Project No.
7380.000.003

July 12, 2011

Mr. Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6540

Subject: 1000 North Vasco Road
Livermore, California
ACEH Case No. RO0003073

INTERIM REMOVAL ACTION WORKPLAN

Dear Mr. Wickham:

We have prepared this Interim Removal Action Workplan for remediation of soil impacts associated with the former leaking underground storage tank and dispenser systems at 1000 North Vasco Road in Livermore, California (Site). The Interim Removal Action Workplan has been prepared following the completion of site characterization activities completed in the spring of 2011, as well as under the direction and comments provided in your directive letter dated July 7, 2011.

BACKGROUND

Site Description

The Site is located between North Vasco Road and Central Avenue and south of a flood control channel in Livermore, California (Figure 1). According to a published USGS topographic map, the 5.8-acre Property slopes gently westward at an elevation of approximately 525 feet above mean sea level (msl). The eastern two-thirds of the Property is currently occupied by a former gasoline station and car wash complex, a restaurant, two metal buildings, and a paved parking lot. The western one-third of the Property is undeveloped. The Site is currently an active Leaking Underground Storage Tank case (LUST) under the oversight of Alameda County Environmental Health (ACEH) (Case No. RO0003073).

SUMMARY OF PREVIOUS INVESTIGATIONS

ENGEO; Modified Phase One Environmental Site Assessment, 1000 North Vasco Road, Livermore, California; October 27, 2006; Project No. 7380.1.001.02.

ENGEO performed a Modified Phase One Environmental Site Assessment at the Property in 2006. Two Recognized Environmental Conditions (RECs) were noted – the gas station and the

automotive service facility. The gas station had been identified as a leaking underground storage tank (LUST) site. Four underground fuel storage tanks (USTs) were removed from the Property in 1994. At the time of the removal, evidence of leakage was observed at the tanks and/or associated piping. The tank pits and fuel dispenser locations were over-excavated as part of the remedial action. Hydrocarbon impact was confirmed within soils near the USTs. In May 1995, three groundwater wells were installed at the Property. One well (MW-1) exhibited detectable total petroleum hydrocarbons as diesel (TPH-d) concentrations for two (first and last) of the four quarters the wells were sampled. Gasoline was reported in one well (MW-3) during the initial 1995 sampling event. None of the BTEX (benzene, toluene, ethylbenzene and total xylene(s)) compounds were detected during the sampling events.

ACEH issued a Remedial Action Completion Certification (RACC) report dated May 22, 2000, stating that no further action related to the petroleum release(s) at the Property was required, and on May 23, 2000, issued a fuel leak site closure letter acknowledging the case was closed. The Regional Water Quality Control Board (RWQCB) signed and stamped the RACC report. The Property is listed as case closed in the LUST database maintained by the RWQCB.

Kens Tire, an automotive service facility, was observed in the south-central area of the Property. Hazardous and potentially hazardous materials were stored and generated at the facility. Though good housekeeping practices were observed at this facility, ENGEO opined that it was possible that unauthorized releases may have produced localized impacts to the subject property.

Additionally, approximately 600 cubic yards of material had been stockpiled on the vacant western portion of the property, which was generated from the UST removal.

Based on the initial findings of the assessment, the work scope was revised to include soil and groundwater sampling. Borings were advanced near USTs and dispensing equipment to facilitate soil and groundwater sampling, and composite soil samples were collected from soil stockpile on the vacant western portion of the Property.

A total of 12 direct push soil borings were advanced near the former USTs and fuel dispenser islands. Most of the collected soil samples exhibited either non-detectable or trace concentrations of hydrocarbon analytes; however, two samples collected near the diesel USTs exhibited elevated total petroleum hydrocarbons as gasoline (TPH-g), TPH-d, and TPH as motor oil (TPH-mo) concentrations (maximum concentrations of 310 milligrams per kilogram (mg/kg), 730 mg/kg, and 2,200 mg/kg for TPH-g, TPH-d, and TPH-mo respectively). No BTEX or MTBE concentrations were detected in the collected soil samples.

Groundwater samples were collected from the two monitoring wells observed on the property. The groundwater samples were recovered from MW-1 (adjacent to the former diesel tank pit) and from MW-3 (near former gasoline fuel dispensers). The samples were analyzed for TPH-g, TPH-d, TPH-mo, BTEX, and MTBE. None of the samples exhibited detectable analyte concentrations.

A total of five 4-point composite soil samples were collected from the stockpiled soil. Trace concentrations of TPH-d, TPH-mo, and toluene were detected in some of the collected samples. These concentrations were below respective screening levels. Additionally, the samples exhibited detectable concentrations of several CAM-17 metal analytes; however, these were within expected background concentrations.

ENGEO; Supplemental Environmental Services, Shell Gas Station, 1000 North Vasco Road, Livermore, California; June 20, 2007; Project No. 7380.1.002.04.

ENGEO conducted a soil gas survey at the Property in 2007. The scope of work consisted of the recovery of three soil gas samples for laboratory analysis. One sample, G-1, was the only sample documented to contain concentrations of compounds at levels above established Environmental Screening Levels (ESLs) established by the RWQCB and California Human Health Screening Levels (CHHSLs) established by the California EPA Office Of Environmental Health Hazard Assessment. The detected concentrations of benzene and tetrachloroethylene were above these respective screening levels. Additionally, significantly elevated concentrations of hexane, tetrahydrofuran, cyclohexane, and 2, 2, 4-trimethylpentane were detected. At the time, ENGEO indicated that the elevated concentrations may have been attributable to a surface or subsurface gasoline release. However, although isopropyl alcohol (the tracer compound used at the time) was not detected, the presence of several of these compounds at elevated concentrations, without the presence of other typical gasoline constituents, indicates that the quality of this sample data may be questioned.

Krazan and Associates, Inc.; Phase I Environmental Site Assessment, BOTW No. 09-510-02, Geno's Country Store, 1000 North Vasco Road, Livermore, California; April 3, 2009; Project No. 013 09074.

Krazan and Associates, Inc. (Krazan) performed a Phase I Environmental Site Assessment at the Property in 2009. Based on their assessment of the Property, Krazan identified two RECs, two potential RECs, and one historic REC. These were as follows:

RECs

- At the time of the reconnaissance, five former gasoline dispenser islands were observed to the east of the restaurant, and four former diesel dispensers were observed to the north of the restaurant. Further, Krazan noted evidence of three USTs to the north and northeast of the restaurant. According to available records, these included two 15,000-gallon gasoline tanks and one 10,000-gallon diesel tank. The tanks and associated dispensers were reportedly installed in 1994 and temporarily sealed and abandoned in 2008.

- Four storm drains were observed during the site reconnaissance. According to the property owner at the time of the assessment, these drains were reportedly not connected to the municipal sewer system that services the Property, but instead were connected to dry wells

measuring approximately 4 to 6 feet in diameter and 15 feet in depth. Given the Property use and the shallow groundwater table, these storm drains were considered an REC.

Potential RECs

- At the time of the reconnaissance, approximately 200 waste tires were observed at the Property. Although not considered an environmental condition, these were considered a potential code compliance issue and potential environmental concern.

- Krazan noted that a citizen's complaint of oil in the creek north of the Property was filed in January 1999. The Livermore-Pleasanton Fire Department (LPFD) reportedly responded to the complaint and observed an oil sheen extending approximately 1 mile in length. A file review did not identify records associated with the spill. The Property owner at the time of the assessment indicated that he was unaware of a release associated with the Property, and an overturned tanker truck near the Property near the time of the complaint may have been responsible for the release.

Historical REC

- Krazan identified the former leaking underground storage tank (LUST) at the Property as a historical REC. Four USTs and associated piping and dispenser systems were removed in 1994. Following tank removal and over-excavation, confirmation soil and groundwater sampling based on visual observation of soil staining and odor identified elevated petroleum hydrocarbons and BTEX constituents. Following additional soil excavation, it was reported that the bulk of impacted soil had been removed. Three groundwater monitoring wells were installed to a depth of 15 feet below the ground surface. Following on-going groundwater monitoring, ACEH issued a Remedial Action Completion Certification (RACC) report in May 2000.

Krazan and Associates, Inc., Phase II Environmental Site Assessment, BOTW No. 09-510-02, Geno's Country Store, 1000 North Vasco Road, Livermore, California; September 28, 2009; Project No. 013-09074.

Krazan performed a Phase II Environmental Site Assessment at the Property in 2009. The work was performed to assess the RECs identified in the Phase I report as well as other potential subsurface areas of impact. A total of 17 soil borings were advanced to depths between 5 and 20 feet below the ground surface (bgs) in the location of the USTs, piping, dispensers, dry wells, and sumps (including near the car wash and the restaurant grease trap). Soil samples collected from the USTs, piping, and dispensers (collected from 15 and 20 feet bgs at the USTs, and 10 and 15 feet bgs at the piping/dispensers) were analyzed for the presence of TPH-g, TPH-d, BTEX, and MTBE. Samples collected near the dry wells and sumps (collected at a depth of 5 feet bgs) were analyzed for the presence of total extractable petroleum hydrocarbons (TEPH), volatile organic compounds (VOCs), and CAM-17 metals. Additionally, a groundwater sample

was collected from MW-3 (located to the east of the restaurant) and analyzed for the presence of TPH-g, TPH-d, BTEX, and MTBE.

TPH-d concentrations were detected in selected samples collected near the dispensers; however, these concentrations were below appropriate screening levels. None of the samples collected near the USTs, piping, or dispensers exhibited detectable concentrations of TPH-g, BTEX, or MTBE. None of the samples collected near the sumps or dry wells exhibited detectable concentrations of TEPH or VOCs. Detected metal analytes were below appropriate screening levels or within typical background concentrations. The groundwater sample exhibited a detected MTBE concentration of 2.2 micrograms per liter (µg/l). No other analytes were detected in the sample. Krazan attributed the MTBE detection to an offsite source.

Based on the results of the assessment, Krazan did not recommend additional subsurface assessment in the areas that had been investigated.

Tank and Pipeline Removal Narrative, 1000 N. Vasco Road Livermore, California, January 21, 2011 and January 27, 2011.

ENGEO reviewed a recently completed tank and pipeline report, summarizing work observed by Mr. Marc Papineau. Following diesel and gasoline tank removal, a total of 23 soil samples were collected, including four from the gasoline storage tank pit, four from the diesel tank pit, twelve from the piping trenches, one from the base of the vent pipe rack below elbow depth, and two from soil stockpiles generated during removal. Additionally, two pit water samples were collected (one from each of the two tank pits). The sampling was reportedly performed under the observation of Inspector Danielle Stefani of the LPFD.

Trace TPH-d concentrations were identified in some of the samples collected near the gasoline dispensers. Elevated concentrations of TPH-d (ranging from 1,400 to 3,200 mg/kg) were detected in three near-surface soil samples collected near the former diesel dispensers. Additionally, concentrations of TPH-g (240 µg/l), MTBE (0.98 µg/l) TBA (5 µg/l), toluene (6.3-7.6 µg/l), ethylbenzene (3.8-4.6 µg/l), and xylene(s) (38-41 µg/l) were detected in water sample collected from the gasoline tank pit. The diesel tank pit water sample exhibited concentrations of 540,000 µg/l of TPH-d, 190 µg/l of ethylbenzene, 800 µg/l of toluene, and 1,500 µg/l of xylene(s).

ENGEO; Phase I Environmental Site Assessment Update, Macedo Property, Livermore, California; March 18, 2011; Project No. 7380.000.002.

ENGEO prepared a phase I environmental site assessment update in March 2011. A review of regulatory databases maintained by county, state, and federal agencies identified the Property as a previous LUST case, having been granted closure in 2000. A review of regulatory agency records and available databases did not identify contaminated facilities at elevations higher than the Property and within the appropriate ASTM search distances that would be expected to affect

the Property. The report noted the recent removal of diesel and gasoline tanks from the Property as well as the reported soil and groundwater impact near the tanks and appurtenant facilities.

Several standpipes were observed around the perimeter of the automotive repair facility. The purpose of these standpipes was subsequently reported to be affiliated with an unfinished sewer system. Additionally, the potential presence of asbestos-containing building materials (ACBM) and lead-based paints was noted, and a lead-based paint and asbestos survey was recommended for completion prior to demolition or significant renovation of the structures.

Several locations across the Property were observed to include the storage and use of fresh and waste petroleum products and potentially hazardous materials, as well as waste tires. Although testing of these materials and locations was not recommended at the time of report preparation, recommendations were made for removal and proper disposal of these materials. Additionally, a recommendation was made for an environmental professional to observe demolition and grading activities in these locations to determine if environmental impact had occurred.

Based on the findings of this assessment, two Recognized Environmental Conditions (RECs) were identified: the identified soil and groundwater impact associated with the former underground storage tanks and the presence of an automotive service facility. Several potential and historical RECs were identified for the Property, including the potential presence of lead based paint and asbestos-containing building materials, the historic LUST case (closed in 2000), and the aforementioned storage of fresh and waste petroleum product, potentially hazardous materials and waste tires.

ENGEO; Site Characterization Report, 1000 North Vasco Road, Livermore, California; June 17, 2011; Project No. 7380.000.003.

ENGEO prepared a site characterization report in June 2011. Several site characterization activities were performed, including stockpile soil sampling, shallow soil sampling, subsurface soil sampling, groundwater sampling, and soil vapor sampling.

Petroleum hydrocarbon impact (consisting primarily of diesel-range hydrocarbons) was confirmed near the former gasoline and diesel USTs and diesel dispenser lines. Isolated groundwater impacts were also identified but were confirmed to be limited in magnitude and in extent. Only two grab groundwater samples exhibited concentrations in excess of respective ESLs. Elevated TPH concentrations detected at the time of UST removal in early 2011 were not considered representative of groundwater conditions and have been attributed to cross-contamination or other transient conditions at the time of sampling.

Elevated gasoline-range hydrocarbons were detected in soil vapor samples collected at the Property. These concentrations have been confirmed to consist of hydrocarbon ranges associated with advanced weathered gasoline or heavier fuel ranges. These are likely attributable to the aforementioned soil impacts. Detections in soil vapor samples collected in areas outside of the

former UST or dispenser areas have been attributed to soil vapors emanating from the identified area of impact.

ENGEO recommended that an excavation program be pursued to remediate the confirmed impacted soil and proposed the preparation of a remedial workplan to outline an excavation program.

CONCEPTUAL SITE MODEL

Combining the data from the recent workplan with that collected during the past explorations and sampling programs completed by ENGEO, Krazan, and Mr. Marc Papineau, we have prepared a conceptual site model (CSM). The CSM has been developed from the known site history and soil and groundwater data collected at the Property to date.

Geology and Topography

The site is located within the Coast Ranges geomorphic province of California. The Coast Ranges are dominated by a series of northwest-trending mountain ranges that have been folded and faulted in a tectonic regime that involves both translational and compressional deformation. The site is located in the southwest portion of the Livermore Valley, which is underlain by a thick sequence of alluvial deposits. The soil deposits in this area are mapped as Pleistocene alluvial fan and fluvial deposits (Helley & Graymer, 1997). According to published USGS topographic maps, the Property slopes gently westward at an elevation of approximately 525 to 530 feet above mean sea level. The earthen slope of the flood control channel bordering the site along the eastern portion of the northern property line is approximately 8 feet in height.

Subsurface Stratigraphy

Based on the findings of ENGEO's past field explorations at the Property, the site soils consist of fill over interbedded silty clay, sandy clay, clayey sand and silty sand with various amounts of gravel. Fill found in a boring drilled at the eastern portion of the site is approximately 2 feet thick and consists of silty clay. The sandy deposits were found to be loose to medium dense in consistency. According to previous CPT soundings, the sandy layers range from very thin to up to approximately 10 feet in thickness. The clayey soils were found to be very stiff (ENGEO, 2010). The borings completed during this workplan confirmed these findings, as areas of fill and interbedded layers and lenses of clayey, sandy, and gravelly soils were encountered.

Groundwater

Groundwater has been encountered at approximate depths ranging between 8 and 15 feet below the ground surface during past geotechnical explorations, environmental investigations, and monitoring well sampling events. During the recent workplan, groundwater was encountered at a depth of approximately 8 to 9 feet below the ground surface. Although a groundwater direction and gradient could not be determined during this study, the groundwater gradient and flow was

determined to be directed in a west-northwest to northwesterly direction during past explorations (Krazan, 2009b).

Nature and Source of Contamination

Petroleum hydrocarbons (TPH-d and TPH-g) have been identified as the constituents of concern (COC) in soil and groundwater at the Property. The soil and groundwater impacts are associated with three of the four former UST locations and two of the three former dispenser locations; all located within the northeast portion of the Site.

The most notable soil impacts are attributed to releases of TPH-d, which appear to have occurred from the dispenser lines, as well as the USTs, since identified soil impacts have been detected at depths ranging from as shallow as 3 feet bgs to as deep as 10 feet bgs (Figure 2). Detections of TPH-mo are collocated in some areas that exhibited TPH-d impacts, which is likely due to weathering of the TPH-d fraction. TPH-g impacts to soil appear to be less extensive compared to TPH-d, and there have been no significant detections of BTEX in soil.

We suspect that much of the TPH-d impact likely occurred before the installation of the new double-wall UST and product lines in 1994. At the time of UST removal in 1994, some impacted soil was removed, although impacted soil remained in-place, potentially acting as a source for the limited groundwater impact that has been detected. Given this, we would expect the groundwater impacts to have attenuated to some extent following the 1994 removal, followed by subsequent conditions of equilibrium. This is supported by historical groundwater data, which shows that the maximum TPH-d concentration detected during our 2011 investigation (890 µg/l) is slightly less than the maximum TPH-d concentration detected in MW-1 in 1995 (910 µg/l). Following remedial activity (described below), target analyte concentrations in MW-1 subsequently decreased to non-detectable concentrations, last confirmed in 2006. TPH-g was detected in one grab groundwater sample at a concentration slightly above the respective ESL. Neither benzene nor MTBE was detected in any of the monitoring wells or soil boring samples. Based on the relatively limited groundwater impacts, we would expect RWQCB to categorize this Site as low risk.

Elevated concentrations of TPH-g and associated VOCs have been detected in shallow soil vapor samples collected at multiple locations at the Property. Despite the elevated TPH-g concentrations, only low-level concentrations of BTEX compounds (all below respective ESLs) and other hydrocarbon analytes typically associated with gasoline were detected. Further, the analytical laboratory has indicated that the detected TPH-g within soil vapor does not follow a typical pattern and is constituted on heavier-phase hydrocarbon chains, further substantiating our opinion that it is emanating from the identified TPH-d soil impact.

Relatively low concentrations of PCE and TCE have been detected in groundwater and soil vapor in various sample locations at the Property. Given that the highest concentration of TCE was exhibited in the southernmost groundwater sample and there have been no documented releases or suspected use of chlorinated solvents at the Property, the impacts appear to represent

a "background" condition, which likely originated from an upgradient source south of the Property. Although one soil vapor sample exhibited a PCE concentration (450 µg/m^3) in excess of its respective ESL, this concentration is not considered indicative of the overall PCE concentrations present in soil vapor at the Property.

Contaminant Migration and Extent of Impact

Based on the data collected during the previous and recent field investigations, TPH-d impacts to soil are present in the lower sidewalls and bases of the UST/dispenser basin excavations and within the basin backfill. Soil remediation will be performed in five "areas of concern" (Figure 2). The specific locations of the remaining soil impacts and reported concentrations are summarized as follows:

- Shallow soil impacts are present at a depth of 3 feet bgs beneath the three northern diesel dispensers that were removed in 2011. Detected concentrations of TPH-d range from 1,400 to 3,200 mg/kg (PL3-S10 through PL3-S12) at this depth. Beneath the northernmost dispenser, the soil impacts extend to a depth of 10 feet bgs; a TPH-d concentration of 860 mg/kg was detected in GP10. Samples collected from a depth of 12 feet bgs did not exhibit detectable concentrations of petroleum hydrocarbons.

- Soil impacts are present at depths of 9 to 10 feet bgs within the approximate limits of the diesel UST basin that was excavated in 1994. At the time of the UST removal in 1994, a limited over-excavation was performed which partially removed the soil impacts. Additionally, an enhanced bioremediation product was placed in groundwater that was present in the open excavation prior to backfilling. The attenuation of TPH-d impacts that were initially detected in MW-1 is attributed to this remedial activity. Recent sampling in this area has confirmed the presence of some remaining TPH-d impact; TPH-d was detected within the approximate sidewalls and base of the former excavation at concentrations ranging from 270 to 2,200 mg/kg (GP9 and 3-P1; collected in 2011 and 2006, respectively). Sample GP9-12', collected from a depth of 12 feet bgs, did not exhibit detected concentrations of petroleum hydrocarbons.

- Impacts within backfill were identified at a depth of 4 feet bgs within the eastern portion of the diesel UST basin that was excavated in 2011. TPH-d was detected in sample GP4 at a concentration of 110 mg/kg, which exceeds its respective ESL. TPH-mo was detected in the same sample at a concentration of 1,000 mg/kg, also exceeding its ESL. Deeper soil boring data from this area and the confirmation samples collected during the UST removal did not identify detectable petroleum hydrocarbon concentrations.

- A discrete area of impact was encountered near Boring 4-P1 in 2006. Elevated concentrations of TPH-g, TPH-d, and TPH-mo were detected at a depth of 7 feet bgs.

- Hydrocarbon impact was also detected within backfill soils within the southeast portion of the gasoline UST basin that was excavated in 2011. TPH-mo was detected (880 mg/kg) at a depth of 4 feet bgs, which is possibly a result of soil from the diesel UST excavation being placed as backfill in the gasoline UST excavation. Deeper soil boring data from this area and the confirmation samples collected during the UST removal did not exhibit detectable concentrations.

REMEDIAL ACTION OBJECTIVES

The development plans for the Site involve construction of single-family residences and a park. Although elevated soil vapor concentrations of TPH-g were detected across the Site, the soil and groundwater impact is limited to the area of the future park. The remedial action objectives (RAOs) of the selected remedial alternative will be to eliminate human health and groundwater quality concerns associated with the subsurface impacts at the Site.

Applicable or Relevant and Appropriate Requirements

Applicable Requirements are defined as: Those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site.

Relevant and Appropriate Requirements are defined as: Those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to the hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site.

Applicable or Relevant and Appropriate Requirements (ARARs) typically are separated into three categories as follows:

Chemical-specific ARARs. Examples include Federal/State drinking water standards, the Clean Water Act, the Clean Air Act, and classification/regulation of hazardous waste.

Location-specific ARARs. An example is the Regional Water Quality Control Board Basin Plan.

Action-specific ARARs. Examples include requirements for the transportation of hazardous waste, occupational health and safety, and hazardous waste generation.

In addition to ARARs, this analysis includes an evaluation of To-Be-Considered (TBC) criteria. TBCs are advisories, criteria, or guidance that may be considered for a particular action or specific issue, as appropriate. TBCs are not ARARs because they are neither promulgated nor enforceable. However, according to the National Contingency Plan (NCP) guidance, these

criteria also are to be considered when evaluating and selecting remedial actions necessary to protect human health and the environment. Examples of TBCs include Department of Toxic Substances Control California Human Health Screening Levels (CHHSLs), San Francisco Bay Regional Water Quality Control Board ESLs, and Environmental Protection Agency Regional Screening Levels (RSLs).

Cleanup Goals

We propose to use numeric cleanup goals as established by the San Francisco Bay Regional Water Quality Control Board. Specifically, we will use ESLs for soil assuming a residential land use scenario where groundwater is considered a potential drinking water source[1]. The proposed cleanup goals are provided in the table below:

TABLE 1
Proposed Cleanup Goals

Analyte	Soil (mg/kg)
TPH-g	83
TPH-d	83
TPH-mo	370
Benzene	0.044
Toluene	2.9
Ethylbenzene	2.3
Xylenes	2.3
MTBE	0.023

PROPOSED REMEDIAL ACTION

Excavation is considered the most expeditious and effective method for remediating soil impacts at the Site. The process involves directly removing impacted soil from the subsurface using an excavator, backhoe, or auger. A geologist or engineer will be present to guide the removal of impacted soil by field screening the sidewalls of the excavation using visual observations, and a photo ionization detector (PID). Once it is determined that the impacted soil has been sufficiently removed based on the field screening techniques, confirmation soil samples are collected from the sidewalls of the excavation. The excavated material will then be loaded into a truck for transport and disposal at an offsite facility.

[1] SFRWQCB ESLs, 2008: Table A-1 – Shallow Soil Screening Levels for Residential Land Use where Groundwater is a Potential Drinking Water Source.

IMPLEMENTATION PLAN AND SCHEDULE

We propose to implement soil excavation to remediate the subsurface impacts at the Site. We plan to perform a limited excavation within the five source areas as presented in Figure 2. The excavation areas and depths are estimated as follows:

- Area 1 – Diesel fuel dispensers – length = 40 feet; width = 17 feet; depth = 11 feet
- Area 2 – Diesel UST – length = 8 feet; width = 8 feet; depth = 5 feet
- Area 3 – Old Diesel UST – length = 30 feet; width = 15 feet; depth = 6 to 11 feet
- Area 4 – 4-P1 impact area – length = 10 feet; width = 10 feet; depth = 8 feet
- Area 5 – Gasoline UST – length = 8 feet; width = 8 feet; depth = 5 feet

The excavations will generate approximately 510 cubic yards of soil. Of the excavated material, more than half of the volume is expected to be free of impact and suitable for onsite reuse as fill material. Impacted material will be segregated and stockpiled on competent concrete or asphalt-paved area near the excavation.

Upon completion of the source area excavation, confirmation samples will be collected from the excavation to verify that the soil cleanup goals have been achieved. A total of one to four confirmation samples will be collected from the base of the excavation (one from Areas 2, 4, and 5; four from Areas 1 and 3). At least one confirmation sample will be collected from each excavation sidewall (minimum of four per excavation). For larger excavations (Areas 1 and 3), one sample will be collected for every 15 feet of excavation sidewall. Sidewall samples will be collected from the $^{2}/_{3}$ depth point of each sidewall (e.g., for an excavation 6 feet in depth, a sample will be collected from a depth of 4 feet below the ground surface). Representative soil samples from the base and sidewalls of the excavation will be collected in the excavator bucket and transferred to stainless steel sample tubes, which will be fitted with Teflon, plastic caps, and labeled with a sample ID. The soil samples will be submitted to a State certified laboratory for analysis of TPH-g and TPH-d by EPA Test Method 8015; and VOCs by EPA Test Method 8260B.

Excavated soil will also be characterized for disposal and/or re-use. Four discrete samples will be collected from each of the respective clean soil and impacted soil stockpiles. Samples will be collected in stainless steel sample tubes, which will be fitted with Teflon, plastic caps, and labeled with a sample ID. The soil samples will be submitted to a State certified laboratory for analysis of TPH-g and TPH-d by EPA Test Method 8015; and VOCs by EPA Test Method 8260B. Four-point composite samples will be created for the TPH-g and TPH-d analysis, while the VOC analysis will be performed on the discrete samples. The clean soil sample results will be compared to the cleanup goals presented in Table 1. If the results meet these goals, the soil may be reused as engineered fill within the excavations. Following characterization, the impacted soil will be transported off-site and disposed of at an appropriate disposal facility.

We estimate the soil excavation activities will be completed within 3 days. Since the disturbed area will be less than 1 acre, and the excavation area is not located within the construction area for the residential development, we do not anticipate preparing a Stormwater Pollution Prevention Plan (SWPPP).

ADDITIONAL CHARACTERIZATION

As requested in the July 7, 2011 directive letter, we will perform additional characterization of subsurface conditions. This will include sampling of the existing soil vapor wells as well as sampling of an offsite well.

Soil Vapor Sampling

In addition to soil and groundwater sampling, we propose to perform a soil vapor sampling program. We will collect a soil vapor sample from each of the existing 12 wells at the Site. Samples will be collected using a sample train connected to the well casing with Swagelok® threaded fittings. The train will consist of a stainless steel twin summa manifold with built-in flow controllers set to 100-200 ml/min and two 1-Liter summa canisters. Prior to sample collection, the purge canister will be opened and three purge volumes will be extracted. A purge volume consists of the internal volume of the well casing and the void space of sand pack. After purging is completed, the purge canister valve on the manifold can be closed, and the purge canister can be removed and connected to the second well. Samples will be collected by opening the sample canister valve and allowing the sample canister to extract soil vapor until the vacuum in the sample canister reaches 5 inches of mercury. The leak detection compound, 1,1-Diflouroethane, will be applied by wrapping a doused rag around the manifold fittings during sample collection.

We will label each sample canister with a unique identification number, sampling time, pre and post sample vacuum readings; and the two vapor samples will be submitted to a State certified laboratory for analysis of VOCs, including TPH-g, by EPA Test Method T0-15 and TPH-d by test EPA TO-17.

A summary of the soil vapor sampling analytical results will be presented in the summary report. This will include a comparison of the soil vapor results to the RWQCB shallow soil gas ESLs for evaluation of potential indoor air impacts considering a residential land use scenario.

Groundwater Sampling

A Sensitive Receptor Survey (SRS) performed during the spring 2011 site characterization identified one supply well, 2S/2E 35L2, within a 2,000-foot radius at a listed address of 1151 Central Avenue. The well completion reports indicated that the screened intervals were from 35 to 43 feet and 61 to 81 feet bgs. In addition, the well completion reports indicated that the well is used for irrigation. This well will be sampled to determine if it has been impacted by the LUST release at the Site. It is anticipated that the well is fitted with a faucet or other

extraction fixture. Prior to sampling, the faucet will be opened and the well will be allowed to dispense for 60 seconds as a "first flush" purging measure. A sample will be collected using laboratory-provided, pre-preserved sample containers, which will be labeled to indicate the sample identification, sample location, date and time of collection and sampler's identification.

The groundwater samples will be preserved in a chilled cooler during transportation to the analytical laboratory with a chain-of custody record. The groundwater samples will be submitted to a State certified laboratory for the analysis of TPH-g and TPH-d by EPA Test Method 8015B (with silica gel cleanup); and VOCs by EPA Test Method 8260B.

A summary of the groundwater sampling analytical results will be presented in the summary report. This will include a comparison of the analytical results to the SFRWQCB ESLs for drinking water use as well as Maximum Contaminant Levels.

We look forward to working with you on this project. If you have any questions regarding the scope of this workplan, please do not hesitate to contact us.

Sincerely,

ENGEO Incorporated

Jeffrey A. Adams, PhD, PE Shawn Munger, CHG, REAII
jaa/sm/rc

Attachments: List of Selected References
Figure 1 – Site Vicinity Map
Figure 2 – Soil Data and Proposed Soil Excavation Areas

cc: 1 - Mr. Scott Menard, Arbor Development Group (e-mail only)

SELECTED REFERENCES

Alameda County Environmental Health Services; Conditional Work Plan Approval for Fuel Leak Case No. RO0003073 and GeoTracker Global ID T10000002919, Geno Country Store, 1000 North Vasco Road, Livermore, CA 94551, April 4, 2011.

Alameda County Environmental Health Services; Review of Site Characterization Report for Fuel Leak Case No. RO0003073 and GeoTracker Global ID T10000002919, Geno Country Store, 1000 North Vasco Road, Livermore, CA 94551, July 7, 2011.

ENGEO; Modified Phase One Environmental Site Assessment, 1000 North Vasco Road, Livermore, California; October 27, 2006, Project No. 7380.1.001.02.

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ENGEO; Geotechnical Exploration, Macedo Property, 1000 North Vasco Road, Livermore, California; October 21, 2011, Project No. 7380.000.000.

ENGEO; Phase I Environmental Site Assessment Update, Macedo Property, 1000 North Vasco Road, Livermore, California; March 18, 2011, Project No. 7380.000.002.

ENGEO; Workplan for Site Characterization, 1000 North Vasco Road, Livermore, California; April 1, 2011, Project No. 7380.000.003.

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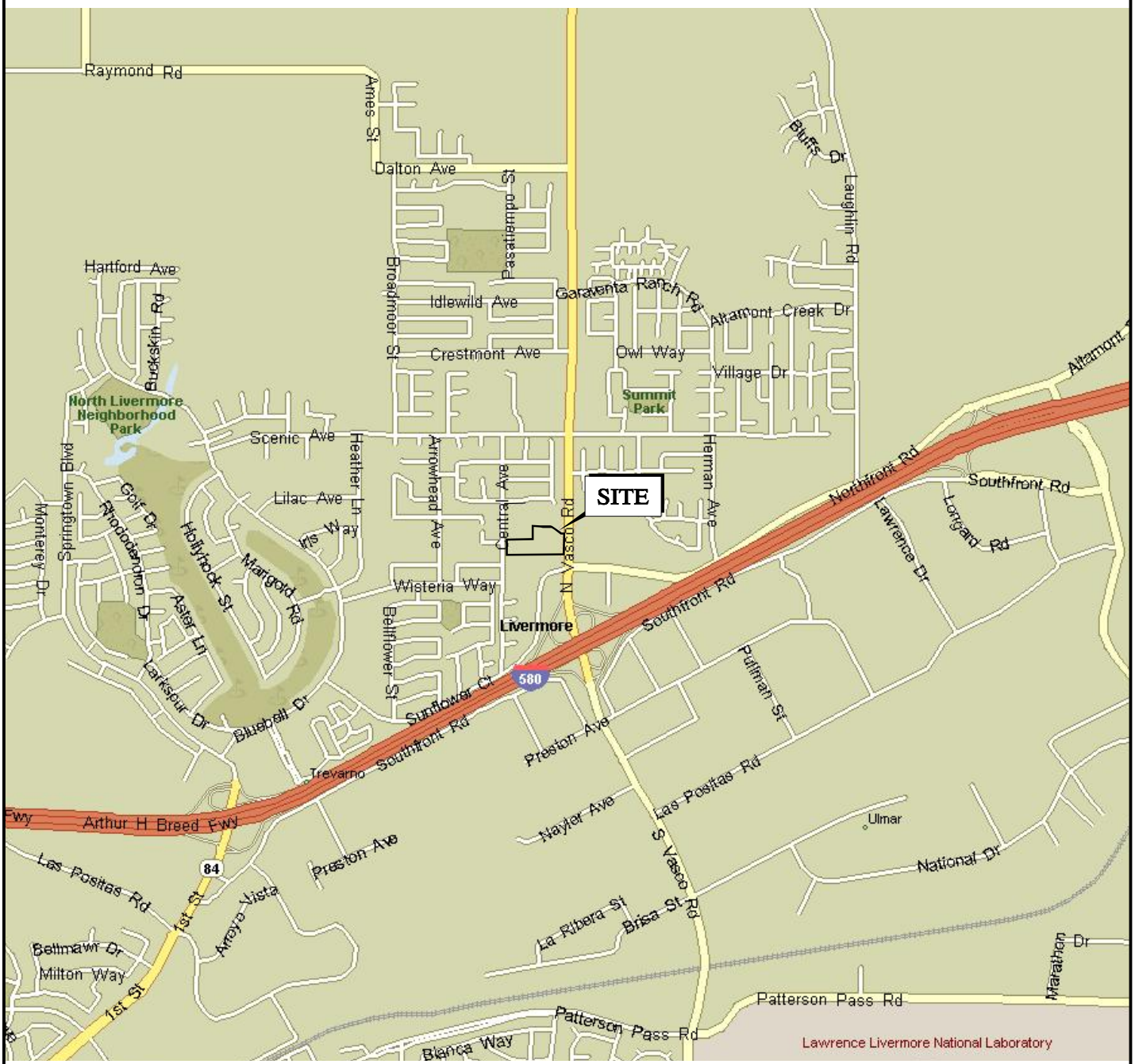
Krazan and Associates, Phase II Environmental Site Assessment, BOTW No. 09-510-02, Geno's Country Store, 1000 North Vasco Road, Livermore, California; September 28, 2009; Project No. 013-09074.

Marc Papineau, Tank and Pipeline Removal Narrative, 1000 N. Vasco Road Livermore, California, January 21, 2011 and January 27, 2011.



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0 FEET 2000

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BASE MAP SOURCE: MS STREETS AND TRIPS

ENGEO Expect Excellence

VICINITY MAP

1000 NORTH VASCO ROAD

LIVERMORE, CALIFORNIA

PROJECT NO.: 7380.000.003		FIGURE NO. 1
SCALE: AS SHOWN		
DRAWN BY: DLB	CHECKED BY: SPM	

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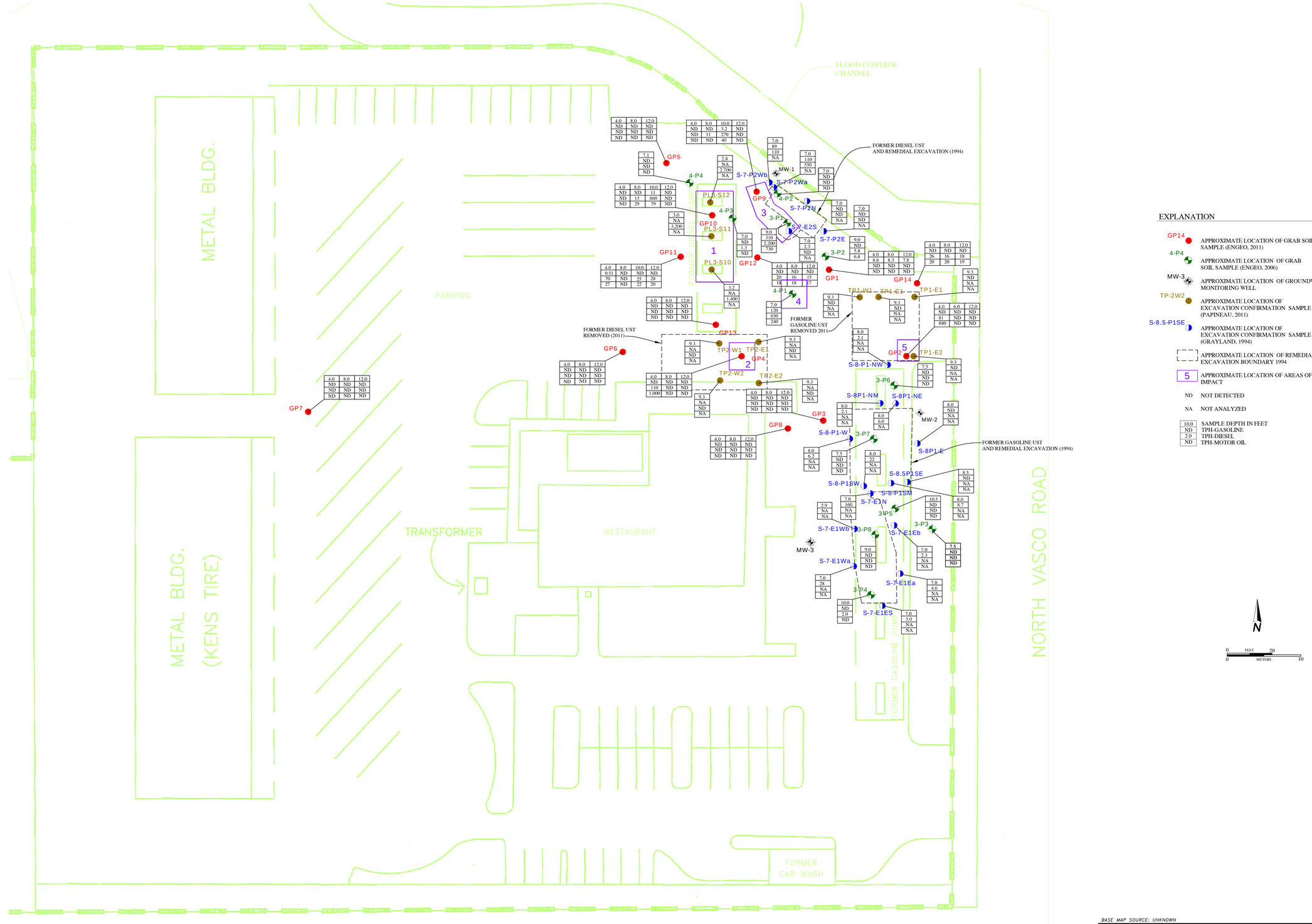
ORIGINAL FIGURE PRINTED IN COLOR



EXPLANATION

- GP14 — APPROXIMATE LOCATION OF GRAB SOIL SAMPLE (ENGEO, 2011)
- 4-P4 — APPROXIMATE LOCATION OF GRAB SOIL SAMPLE (ENGEO, 2006)
- MW-3 — APPROXIMATE LOCATION OF GROUNDWATER MONITORING WELL
- TP-2W2 — APPROXIMATE LOCATION OF EXCAVATION CONFIRMATION SAMPLE (PAPINEAU, 2011)
- S-8.5-P1SE — APPROXIMATE LOCATION OF EXCAVATION CONFIRMATION SAMPLE (GRAYLAND, 1994)
- APPROXIMATE LOCATION OF REMEDIAL EXCAVATION BOUNDARY 1994
- 5 — APPROXIMATE LOCATION OF AREAS OF IMPACT
- ND — NOT DETECTED
- NA — NOT ANALYZED

10.0	SAMPLE DEPTH IN FEET
ND	TPH-GASOLINE
2.0	TPH-DIESEL
ND	TPH-MOTOR OIL

BASE MAP SOURCE: UNKNOWN

ENGEO Expect Excellence	SOIL DATA AND PROPOSED EXCAVATION LOCATIONS 1000 NORTH VASCO ROAD LIVERMORE, CALIFORNIA	PROJECT NO.: 7380.000.003 SCALE: AS SHOWN DRAWN BY: SRP / CHECKED BY: SPM	FIGURE NO. 2

ORIGINAL FIGURE PRINTED IN COLOR

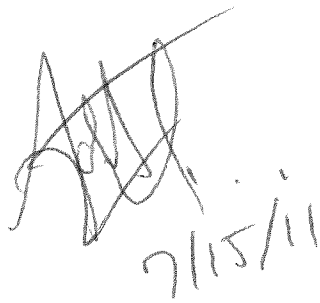
Date: July 15, 2011

Subject: 1000 N. Vasco Road, Livermore California
Fuel Leak Case No. RO0003073

PERJURY STATEMENT

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

Submitted by Responsible Party:



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