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	3.6	---	---	5.3	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.32	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.03
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.63	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.14
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.324	<0.00100	<0.00500	0.0321	0.011	0.00958	---	<0.0100	---	---	<0.000500	<0.00500	0.0394	<0.0150	<0.00500	<0.0150	0.0214	0.0511
	7/5/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.171	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0317
MW-12	3/10/2005[1]	200.7	---	---	---	---	---	---	---	---	---	---	230	----	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	2.2		---	1.9	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.42	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	0.01	<0.05	<0.01	<0.05	<0.01	0.06
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005[1]	3010/6010	<0.15	<0.20	0.7	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.2
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.146	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00829	<0.0150	<0.00500	<0.0150	0.00561	0.0407
	7/5/2006[1]	6010B / 7470A	<0.0150	<0.0100	0.141	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00805	<0.0150	<0.00500	<0.0150	0.0086	0.0537

Table C-3
Historical Summary of Metals in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Inorganic Compounds																			
			Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
			Results (mg/L)																			
MW-13	3/10/2005(1)	200.7	---	---	---	---	---	---	---	---	---	---	83	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	0.3		---	0.37	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.25	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.05
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005(1)	3010/6010	<0.15	<0.20	0.29	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.091
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.0492	<0.00100	<0.00500	0.00768	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00721	<0.0150	<0.00500	<0.0150	0.00751	0.0134
	7/5/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.0382	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0124
MW-14	3/10/2005(1)	200.7	---	---	---	---	---	---	---	---	---	---	190	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	0.8	---	---	0.78	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.46	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	0.09
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005(1)	3010/6010	<0.15	<0.20	0.6	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.18
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/5/2006	6010B / 7470A	<0.0150	<0.0100	0.14	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0743
			<0.0150	<0.0100	0.143	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0439
	7/5/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.121	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0631
			<0.0150	<0.0100	0.117	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0207
MW-15	3/10/2005(1)	200.7	---	---	---	---	---	---	---	---	---	---	400	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	0.1		---	4.1	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.52	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	0.02	<0.05	<0.01	<0.05	<0.01	0.06
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005(1)	3010/6010	<0.15	<0.20	0.82	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.2
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.223	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.022
	7/6/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.218	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00613	<0.0150	<0.00500	<0.0150	<0.00500	0.0261
MW-16	6/28/2005(1)	3010/6010	<0.15	<0.20	0.7	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.2
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.154	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00578	<0.0150	<0.00500	<0.0150	<0.00500	0.0114
	7/6/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.146	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0629
MW-17	3/10/2005(1)	200.7	---	---	---	---	---	---	---	---	---	---	45	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	<0.1		---	0.06	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.04	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005(1)	3010/6010	<0.15	<0.20	0.47	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	<0.05
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.127	<0.00100	<0.00500	0.0146	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.0166	<0.0150	<0.00500	<0.0150	0.0105	0.018
	7/6/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.0957	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	<0.00500	<0.0150	<0.00500	<0.0150	<0.00500	0.0296
MW-18	3/10/2005(1)	200.7	---	---	---	---	---	---	---	---	---	---	220	---	---	---	---	---	---	---	---	---
		200.8	---	---	---	---	---	---	---	---	0.8		---	0.77	---	---	---	---	---	---	---	---
		6020	<0.05	<0.05	0.76	<0.005	<0.01	<0.01	<0.01	<0.005	---	<0.005	---	---	---	0.02	0.02	<0.05	<0.01	<0.05	0.01	0.16
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.0002	---	---	---	---	---	---	---
		SM 2340B	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	6/28/2005(1)	3010/6010	<0.15	<0.20	0.79	<0.01	<0.01	<0.01	<0.05	<0.05	---	<0.05	---	---	---	<0.05	<0.05	<0.20	<0.01	<0.40	<0.05	0.16
		7470	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	---	---	---	---	---	---	---
	7/6/2006	6010B / 7470A	<0.0150	<0.0100	0.159	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00965	<0.0150	<0.00500	<0.0150	0.0101	0.0177
	7/6/2006(1)	6010B / 7470A	<0.0150	<0.0100	0.153	<0.00100	<0.00500	<0.00500	<0.00500	<0.00500	---	<0.0100	---	---	<0.000500	<0.00500	0.00653	<0.0150	<0.00500	<0.0150	0.00856	<0.0100

Notes:
(1) sample was filtered in the field using 0.45 micron filter
mg/L = milligrams per liter
"<" = not detected at or above laboratory reporting limit
--- = not analyzed

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-1	12/10/1987	610	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1/8/1988	610	<2	<4	<2	<4	<2	<2	<2	<6	<2	<8	<3	<5	<3	<3	<3	<4
	11/8/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	11/10/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	3/27/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	1/12/1996	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	3/10/2005(2)	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/29/2007	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.027 J**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2011	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/18/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-2	12/10/1987	610	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1/8/1988	610	<2	<4	<2	<4	<2	<2	<2	<6	<2	<8	<3	<5	<3	<3	<3	<4
	11/8/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	11/10/1988	610	<5	<5	<5	<25	<5	<5	---	<5	<5	<5	<5	<5	<5	<5	<25	<25
	3/9/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	1/12/1996	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	11/10/1998	610	----	----	----	----	----	----	<5	----	----	----	----	----	----	----	----	----
	2/15/2000	8310	<0.20	<0.20	<0.20	**0.33**	**0.26**	<0.20	<0.20	<0.20	**0.37**	<0.20	**0.34**	<0.20	<0.20	<0.20	<0.20	**0.24**
	5/17/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/15/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	11/17/2000	8310	**0.23**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/14/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.29**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	5/10/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/7/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	11/5/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2002	8310	<0.5	**0.41**	<2.0	<0.1	<0.05	<0.1	<0.2	<0.05	<0.05	<0.1	<0.1	<10	<2	<5.0	<0.1	<0.05
	11/11/2002	SW8310	<1	<0.4	<4.0	<0.2	<0.1	<0.2	<0.4	<0.1	<0.1	<2.0	<0.2	<20	<4.0	<10	<0.2	<0.1
	2/10/2003	SW8310	<0.5	<0.2	<2.0	<0.1	<0.05	<0.1	<0.2	<0.05	**0.2**	<1.0	<0.1	<10	<2.0	<5.0	<0.1	<0.05
	1/30/2004	8270	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	12/21/2004	8270	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-2	3/10/2005[2]	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005[1]	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006[1]	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	**1.2**	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/29/2007	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.029 J**	<0.11	<0.11	<0.11	**0.047 J**	<0.11	<0.11	<0.11	<0.11	<0.11
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.14**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/20/2013	8270C SIM	<0.10	<0.10	<0.10	**0.24**	**0.41**	<0.10	<0.10	**0.13**	**0.56**	**0.21**	**0.27**	**0.31**	**0.12**	**0.21**	<0.10	**0.17**
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-3	12/1/1987	610	**117.4**	**23.7**	**24.8**	**25.4**	**36.8**	**67.2**	**21.2**	**41.2**	**182.4**	**17.2**	**22.5**	**12.8**	<3	**26.3**	<3	<4
			138	**16**	**16.6**	**14.2**	**34**	**76.2**	**15.6**	**28.6**	**90.8**	**26.7**	**17.7**	**24.3**	<3	**33.8**	<3	<4
	12/10/1987	610	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	1/8/1988	610	**17.2**	**4.3**	**2.2**	<4	**10.3**	**8.5**	<2	<6	**9.3**	<8	**3.1**	<5	<3	**4.6**	<3	<4
	3/4/1988	610	**11.5**	<1	<1	<1	**2.5**	**4.1**	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	11/8/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	11/10/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	3/9/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	3/5/1997	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	6/19/1997	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<3	<10	<10	<10	<4.5	<10
MW-4	5/20/1988	unknown	**3.5**	<1	<1	<1	<1	**1.2**	**1**	<1	<1	<1	<1	<1	<1	<1	<1	<1
	3/9/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	4/19/1997	8310	**33**	<2	**1.2**	<0.4	**1.5**	**9.5**	**1.8**	<0.1	**2.5**	<0.2	<2	<0.2	<0.2	<0.3	<0.6	<0.2
	6/19/1997	8270	**33**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<3	<10	<10	<10	<4.5	<10
MW-5	5/20/1988	unknown	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	11/8/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	11/10/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	3/9/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	1/12/1996	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	2/15/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	5/17/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/15/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	11/17/2000	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/14/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	5/10/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/7/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	11/5/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2002	8310	<0.5	**0.23**	<2.0	<0.1	<0.05	<0.1	<0.2	<0.05	<0.05	<0.1	<0.1	<10	<2	<5.0	<0.1	<0.05

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-7	5/20/1988	unknown	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	11/8/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	11/10/1988	610	<5	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<25
	3/27/1989	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	1/12/1996	8270	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	3/10/2005(2)	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.3**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/19/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	5/22/2008	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	12/1/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	**0.12**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/1/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/2/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	0.13	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-8	6/15/1999	8310/3510	**95**	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	8/11/1999	8310/3510	**190**	<2.0	<2.0	<2.0	**15**	<2.0	**40**	**4.5**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	11/11/1999	8310/3520	**62**	<0.20	<0.20	<0.20	<0.20	<0.20	**5.9**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2000	8310	**53**	<0.20	**5.4**	<0.20	**0.94**	<0.20	**44**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	5/17/2000	8310	**57**	<2.0	**6.8**	<2.0	**6.8**	<2.0	**7.7**	<2.0	**43**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	8/15/2000	8310	**47**	<0.20	**7**	**2**	**3.4**	<0.20	<0.20	<0.20	**13**	**2.4**	**0.79**	<0.20	**1.3**	**3.4**	<0.20	<0.20
	11/17/2000	8310	**47**	<0.20	**3.6**	**0.43**	<0.20	<0.20	**4.3**	<0.20	**4.7**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/14/2001	8310	**44**	<0.20	<0.20	**0.26**	<0.20	<0.20	<0.20	<0.20	**13**	<0.20	**0.22**	<0.20	<0.20	<0.20	<0.20	<0.20
	5/10/2001	8310	**25**	<0.20	<0.20	<0.20	<0.20	<0.20	**2.9**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/7/2001	8310	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	11/5/2001	8310	**13**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2002	8310	**14**	**1.3**	<2.0	<0.5	**0.53**	<0.5	**1.3**	<0.5	<0.5	<0.5	<0.5	**0.98**	<2	<5.0	<0.5	<0.5
	11/11/2002	SW8310	**7.3**	<1	<10	<0.5	<0.2	<0.5	<1	<0.2	<0.2	<5.0	<0.5	<50	<10	<25	<0.5	<0.2
	2/10/2003	SW8310	**2.1**	<1.0	<10	<0.5	**0.6**	<0.5	<1.0	<0.2	**0.64**	<5.0	<0.5	<50	<10	<25	<0.5	<0.2
	1/30/2004	8270	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	12/21/2004	8270	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
	3/10/2005(2)	8270 (SIM)	**1.3**	<0.1	<0.1	<0.1	<0.1	<0.1	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	**2**	<1.0	<0.10	<0.10	**0.11**	<0.10	<2.0	<0.10	**0.1**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	11/30/2009	8270C (SIM)	**0.14**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-9	6/15/1999	3510	----	----	----	----	----	----	----	----	**1.4**	----	----	----	----	----	----	----
		8310/3510	<0.20	<0.20	**6.5**	<0.20	**0.83**	<0.20	<0.20	**3.5**	----	<0.20	**1.1**	<0.20	<0.20	**0.31**	<0.20	<0.20
	8/11/1999	8310/3510	**66**	<2.0	**24**	**6**	**21**	<2.0	**23**	**3.1**	**39**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	**6.8**
	11/11/1999	8310/3520	**44**	<0.20	**5.2**	<0.20	**3.6**	<0.20	**4.9**	<0.20	**4**	<0.20	**1.2**	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2000	8310	**33**	<0.20	**4.6**	**0.29**	**0.77**	<0.20	**11**	**0.82**	**1.3**	**0.34**	**0.26**	<0.20	<0.20	**0.22**	<0.20	<0.20
	5/17/2000	8310	**30**	<0.20	**2.3**	**0.83**	**1.3**	<0.20	**3.8**	<0.20	**1.5**	**0.94**	**1**	**0.77**	**0.32**	**0.7**	<0.20	**0.76**
	8/15/2000	8310	**36**	<0.20	**7.6**	**0.35**	**1.4**	<0.20	**2.2**	<0.20	**1.5**	**0.41**	**1.3**	<0.20	<0.20	**0.41**	<0.20	**0.25**
	11/17/2000	8310	**42**	<0.20	**9.1**	<0.20	<0.20	<0.20	**2.2**	<0.20	**0.22**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/14/2001	8310	**26**	<0.20	**4.1**	<0.20	**0.63**	**9**	**2**	<0.20	**1**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	5/10/2001	8310	**25**	<0.20	<0.20	<0.20	<0.20	<0.20	**1.6**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	8/7/2001	8310	**11**	<0.20	<0.20	<0.20	<0.20	<0.20	**0.73**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.29**	<0.20	<0.20
	11/5/2001	8310	**29**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	2/15/2002	8310	**11**	**1.7**	<2.0	<0.5	**0.49**	<0.5	**0.73**	<0.5	<0.5	<0.5	<0.5	**0.98**	<2	<5.0	<0.5	<0.5
	11/11/2002	SW8310	**8.2**	<1.0	<10	<0.5	<0.2	<0.5	<1	<0.2	<0.2	<5.0	<0.5	<50	<10	<25	<0.5	<0.2
	2/10/2003	SW8310	**4.4**	<1.0	<10	<0.5	<0.2	<0.5	<1.0	<0.2	**0.29**	<5.0	<0.5	<50	<10	<25	<0.5	<0.2
	1/30/2004	8270	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	12/21/2004	8270	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	3/10/2005(2)	8270 (SIM)	**0.6**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	**0.012 J**	**0.033 J**	<0.11	<0.11	**0.023 J**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/1/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/2/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.1**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/2/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**<0.10**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**<0.10**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/18/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-10	3/10/2005(2)	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.023 J**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.13**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
			<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-10	3/9/2009	8270C (SIM)	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
	11/30/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/10/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-11	3/10/2005(2)	8270 (SIM)	**0.2**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	**1.3**	<1.0	**0.21**	<0.10	<0.10	**0.52**	<2.0	**0.12**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-12	3/10/2005(2)	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/29/2007	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/20/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-13	3/10/2005(2)	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-14	3/10/2005(2)	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	**2**	<1.0	**0.16**	<0.10	<0.10	**0.72**	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/5/2006	8270C	**4.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
			4.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/5/2006(1)	8270C	**3.5**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
			3.7	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-15	3/10/2005(2)	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-16	6/28/2005(1)	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/18/2007	8310	<1.0	**3.4**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	**<0.10**	<0.10	<0.10	**0.13**	**0.043 J**	**0.026 J**	**0.029 J**	<0.10	**0.26**	<0.10	<0.10	<0.10	<0.10	**0.097 J**	<0.10	<0.10
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/9/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.19**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-17	3/10/2005(2)	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	**0.15**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-18	3/10/2005(2)	8270 (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	6/28/2005(1)	8310	<1.0	<1.0	<0.10	<0.10	<0.10	<0.10	<2.0	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	7/6/2006	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	7/6/2006(1)	8270C	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	4/19/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-18	11/28/2007	8270C (SIM)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/1/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/1/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/2/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-19	4/18/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	**0.081 J**	<0.10	<0.10	<0.10	**0.031 J**	**0.019 J**	**0.042 J**	**0.011 J**	**0.038 J**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
			<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.13**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	**0.27**	<0.11	<0.11	<0.11	<0.11	<0.11	**9.2**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
			0.25	<0.11	<0.11	<0.11	<0.11	<0.11	**7.9**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
MW-19S	3/3/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-19D	11/30/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/3/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.12**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/18/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/10/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-20	4/19/2007	8310	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.20	<1.0	<1.0	<1.0	<1.0	<1.0
	11/28/2007	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.020 J**	**0.016 J**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
			<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	**0.022 J**	**0.013 J**	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
	5/22/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	**0.12**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/9/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	11/30/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.10**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
MW-20	3/10/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-21	5/30/2008	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/9/2009	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	12/2/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.11**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-22	12/2/2009	8270C (SIM)	**0.17**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	**0.82**	**0.12**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/16/2010	8270C SIM	**0.12**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2011	8270C SIM	**0.31**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/4/2012	8270C SIM	**0.37**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	**0.39**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.11**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	**0.32**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
MW-23	11/30/2009	8270C (SIM)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.28**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	**0.12**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/3/2011	8270C SIM	<0.10	**0.17**	**0.23**	<0.10	**0.29**	**0.21**	**0.83**	**0.46**	**0.3**	**0.14**	<0.10	**0.11**	<0.10	**0.13**	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/18/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/9/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/10/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
EBAMW-1	3/10/2009	8270C (SIM)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	4/1/2010	8270C (SIM)	**0.66**	**1.0**	<0.10	<0.10	<0.10	**0.16**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/7/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/19/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Table C-4
Historical Summary of PAHs in Groundwater
Former Santa Rosa MGP
Santa Rosa, California

Well Name	Sample Date	Analytical Method	Non-Carcinogenic Polycyclic Aromatic Hydrocarbons									Carcinogenic Polycyclic Aromatic Hydrocarbons						
			Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (ghi) perylene	Fluoran-thene	Fluorene	Naphthalene	Phenan-threne	Pyrene	Benzo(a) Anthra-cene	Benzo(a) pyrene	Benzo(b) Fluoran-thene	Benzo(k) Fluoran-thene	Chrysene	Dibenzo (a,h) Anthracene	Indeno-(1,2,3-cd)-pyrene
			Results (ug/L)									Results (ug/L)						
EBAMW-2	12/2/2008	8270C (SIM)	<0.11	<0.11	<0.11	<0.11	<0.11	**0.51**	**18**	**0.23**	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
	3/10/2009	8270C (SIM)	**1.2**	<0.56	**0.79**	<0.56	<0.56	<0.56	**2.2**	**38**	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56	<0.56
	12/1/2009	8270C (SIM)	**1.2**	**0.55**	**0.72**	<0.1	**0.33**	**2.1**	**0.16**	**1.1**	**0.22**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	4/1/2010	8270C (SIM)	**0.58**	**0.32**	**0.35**	<0.10	**0.13**	**1.3**	**0.13**	<0.10	**0.13**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/15/2010	8270C SIM	**0.61**	**0.35**	**0.43**	<0.10	**0.18**	**2.3**	**0.11**	<0.10	**0.14**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/4/2011	8270C SIM	**1.0**	**0.45**	**0.57**	<0.10	**0.21**	**2.8**	**0.17**	<0.10	**0.15**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/13/2011	8270C SIM	**0.7**	**0.3**	**0.34**	<0.10	**0.15**	**1.9**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/8/2012	8270C SIM	**0.72**	**0.33**	**0.31**	<0.10	**0.14**	**1.1**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/5/2012	8270C SIM	**0.29**	**0.21**	**0.26**	<0.10	**0.18**	**0.30**	<0.10	<0.10	**0.11**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/20/2013	8270C SIM	<0.10	<0.10	**0.13**	<0.10	<0.10	**0.11**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	9/10/2013	8270C SIM	**0.17**	**0.10**	**0.15**	<0.10	<0.10	**0.23**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	3/11/2014	8270C SIM	**0.11**	<0.10	<0.10	<0.10	<0.10	**0.17**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Notes:
(1) sample was filtered by the laboratory prior to analysis using 0.7 micron glass fiber filter
(2) sample was filtered in the field using 0.45 micron filter
PAH = polycyclic aromatic hydrocarbon
ug/L = micrograms per liter
"<" = not detected at or above laboratory reporting limit
--- = not analyzed
J = Result is less than the reporting limit (RL) but greater than or equal to the method detection limit (MDL) and the concentration is an approximate value