LETTER OF TRANSMITTAL

BLYMYER ENGINEERS, INC.

1829 Clement Avenue

Alameda, California 94501-1396

(510) 521-3773 FAX: (510) 865-2594

DATE October 10, 2005	BEI Job No. 202016
ATTENTION: Mr. Barney Chan	
SUBJECT: Dolan Property	
Scarlett Ct.	
Dublin, CA	
Fuel Leak Case No. RO0000210	

Alameda County Health Care Services Agency

Environmental Protection Division

1131 Harbor Bay Parkway, Suite 250

Alameda, CA 94502-6577

Alameda County
OCT 12 2005
Environmental Health

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1	10/7/05		Blymyer Engineers; Final; *Remedial Investigation / Feasibility Study Report*

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REMARKS: The attached report has been distributed as noted below. If you have questions, please contact me.

COPY TO: File
Mr. Michael Fitzpatrick, Trustee
Mr. Peter MacDonald, Esquire

SIGNED: Mark Detterman

If enclosures are not as noted, kindly notify Blymyer Engineers, Inc. at once.

Remedial Investigation/Feasibility Study Report

Dolan Trust Property
6393 Scarlett Court
Dublin, California
ACEH Fuel Leak Case No. RO0000210

October 7, 2005
BEI Job No. 202016

Prepared for:

Estate of Michael Dolan
Mr. Michael Fitzpatrick, Trustee
3215 Deer Park Dr.
Walnut Creek, CA 94598

Prepared by:

Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501-1395
(510) 521-3773

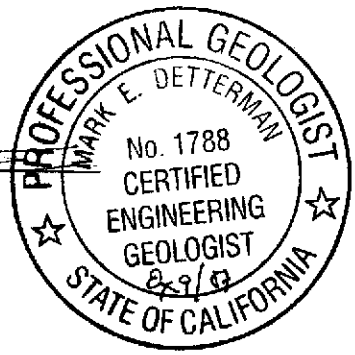
Limitations

Services performed by Blymyer Engineers, Inc. have been provided in accordance with generally accepted professional practices for the nature and conditions of similar work completed in the same or similar localities, at the time the work was performed. The scope of work for the project was conducted within the limitations prescribed by the client. This report is not meant to represent a legal opinion. No other warranty, expressed or implied, is made. This report was prepared for the sole use of the client, The Estate of Michael Dolan.

Blymyer Engineers, Inc.

By: _____

Mark E. Detterman, CEG
Senior Geologist



And: _____

Michael S. Lewis, REA
Vice President, Technical Services

Executive Summary

Blymyer Engineers, Inc. (Blymyer), on behalf of Mr. Michael Fitzpatrick, Executor of the Estate of Michael Dolan (The Estate), has undertaken work at the subject site in response to the November 15, 2004 letter from Alameda County Environmental Health (ACEH). Requested work principally concerned further vertical and lateral delineation of the hydrocarbon contaminant plume.

An approximately 600-gallon underground storage tank (UST) was removed in February 1990 from the subject site. Although the UST had reportedly stored diesel more recently, soil and groundwater samples collected for laboratory analysis indicated that the principal contaminant of concern at the site is gasoline. Files maintained by the ACEH do not contain waste manifests for the disposal of soil, although a *Uniform Hazardous Waste Manifest* is present documenting the disposal of a 600-gallon UST.

Since October 1990, thirty-two soil bores and seven groundwater monitoring wells have been installed in several phases at the site for the collection of soil, grab groundwater, and groundwater samples. Of that total, work reported on herein includes four soil bores and one deeper groundwater monitoring well. Early soil bores (20) and several wells (2) did not investigate indications of volatile compounds at depth, whereas more recent bores and wells did investigate deeper contamination. Hydrocarbons at significant concentrations have been encountered up to 20 feet below grade surface (bgs), with lesser concentrations below that depth to the maximum depth explored (50 feet bgs; CPT-1, CPT-2, and well MW-7). Significant concentrations are currently up to 17 feet below the current groundwater level. It is presumed that releases at the site predate drought years and followed the decline in groundwater levels, remaining trapped in multiple granular layers at various depths upon return of higher groundwater conditions.

The remedial goal at the site is to reduce the majority of soil and groundwater concentrations to below commercial / industrial land use concentration limits listed in the San Francisco Bay Regional Water Quality Control Board Environmental Screening Level (ESL) look-up tables. Soil above these goals is largely centered on the former location of the UST. The selected corrective action contained herein will consist of overexcavation and construction dewatering within an area of 40 feet by 40 feet, to a depth of 20 feet bgs, augmented with the introduction of Oxygen Releasing Compound (ORC) slurry and a bio-nutrient NPK package into the backfill of the overexcavation, and the subsequent injection of ORC and bio-nutrients at a number of Geoprobe bore locations thereafter. This will allow the quick removal of impacted soil, will also allow removal and treatment of groundwater impacted with higher contaminant concentrations, and will also provide the introduction of the ORC compound and bio-nutrients, capable of handling residual concentrations over a longer period of time. A minimum of four quarters of groundwater monitoring is estimated to be required to monitor the degradation process.

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1.0 Introduction

1.1 Background

A 600-gallon underground storage tank (UST) was removed in February 1990 from the subject site (Figures 1 and 2). Although the UST had reportedly stored diesel more recently, soil and groundwater samples collected for laboratory analysis indicated that the contaminant of concern at the site was gasoline. Files maintained by the Alameda County Environmental Health (ACEH) do not contain waste manifests for the disposal of soil, although a *Uniform Hazardous Waste Manifest* is present documenting the disposal of a 600-gallon UST. This suggests that contaminated soil may not have been removed from the site.

In October 1990, five soil bores were installed at the site, and soil and grab groundwater samples were collected. Additional delineation work was conducted in November 1991, when groundwater monitoring wells MW-1 through MW-4 were installed to a depth of 20 feet below grade surface (bgs). Soil and groundwater samples were collected. In November 1992, 14 additional soil bores were installed, and soil and grab groundwater samples were collected from selected bore locations. Although there were several data gaps in the perimeter zone of soil and groundwater delineation, the soil and groundwater plumes were largely defined as a result of this investigation. The groundwater plume did not appear to extend offsite; however, a thin free-phase layer was present immediately adjacent to the former UST basin, and at a location approximately 40 feet to the east. Additional wells were proposed to fill the existing data gaps and to monitor the lateral extent of impacted groundwater and free-phase. As a consequence, in March 1995, wells MW-5 and MW-6 were installed to a depth of 10 feet bgs.

Intermittent groundwater sample collection or groundwater monitoring has occurred at the facility since 1991. In an August 1998 letter, the ACEH suggested that a health risk analysis or the installation of an oxygen releasing compound (ORC) might be appropriate for the site. Also in the August 1998 letter, the ACEH stated that groundwater sampling of wells MW-1, MW-3, MW-5, and

MW-6 could be discontinued, stated that the sampling interval could be decreased to a semiannual basis, and requested resumption of groundwater monitoring.

In May 2002, Blymyer Engineers was retained by Mr. Michael Fitzpatrick, on behalf of Mr. Michael Dolan, to conduct semiannual groundwater sampling of wells MW-2 and MW-4, and to conduct a file review to help determine the next appropriate step at the site.

In May 2002, Blymyer Engineers located and rehabilitated the wells at the site. Well MW-5 required the most extensive rehabilitation work, and required resurveying due to a change in well casing elevation (resurveying did not occur until April 13, 2005). In June 2002, wells MW-2 and MW-4 were sampled, while depth to groundwater was measured all of the wells. Groundwater was analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline; benzene, toluene, ethylbenzene, total xylenes (BTEX); and methyl tert-butyl ether (MTBE). Except for a slight increase in benzene in groundwater from well MW-4, the concentration of all analytes in the two wells decreased from the August 1997 sampling event. Based upon a review of the results, the ACEH recommended that well MW-5 be incorporated into the sampling program and that quarterly groundwater monitoring resume in order that contaminant concentrations and contaminant trends could be quickly generated for the recommended health risk assessment, and that TPH as diesel be added into the analytical program.

Two additional quarters were completed prior to the death of Mr. Dolan. Groundwater monitoring was on hold after January 2003 due to the Estate becoming established. During the groundwater monitoring event in December 2002, analysis for the fuel oxygenates was conducted by EPA Method 8260B. All fuel oxygenates were found to be non-detectable at good limits of detection. Consequently, all sporadic occurrences of MTBE previously detected at the site were attributed to 3-methyl-pentane, another gasoline related compound. This suggested that the release predates the use of MTBE and other fuel oxygenates as gasoline additives. More recent analysis by EPA Method 8260B has indicated that MTBE is present in groundwater collected from well MW-5 and suggests surface infiltration into this well prior to repair. Additional analytical testing for 1, 2-Dichloroethane (1, 2-DCA) and 1, 2-Dibromoethane (or ethylene dibromide - EDB) indicates that 1, 2-DCA to be

present in groundwater collected from well MW-2. All previously available data from the site has been tabulated on Tables I through VI.

On June 13, 2003, a workplan was submitted to the ACEH in order to allow further subsurface delineation of impacted soil at the site. In a telephone conversation on June 16, 2003, Mr. Scott Seery mentioned that it was unlikely that he would be able to respond in a timely manner due to the work load at the ACEH, and noted that if a response was not issued 60 days after receipt, regulations stated that the workplan should be considered approved. Consequently, field work commenced on September 13, 2003. Nine Geoprobe® soil bores were installed at the site to augment existing soil data. The data indicated that the lateral and vertical extent of impacted soil at the site had been adequately delineated to relatively low concentrations, and the limits further refined for the purposes of determining appropriate remedial actions (*Geoprobe® Subsurface Investigation*, dated October 10, 2003).

Based on these data and a lack of further comments by the ACEH, a *Remedial Action Plan* (RAP), dated April 6, 2004, was issued. The plan detailed overexcavation and construction dewatering as the principal method of remedial action. Introduction of an ORC paste into the resulting excavation as an additional measure of insurance, should residual contamination be intentionally or unintentionally left in place, was also proposed. The use of a paste rather that a powder was to allow the ORC to remain at the level of placement, rather than to float as ORC powder does. This would allow quicker migration of the resulting released oxygen into all water-bearing zones. Use of ORC was proposed based on general knowledge that biodegradation of petroleum hydrocarbons is generally an oxygen limited process. A Request for Proposal (RFP) was generated in early May 2004 for contractor bidding purposes; however, it was not released due to a change in the timeline for sale closure. On September 2, 2004, Blymyer Engineers contacted Mr. Seery in order to determine the status of the RAP review. At that time, Mr. Seery notified Blymyer Engineers that Mr. Robert Schultz was the new case manager for the site. Mr. Schultz required time to review and become familiar with the file. On November 15, 2004, the ACEH issued a 5 page response letter

(*Fuel Leak Case No. RO0000210*) requesting extensive further work and containing several deadlines. The letter requested the following:

- Additional site investigation including verification of the vertical extent of soil contamination, and collection of depth-discrete groundwater samples in order to verify the vertical extent of groundwater contamination,
- A feasibility study and evaluation of three remedial alternatives including verification that oxygen enhancement of the subsurface is appropriate, and an evaluation that intrinsic bioremediation is an active process beneath the site,
- An evaluation of the site under the State Water Resources Control Board's Low-Risk Case Closure scenario, and should it not be feasible to achieve water quality goals during remedial actions, an evaluation of the likely time period for site groundwater to meet Basin Plan water quality objectives,
- A detailed soil reuse plan based on the October 24, 2001, San Francisco Bay Regional Water Quality Control Board (RWQCB) guidance for reuse of hydrocarbon-impacted soil at a site,
- An evaluation of bioparameters in groundwater to assist in evaluating biodegradation as a component of natural attenuation at the site, and to further substantiate the use of ORC at the site; requested bioparameters including dissolved oxygen (DO), the oxygen reduction potential (ORP), methane, nitrate, sulfate, and dissolved ferrous iron,
- Clarification of the application technique of ORC at the site in order to ensure that the diffusion of oxygen would target all impacted water-bearing zones,
- A conduit study be conducted,
- Additional data presentation including a series of maps showing location of sources, extent of soil and groundwater contamination at appropriate depth intervals, a rose diagram of historical groundwater gradients, and locations of receptors; several geologic cross-sections, including conduits, the vertical and lateral extent of impacted soil and groundwater; copies of all bore and well logs; a table of well construction details; and a list of identified data gaps, and,

- A return to quarterly groundwater monitoring with analysis for TPH as gasoline, BTEX, MTBE, other fuel oxygenates, and the fuel scavengers EDB and 1, 2-DCA.

A December 31, 2004 deadline was established for a workplan for additional site characterization. A *Workplan for Additional Investigation and Letter Report*, dated December 23, 2004, was submitted to the ACEH on January 3, 2005. In a letter dated January 24, 2005, the ACEH approved the workplan provided four conditions were met:

- A pilot hole was to be used to identify lithology prior to collection of a groundwater sample from a deeper water-bearing zone,
- Should additional groundwater wells be required, the ACEH would be consulted regarding well construction details, consistent with dynamic investigation procedures,
- Should additional soil or groundwater samples be required, the ACEH would be kept informed of planned changes and,
- A 72-hour written advanced warning would be provided.

As a part of another related project, Blymyer Engineers oversaw the permitted destruction of two old water production wells between May 16 and May 24, 2005. According to Zone 7, both wells appear to have dated from the 1940s or 1950s. Well "3S/1E 6F 1", located on the subject parcel was constructed of 8-inch-diameter steel casing and was 95 feet in total depth. Well "3S/1E 6F 2" was located on the adjacent parcel, also owned by Dolan Properties, and was constructed of 13-inch-diameter riveted steel casing and was 38 feet in total depth. All Zone 7 permit conditions were observed; however, the upper 6 to 7.5 feet of each well casing was removed by excavation seven days after it had been filled to the surface with cement grout. An approximately 6 to 12 inch thick concrete mushroom cap was placed over and around the remaining casing at depths of 6 and 7.5 feet bgs, respectively (where the casing broke during removal). The excavation was backfilled with native soil, and track rolled.

1.2 Recent Groundwater Monitoring

Groundwater monitoring has occurred intermittently at the site; however, as requested, recent groundwater monitoring has been conducted on a quarterly basis. The most recent quarterly groundwater monitoring event was conducted on June 22, 2005. The following conclusions and recommendations are modified from the *Second Quarter 2005 Groundwater Monitoring Event* report, dated July 27, 2005:

- Hydrocarbon analysis of groundwater samples from perimeter wells MW-1, MW-3, and MW-6 was not conducted during the last two sampling events due to the lack of detectable results during the December 2004 quarterly event. This was consistent with over 11 to 13 years of analytical results.
- Except for the detection of MTBE at a concentration of 31 micrograms per liter (μg/L) in well MW-5, the well yielded nondetectable concentrations of petroleum hydrocarbons, consistent with the majority of historic groundwater analytical results from this perimeter well.
- Plume core well MW-2 yielded concentrations of all analytes at significantly lower concentrations in comparison to the previous groundwater sampling event conducted in March 2005.
- Previously confirmed fuel scavenger 1, 2-DCA (well MW-2), and the fuel oxygenate MTBE (well MW-5) were not confirmed by EPA Method 8260B during the June 2005 event; however, they are presumed to be present in these wells based on their previous detection.
- Remediation by Natural Attenuation (RNA) analytical parameters were investigated to help determine the level of biological degradation of the petroleum hydrocarbons at the site. DO, ORP, carbon dioxide, nitrate, ferrous iron, sulfate, and methane were analyzed. Microbial use of petroleum hydrocarbons as a food source appears to be principally affected by the concentration of DO in the groundwater; as it is the preferred electron acceptor for the biodegradation of hydrocarbons. Because each of the other electron acceptors, in the listed order, is less preferred by microbes to degrade hydrocarbons, and because each parameter

was apparently fully utilized by microbes beneath the site, it appears that biological degradation of hydrocarbons is occurring in groundwater beneath the investigation area, and that the process is oxygen-limited. This was also the conclusion generated from data collected during the December 2004 and the March 2005 events.

- Groundwater beneath the site appears to be naturally low in nitrate.
- Groundwater flow appears to be towards the south-southeast and the average groundwater gradient was calculated at 0.004 feet/foot for this monitoring event.

The following recommendations were generated from the available data discussed above:

- The next quarterly groundwater sampling event should occur in September 2005.
- The site should be incorporated into the state GeoTracker program now that site wells have been resurveyed.
- Collection of RNA indicator data can be discontinued due to the documentation of consistent results over three quarters of data collection. The collection of additional data will not significantly increase the understanding of biodegradation beneath the site. Collection of RNA indicator data can be resumed in the future should a need be documented.

1.3 Proposed Scope of Work

The following proposed scope of work for the subsurface investigation was contained in the workplan:

- Secure all required permits
- Modify the existing site-specific health and safety plan
- Locate utilities
- Install two Geoprobe® bores
- Field screen and collect soil samples for laboratory analysis

- Collect two grab groundwater samples per Geoprobe® bore for laboratory analysis
- Contingency installation of up to four groundwater monitoring wells
- Contingency monitoring well development and sampling procedures
- Groundwater monitoring wellhead survey
- Soil and groundwater waste handling
- Generate letter report
- Generate a feasibility study
- Generate a corrective action plan after approval of the feasibility study by ACEH

1.4 Required Changes to the Proposed Scope of Work

On February 18, 2005, Blymyer Engineers mobilized to the site to install two dual-tube direct-push Geoprobe® soil bores in an attempt to collect the approved soil and depth-discrete groundwater samples. As a precursor to the mobilization, a conduit survey was conducted. Due to poor soil recovery from the dual-tube system the bore effort was terminated, necessitating an additional mobilization to the site. After notifying via e-mail, and obtaining an e-mail approval from Mr. Schultz of the ACEH on March 23, 2005, 72 hours in advance, a Cone Penetration Testing (CPT) direct-push rig was mobilized to the site on March 28, 2005. Mr. Schultz additionally approved a reduction in the quarterly analytical program, based on the results of the December 2004 quarterly groundwater event and historical analytical trends. Specifically, hydrocarbon analysis of groundwater samples from wells MW-1, MW-3, and MW-6 was eliminated. Mr. Schultz further requested that site data be entered into the state database GeoTracker, by the end of April 2005.

2.0 Environmental Setting

2.1 Regional Geology and Hydrogeology

The site is located in the greater San Francisco Bay Area, just east of the informally designated East Bay Hills, in the greater Livermore Valley. It lies at the approximate confluence of the San Ramon and Amador Valleys of the Tri-Valley area. It sits on a gently southward sloping plain at the southern end of the Dougherty Hills at an approximate elevation of 328 feet, National Geodetic Vertical Datum.

The San Francisco Bay Area is a region dominated by northwest trending topography, enclosed in the Coast Range Province of California. The topography of the region reflects activity of a major fault system that includes the San Andreas Fault Zone on the west side of San Francisco Bay, the Hayward Fault at the western base of the East Bay Hills, the Calaveras Fault at the eastern base of the East Bay Hills, and additional active faults further to the east. The Hayward and Calaveras faults essentially define the topographic expression of the East Bay Hills. Rock types in the region range from Jurassic age sedimentary, metamorphic, and plutonic basement to Quaternary alluvium (Norris and Webb, *Geology of California*, 1990). The property is underlain by Quaternary alluvium as mapped by Thomas Dibblee, Jr. (*Preliminary Geologic Map of the Dublin Quadrangle, Alameda and Contra Costa Counties, California*, 1980, U.S.G.S. Open File Report 80-537). E.J. Helley and R.W. Graymer (*Quaternary Geology of Alameda County, and Parts of Contra Costa, Santa Clara, San Mateo, San Francisco, Stanislaus, and San Joaquin Counties, California: A Digital Database*, 1997, U.S.G.S. Open File Report 97-97) further identified the underlaying sediments as Holocene Basin Deposits consisting of very fine silty clay to clay deposits that occupy flat-floored basins at the distal edge of alluvial fans.

On behalf of Zone 7 Water Agency, Norfleet Consultants conducted an investigation into the sequence stratigraphy of the Livermore-Amador Groundwater Basin (*Preliminary Stratigraphic Evaluation West Side of the Main Basin Livermore-Amador Groundwater Basin*, January 29, 2004).

The study area lies to the south and east of the subject site; however, it provides further detail on the overall framework of the Livermore-Amador Groundwater Basin should that data be useful.

The regional groundwater flow direction would predominantly be expected to follow surface topography, and should thus be anticipated to generally flow towards the south. Undocumented, local buried alluvial channels may influence groundwater to flow in a slightly more western or eastern flow direction.

2.2 Climate

The Tri-Valley region exhibits a Mediterranean-type climate with cool, wet winters and warmer, dry summers. Average annual precipitation in nearby Livermore is 14.42 inches. The average monthly rainfall is 2.93 inches in January and 0.05 inches in August. Average maximum temperatures are 56.6 degrees Fahrenheit (°F) in January and 89.4 °F in July; and average minimum temperatures are 36.3 °F in January and 54.1 °F in July (Western Regional Climate Center; April 1930 to March 2003; www.wrcc.dri.edu).

3.0 Remedial Investigation Data Collection

3.1 Soil Bore Installation

3.1.1 Dual-Walled Direct Push or Geoprobe Rig

After receipt of written approval of the workplan (*Workplan Approval*, January 24, 2005) by Mr. Robert Schultz of the ACEH, Blymyer Engineers scheduled the work with Gregg Drilling, and submitted a *Drilling Permit Application* to the Zone 7 Water Agency (Zone 7) to obtain a drilling permit for two to three soil bores. Utilities were cleared under Underground Service Alert (USA) Ticket Number 049005. A copy of the Zone 7 permit is included in Appendix A.

On February 18, 2005, Blymyer Engineers mobilized to the site and installed two dual-walled direct push or Geoprobe soil bores (SB –J and SB-K, Figure 2) to a depth of approximately 20 and 36 feet below grade surface (bgs), respectively under Drilling Permit Number 25020. The soil bores were installed by Gregg Drilling, Inc. (C57 – 485165) initially using a dual-walled direct push rig, under the direction of a Blymyer Engineers geologist. An attempt to collect continuous soil samples was undertaken in both bores in order to field screen the soils with a photoionization detector (PID) and for lithological description. Due to extremely poor sample recovery in SB-J, the bore was terminated at a depth of approximately 20 feet bgs prior to reaching the planned depth of approximately 35 feet bgs. Planned groundwater samples were not collected from this bore due to the inability to confirm soil stratigraphy within the bore. In bore SB-K, at a depth of 20 feet bgs, the driller called rig refusal. As a consequence, in an attempt to probe deeper sediments, the rig was converted to a single-walled Geoprobe setup system after collection of a depth-discrete groundwater sample. Recovery of soil samples using the Geoprobe system was also problematic, and down-hole sloughing could not be ruled out; consequently no soil samples below approximately 20 feet bgs were submitted for laboratory analysis. Due to these changes in drilling conditions, the recovered soil sample exhibiting the highest PID reading, or a soil sample augmenting previously collected data in other soil bores, was submitted for laboratory analysis. The soil bores were backfilled with cement grout tremied to

total depth upon completion. All soil and grab groundwater samples were collected in accordance with previously forwarded Blymyer Engineers Standard Operating Procedures (SOPs). Soil descriptions and PID readings are shown in the soil bore logs, included in Appendix B.

All soil cuttings generated during soil bore installation were placed in a DOT-approved, 5-gallon, bucket, that was labeled and left on-site for future off-site disposal.

3.1.2 Cone Penetrometer Rig

After notifying Mr. Schultz of the ACEH via e-mail of the problems encountered using the dual-walled direct push system, and requesting modification of the workplan to include use of a CPT direct-push rig, an e-mail approval was received on March 23, 2005, from Mr. Schultz. Concurrently a *Drilling Permit Application* was submitted to Zone 7 to obtain a drilling permit for the installation of soil bores using a CPT rig, and Blymyer Engineers scheduled the work with Gregg Drilling. Utilities were marked and cleared under USA Ticket Number 0099462. A copy of the Zone 7 permit is included in Appendix A.

On March 28, 2005, Blymyer Engineers mobilized to the site and installed two CPT direct-push soil bores (CPT-1 and CPT-2, Figure 2) to depths of approximately 50 feet bgs under Drilling Permit Number 25041. The soil bores were installed by Gregg Drilling, Inc. (C57 – 485165) using a 20-ton capacity CPT direct-push rig, under the direction of a Blymyer Engineers geologist. The cone tip collects measurements of cone bearing, sleeve friction, and pore water pressure at 5 centimeter intervals to provide a nearly continuous lithologic log. Data interpretation yielding stratigraphic information is based on the interrelationship of the collected data. Data reduction and interpretation is performed in real time, allowing field decisions, and they are recorded on a disk for future reference. Preliminary lithologic logs are generated in real time; however, these logs are subject to generally minor revision prior to finalization. After a continuous CPT run, a second bore was installed within approximately 2 feet in order to collect soil or depth-discrete groundwater samples.

The Ultra Violet Induced Fluorescence (UVIF) test module was also run in each CPT bore. The UVIF module uses ultra-violet light to induce fluorescence in hydrocarbons and, depending on the re-emitted wavelength; a determination can be made in hydrocarbon concentration and hydrocarbon range (lighter gasoline fuels through heavier motor oils). In general, lighter hydrocarbon compounds fluoresce at shorter wavelengths, while heavier hydrocarbon compounds fluoresce at longer wavelengths. The module follows the cone tip by approximately 2.5 feet. Unfortunately, the UVIF module did not return usable data at the site, and further discussion is not included in this report.

Because bore CPT-1 was closely associated with other soil bores (within 8 and 7 feet of MW-2 and SB-K, respectively), soil samples were not collected until a depth of 25 feet bgs. Thereafter, soil samples were collected at generally 5-foot intervals in order to cross check the real time lithologic log and to obtain PID readings; however, two 10-foot intervals were utilized. Three depth-discrete groundwater samples were attempted; however groundwater was not recovered at the 25-foot depth interval. In bore CPT-2, soil samples were collected at generally 5-foot intervals due to its location in a relatively unexplored area of the site for similar reasons; however, two 10-foot intervals were again utilized. Two depth-discrete groundwater samples were collected.

The CPT soil bores were backfilled with cement grout tremied to total depth upon completion. Bore logs with abbreviated soil descriptions and PID readings are included in Appendix B, while a copy of the report, including lithologic logs, generated by Gregg Drilling is included in Appendix C.

Minimal soil cuttings were generated during soil sample collection and were placed in a DOT-approved 5-gallon bucket that was labeled and left on-site for future off-site disposal.

On May 10, 2005, Blymyer Engineers submitted the *Additional Site Investigation Data Transmittal* to the ACEH providing a brief summary of the results of the CPT bore installations. Based on the detection of hydrocarbon compounds in groundwater between 30 and 40 feet bgs, the letter proposed the installation of groundwater well MW-7 across a deeper water-bearing zone in a downgradient position. The dominant downgradient direction was identified by a Rose diagram plot of all previous

groundwater gradients (excluding shallow wells MW-5 and MW-6 which have historically yielded groundwater elevations reflective of another groundwater-bearing zone). A copy of the Rose diagram was included with the referenced data transmittal. Shortly thereafter, the ACEH reported that Mr. Schultz had left the employ of the agency and that the case had not been assigned to a new case worker yet. The ACEH was apprised that due to the sale of the parcel, work would proceed, pending agency review.

3.2 Monitoring Well Installation

Blymyer Engineers concurrently scheduled the work with Gregg Drilling and submitted a *Drilling Permit Application* to Zone 7 to obtain a drilling permit for the well installation. Utilities were marked and cleared under USA Ticket Number 0238359. Ms. Donna Drogos of the ACEH was notified via e-mail on July 1, 2005, of the intent to install well MW-7. A copy of the approved permit from Zone 7 is included in Appendix A.

On July 5, 2005, Blymyer Engineers mobilized to the site to begin the installation of permanent groundwater monitoring well MW-7 (Figure 2) under Drilling Permit Number 25105. The conductor casing and groundwater monitoring well were installed by Gregg Drilling, Inc. (C57 – 485165). A mud rotary drilling rig was used to install the 10-inch-diameter conductor casing between the depths of 1 to 30 feet bgs on July 5, 2005. The conductor casing was installed in a 15-inch-diameter mud rotary borehole, using SuperGel X, a bentonite mud product, and the conductor casing was grouted in place with cement grout. The cement grout was allowed to cure for approximately 60 hours prior to the installation of monitoring well MW-7. On July 8, 2005, Blymyer Engineers remobilized to the site to complete the installation of well MW-7. The well was installed by Gregg Drilling using a hollow-stem auger drill rig, under the direction of a Blymyer Engineers geologist. The well was installed to a maximum depth of 40 feet bgs, and across a water-bearing zone first encountered at a depth of approximately 34 feet bgs. For the well as a whole, soil samples were collected generally at 5-foot intervals using a split-spoon sampler for field screening with a PID and for lithological description. The soil sample exhibiting the highest PID reading and shallowest soil sample without a

PID reading were submitted for laboratory analysis for vertical delineation purposes. All soil samples were collected in general conformance with previously forwarded Blymyer Engineers SOPs. Soil descriptions and PID results are shown in the bore logs, included in Appendix B.

The soil bore was converted to a 2-inch-diameter groundwater monitoring well using Schedule 40 PVC casing, with a 10-foot section of factory-slotted 0.010-inch screen installed between 30 and 40 feet bgs. The annulus between the borehole wall and the PVC casing was filled with Number 2/12 filter sand from the bottom of the borehole to 2 feet above the screened interval. Two feet of bentonite pellets were then placed in the annulus and hydrated to form a surface seal. The remaining annular space was filled with cement grout, and a lockable aboveground steel "stove-pipe" cover was set in concrete over the top of the monitoring well. The monitoring well installation was performed in general conformance with previously forwarded Blymyer Engineers SOPs. Well construction details are shown on the bore log, included in Appendix B.

All bentonite mud and soil cuttings generated during conductor casing and monitoring well installation were placed in DOT-approved, 55-gallon, open-top drums, which were labeled and left on-site for future off-site disposal.

3.3 Monitoring Well Development and Sampling Procedures

A minimum of 72 hours was allowed to lapse after well installation prior to initiation of well development in order to allow the grout and concrete to properly set. On July 15, 2005, Blaine Tech Services, Inc. (Blaine) mobilized to the site to develop the groundwater monitoring well. Per standard protocol, the well was developed until either the groundwater appeared to be clear of sediment, or until a maximum of 10 well volumes of groundwater had been removed. In this well, the removal of 10 well volumes of groundwater was required. The monitoring well was developed in conformance with Blaine's SOPs, a copy of which is included in Appendix D.

After waiting a minimum of 72 hours after well development to allow the aquifer to recover from development, the well was sampled. Blaine mobilized to the site on July 18, 2005. The well was purged of a minimum of three well volumes prior to sampling, and a groundwater sample was obtained from the well. Groundwater sample collection procedures were performed in general conformance with Blaine's SOPs. A copy of Blaine's well purge and sampling field forms are included in Appendix E.

All development and purge water was placed in DOT-approved, 55-gallon, closed-top drums, which were labeled and left on-site for future off-site disposal.

3.4 Soil and Groundwater Sample Analytical Methods

Soil and groundwater samples were submitted to McCampbell Analytical, Inc. (McCampbell), a California-certified laboratory located in Pacheco, California. The samples were analyzed on a 5-day turnaround time for analysis of Total Petroleum Hydrocarbons as Gasoline (TPH AS GASOLINE) and Diesel (TPH-D) using modified EPA Method 8015; and for benzene, toluene, ethylbenzene, total xylenes (BTEX), and methyl tert-butyl ether (MTBE) by EPA Method 8021B. One soil sample was additionally analyzed for fuel oxygenates and lead scavengers by EPA Method 8260B.

3.5 Conduit Survey

On February 9, 2005, a conduit survey was conducted at the site, partly to clear proposed borehole locations for upcoming drilling (dual-walled direct push bores) of underground utilities. The results are depicted on Figure 3. It is assumed that all utility depths are under 5 feet bgs. With groundwater as shallow as 3 feet bgs, it is assumed that the utility corridors may act as conduits for groundwater movement. However, it should be noted that the Dublin-San Ramon Water District field representative reported that the water main running inside the property boundary and roughly parallel with Scarlett Court is constructed of Transite and that the backfill was most likely native soil, thus it is not expected to be a significant conduit.

4.0 Data Interpretation

4.1 Site Geology and Hydrogeology

As noted in previous reports, the upper soil stratigraphy at the site is highly variable. Soil bore SB-J, installed through the former UST basin, documented contaminated basin backfill at a depth of approximately 5.5 feet, with backfill extending to an approximate depth of 7 feet bgs. It is possible that the contamination is from secondary recontamination of clean tank basin fill; however, this cannot be confirmed and may be primary contamination not yet removed. It should also be recalled that waste manifest forms were not found for soil, only for the 600-gallon UST. Although there was very poor recovery from bore SB-J, impacted soils appear to have been retrieved up to a depth of approximately 16 feet bgs, and perhaps deeper. Exceptionally poor recovery was also present in soil bore SB-K. With the exception of an approximately 1-foot-thick clayey sand layer at approximately 4 to 5 feet bgs, the upper 19 feet appears to have been a medium to light brown silty clay. Clayey sand was sampled at an approximate depth of 19.5 feet bgs. Thereafter recovery was limited to approximately 5% in most of the four-foot long sleeves, to a total depth of 36 feet. Of importance however, is that all recovered soils below approximately 20 feet bgs all contained a native brown color, thus indicating the vertical limits of soil contamination had been roughly defined (roughly between 20 and 28 feet bgs) in close proximity to the release location.

Because of the uncertainty of the soil stratigraphy beneath approximately 20 feet bgs, it was decided that a CPT rig should be utilized to better define soil stratigraphy below that depth, and to allow collection of depth-discrete groundwater samples in order to define the vertical depth of impacted groundwater. Two CPT bores were installed at the locations depicted on Figure 2. The predominant soil type encountered to an approximate depth of 35 to 36 feet bgs was identified as clayey silt to silty clay; however, each bore also encountered layers of silt. CPT-1 encountered silt at the approximate depths of 8 (revised log only), 13, 18, 23.5, 27, and 32 feet (revised log only). The upper three of these are likely to correspond to similar impacted water-bearing zones observed in SB-I; however, those units were described as silty to clayey sands. It should be noted that an attempt to

collect groundwater at the 23.5-foot-bgs silt layer did not yield groundwater in CPT-1. CPT-2 encountered silt layers at 23, 26.5, 27.5, 32, and 35 to 38.5 feet bgs (the 23-foot-bgs silt layer in CPT-2 slowly yielded groundwater). At a depth of approximately 35 to 36 feet bgs, a one- to three-foot thick section of sand to sandy silt was encountered in each bore. Additional layers of silt and sandy silt were encountered to an approximate depth of 45 or 46 feet bgs in CPT-1. Thereafter only silty clay was encountered to a total depth of 50 feet bgs. In CPT-2, only silty clay to clayey silt was encountered to a depth of approximately 47 feet bgs, where upon silt to sandy silt was present.

The logging and description of the upper 30 feet of soil bore MW-7 was hindered by the use of a mud-rotary drilling system; however, some details were noted. The upper approximately 9.5 feet bgs appeared to be a section predominantly composed of silty sand with an approximately 1-foot-thick clay layer located at a depth of approximately 3 to 4 feet bgs. Below 9.5 feet, to a depth of approximately 30 feet bgs, a series of silty clay units were encountered. After switching to a hollow-stem auger drilling method for depths below 30 feet bgs, clay continued to an approximate depth of 34.5 feet. Thereafter, to the total depth of 40 feet, a series of predominately silty sand units were encountered. As noted in previous reports, the variability of the site is consistent with an alluvial depositional environment.

Initial groundwater was encountered in all recent bores between the approximate depth of 1 to 3 feet bgs, and except for well MW-7 is presumed to represent perched near-surface groundwater conditions. The thick granular section encountered in the upper 9.5 feet at well MW-7, may represent a perched condition; however, it is possible that the granular section is connected to a larger, laterally extensive, unconfined, near-surface water-bearing zone.

Groundwater-bearing zones were present deeper in each CPT bore and allowed collection of depth-discrete groundwater samples from each CPT bore. As noted, groundwater was not present at an approximate depth of 25 feet bgs in CPT-1, but was present at approximately 23 feet bgs in CPT-2 and was slow to infiltrate into the borehole. These sections were identified as silt or clayey silt in the field during bore installation, and it is surmised that the groundwater sample obtained from CPT-2 is

representative of this tight portion of the stratigraphic section (in conjunction, please see the following sections on laboratory analysis). Quicker infiltration of groundwater was readily apparent at the approximate depths of 35 feet and 40 feet bgs in bore CPT-1, and at the approximate depth of 35 feet bgs in CPT-2. As depicted in the respective bore logs in Appendix B and C, these intervals contained more granular units.

Groundwater was not readily apparent beneath the upper groundwater-bearing zone in bore MW-7 until it was encountered at an approximate depth of 34.25 feet. The bottom of the conductor casing at 30 feet bgs remained dry nearly three days after installation of the casing as the cement grout was allowed to cure. Groundwater at this depth is appeared to be confined and field stabilized rapidly at approximately 11.9 feet bgs.

PID readings in bores SB-J and SB-K (as well as earlier bores) indicate elevated readings in the upper approximately 20 feet bgs, but also indicate a significant decrease in organic vapors below an approximate depth of 20 feet bgs. Due to proximity to bore SB-I and MW-2, soil samples and thus PID readings, were not collected in bore CPT-1 in the upper 20 feet bgs; however, below approximately 20 feet bgs the PID readings also indicate a significant decrease in organic vapors relative to organic vapors in SB-I. Collection of PID readings in bore CPT-2 began at an approximate depth of 8 feet bgs. All PID readings in bore CPT-2 were very low, indicating that no significant organic vapors were present at that bore location. PID readings in bore MW-7 were also significantly lower in the upper 20 feet bgs, and were non-detectable below approximately 20 feet bgs. Earlier soil bores proximal to the former UST location (and with better soil recovery than SB-J and SB-K) indicated higher PID readings with successfully deeper sandier zones to a depth of approximately 16 to 18 feet bgs, up to 10 feet below groundwater at the time. This was assumed to indicate that groundwater was much lower during the drought years and allowed the petroleum release to migrate downwards through soil; however, it should be noted that soil analytical data is not in full agreement with an increase with depth (see for example SB-I, Table I).

In general, the interpreted olive green discoloration of the soils decreased with distance from the former UST basin, and with depth in the silty clay sections of a particular soil bore. Closer to the former UST basin the soils at a depth of 19 to 20 feet bgs became light brown in color. This has been interpreted to represent the lower extent of impacted soil adjacent to the release location, and it should be noted that the olive green color extended to the bottom of the bore at the location of SB-I. Isolated globules of free product were noted in each of the sandy units, but not in the clayey units, of soil bore SB-I, to the maximum depth explored (20 feet bgs). Conversely it should be noted that in bore CPT-2, with very low PID readings, the upper approximately 25 feet of sedimentary section was an olive-drab color, and that this may represent the actual native soil coloration at the site, prior to the release of hydrocarbons at the site. Thus there is likely a greenish hydrocarbon discoloration overprinted on native greenish soil coloration at the site. Below approximately 25 feet bgs, bore CPT-2 was also essentially light brown in color.

For detailed lithologic descriptions, please refer to the soil bore logs included in Appendix B and C. Cross sections have been generated from the soil bore logs and the data are depicted in Figures 4 and 5. Per the request of ACEH, copies of all previous bore and well logs are included in Appendix F. Well construction details are contained in Table F-1, also in Appendix F.

4.2 Discussion of Soil Sample Analytical Results

For the current investigation, TPH as gasoline concentrations in soil ranged from a low of non-detectable to 550 mg/Kg (Table I). The laboratory included a note for most samples that indicated that the hydrocarbon identified was unmodified or weakly modified gasoline. TPH as diesel concentrations in soil ranged from non-detectable to 33 mg/Kg. The laboratory included a note for the samples that indicated that diesel range hydrocarbons contained no recognizable pattern, and that gasoline range compounds were also significant. The concentration of benzene ranged from non-detectable to 4.8 mg/Kg; toluene from non-detectable to 1.7 mg/Kg; ethylbenzene from non-detectable to 8.5 mg/Kg; and total xylenes from non-detectable to 13 mg/Kg. MTBE was inadvertently not analyzed for in most of these soil samples; however, it was non-detectable in soil

collected from bore MW-7. The laboratory included a note for soil sample MW7-16 that indicated that a Stoddard solvent / mineral spirit pattern was present. Soil sample SBJ-7.5, in the heart of the plume, was analyzed for fuel oxygenates and lead scavengers. All were nondetectable at good limits of detection (Table II).

Figures 6 through 13 depict the lateral and vertical limits of Total TPH and benzene in soil at the site. Four depth intervals are provided (3.5 to 11 feet, 11.5 to 19.5 feet, 3.5 to 19.5 feet, and 20 to 42 feet bgs) for each contaminant and help to illustrate the area of impacted soil. The vertical extent of impacted soil appears to be confined to the upper 20 feet bgs. The lateral extent of impacted soil may be underestimated in the 11.5 to 19.5 depth interval due to the concentration of prior analytical testing at shallower depths, reflective of the lighter-than water (floating) nature of hydrocarbons (see for example the PID readings contained in bore logs MW-2 and MW-4; additionally all of the B-1 to B-13 bores are less than 11 feet in total depth). Regardless, the figures help to illustrate that the vertical and lateral extent of impacted soil has been adequately defined.

Analytical results for the recently collected soil samples are summarized in Table I. A copy of the analytical report is included in Appendix G.

4.3 Discussion of Depth-Discrete Groundwater Sample Analytical Results

TPH as gasoline concentrations in the depth-discrete groundwater samples ranged from nondetectable to 74,000 micrograms per liter (µg/L; Table II). The laboratory included a note for all samples that indicated that the hydrocarbon identified was unmodified or weakly modified gasoline. TPH as diesel concentrations in the depth-discrete groundwater samples ranged from nondetectable to 47,000 µg/L (Table II). The laboratory included a note for several samples that indicated that diesel range hydrocarbons with no apparent pattern were present, and that gasoline range hydrocarbons were also significant. An immiscible sheen was noted at both depths collected from SB-K, which yielded the elevated analytical results. The concentration of benzene ranged from nondetectable to 9,100 µg/L; toluene from nondetectable to 840 µg/L; ethylbenzene from

nondetectable to 4,200 µg/L; and total xylenes from nondetectable to 11,000 µg/L. MTBE was inadvertently not analyzed in the depth-discrete groundwater samples; however, results exist for the groundwater monitoring wells at the site.

It should be noted that discrete-depth groundwater sample SB-K-19.5 is considered to be either suspect or could represent only a thin water-bearing zone in the bore at that location. The drillers were having difficulties with the dual-walled sampling system that was not fully witnessed, but which may have resulted in collection of a suspect discrete-depth groundwater sample. The elevated concentration in the groundwater sample does not appear to reflect the relatively low concentration detected in the soil sample collected at this depth, and the nearly identical result yielded by soil sample SB-K-9. Additional evidence of this comes from soil bore CPT-1, which was placed within approximately 8 feet of SB-K, and did not detect the presence of a clayey sand unit at that depth, but detected predominately a clayey silt sedimentary section in that depth interval. An attempt to collect a groundwater sample at an approximate depth of 24 feet bgs in CPT-1 did not yield groundwater, additionally suggesting a tight silt or clayey soil.

Regardless, the discrete-depth groundwater samples collected from CPT-1 and CPT-2 appear to have largely defined the vertical extent of significant hydrocarbon impact, but also indicated that significantly lower concentrations of hydrocarbons appear to be present below approximately 20 feet bgs. Thus well MW-7 was recommended for installation in a downgradient direction from the former UST basin.

Analytical results for the recently collected groundwater samples are summarized in Tables III through V. Copies of the analytical reports are included in Appendix G.

4.4 Discussion of Groundwater Sample Analytical Results

Deep groundwater monitoring well MW-7 was the only well installed and sampled in this phase of investigation. The well was screened between 32.5 and 42.5 feet bgs based on the lithology

encountered in bores CPT-1, CPT-2, and MW-7, as well as the discrete-depth groundwater samples from bores CPT-1 and CPT-2. The well was placed approximately 15 feet downgradient of the former UST basin. TPH as gasoline, TPH as diesel, BTEX, and MTBE were all nondetectable in the groundwater sampled collected on July 18, 2005 (Table III). All other wells were sampled during the most recent quarterly groundwater monitoring event on June 22, 2005, and the results were reported under separate cover.

Figures 14 through 19 depict the lateral and vertical limits of Total TPH and benzene in groundwater at the site. Three figures are provided for each contaminant and help to illustrate the area of impacted groundwater. The figures include the lateral extent of the contaminants in the 4- to 20-foot depth interval during two time periods (during the October 1990 to December 1992 period, and during the 2004 to 2005 period), and also below 20 feet bgs, during the current time period. The lateral extent of impacted groundwater in the earlier time period is not expected to have been significantly different based on the existence of wells MW-1 through MW-4 at that time; however, some limited offsite migration to the southwest may have occurred (Figures 14 and 17).

Analytical results for the recently collected groundwater samples are summarized in Tables III and V. Copies of the analytical reports are included in Appendix G.

4.5 Groundwater Elevations and Gradient

Depth to groundwater in well MW-7 was 6.38 feet below the top of the well casing. Because the well was completed aboveground approximately 2.5 feet, the piezometric surface was found at an approximate depth of 3.9 feet bgs. The pressure head appears to be slightly different than the other six wells based on the available data; however, it may not be statistically different (Table VI). Because this is the only well screened across the deeper water-bearing zone, there is not a plan to survey the well.

Recently surveyed top-of-casing (TOC) elevations (Appendix H) were used to construct a

groundwater gradient map for wells screened in the shallower groundwater bearing zone (Figure 20). Wells MW-5 and MW-6 were not used to construct the map as the wells are screened at a shallower level than wells MW-1 through MW-4. Well MW-7 was also not used as the well is screened across a deeper zone. Based on a review of the case file at the ACEH, groundwater elevations in wells MW-5 and MW-6 appear to have been historically consistently different than wells MW-1 through MW-4 at the site. However, as opposed to the previous quarterly event, there does not appear to be a difference in the groundwater level between shallower well MW-5 and deeper well sets during the most recent quarterly event. Groundwater depths collected from wells MW-1 through MW-6 at the time well MW-7 was sampled ranged between 2.21 to 3.69 feet below the top of the casings. It should be noted that depth to groundwater in well MW-7 was approximately 3.9 feet bgs. As noted, this may not be a statistically significant difference and likely argues that the independent water-bearing zones are interconnected. The direction of groundwater flow appears to be trending south-southwest. Historically, groundwater has generally flowed to the south to southwest at the site (see, for example, the Rose Diagram of historic groundwater flow directions included in the *Additional Site Investigation Data Transmittal*); however, in November 1993 groundwater was documented to have flowed to the east. The average groundwater gradient was calculated to be 0.052 feet/foot at the time well MW-7 was sampled.

5.0 Feasibility Study - Site Conceptual Model

The site is currently under redevelopment, and past site features, including buildings, have been demolished. The subsurface has been impacted by the release of fuel hydrocarbon products consisting of diesel and gasoline, as determined by TPH as diesel and TPH as gasoline analysis. Chemical compounds associated with these hydrocarbon formulations including BTEX, and the fuel additives MTBE and 1,2-DCA, have been found in soil or groundwater and are the primary chemicals of concern at the site.

A concise description of the nature and extent of hydrocarbon impacts at the site was presented in the Remedial Investigation report. Subsurface soils consist predominantly of low permeability silty clay. Layers of silty or clayey sand are dispersed throughout the fine grained soils. Geologic cross-sections that show the relationship of soil types through the site are presented in Figures 3 and 4.

An immiscible sheen and hydrocarbon free product globules were noted in soil samples recently collected from borings SB-I and SB-K, which indicate that free phase hydrocarbons are present in the subsurface to a depth of approximately 20 feet bgs. Free product has historically been noted in grab groundwater samples from boreholes B-1, B-2, B-4, and B-8.

Groundwater flow beneath the site has historically been to the south and southwest. Based on PID readings from recent investigation borings, hydrocarbon impacts to saturated soil are more persistent in silty sands that occur at depths ranging from about 8 to 19 feet bgs. Historical groundwater monitoring data indicate that hydrocarbon impacts to groundwater are most severe in the area of monitoring wells MW-2 and MW-4. Based on the recent results obtained from newly installed groundwater monitoring well MW-7, groundwater at depths of 30 feet bgs and below does not appear to be impacted by hydrocarbons.

The locations of site investigation borings and groundwater monitoring wells are shown in Figure 2. Summaries of site historical investigation data are presented in the following tables:

Table I: Summary of Soil Sample Hydrocarbon Analytical Results

Table II: Summary of Lead and Fuel Oxygenate Soil Sample Analytical Results

Table III: Summary of Grab or Depth-Discrete Groundwater Sample Hydrocarbon Analytical Results

Table IV: Summary of Groundwater Sample Hydrocarbon Analytical Results

Table V: Summary of Groundwater Sample Fuel Oxygenate Analytical Results

Table VI: Summary of Groundwater Elevation Measurements

The objective of this remediation effort is to quickly reduce free hydrocarbon product and TPH as gasoline at or above 100 mg/Kg in subsurface soils of the site. Any residual hydrocarbons left insitu following the soil source removal will likely decline due to natural attenuation processes.

6.0 Evaluation of Remedial Alternatives

The objective of the Remedial Evaluation (RE) is to consider remedial alternatives that are technically and economically appropriate for the site. Existing site conditions will have a significant impact on technology selection, especially areas where free phase hydrocarbons are present.

The goals of remediation are:

1. Reduce levels of contamination to limit further spread of contaminants.
2. Restore site conditions, such that any potential health or ecological risk will not impede future land use.
3. Restore groundwater to background and/or beneficial use.

To achieve these remediation goals, the following three remedial options are selected:

- Monitored Natural Attenuation
- Dual (soil vapor and groundwater) Phase Extraction and Treatment
- Source Soil Excavation and Dewatering, and Insitu Oxygen Release Compound Injection

6.1 Evaluation of Remedial Alternatives

The remedial options evaluated for the site are rated based on the potential remedial technology effectiveness, implementability and cost. The rating factors have been defined as follows:

- **Effectiveness** is a rating of the remedial technology's ability to reach cleanup goals within a desired time frame. However, the ability to predict actual clean-up time to either risk based, regulatory mandated, or Maximum Contaminant Level (MCL) target levels is only a judgment based on applying like or similar remedial technologies at other environmentally impaired properties similar to the site.

- **Implementability** is a rating of the degree of difficulty required to construct and maintain the remedial technology, this factor also includes administrative burdens, such as permitting or operational fees.

- **Cost** is a financial estimate for the design, implementation, future maintenance, and shutdown of the remedial technology. As it is not possible to predict actual clean-up times, the cost estimates presented in this study are for system design, construction, system start-up and shutdown, and only one-year of operation and maintenance.

The following discussion provides details of each remedial alternative, as it would be applied at the site. A summary for the rating of evaluated remedial technologies is presented in Table VII. A cost estimate summary for each remedial technology is presented in Appendix I.

6.2 Site Constraints

The chemicals of concern at the site are known to be volatile and dissolved phase hydrocarbons that are biodegradable under aerobic conditions. Therefore, the selection and application of field tested and proven remedial technologies will be largely dependent on site conditions and economics. Site conditions important to remedial design and implementation for the site are:

- The presence of free phase hydrocarbons or light non-aqueous phase liquid (LNAPL) below the water table surface will significantly increase the time to remediate groundwater. Free phase hydrocarbons are observed to be sorbed to soil below the current water table due to releases at times when much lower water tables existed at the site.

- The low permeability soils at the site will increase the amount of effort required to remediate the site, due to increased frequency of extraction points and corresponding increase in equipment to drive remediation.

- Shallow groundwater conditions at the site will impede remediation methods that take advantage of the hydrocarbon's volatility, as the shallow groundwater restricts the zone of influence of air flow (vapor) systems.

- Structural controls (that is, buildings, property lines, and pavements) limit the ability to employ certain types of remedial equipment. The site is free of any buildings and subsurface contamination is located in an accessible area of the site.

6.3 Source Soil Remediation

The site conceptual model identified areas at the site where possible free phase hydrocarbons may exist. The remedial options discussed below are proven methods of removing hydrocarbon-impacted soil. However, the ability to achieve complete removal within a specific time frame cannot be predicted with surety.

6.3.1 Monitored Natural Attenuation

The monitored natural attenuation (MNA) remedial approach represents a groundwater monitoring only option and is generally not an acceptable remedial option to regulators unless natural attenuation of the contaminant can be demonstrated. The MNA option represents the scenario that no human health risk or environmental degradation will result due to the presence of the hydrocarbon contamination. Groundwater monitoring would be performed on a semi-annual basis to confirm the stability of groundwater flow conditions and plume geometry. This option is easy to implement, but remediation is generally slow and provides no control of chemical movement.

The presence of LNAPL in both the saturated and unsaturated soil is significant and only total removal of free phase hydrocarbon product will reduce future degradation of the environment. A review of site groundwater monitoring data does indicate that hydrocarbon concentrations have declined over time since groundwater monitoring was initiated in 1991. This decline in hydrocarbon

compounds is noted for wells MW-2 and MW-4, and therefore, MNA processes can be considered feasible based on site history.

To estimate the time to regulatory closure via the MNA approach, historical data from well MW-2 is used. The estimated time to closure is based on the observed decline of benzene, as benzene is the major risk driver at the site with a State of California MCL of 1 μg/L. The rate of MNA can be estimated using the first-order rate equation, $C(t) = C_o.e^{-kt}$, where $C(t)$ is the concentration of contaminant after time t, and C_o represents the initial contaminant concentration and k represents the natural attenuation decay constant.

Applying the above rate equation, a time to achieve regulatory compliance is estimated and the results are shown on Figure 21; data shown include actual site concentration data and predicted results based on the rate equation. Based on closeness of fit between actual and model data, a decay constant, k, of 0.0006 micrograms per liter per day (μg/L/day) is estimated. Using this decay rate and projecting to a benzene concentration of 1 μg/L, the site plume (with respect to benzene) will take approximately 33 years from present to reach the MCL for benzene.

MNA is a viable remediation option for the site. Though this option does not actively contain the hydrocarbon plume, future sampling may show the plume to be stabilized through biological degradation. This option has the longest life expectancy of the remedial options considered, however, it is the easiest option to initiate, and does not require any additional administrative burden beyond what is currently in place. Assuming semi-annual monitoring, MNA has the highest estimated life-cycle cost due to the long life span of the project.

6.3.2 Dual Phase Extraction

Dual phase extraction (DPE) is a proven technology that combines soil vapor extraction with groundwater extraction. The DPE method would involve installing up to six DPE wells within the

area defined by the extent of TPH as gasoline above 500 mg/Kg in soil (between 10 to 20 feet bgs). The extraction wells would be 6-inch-diameter wells and screened approximately 10 to 20 feet bgs. The wells are fitted with a groundwater extraction pump and the wellhead is completed so that a vacuum of approximately 15 inches of mercury can be applied to the wellhead. The groundwater pump would lower water levels surrounding the well while the applied vacuum draws in soil vapor surrounding the well screen. The extraction well heads would be manifolded together into a piping network that flows to a treatment compound.

Using the DPE method, the effectiveness of soil venting and groundwater extraction is greatly enhanced due to the drawdown effect of groundwater pumping and the uplift of the water table due to the applied vacuum. These opposing forces within the same well screen enhance dewatering and vapor stripping in the vicinity of the well.

Extracted groundwater would be treated via liquid phase activated carbon and discharged to local storm drain system, if capacity is available, under authority of a National Pollutant Discharge Elimination System (NPDES) permit or to the sanitary sewer system under permit from the local Publicly Owned Treatment Works (POTW). Typical groundwater extraction treatment equipment would include downhole pumps and motor controls, water level switches, holding tanks, particulate filters, and activated carbon filters. Trenching would also be required to plumb the systems together, and a power supply would be required to operate the DPE system.

Extracted soil vapor would be treated by either thermal oxidation or vapor phase activated carbon depending on hydrocarbon vapor concentrations and discharged to atmosphere under permit from the Bay Area Air Quality Management District (BAAQMD). Typical soil vapor extraction treatment equipment would include a vacuum pump, water knockout tank, system controls and abatement equipment.

Considerable construction effort will be required to implement DPE, including construction of a treatment plant, and trenching for a collection-piping network. Also, permits would be required for construction of the extraction wells and treatment compound.

Typically, the operation of a DPE system can result in relatively rapid decline in contamination within a 6- to 14-month period. However, factors that may reduce the effectiveness of implementing the DPE technology at the site are the shallow groundwater conditions, low permeability of soils, and discontinuous (silty) sand stringers at multiple depths.

This option has the highest administrative burden and second highest estimated life cycle cost, and operation and maintenance labor and cost associated with this option are high.

6.3.3 Source Soil Excavation and Dewatering

The implementation of the source soil excavation and dewatering would involve the removal of the soil with free phase product and TPH as gasoline impacts greater than 100 mg/Kg. An excavation would be dug in the area indicated in Figure 22, which contains the areas defined from field investigations as areas impacted by free phase hydrocarbon product. The excavation would have surface area dimensions of 40 feet by 40 feet and be dug to a depth of 20 feet bgs. The excavation would be supported by interlocking sheet pile shoring driven to 30 feet bgs.

The excavation would have a total volume of approximately 1,185 cubic yards (32,000 cubic feet) with a total soil mass of approximately 1,600 tons (assuming an average soil density of 100 pounds per cubic foot [(lbs/ft^3]). The excavation will remove impacted unsaturated and saturated soils. Soil will be excavated with a backhoe with an appropriate boom length to remove soil to a depth of 20 feet bgs. Soil stockpiles will be placed adjacent to the excavation and covered when not in use to prevent airborne dust.

Stockpiled soil will be profiled and loaded onto trucks and transported to a Class II landfill (for the purpose of this evaluation, it is assumed that excavated soil will be acceptable at a Class II landfill). Dump truck bins will be lined with sufficient Visqueen plastic prior to loading so that the soil load can be "burrito wrapped" upon completion of loading.

The area of excavation will be dewatered using temporary perforated caissons as well points. Groundwater will be lowered prior to and during excavation to a maximum depth of 25 feet bgs. Based on historic depth to water measurements, groundwater ranges from about 1.5 to 5.5 feet bgs, assuming that groundwater will be approximately 2 feet bgs at the time of excavation, then approximately 18 feet of saturated soil may be encountered prior to excavation. Assuming saturated soil has an effective drainage porosity of 10%, then approximately 21,600 gallons of free water will be contained within soil pores. Additional groundwater will likely seep into the excavation pit during digging activities, but rapid recharge of the excavation is not expected due to the relatively tight soil at the site; however, initial recharge may be rapid and should be considered for planning purposes. At a minimum, three 20,000-gallon storage tanks should be maintained onsite during excavation activities. Water laden excavated soil will be stockpiled in an adjacent bermed area covered with a double lining of 60-mil Visqueen plastic. A temporary ditch will be trenched for the stockpile water to drain back into the excavation.

Dewatering during this phase of the remedial effort will also allow significant quantities of dissolved phase BTEX impacted groundwater to be captured and treated. Groundwater from the dewatering process will be passed through particulate filters and carbon vessels prior to discharge to a POTW or storm drain via a NPDES permit. The dewatering process allows for a much faster and efficient way to capture and treat the hydrocarbon impacted groundwater that surrounds the excavation (source) areas.

6.4 Groundwater Remediation

The soil remedial efforts will capture a significant portion of the more highly contaminated groundwater, therefore, to treat remaining low concentration hydrocarbons beyond the limits of the soil remediation, enhanced insitu bioremediation (EIB) is recommended. The site's intrinsic bioremediation field study results collected during previous groundwater monitoring indicate that anaerobic and reducing conditions exist in the areas with high dissolved hydrocarbon concentrations (that is, wells MW-2 and MW-4). Aerobic and oxidative conditions exist in the area of well MW-3; an area of the site that has probably never been affected by the hydrocarbon release. To cost effectively address the residual hydrocarbons in groundwater post soil remediation, the placement of an oxygen release compound (ORC) and bio-nutrient compounds (typically, NPK fertilizer) into groundwater should be an effective low cost remediation solution.

Based on PID readings noted on boring logs and soil sample results, a limited number of ORC injection boreholes should be strategically located to oxygenate groundwater at depth of 8 to 19 feet bgs. The proposed location of ORC injection boreholes is shown in Figure 22.

The effectiveness of EIB can be measured by traditional groundwater sampling methods. Monitoring data can be compared against predicted first-order biological reaction kinetics to assess overall cleanup effectiveness.

6.5 Remedial Conclusion - Selection of Soil Source and Groundwater Remedial Options

The site conceptual model shows that the hydrocarbon impacts are contained within relatively low permeability soil. MNA would be the easiest approach to adopt, but has the longest life span and highest associated cost. The effectiveness of DPE may be limited due to site conditions that include, shallow groundwater, low permeability soils, and discontinuous (silty) sand stringers at multiple depths. To meet the remediation objectives, soil source excavation and dewatering the core of the groundwater plume provides the quickest and most cost-effective remedial option.

For the portion of the backfill within the saturated zone, the coarse rock fill may be amended with bio-nutrients (ORC and NPK fertilizer) to foster EIB. For residual hydrocarbon concentration in groundwater outside the area of excavation, the hydrocarbons will be treated by strategically locating several boreholes for ORC placement to foster EIB.

To achieve final site closure, a period of groundwater monitoring, typically a minimum of four quarters, will likely be required. Should contaminant concentrations be reduced below regulatory acceptable levels or show a declining trend, then site closure may be achieved through the risk-based corrective action (RBCA) approach.

7.0 Conclusions and Recommendations

The following conclusions can be made from the data generated during the Remedial Investigation / Feasibility Study at the site:

- Four soil bores and one groundwater monitoring well bore were installed at the site to help further delineate the vertical and lateral extent of impact to soil and groundwater in the subsurface. The vertical and lateral extent of soil and groundwater has been adequately delineated.
- Soil in the investigation vicinity is predominately composed of silty clay, clayey silt, or silt to a depth of approximately 35 to 36 feet bgs. At a depth of approximately 35 to 36 feet bgs, a one to three foot thick section of sand to sandy silt was encountered in each bore. Additional layers of silt and sandy silt were encountered to an approximate depth of 45 or 46 feet bgs in CPT-1. Thereafter only silty clay was encountered to a total depth of 50 feet bgs. In CPT-2 only silty clay to clayey silt was encountered to a depth of approximately 47 feet bgs, where upon silt to sandy silt was present.
- Earlier bore logs document a series of 1- to 3-foot-thick water-bearing zones in the upper approximately 20 feet bgs close to the former location of the UST, which consisted of silty to clayey sands. These units were identified in the closely associated CPT-1 bore as silts. Silt layers between approximately 20 and 33 feet did not yield, or only slowly yielded, groundwater samples. Ample groundwater was yielded only at an approximate depth of 35 to 36 feet bgs in both CPT bores.
- Depth-discrete groundwater samples were collected from SB-K, CPT-1, and CPT-2. The elevated contaminant concentrations in the groundwater sample collected in SB-K are considered suspect, and may represent infiltration from a shallower depth into the bore. A significant decrease in the concentrations of groundwater contaminants is documented by the groundwater samples obtained in both CPT bores at depths greater than approximately 20 feet bgs.

- Except at bore MW-7, all groundwater appears to be perched or confined. Initial near surface groundwater at bore MW-7 appears unconfined and may be isolated or laterally connected. Deeper groundwater in bore MW-7 appeared to be confined at an approximate depth of 34.25 feet, and rapidly field stabilized at approximately 11.9 feet bgs; however, the piezometric surface at the time of sampling was only about 3.9 feet bgs, so the difference in groundwater elevations between well MW-7 and wells screened in shallower zones may not be statistically significant.
- PID readings in bores SB-J and SB-K (as well as earlier bores) indicate elevated readings in the upper approximately 20 feet bgs, but also indicate a significant decrease in organic vapors below an approximate depth of 20 feet bgs. This trend was also observed in CPT-1. PID readings in bore MW-7 were also significantly lower in the upper 20 feet bgs, and were non-detectable below approximately 20 feet bgs. The earlier soil bores proximal to the former UST location (and with better soil recovery than SB-J and SB-K) indicated higher PID readings with successfully deeper sandier zones to a depth of approximately 16 to 18 feet bgs, up to 10 feet below groundwater at the time. This was assumed to indicate that groundwater was lower during the drought years and allowed the petroleum release to migrate downwards through soil; however, soil analytical data is not in full agreement with a contaminant concentration increase with depth.
- For the current investigation, TPH as gasoline concentrations in soil ranged from a low of non-detectable to 550 mg/Kg. The laboratory included a note for most samples that indicated that the hydrocarbon identified was unmodified or weakly modified gasoline. TPH as diesel concentrations in soil ranged from non-detectable to 33 mg/Kg. The laboratory included a note for the samples that indicated that diesel range hydrocarbons contained no recognizable pattern, and that gasoline range compounds were also significant. The concentration of benzene ranged from non-detectable to 4.8 mg/Kg; toluene from non-detectable to 1.7 mg/Kg; ethylbenzene from non-detectable to 8.5 mg/Kg; and total xylenes from non-detectable to 13 mg/Kg. MTBE was inadvertently not analyzed for in most of these soil samples; however, it was non-detectable in soil collected from bore MW-7. The laboratory

included a note for soil sample MW7-16 that indicated that a Stoddard solvent / mineral spirit pattern was present.

- For the site as a whole, TPH as gasoline in soil ranges up to 2,600 mg/kg, TPH as diesel up to 1,500 mg/kg, benzene up to 19 mg/kg, toluene up to 45 mg/kg, ethylbenzene up to 51 mg/kg, and total xylenes up to 110 mg/kg. Significantly higher concentrations are typically, but not exclusively, found at the shallowest depths in the upper 20 feet.
- Discrete-depth groundwater samples collected from CPT-1 and CPT-2 largely defined the vertical extent of significant hydrocarbon impact, and the samples indicate that significantly lower concentrations of hydrocarbons may be present below approximately 20 feet bgs.
- Deep groundwater monitoring well MW-7 was the only well installed and sampled in this phase of investigation, and was screened between 32.5 and 42.5 feet bgs. The well was placed approximately 15 feet downgradient of the former UST basin. TPH as gasoline, TPH as diesel, BTEX, and MTBE were all nondetectable in the groundwater sample.
- The lateral and vertical limits of Total TPH and benzene in soil and groundwater were depicted in a series of figures. The lateral extent of impacted soil may be underestimated in the 11.5 to 19.5 depth interval due to the concentration of prior analytical testing at shallower depths, reflective of the lighter-than water (floating) nature of hydrocarbons. Concentrations in groundwater were also depicted over time and at selected depth intervals. The lateral extent of impacted groundwater in the earlier time period is not expected to have been significantly different based on the existence of wells MW-1 through MW-4 at that time; however, some limited offsite migration to the southwest may have occurred.
- Depth to groundwater in well MW-7 was 6.38 feet below the top of the well casing. Because the well was completed aboveground approximately 2.5 feet, groundwater was found at an approximate depth of 3.9 feet bgs. The pressure head appears to be slightly different than the other six wells based on the available data. Because this is the only well screened across the deeper water-bearing zone, there is not a plan to survey the well.

- The feasibility study evaluated three remedial alternatives to address soil and groundwater contamination at the site:
    - Monitored Natural Attenuation,
    - Dual Phase Extraction, and
    - Source Soil Excavation and Dewatering

  Source Soil Excavation and Dewatering was determined to be the quickest and most cost-effective option to meet remediation objectives at the site.
- Blymyer recommends that a Corrective Action Plan for Source Soil Excavation and Dewatering be submitted to ACEH for approval.
- A copy of this report has been forwarded to:

  Mr. Barney Chan
  Alameda County Environmental Health
  1131 Harbor Bay Parkway, Suite 250
  Alameda, CA 94502-6577

Tables

Table I. Summary of Soil Sample Hydrocarbon Analytical Results
BEI Job No: 202016 Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Depth (ft)	Date	Soil Type (USCS)	Modified EPA Method 8015 (mg/Kg)		EPA Method 8020 or 8021B (mg/Kg)				
				TPH as Gas	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
East of 600 gal tank	7	2/5/90	N/A	740	1,100 *	14	35	23	110	NA
Dirt pile (composite)	---	2/6/90	N/A	1,700	2,000 **	15	78	37	210	NA
D1-10*	11.0	10/3/90	N/A	0.60	NA	<0.005	<0.005	<0.005	<0.005	NA
MW1-4A	11.0	11/22/91	CL/CH	<1	NA	<0.003	<0.003	<0.003	<0.003	NA
MW2-4A	11.0	11/22/91	CH (w/Sa)	140	NA	1.7	3.6	2.6	14	NA
MW3-4A	15.0	11/22/91	CL/CH (w/Sa)	<1	NA	<0.003	0.005	<0.003	<0.003	NA
MW4-2A	11.0	11/22/91	CL/CH	<1	NA	<0.003	0.006	0.005	<0.003	NA
B-1	5.0	11/3/92	CL	23	NA	0.13	0.033	1.4	0.038	NA
B-1	10.0	11/3/92	CL	36	NA	0.095	0.030	0.69	1.7	NA
B-2	5.0	11/3/92	CL	34	NA	0.28	1.4	0.63	4.1	NA
B-2	10.0	11/3/92	CL	40	NA	1.3	0.63	0.98	4.8	NA
B-3	5.0	11/3/92	SP	<1	NA	<0.003	0.004	<0.003	0.008	NA

Table 1. Summary of Soil Sample Hydrocarbon Analytical Results
BEI Job No 202016, Dolan Rentals
6303 Scarlett Court, Dublin, California

Sample ID	Depth (ft)	Date	Soil Type (USCS)	Modified EPA Method 8015 (mg/Kg)		EPA Method 8020 or 8021B (mg/Kg)				
				TPH as Gas	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
B-3	10.0	11/3/92	CL	42	NA	1.1	0.13	0.86	4.7	NA
B-4	5.0	11/3/92	CL/CH	470	NA	2.3	8.6	6.6	38	NA
B-4	10.0	11/3/92	CL	23	NA	0.89	0.22	0.47	2.3	NA
SB-A-3.5	3.5	9/16/03	SC	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
SB-B-7.5	7.5	9/16/03	CL	5.9 [a]	1.4 [b]	0.024	0.17	0.098	0.019	<0.05
SB-B-17	17	9/16/03	SM	49 [a]	10 [b]	0.022	0.17	0.30	0.67	<0.05
SB-C-8.5	8.5	9/16/03	SM	150 [a]	32 [b c d]	3.1	1.2	2.4	11	<0.50
SB-C-18	18	9/16/03	SM	640 [a]	180 [b c d]	9.9	7.1	11	42	<2.5
SB-D-10	10	9/16/03	CL	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
SB-D-13	13	9/16/03	SM	5.2 [a]	2.9 [b d]	0.014	0.040	0.088	0.046	<0.05
SB-E-13.5	13.5	9/16/03	SM	1.7 [a]	2.6 [c d]	<0.005	0.036	<0.005	<0.005	<0.05
SB-F-17.75	17.75	9/16/03	CL/SM	210 [a]	62 [b c]	0.27	0.56	2.1	1.0	<5.0
SB-G-8	8	9/16/03	CL	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05

Table 1: Summary of Soil Sample Hydrocarbon Analytical Results
REI Job No. 202016: Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Depth (ft)	Date	Soil Type (USCS)	Modified EPA Method 8015 (mg/Kg)		EPA Method 8020 or 8021B (mg/Kg)				
				TPH as Gas	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
SB-H-12	12	9/16/03	CL	65 [a]	12 [b c d]	<0.025	0.64	0.37	0.11	<0.25
SB-I-3.5	3.5	9/16/03	SP	2,600 [a]	1,500 [b c]	3.1	3.4	51	20	<10
SB-I-8.25	8.25	9/16/03	CL/SM	1,600 [a]	260 [b c]	19	46	33	110	<10
SB-I-13.5	13.5	9/16/03	SM	430 [a]	110 [b c d]	11	14	8.7	35	<10
SB-J-7.5	7.5	2/18/05	CL	550 [a]	33 [b c]	2.8 [e]	0.83	8.5	13	NA
SB-K-9	9.0	2/18/05	CL	130 [a]	8.8 [b c]	4.3	1.7	2.3	8.6	NA
SB-K-19.5	19.5	2/18/05	CL/SM	130 [a]	4.4 [b c]	0.48	1.2	1.6	6.2	NA
CPT1-23.5	23.5	3/28/05	ML	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	NA
CPT1-29.5	29.5	3/28/05	ML	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	NA
CPT1-41.5	41.5	3/28/05	ML	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	NA
CPT2-8.0	8.0	3/28/05	CL	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	NA
CPT2-28	28	3/28/05	CL	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	NA
CPT2-43	43	3/28/05	SM	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	NA

Table 1, Summary of Soil Sample Hydrocarbon Analytical Results
RFI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Depth (ft)	Date	Soil Type (USCS)	Modified EPA Method 8015 (mg/Kg)		EPA Method 8020 or 8021B (mg/Kg)				
				TPH as Gas	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
MW7-16	16	7/5/05	CL	**38** [f]	**4.2** [c, e]	<0.050	**0.62**	**0.078**	**0.056**	<0.50
MW7-21	21	7/5/05	CL	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
RWQCB ESL Commercial / Industrial Land Use; **Shallow Soils** (<3m); Groundwater IS Current or Potential Source of Drinking Water (Table A)				100	100	0.044	2.9	3.3	1.5	0.023
RWQCB ESL Commercial / Industrial Land Use; **Deep Soils** (>3m); Groundwater IS Current or Potential Source of Drinking Water (Table B)				100	100	0.044	2.9	3.3	1.5	0.023

Table II, Summary of Lead and Fuel Oxygenate Soil Sample Analytical Results
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Date	Method SW 7010 (mg/Kg)	EPA Method 8260B (Mg/Kg)						
		Total Lead	TAME	TBA	EDB	1,2-DCA	DIPE	ETBE	MTBE
SB-B-7.5	9/16/03	<3.0	NA	NA	NA	NA	NA	NA	NA
SB-B-17	9/16/03	<3.0	NA	NA	NA	NA	NA	NA	NA
SB-C-18	9/16/03	<3.0	NA	NA	NA	NA	NA	NA	NA
SB-F-17.75	9/16/03	<3.0	NA	NA	NA	NA	NA	NA	NA
SB-I-3.5	9/16/03	<3.0	NA	NA	NA	NA	NA	NA	NA
SB-I-8.25	9/16/03	**7.6**	NA	NA	NA	NA	NA	NA	NA
SB-I-13.5	9/16/03	<3.0	NA	NA	NA	NA	NA	NA	NA
SB-J-7.5	2/18/05	NA	<0.005	<0.025	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:
mg/Kg = Milligrams per kilogram
<x = Less than the analytical detection limit (x)
TAME = Methyl *tert*-Amyl Ether
EDB = 1,2-Dibromoethane
DIPE = Di-isopropyl Ether
MTBE = Methyl *tert*-butyl Ether
TBA = *tert*-Butyl Alcohol
1,2-DCA = 1,2-Dichloroethane
ETBE = Ethyl *tert*-Butyl Ether
NA = Not analyzed

Bold results indicate detectable analyte concentrations.
Shaded results indicate analyte concentrations above the RWQCB ESL values.

Table III: Summary of Grab or Depth-Discrete Groundwater Sample Hydrocarbon Analytical Results
BEI Job No. 203016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Date	Modified EPA Method 8015 (μg/L)		EPA Method 8020 (μg/L)				
		TPH as Gasoline	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
D1	10/3/90	**22,000**	NA	**250**	<30	**750**	**880**	NA
D3	10/3/90	**110,000**	NA	**600**	**300**	**800**	**1,000**	NA
D4	10/3/90	**15,000**	NA	**1,300**	<30	**700**	**1,000**	NA
D5	10/3/90	**420**	NA	**2.4**	<0.3	**14**	**4.2**	NA
D6	10/3/90	**320,000**	NA	**4,000**	**4,400**	**3,700**	**10,000**	NA
B-1	11/4/92	**Free Product**						
B-2	11/4/92	**Free Product**						
B-3	11/4/92	NA	NA	NA	NA	NA	NA	NA
B-4	11/4/92	**Free Product**						
B-5	11/4/92	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
B-6	11/4/92	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
B-7	11/4/92	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
B-8	11/4/92	**Free Product**						

Table III. Summary of Grab or Depth-Discrete Groundwater Sample Hydrocarbon Analytical Results
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Date	Modified EPA Method 8015 (μg/L)		EPA Method 8020 (μg/L)				
		TPH as Gasoline	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
B-9	11/4/92	**170**	NA	**1.7**	<0.3	**2.4**	**1.4**	NA
B-10	11/4/92	**7,800**	NA	**48**	**19**	**190**	**150**	NA
B-11	11/14/92	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
B-12	11/14/92	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
B-13	12/10/92	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
SB-K-4W	2/18/05	**74,000** [a,b]	**47,000** [a,c,d]	**9,100**	**840**	**4,200**	**11,000**	NA
SB-K-19.5W	2/18/05	**5,600** [a,b]	**2,400** [a,c,d]	**240**	**140**	**160**	**550**	NA
CPT1-34W	3/28/05	**150** [a]	<50	**11**	**6.5**	**5.3**	**17**	NA
CPT1-40W	3/28/05	**320** [a]	**61** [d]	**33**	**23**	**15**	**46**	NA
CPT2-23W	3/28/05	<50	<50	<0.5	<0.5	<0.5	<0.5	NA
CPT2-35W	3/28/05	<50	**60** [d]	<0.5	<0.5	<0.5	<0.5	NA
RWQCB Groundwater ESL: Groundwater IS a Current or Potential Source of Drinking Water (Table A)		100	100	1.0	40	3.0	13	5.0

Table III, Summary of Grab or Depth-Discrete Groundwater Sample Hydrocarbon Analytical Results

Notes:
- µg/L = Micrograms per liter
- TPH = Total Petroleum Hydrocarbons
- MTBE = Methyl *tert*-butyl ether
- NA = Not analyzed
- <x = Less than the analytical detection limit (x)
- EPA = Environmental Protection Agency
- N/A = Not applicable
- [a] = Laboratory note indicates an unmodified or weakly modified gasoline pattern.
- [b] = Laboratory note indicates a lighter than water immiscible sheen / product is present.
- [c] = Laboratory note indicates diesel range compounds are significant; no recognizable pattern.
- [d] = Laboratory note indicates gasoline range compounds are significant.
- [e] = Laboratory note indicates oil range compounds are significant.

Bold results indicate detectable analyte concentrations.
Shaded results indicate analyte concentrations above the respective RWQCB ESL value (Groundwater IS Current or Potential Source of Drinking Water).

Table IV, Summary of Groundwater Sample Hydrocarbon Analytical Results
BEI Job No: 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Date	Modified EPA Method 8015 (μg/L)		EPA Method 8020 or 8021B (μg/L)				
		TPH as Gasoline	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
MW-1	11/27/91	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	9/30/92	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	4/7/94	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
	8/12/94	<50	NA	1	1	<0.3	<2	NA
	11/29/94	<50	NA	<0.5	<0.5	<0.5	<2	NA
	3/21/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	5/22/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	8/24/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	2/12/96	<50	NA	<0.5	<0.5	<0.5	<2	NA
	6/6/02*	NA	NA	NA	NA	NA	NA	NA
	9/23/02	NA	NA	NA	NA	NA	NA	NA
	12/13/02	NA	NA	NA	NA	NA	NA	NA
	12/14/04	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	3/23/05	NA	NA	NA	NA	NA	NA	NA
	6/22/05	NA	NA	NA	NA	NA	NA	NA

Table IV, Summary of Groundwater Sample Hydrocarbon Analytical Results
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Date	Modified EPA Method 8015 (µg/L)		EPA Method 8020 or 8021B (µg/L)				
		TPH as Gasoline	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
MW-2	11/27/91	170,000	NA	24,000	13,000	3,500	16,000	NA
	9/30/92	120,000	NA	24,000	15,000	3,800	17,000	NA
	4/7/94	120,000	NA	21,000	14,000	4,300	21,000	NA
	8/12/94	140,000	NA	17,000	10,000	4,300	18,000	NA
	11/29/94	90,000	NA	17,000	7,500	3,400	15,000	NA
	3/21/95	83,000	NA	17,000	8,000	3,800	17,000	NA
	5/22/95	82,000	NA	14,000	6,000	4,000	16,000	NA
	8/24/95	86,000	NA	13,000	8,100	3,700	16,000	NA
	2/12/96	78,000	NA	15,000	8,100	4,200	18,000	NA
	2/5/97	58,000	NA	11,000	6,900	3,500	15,000	480
	8/6/97	66,000	NA	7,000	9,200	3,500	16,000	<500
	6/6/02*	25,000 [a]	NA	2,900	50	2,700	2,200	<250
	9/23/02	14,000 [b]	4,300 [c]	2,700	81	2,100	1,800	<250
	12/13/02	26,900	4,000 [c]	1,120	91.0	1,480	2,370	197 [d]
	12/14/04	21,000 [e]	7,600 [c,e]	1,700	120	1,600	2,400	<60
	3/23/05	27,000 [d]	15,000 [c,e,f]	1,400	170	1,700	2,500	<170
	6/22/05	5,800 [g]	1,200 [c]	53	46	570	58	<50

Table IV, Summary of Groundwater Sample Hydrocarbon Analytical Results
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Date	Modified EPA Method 8015 (µg/L)		EPA Method 8020 or 8021B (µg/L)				
		TPH as Gasoline	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
MW-3	11/27/91	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	9/30/92	<50	NA	<0.3	<0.3	<0.3	<0.3	NA
	4/7/94	<50	NA	**2.5**	**5.5**	**0.9**	**5.1**	NA
	8/12/94	<50	NA	<0.5	<0.5	<0.3	<2	NA
	11/29/94	<50	NA	<0.5	<0.5	<0.5	<2	NA
	3/21/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	5/22/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	8/24/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	2/12/96	<50	NA	<0.5	<0.5	<0.5	<2	NA
	2/5/97	<50	NA	<0.5	<0.5	<0.5	<0.5	<5
	6/6/02*	NA	NA	NA	NA	NA	NA	NA
	9/23/02	NA	NA	NA	NA	NA	NA	NA
	12/13/02	NA	NA	NA	NA	NA	NA	NA
	12/14/04	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	3/23/05	NA	NA	NA	NA	NA	NA	NA
	6/22/05	NA	NA	NA	NA	NA	NA	NA

Table IV, Summary of Groundwater Sample Hydrocarbon Analytical Results
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Date	Modified EPA Method 8015 (µg/L)		EPA Method 8020 or 8021B (µg/L)				
		TPH as Gasoline	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
MW-4	11/27/91	11,000	NA	100	0.7	250	330	NA
	9/30/92	380	NA	3.5	2.4	8.9	3.4	NA
	4/7/94	1,100	NA	61	5.5	17	12	NA
	8/12/94	1,000	NA	3	1	8	4	NA
	11/29/94	1,100	NA	2	<0.5	10	6	NA
	3/21/95	1,400	NA	200	5	66	18	NA
	5/22/95	1,200	NA	60	1	12	8	NA
	8/24/95	400	NA	1	<0.5	1	<2	NA
	2/12/96	1,500	NA	130	<0.5	120	51	NA
	2/5/97	1,200	NA	250	4.9	94	12	16
	8/6/97	330	NA	1.5	<0.5	<0.5	<0.5	<5
	6/6/02*	<50	NA	1.7	<0.5	<0.5	<0.5	<2.5
	9/23/02	<50	<48	<0.5	1.3	<0.5	<0.5	<2.5
	12/13/02	<50	86 [c]	<0.5	<0.5	<0.5	<1.5	<0.5
	12/14/04	95 [h]	<50	2.6	<0.5	<0.5	<0.5	<5.0
	3/23/05	120 [h]	<50	<0.5	5.0	<0.5	<0.5	<5.0
	6/22/05	180 [h]	<50	1.7	7.5	<0.5	<0.5	<5.0

Table IV, Summary of Groundwater Sample Hydrocarbon Analytical Results
REI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Date	Modified EPA Method 8015 (µg/L)		EPA Method 8020 or 8021B (µg/L)				
		TPH as Gasoline	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
MW-5	3/21/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	5/22/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	8/24/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	2/12/96	<50	NA	<0.5	<0.5	<0.5	<2	NA
	2/5/97	<50	NA	<0.5	<0.5	<0.5	<0.5	<5
	6/6/02*	NA	NA	NA	NA	NA	NA	NA
	9/23/02	<50	**310** [c]	<0.5	<0.5	<0.5	<0.5	<2.5
	12/13/02	<50	**97** [c]	<0.5	<0.5	<0.5	<1.5	**0.720** [d]
	12/14/04	<50	<50	<0.5	<0.5	<0.5	<0.5	**12**
	3/23/05	<50	<50	<0.5	<0.5	<0.5	<0.5	**23**
	6/22/05	<50	<50	<0.5	<0.5	<0.5	<0.5	**31**

Table IV, Summary of Groundwater Sample Hydrocarbon Analytical Results
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Date	Modified EPA Method 8015 (μg/L)		EPA Method 8020 or 8021B (μg/L)				
		TPH as Gasoline	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
MW-6	3/21/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	5/22/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	8/24/95	<50	NA	<0.5	<0.5	<0.5	<2	NA
	2/12/96	<50	NA	<0.5	<0.5	<0.5	<2	NA
	2/5/97	<50	NA	<0.5	<0.5	<0.5	<0.5	<5
	6/6/02*	NA	NA	NA	NA	NA	NA	NA
	9/23/02	NA	NA	NA	NA	NA	NA	NA
	12/13/02	NA	NA	NA	NA	NA	NA	NA
	12/14/04	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	3/23/05	NA	NA	NA	NA	NA	NA	NA
	6/22/05	NA	NA	NA	NA	NA	NA	NA
MW-7	7/18/05	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
RWQCB Groundwater ESL: Groundwater IS a Current or Potential Source of Drinking Water (Table A)		100	100	1.0	40	3.0	13	5.0

Table IV, Continued; Summary of Groundwater Sample Hydrocarbon Analytical Results

Notes:
- μg/L = Micrograms per liter
- TPH = Total Petroleum Hydrocarbons
- MTBE = Methyl *tert*-butyl ether
- NA = Not analyzed
- <x = Less than the analytical detection limit (x)
- EPA = Environmental Protection Agency
- NV = No value established
- * = Initial data set collected under direction of Blymyer Engineers, Inc.
- a = Laboratory note indicates the result is an unidentified hydrocarbon within the C6 to C10 range.
- b = Laboratory note indicates the result is gasoline within the C6 to C10 range.
- c = Laboratory note indicates the result is a hydrocarbon within the diesel range but that it does not represent the pattern of the requested fuel.
- d = MTBE analysis by EPA Method 8260B yielded a non-detectable concentration at a detection limit of 0.50 μg/L. See Table III.
- e = Laboratory note indicates that unmodified or weakly modified gasoline is significant.
- f = Laboratory note indicates that diesel range compounds are significant, with no recognizable pattern.
- g = Laboratory note indicates that gasoline range compounds are significant.
- h = Laboratory note indicates that no recognizable pattern is present.
- i = Laboratory note indicates that a lighter than water immiscible sheen / product is present.

Bold results indicate detectable analyte concentrations.
Shaded results indicate analyte concentrations above the respective RWQCB ESL value.

Table V. Summary of Groundwater Sample Fuel Additive Analytical Results
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Sample ID	Date	EPA Method 8260B								
		TAME (µg/L)	TBA (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)	DIPE (µg/L)	Ethanol (µg/L)	ETBE (µg/L)	Methanol (µg/L)	MTBE (µg/L)
MW-2	12/13/02	<0.50	<2,000	NA	NA	<0.50	NA	<0.50	NA	<0.50
	3/23/05	<5.0	<50	<5.0	**5.4**	<5.0	<500	<5.0	<5,000	<5.0
MW-5	12/14/04	<0.5	<5.0	<0.5	<0.5	<0.5	<50	<0.5	<500	**12**
RWQCB Groundwater ESL: Groundwater IS a Current or Potential Drinking Water Resource (Table F-1b)		NV	12	0.05	0.5	NV	NV	NV	NV	5

Notes:
TAME = Methyl *tert*-Amyl Ether
TBA = *tert*-Butyl Alcohol
EDB = 1,2-Dibromoethane
1,2-DCA = 1,2-Dichloroethane
DIPE = Di-isopropyl Ether
ETBE = Ethyl *tert*-Butyl Ether
MTBE = Methyl *tert*-butyl Ether
(µg/L) = Micrograms per liter
NA = Not analyzed
NV = No value

Table VI, Summary of Groundwater Elevation Measurements BEI Job No. 202016, Dolan Rentals 6393 Scarlett Court, Dublin, California				
Well ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
MW-1	11/27/91	326.61	4.82	321.79
	9/30/92		5.34	321.27
	4/7/94		3.38	323.23
	8/12/94		4.23	322.38
	11/29/94		3.44	323.17
	3/21/95		1.00	325.61
	5/22/95		2.20	324.41
	8/24/95		3.45	323.16
	2/12/96		1.95	324.66
	2/5/97		Data	Missing
	8/6/97		3.60	323.01
	6/6/02*		2.89	323.72
	9/23/02		3.48	323.13
	12/13/02		3.18	323.43
	12/14/04		2.76	323.85
	3/23/05		1.14	325.47
	6/22/05	329.41 [1]	2.58	326.83
	7/18/05		2.21	327.20

Table VI, Summary of Groundwater Elevation Measurements
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Well ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
MW-2	11/27/91	326.67	4.92	321.75
	9/30/92		5.42	321.25
	4/7/94		3.48	323.19
	8/12/94		4.18	322.49
	11/29/94		3.76	322.91
	3/21/95		1.25	325.42
	5/22/95		2.20	324.47
	8/24/95		3.57	323.10
	2/12/96		2.60	324.07
	2/5/97		1.72	324.95
	8/6/97		3.72	322.95
	6/6/02*		3.46	323.21
	9/23/02		4.14	322.53
	12/13/02		3.45	323.22
	12/14/04		2.96	323.71
	3/23/05		1.83	324.84
	6/22/05	329.46 [1]	3.82	325.64
	7/18/05		3.55	325.91

Table VI, Summary of Groundwater Elevation Measurements
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Well ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
MW-3	11/27/91	326.58	4.96	321.62
	9/30/92		5.46	321.12
	4/7/94		3.66	322.92
	8/12/94		4.37	322.21
	11/29/94		3.60	322.98
	3/21/95		1.62	324.96
	5/22/95		2.73	323.85
	8/24/95		3.76	322.82
	2/12/96		2.45	324.13
	2/5/97		1.99	324.59
	8/6/97		3.83	322.75
	6/6/02*		3.66	322.92
	9/23/02		4.66	321.92
	12/13/02		3.66	322.92
	12/14/04		3.52	323.06
	3/23/05		1.83	324.75
	6/22/05	329.37 [1]	3.99	325.38
			3.60	322.98

Table VI, Summary of Groundwater Elevation Measurements
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Well ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
MW-4	11/27/91	326.92	5.26	321.66
	9/30/92		5.78	321.14
	4/7/94		4.02	322.90
	8/12/94		4.81	322.11
	11/29/94		4.39	322.53
	3/21/95		1.80	325.12
	5/22/95		3.07	323.85
	8/24/95		4.09	322.83
	2/12/96		2.80	324.12
	2/5/97		2.32	324.60
	8/6/97		4.14	322.78
	6/6/02*		3.76	323.16
	9/23/02		4.14	322.78
	12/13/02		3.90	323.02
	12/14/04		3.68	323.24
	3/23/05		1.93	324.99
	6/22/05	329.70 [1]	3.65	326.05
	7/18/05		3.69	323.23

Table VI, Summary of Groundwater Elevation Measurements
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Well ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
MW-5	3/21/95	326.50	2.10	324.40
	5/22/95		2.93	323.57
	8/24/95		1.57	324.93
	2/12/96		2.78	323.72
	2/5/97		2.24	324.26
	8/6/97		3.02	323.48
	6/6/02*	**	2.79	NM
	9/23/02		3.07	NM
	12/13/02		3.14	NM
	12/14/04		2.92	NM
	3/23/05		2.39	NM
	6/22/05	329.16 [1]	2.99	326.17
	7/18/05		3.39	325.77

Table VI, Summary of Groundwater Elevation Measurements
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Well ID	Date	TOC Elevation (feet)	Depth to Water (feet)	Water Surface Elevation (feet)
MW-6	3/21/95	327.23	3.24	323.99
	5/22/95		4.70	322.53
	8/24/95		4.95	322.28
	2/12/96		4.50	322.73
	2/5/97		3.68	323.55
	8/6/97		4.79	322.44
	6/6/02*		4.81	322.42
	9/23/02		5.10	322.13
	12/13/02		4.88	322.35
	12/14/04		4.61	322.62
	3/23/05		3.40	323.83
	6/22/05	330.02 [1]	4.72	325.30
	7/18/05		2.65	327.37
MW-7	7/18/05	NA	6.38	---

Notes: TOC = Top of casing
* = Initial data set collected under direction of Blymyer Engineers, Inc.
** = Surveyed elevation not yet available
NM = Not measured
[1] = Resurveyed for GeoTracker database on April 13, 2005 by CSS Environmental Services, Inc.
Elevations in feet above mean sea level

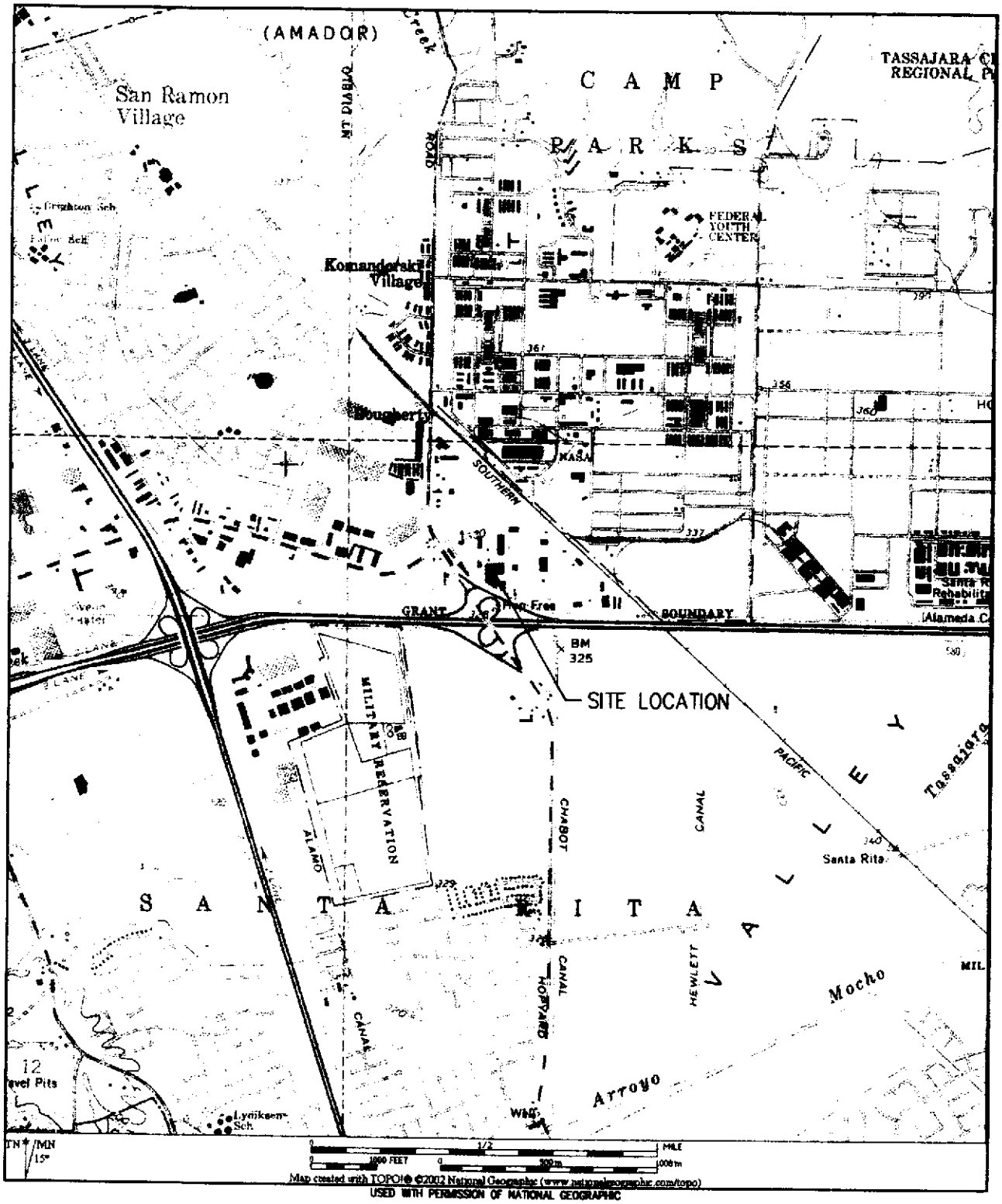
TABLE VII

RATING OF EVALUATED REMEDIAL TECHNOLOGIES
Dolan Estate
6393 Scarlett Court, Dublin, California

REMEDIAL ALTERNATIVE	SCORE	CRITERIA			
		Effectiveness	Implementation	Cost	Estimated Cost
MNA - Semi-annual Monitoring	11	3	5	3	$695,100
Dual Phase Extraction DPE	11	4	3	4	$635,542
Soil Excavation & Dewatering	14	5	4	5	$489,055

Notes:
Soil excavation and dewatering cost also includes ORC groundwater remedial effort.

Figures



BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	6-27-02

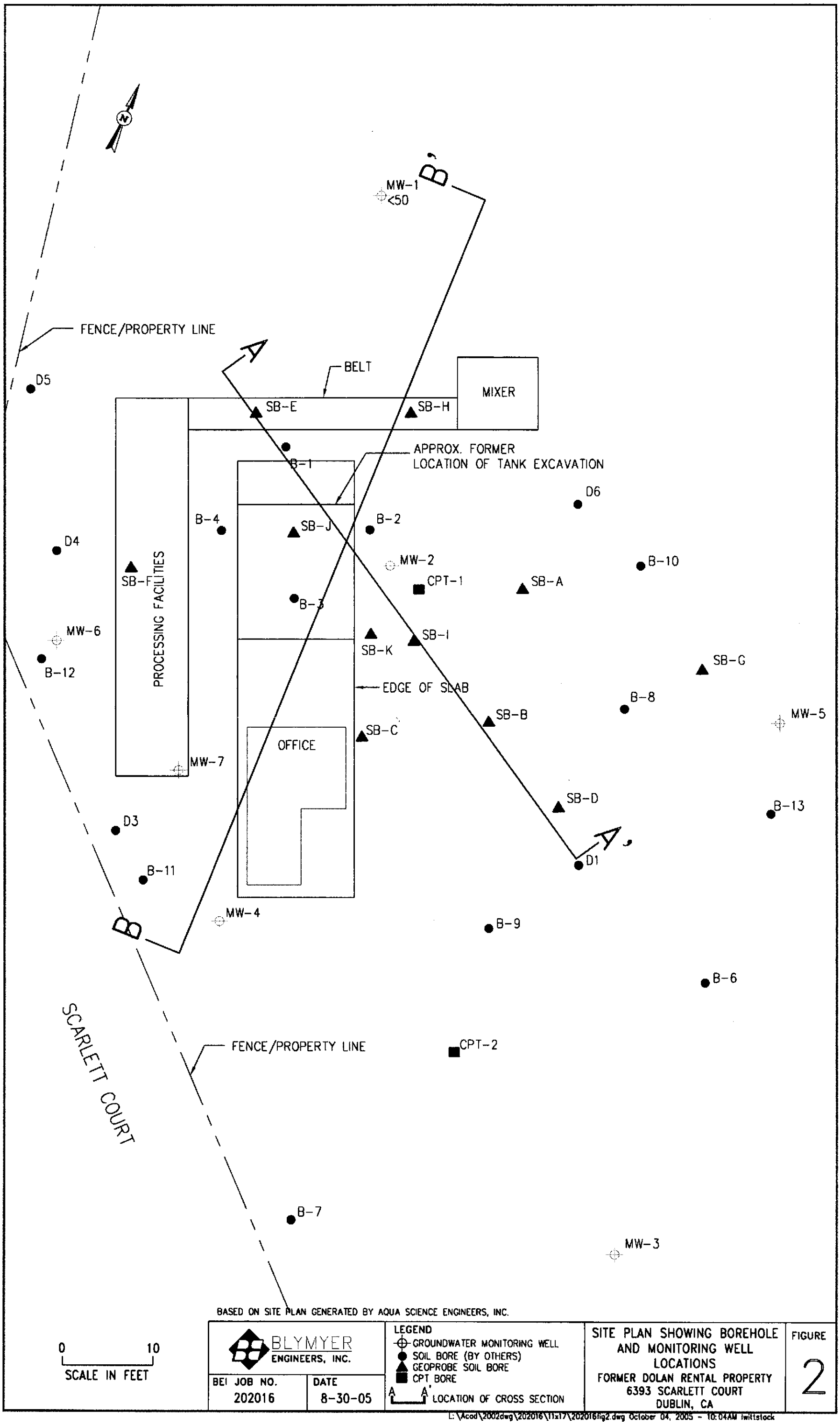
LEGEND

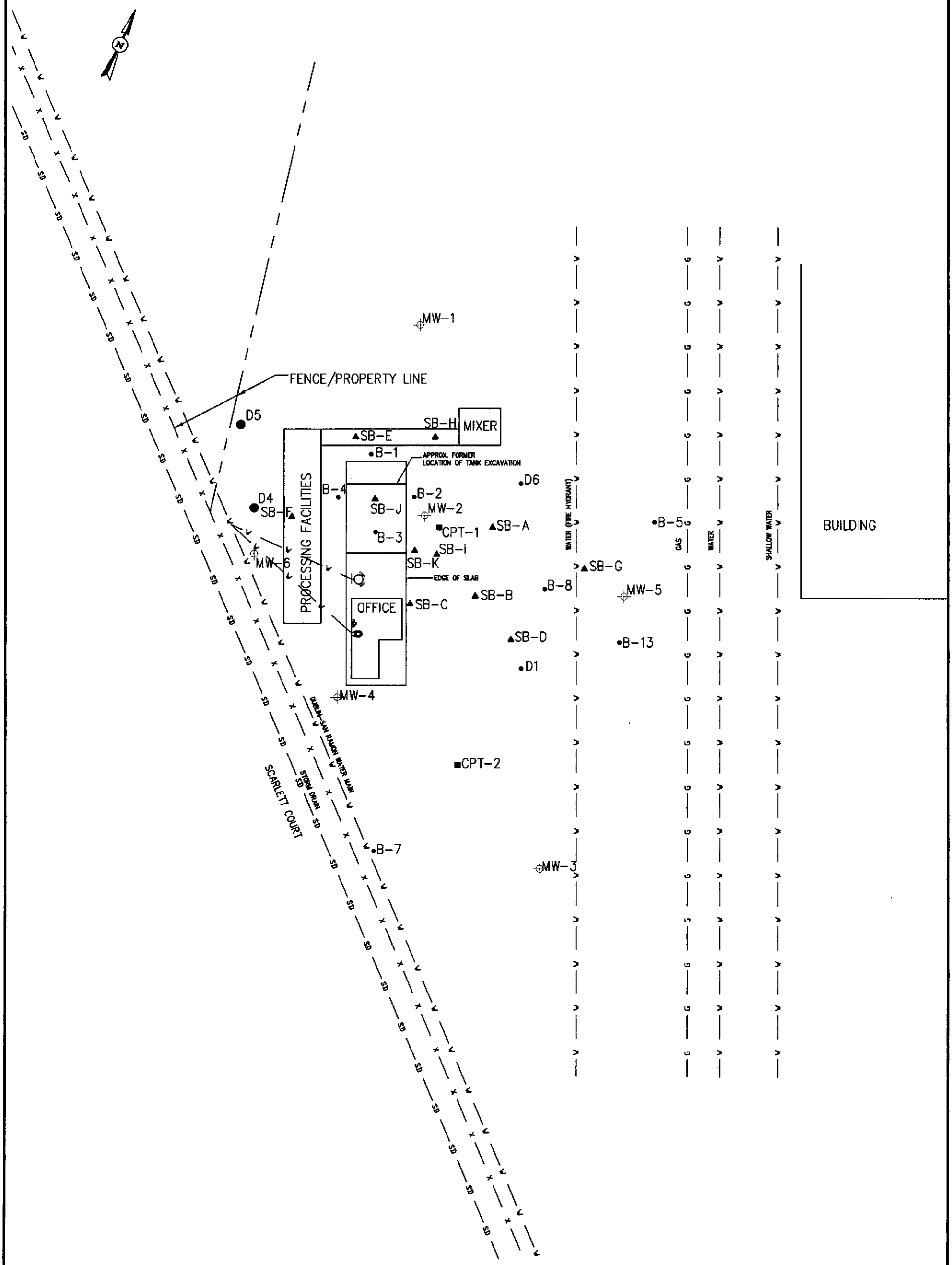
-

SITE LOCATION MAP

FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE 1


N
MW-1
<50
B
B'
FENCE/PROPERTY LINE
A
BELT
MIXER
D5
SB-E
SB-H
APPROX. FORMER
LOCATION OF TANK EXCAVATION
B-1
D6
B-4
SB-J
B-2
D4
MW-2
B-10
SB-F
CPT-1
SB-A
PROCESSING FACILITIES
B-3
MW-6
SB-K
SB-I
SB-G
B-12
EDGE OF SLAB
B-8
SB-B
MW-5
SB-C
OFFICE
MW-7
SB-D
B-13
D3
A'
D1
B-11
MW-4
B-9
B-6
SCARLETT COURT
FENCE/PROPERTY LINE
CPT-2
B-7
MW-3
BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.
0
10
SCALE IN FEET
BLYMYER
ENGINEERS, INC.
BEI JOB NO.
202016
DATE
8-30-05
LEGEND
GROUNDWATER MONITORING WELL
SOIL BORE (BY OTHERS)
GEOPROBE SOIL BORE
CPT BORE
A A' LOCATION OF CROSS SECTION
SITE PLAN SHOWING BOREHOLE AND MONITORING WELL LOCATIONS
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA
FIGURE
2
L:\Acad\2002dwg\202016\11x17\202016fig2.dwg October 04, 2005 - 10:04AM twittstock



BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 20
SCALE IN FEET

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND
- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE

CONDUIT SURVEY RESULTS

FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE 3

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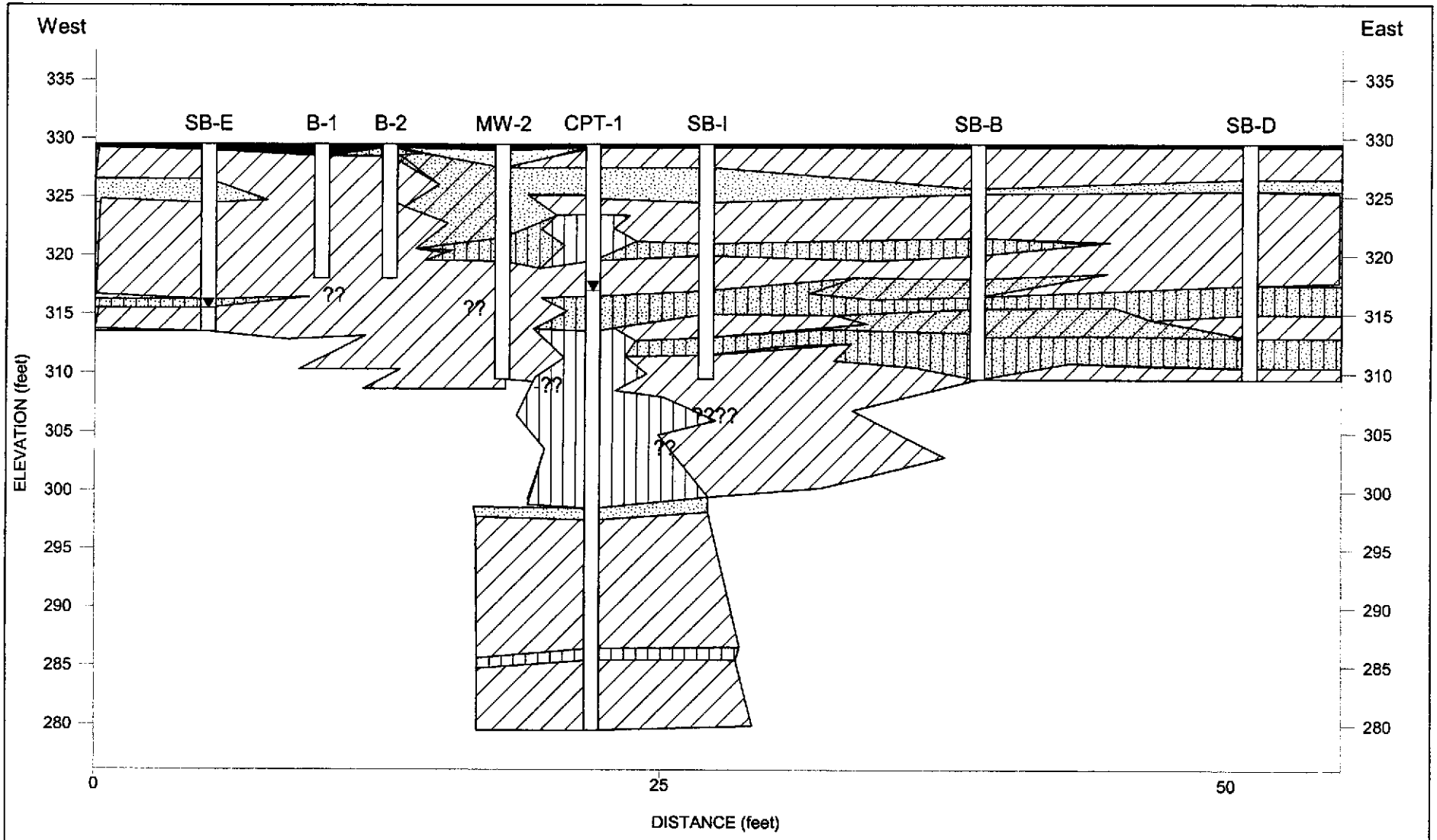


Dolan Properties
6393 Scarlett Court
Dublin, CA
ACEH Leak Case RO0000210
BEI Job # 202016

BLYMYER ENGINEERS, INC.

Figure A - A'

GEOLOGIC CROSS SECTION

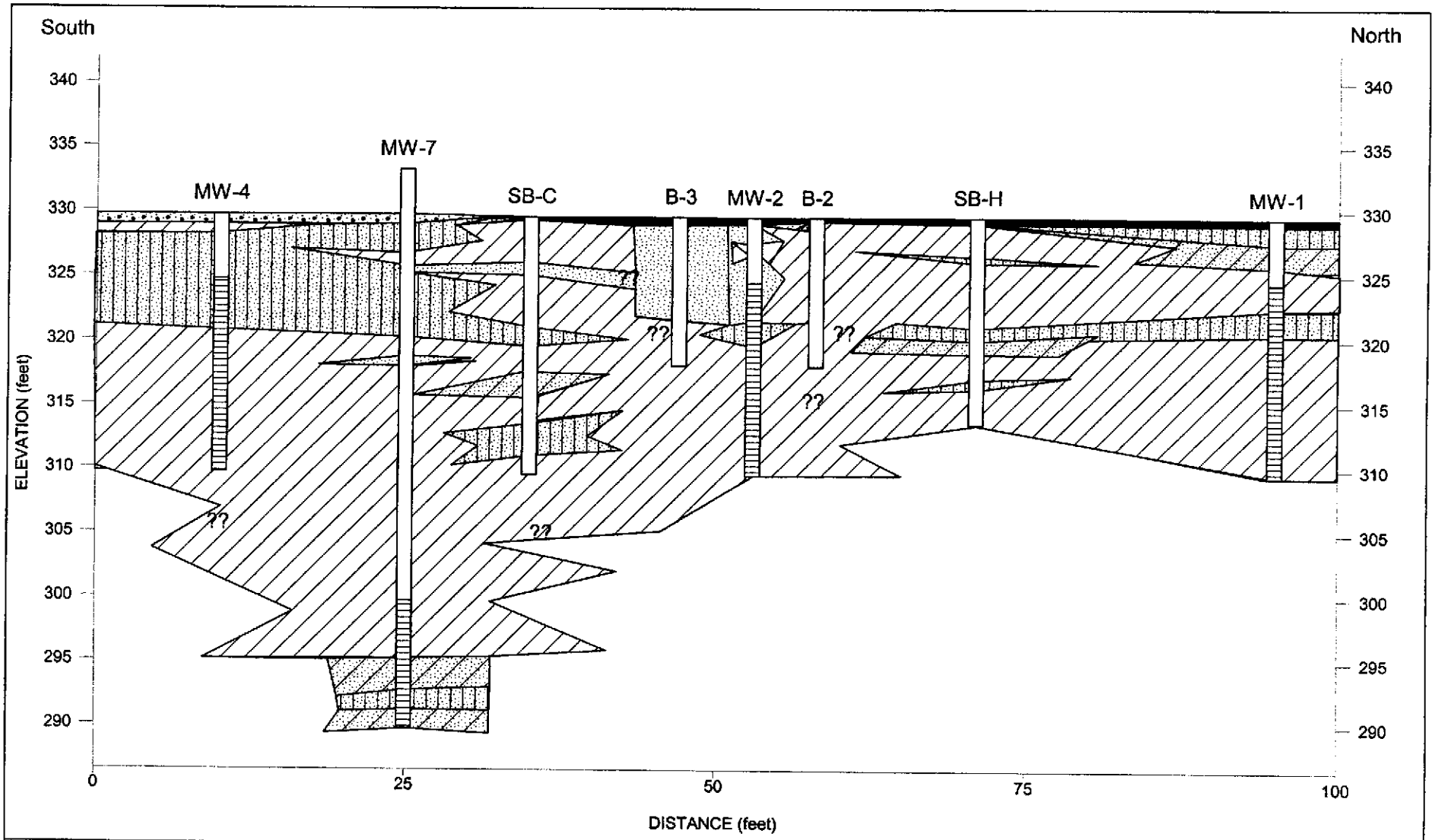
Section East - West
Cross Gradient Section

LEGEND

- SM: SILTY SAND
- CL: CLAY
- CLAYEY SAND
- GRAVEL, Well Graded
- SAND, Poorly Graded
- SAND, Well Graded
- SANDY SILT

FIGURE 4

09-20-2005 H:\Blymyer_Jobs\2002\202016 dolan\202016.dol\Bore Logs\202016EWcross.cro



Dolan Properties
6393 Scarlett Court
Dublin, CA
ACEH Leak Case RO0000210
BEI Job # 202016

BLYMYER ENGINEERS, INC.

Figure B - B'

GEOLOGIC CROSS SECTION

Section North - South
Flow Direction Section

LEGEND

- SM: SILTY SAND
- CL: CLAY
- CLAYEY SAND
- GRAVEL, Well Graded
- SAND, Poorly Graded
- SAND, Well Graded
- SANDY SILT

FIGURE 5

09-20-2005 H:\Blymyer_Jobs\2002\202016 dolan\202016.dot\Bore Logs\202016NScross3.cro

MW-1
<1

FENCE/PROPERTY LINE

BELT

MIXER

SB-E
NS

SB-H
NS

B-1
23/36

APPROX. FORMER
LOCATION OF TANK EXCAVATION

D6
NS

B-4
470/23

SB-J
583

B-2
34/40

MW-2
140

CPT-1
NS

SB-A
<1

SB-F

PROCESSING FACILITIES

B-3
<1/42

SB-I
4,100/1,860

MW-6

SB-K
138.8

SB-G
<1

EDGE OF SLAB

B-8
NS

SB-B
7.3

MW-5
NS

OFFICE

SB-C
182

MW-7
NS

SB-D
<1

D1
0.60

MW-4
<1

SCARLETT COURT

FENCE/PROPERTY LINE

CPT-2
<1

B-7
NS

MW-3
<1

BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 10
SCALE IN FEET

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND

- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL

SOIL TOTAL TPH
ISOCONCENTRATION MAP,
3.5-11FT. BGS
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE
6

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MW-1
NS

FENCE/PROPERTY LINE

BELT

MIXER

SB-E
4.3

SB-H
77

APPROX. FORMER
LOCATION OF TANK EXCAVATION

B-1
NS

B-2
NS

D6
NS

B-4
NS

SB-J
NS

D4
NS

SB-F
272

PROCESSING FACILITIES

MW-2
NS

CPT-1
NS

SB-A
NS

B-3
NS

MW-6
NS

SB-I
540

SB-K
134.4

EDGE OF SLAB

SB-G
<1

B-8
NS

SB-C
820

SB-B
59

MW-5
NS

OFFICE

MW-7
42.2

SB-D
8.1

B-13
NS

MW-4
NS

SCARLETT COURT

FENCE/PROPERTY LINE

CPT-2
NS

B-7
NS

MW-3
NS

BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 10
SCALE IN FEET

BLYMYER
ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND
- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL

SOIL TOTAL TPH
ISOCONCENTRATION MAP,
11.5-19.5FT. BGS
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE
7

L:\Acad\2002dwg\202016\11x17\202016fig7.dwg September 20, 2005 - 5:37PM lwittstock

MW-1
<1

FENCE/PROPERTY LINE

BELT

MIXER

SB-E
23/36

SB-H
NS

B-1
NS

APPROX. FORMER
LOCATION OF TANK EXCAVATION

B-2
34/40

D6
NS

B-4
470/23

SB-J
583

MW-2
140

CPT-1
NS

SB-A
<1

SB-F
272

PROCESSING FACILITIES

B-3
<1/42

1000

MW-6
NS

SB-K
138.8/134.4

SB-I
4,100/1,860/540

SB-G
<1

EDGE OF SLAB

B-8
NS

SB-C
182/820

SB-B
7.3/59

MW-5
NS

OFFICE

MW-7
42.2

100

SB-D
<1/8.1

D1
0.60

MW-4
<1

SCARLETT COURT

FENCE/PROPERTY LINE

CPT-2
<1

MW-3
<1

BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 10
SCALE IN FEET

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND
- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL

SOIL TOTAL TPH
ISOCONCENTRATION MAP,
3.5-19.5FT. BGS
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE
8

L:\Acad\2002dwg\202016\11x17\202016fig8.dwg September 20, 2005 - 5:37PM lwittstock

MW-1
NS

FENCE/PROPERTY LINE

BELT

MIXER

D5
NS

SB-E
NS

SB-H
NS

B-1
NS

APPROX. FORMER
LOCATION OF TANK EXCAVATION

PROCESSING FACILITIES

MW-2
NS

CPT-1
<1.0/<1.0/<1.0

MW-6
NS

EDGE OF SLAB

MW-5
NS

OFFICE

MW-7
<1.0

MW-4
NS

SCARLETT COURT

FENCE/PROPERTY LINE

CPT-2
<1.0/<1.0

MW-3
NS

BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 10
SCALE IN FEET

BLYMYER
ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

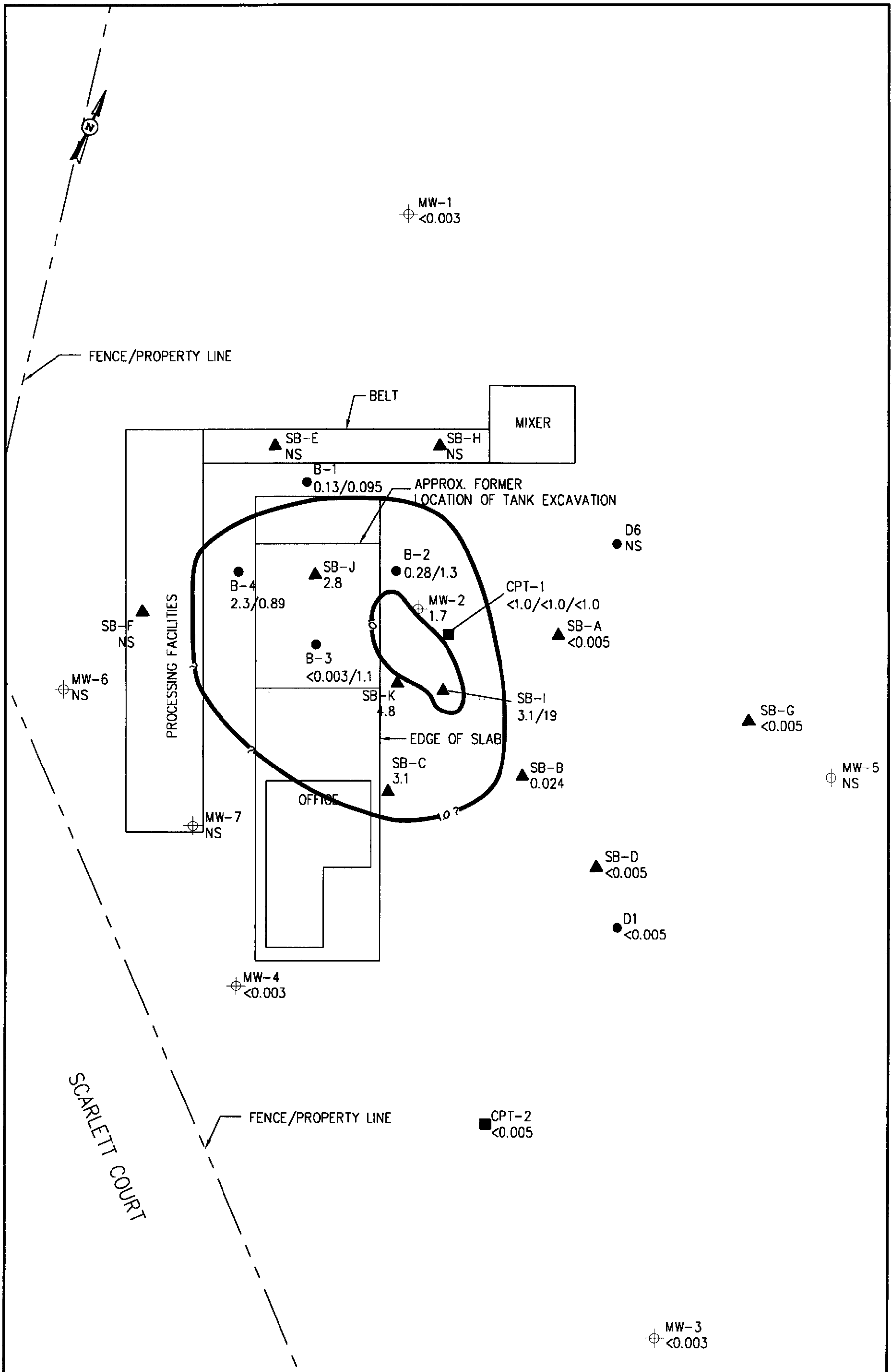
LEGEND

- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL

SOIL TOTAL TPH
ISOCONCENTRATION MAP,
20-43FT. BGS
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE
9

L:\Acad\2002dwg\202016\11x17\202016fig9.dwg September 20, 2005 - 5:37PM lwittstock


MW-1
<0.003
FENCE/PROPERTY LINE
BELT
MIXER
SB-E
NS
SB-H
NS
B-1
0.13/0.095
APPROX. FORMER
LOCATION OF TANK EXCAVATION
D6
NS
B-2
0.28/1.3
SB-J
2.8
B-4
2.3/0.89
MW-2
1.7
CPT-1
<1.0/<1.0/<1.0
SB-F
NS
SB-A
<0.005
B-3
<0.003/1.1
MW-6
NS
PROCESSING FACILITIES
SB-K
4.8
SB-I
3.1/19
SB-G
<0.005
EDGE OF SLAB
SB-C
3.1
SB-B
0.024
MW-5
NS
OFFICE
MW-7
NS
SB-D
<0.005
D1
<0.005
MW-4
<0.003
SCARLETT COURT
FENCE/PROPERTY LINE
CPT-2
<0.005
MW-3
<0.003
BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.
0
10
SCALE IN FEET
BLYMYER
ENGINEERS, INC.
BEI JOB NO.
202016
DATE
8-30-05
LEGEND
GROUNDWATER MONITORING WELL
SOIL BORE (BY OTHERS)
GEOPROBE SOIL BORE
CPT BORE
NS NOT SAMPLED
ISOCONCENTRATION (mg/kg)
<1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL
SOIL BENZENE
ISOCONCENTRATION MAP,
3.5-11FT. BGS
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA
FIGURE
10
L:\Acad\2002dwg\202016\11x17\202016fig10.dwg September 20, 2005 - 5:36PM lwittstock

MW-1
NS

FENCE/PROPERTY LINE

BELT

MIXER

SB-E
<0.005

SB-H
<0.025

B-1
NS

APPROX. FORMER
LOCATION OF TANK EXCAVATION

D6
NS

B-2
NS

SB-J
NS

B-4
NS

MW-2
NS

SB-F
0.27

CPT-1
NS

SB-A
NS

PROCESSING FACILITIES

B-3
NS

MW-6
NS

SB-K
0.48

SB-I
11

SB-G
NS

SB-B
0.022

MW-5
NS

OFFICE

SB-C
9.9

MW-7
NS

EDGE OF SLAB

SB-D
<0.014

D1
<0.005

MW-4
NS

SCARLETT COURT

FENCE/PROPERTY LINE

CPT-2
NS

MW-3
NS

BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 10
SCALE IN FEET

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND

- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL

SOIL BENZENE
ISOCONCENTRATION MAP,
11.5-19.5FT. BGS
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE
11

L:\Acad\2002dwg\202016\11x17\202016fig11.dwg September 20, 2005 - 5:36PM twittstock

MW-1
<0.003

FENCE/PROPERTY LINE

BELT

MIXER

SB-E
<0.005

SB-H
<0.025

B-1
0.13/0.095

APPROX. FORMER
LOCATION OF TANK EXCAVATION

D6
NS

B-2
0.28/1.3

SB-J
2.8

B-4
2.34/0.89

SB-F
0.27

MW-2
1.7

CPT-1
NS

SB-A
<0.005

PROCESSING FACILITIES

B-3
<0.003/1.1

MW-6
NS

SB-K
4.8/0.48

SB-I
3.1/19/11

SB-G
<0.005

SB-C
3.1/9.9

SB-B
0.024/0.022

MW-5
NS

MW-7
0.050

OFFICE

EDGE OF SLAB

SB-D
<0.005/<0.014

D1
<0.005

MW-4
0.003

SCARLETT COURT

FENCE/PROPERTY LINE

CPT-2
<0.005

MW-3
<0.003

BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 10
SCALE IN FEET

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND
- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL

SOIL BENZENE
ISOCONCENTRATION MAP,
3.5-19.5FT. BGS
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE
12

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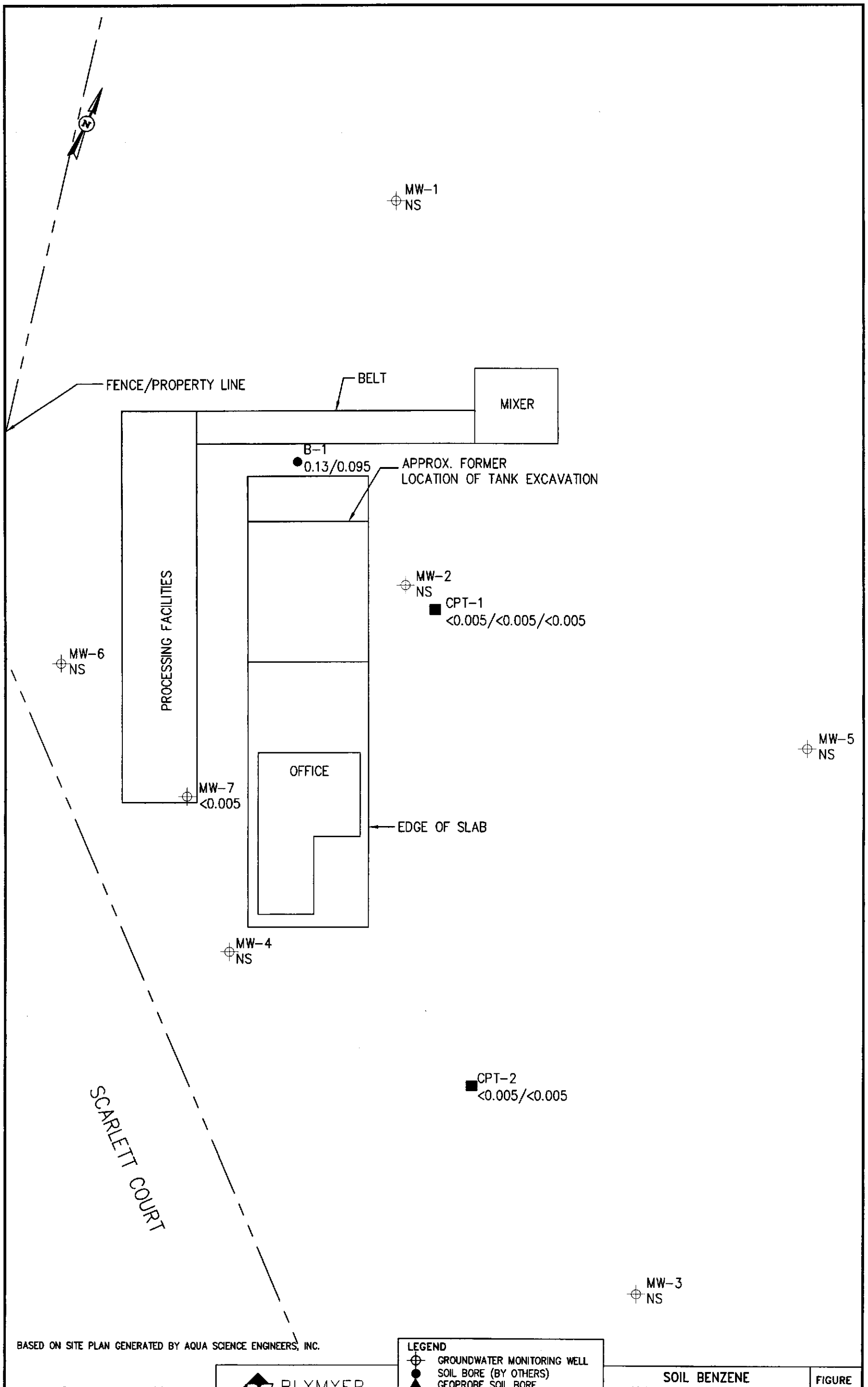
MW-1
NS
FENCE/PROPERTY LINE
BELT
MIXER
B-1
0.13/0.095
APPROX. FORMER
LOCATION OF TANK EXCAVATION
PROCESSING FACILITIES
MW-2
NS
CPT-1
<0.005/<0.005/<0.005
MW-6
NS
MW-5
NS
OFFICE
MW-7
<0.005
EDGE OF SLAB
MW-4
NS
SCARLETT COURT
CPT-2
<0.005/<0.005
MW-3
NS
BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.
0
10
SCALE IN FEET
BLYMYER
ENGINEERS, INC.
BEI JOB NO.
202016
DATE
8-30-05
LEGEND
GROUNDWATER MONITORING WELL
SOIL BORE (BY OTHERS)
GEOPROBE SOIL BORE
CPT BORE
NS NOT SAMPLED
ISOCONCENTRATION (mg/kg)
<1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL
SOIL BENZENE
ISOCONCENTRATION MAP,
20-43FT. BGS
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA
FIGURE
13
L:\Acad\2002dwg\202016\11x17\202016fig13.dwg September 20, 2005 - 5:51PM lwittstock

MW-1
<50

FENCE/PROPERTY LINE

D5
420

BELT

MIXER

SB-E
NS

SB-H
NS

APPROX. FORMER
LOCATION OF TANK EXCAVATION

B-1
FP

D6
320,000

B-4
FP

SB-J
NS

B-2
FP

D4
15,000

MW-2
170,000/120,000

B-10
7,800

SB-F
NS

CPT-1
NS

SB-A
NS

MW-6
NS

B-3
NS

PROCESSING FACILITIES

SB-K
NS

SB-I
NS

B-12
<50

SB-G
NS

EDGE OF SLAB

SB-C
NS

SB-B
NS

B-8
FP

MW-5
NS

OFFICE

MW-7
NS

100,000

SB-D
NS

B-13
<50

D3
110,000

10,000

B-11
<50

D1
22,000

MW-4
11,000/380
(SEE NOTE)

B-9
170

B-6
<50

SCARLETT COURT

FENCE/PROPERTY LINE

CPT-2
NS

B-7
<50

MW-3
<50

NOTE
TWO GROUNDWATER EVENTS COLLECTED FROM WELLS MW-1 TO MW-4 DURING TIME PERIOD. ONLY MW-4 DOCUMENTED SIGNIFICANT CHANGES.

0 10
SCALE IN FEET

BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

BLYMYER
ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND
- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL

GROUNDWATER TOTAL TPH
ISOCONCENTRATION MAP
OCT. 1990-DEC. 1992
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE
14

L:\Acad\2002dwg\202016\11x17\202016fig14.dwg October 04, 2005 - 10:05AM lwittstock

MW-1
<50

FENCE/PROPERTY LINE

BELT

MIXER

SB-E
NS

SB-H
NS

B-1
NS

APPROX. FORMER
LOCATION OF TANK EXCAVATION

B-4
NS

D6
NS

B-2
NS

SB-J
NS

MW-2
42,000

SB-F
NS

PROCESSING FACILITIES

SB-A
NS

B-3
NS

100,000

MW-6
<50

SB-I
NS

CPT-1
121,000/18,000

SB-K
NS

SB-G
NS

EDGE OF SLAB

10,000

SB-B
NS

MW-5
<50

OFFICE

SB-C
NS

MW-7
NS

SB-D
NS

100

MW-4
95/120

SCARLETT COURT

CPT-2
NS

MW-3
<50

BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 10
SCALE IN FEET

BLYMYER
ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND

- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL

DEPTH-DISCRETE
GROUONDWATER TOTAL TPH
ISOCONCENTRATION MAP
4-20FT BGS (2004-2005)
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE
15

L:\Acad\2002dwg\202016\11x17\202016fig15.dwg October 04, 2005 - 10:06AM twittstock

MW-1
<50

FENCE/PROPERTY LINE

BELT

MIXER

APPROX. FORMER
LOCATION OF TANK EXCAVATION

PROCESSING FACILITIES

MW-2
NS

CPT-1
150/38

MW-6
<50

EDGE OF SLAB

OFFICE

MW-7
<50

MW-5
NS

MW-4
<50

SCARLETT COURT

FENCE/PROPERTY LINE

CPT-2
60

MW-3
NS

0 10
SCALE IN FEET

BLYMYER
ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND
- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (ug/L)

DEPTH-DISCRETE GROUNDWATER
TOTAL TPH ISOCONCENTRATION
MAP
>20FT BGS (2005)
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE
16

L:\Acad\2002dwg\202016\11x17\202016fig16.dwg October 04, 2005 - 10:07AM lwittstock

MW-1
<50

FENCE/PROPERTY LINE

SB-E
NS

BELT

SB-H
NS

MIXER

D5
2.4

B-1
FP

APPROX. FORMER
LOCATION OF TANK EXCAVATION

D6
4,000

B-4
FP

B-2
FP

SB-J
NS

D4
1,300

SB-F
NS

MW-2
24,000/24,000

B-10
48

SB-A
NS

CPT-1
NS

PROCESSING FACILITIES

B-3
600

MW-6
NS

SB-K
NS

SB-I
NS

B-12
<0.3

SB-G
NS

EDGE OF SLAB

B-8
FP

SB-B
1,000

1,000

MW-5
NS

SB-C
NS

OFFICE

MW-7
NS

SB-D
NS

B-13
<0.3

D3
NS

B-11
<0.3

D1
250

? 100

MW-4
100/3.5

B-9
1.7

B-6
<0.3

SCARLETT COURT

CPT-2
NS

B-7
<0.3

MW-3
<0.3

BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 10
SCALE IN FEET

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND

- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL

GROUNDWATER BENZENE ISOCONCENTRATION MAP
OCT. 1990 – DEC. 1992

FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE
17

L:\Acad\2002dwg\202016\11x17\202016fig17.dwg October 04, 2005 - 10:08AM lwittstock

MW–1
<0.5

FENCE/PROPERTY LINE

BELT

MIXER

APPROX. FORMER
LOCATION OF TANK EXCAVATION

PROCESSING FACILITIES

MW–2
1,400

CPT–1
9,100/210

MW–6
<0.5

EDGE OF SLAB

OFFICE

MW–7
NS

MW–5
<0.5

MW–4
<0.5

SCARLETT COURT

FENCE/PROPERTY LINE

CPT–2
NS

MW–3
<0.5

BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 10
SCALE IN FEET

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8–30–05

LEGEND
- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL

GROUNDWATER BENZENE
ISOCONCENTRATION MAP
4–20FT. BGS
(2004–2005)
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE
18

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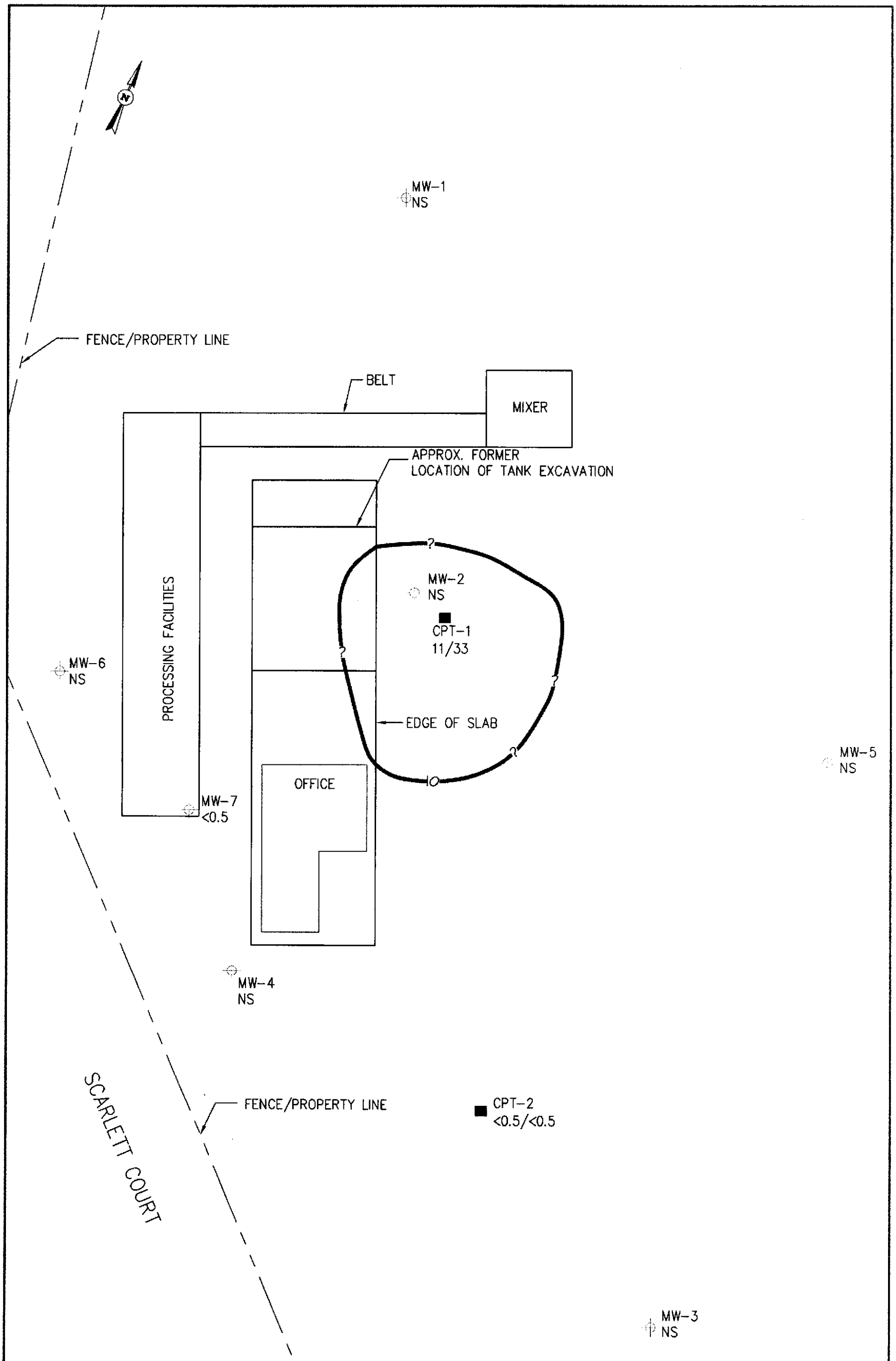

BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 10
SCALE IN FEET

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND

- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL

GROUNDWATER BENZENE ISOCONCENTRATION MAP
>20FT. BGS
(2005)
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE 19

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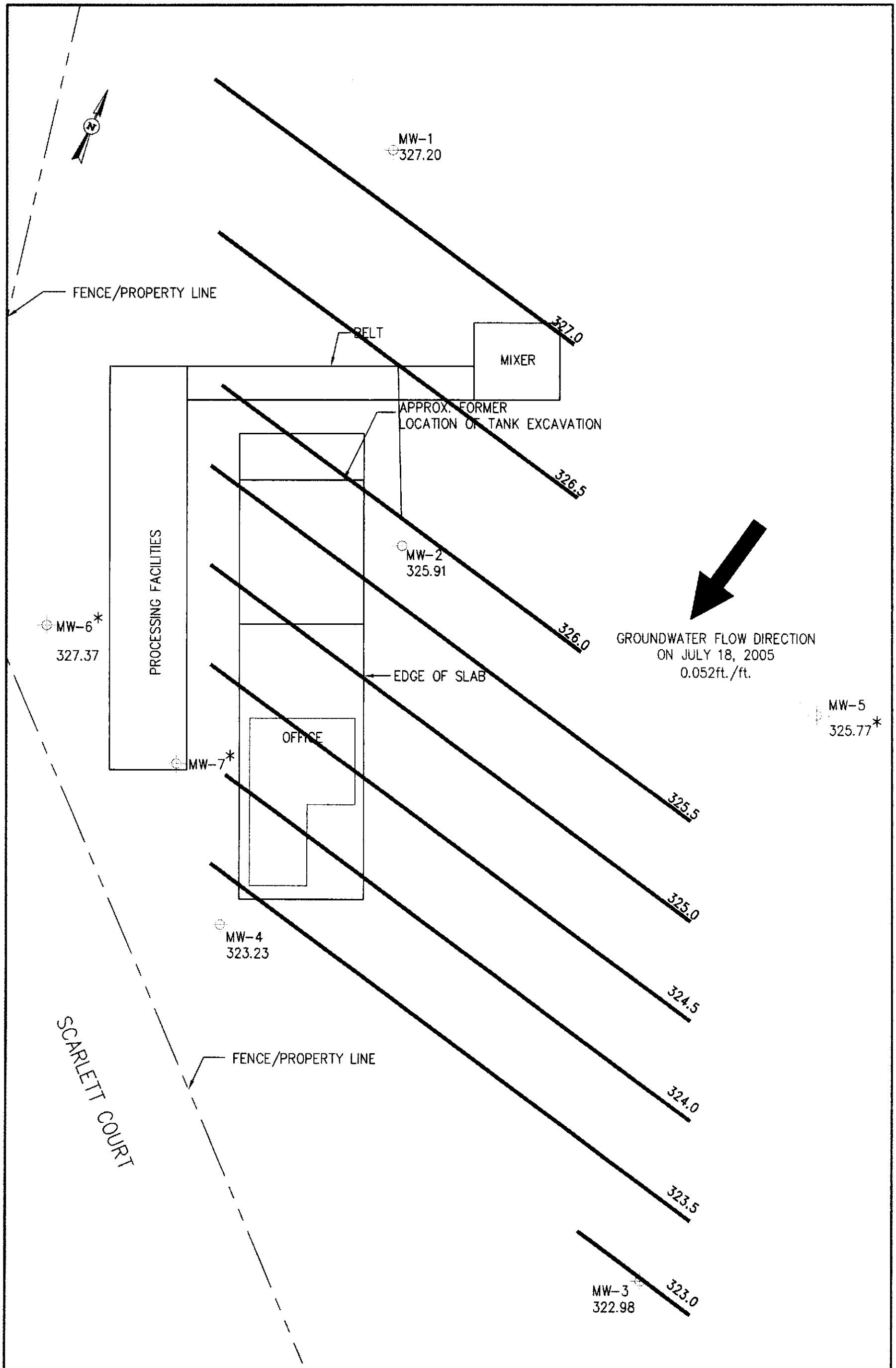
MW-1
327.20
FENCE/PROPERTY LINE
BELT
MIXER
APPROX. FORMER
LOCATION OF TANK EXCAVATION
327.0
326.5
PROCESSING FACILITIES
MW-2
325.91
MW-6*
327.37
326.0
GROUNDWATER FLOW DIRECTION
ON JULY 18, 2005
0.052ft./ft.
EDGE OF SLAB
MW-5
325.77*
OFFICE
MW-7*
325.5
325.0
MW-4
323.23
324.5
SCARLETT COURT
FENCE/PROPERTY LINE
324.0
323.5
MW-3
322.98
323.0
BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.
0
10
SCALE IN FEET
BLYMYER
ENGINEERS, INC.
BEI JOB NO.
202016
DATE
8-30-05
LEGEND
GROUNDWATER MONITORING WELL
SOIL BORE (BY OTHERS)
GEOPROBE SOIL BORE
CPT BORE
NS NOT SAMPLED
* WELL NOT USED FOR CONTOURING
ISOCONCENTRATION (ug/L)
GROUNDWATER GRADIENT
JULY 18, 2005
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA
FIGURE
20
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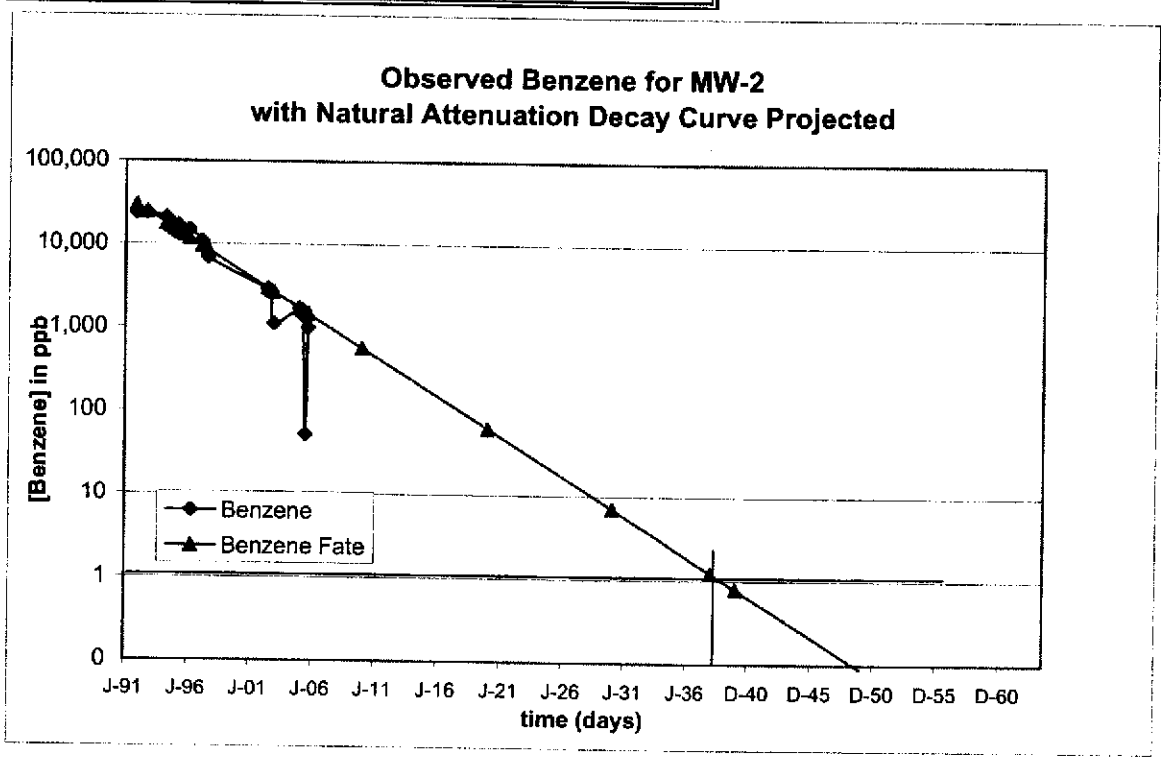
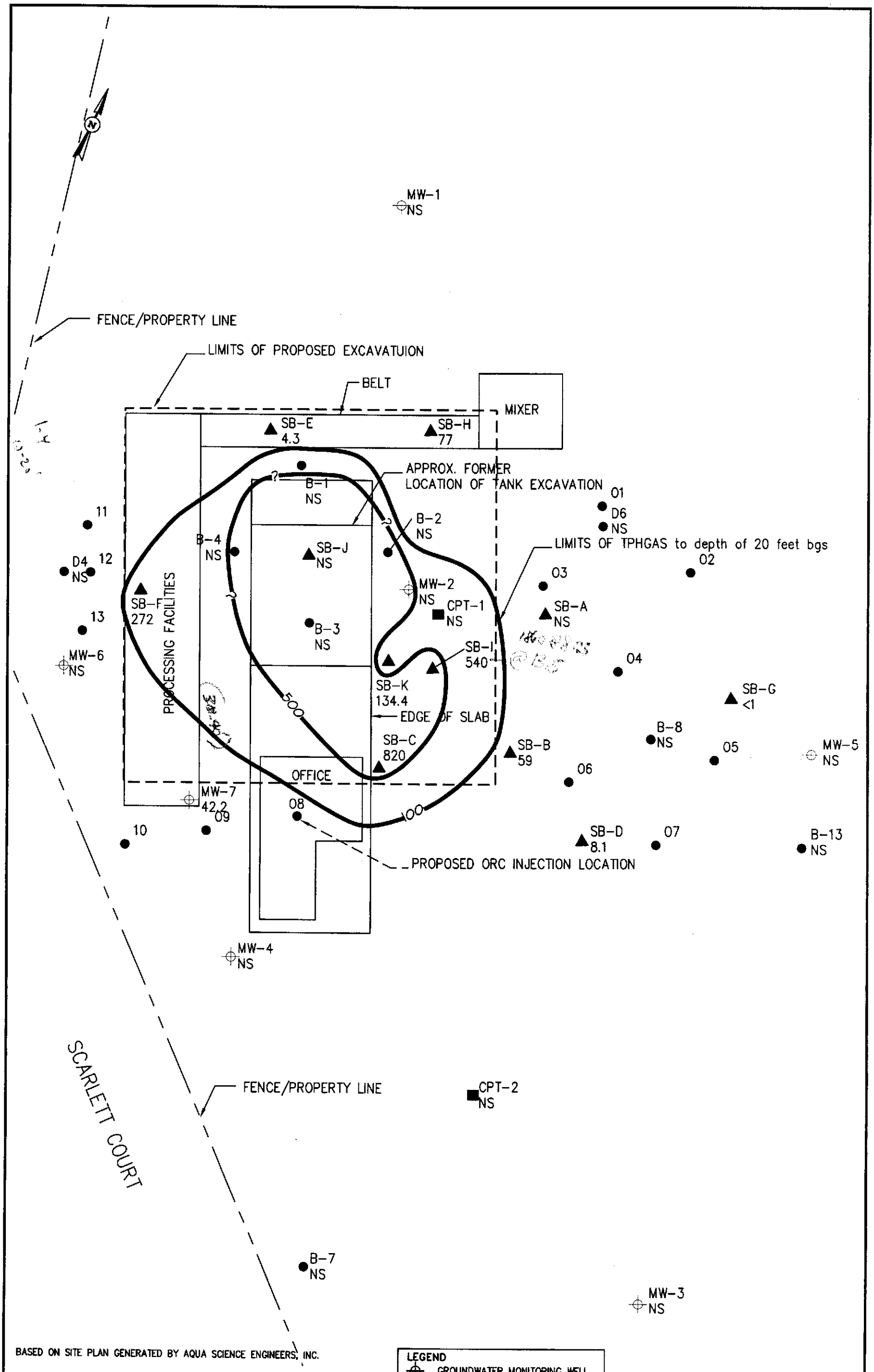
Figure 21: Benzene Fate Assuming Natural Attentuation

Modeled Natural Attenuation
Decay equation $C(t) = C_0 e^{-kt}$
k= 0.0006 ppb/d C_0 = 30,000

Measured MW-2 Data Date	Days	Actual [Benzene]	Model Benzene Fate	
11/27/91	0	[redacted]	30,000	Initial Conditions
09/30/92	308	[redacted]	24,938	
04/07/94	862	[redacted]	17,886	
08/12/94	989	[redacted]	16,573	
11/29/94	1,098	[redacted]	15,524	
03/21/95	1,210	[redacted]	14,515	
05/22/95	1,272	[redacted]	13,985	
08/24/95	1,366	[redacted]	13,218	
02/12/96	1,538	[redacted]	11,922	
02/05/97	1,897	[redacted]	9,612	
08/06/97	2,079	[redacted]	8,618	
06/06/02	3,844	[redacted]	2,989	
09/23/02	3,953	[redacted]	2,799	
12/13/02	4,034	[redacted]	2,667	
12/14/04	4,766	[redacted]	1,719	
03/23/05	4,865	[redacted]	1,620	
06/22/05	4,956	[redacted]	1,534	
09/06/05	5,032	[redacted]	1,465	Present Conditions
01/01/10	6,610		568	
01/01/20	10,262		64	
01/01/30	13,915		7	
01/01/38	16,837		1.2	Groundwater Goals
01/01/40	17,567		0.8	
01/01/50	21,220		0.1	





BASED ON SITE PLAN GENERATED BY AQUA SCIENCE ENGINEERS, INC.

0 10
SCALE IN FEET

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	8-30-05

LEGEND

- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- GEOPROBE SOIL BORE
- CPT BORE
- NS NOT SAMPLED
- ISOCONCENTRATION (mg/kg)
- <1/42 MULTIPLE CONCENTRATIONS WITHIN DEPTH INTERVAL (g + d)

LAYOUT for RECOMMENDED REMEDIAL ACTION PLAN

FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE 22

L:\Acad\2002dwg\202016\11x17\202016fig6.dwg October 04, 2005 - 12:00PM twittstock

Appendix A

Zone 7 Water Agency,
Alameda County Flood Control and Water Conservation District,
Drilling Permits

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94588-5127 • PHONE (925) 484-2600 FAX (925) 462-3914

February 9, 2005

Mr. Mark Detterman
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501

Dear Mr. Detterman:

Enclosed is drilling permit 25020 for a contamination investigation at 6393 Scarlett Court in Dublin for Mike Dolan. Also enclosed are current drilling permit applications for your files.

Please note that permit conditions A-2 and G requires that a report be submitted after completion of the work. The report should include drilling and completion logs, location sketch, permit number and any analysis of the soil and water samples. Please submit the original of your completion report. We will forward your submittal to the California Department of Water Resources.

If you have any questions, please contact me at extension 235 or Matt Katen at extension 234.

Sincerely,

Wyman Hong

Wyman Hong
Water Resources Specialist

Enc.

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588-5127 VOICE (925) 484-2600 X235 FAX (925) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Dolan Property
6393 Scarlett Ct.
Dublin, CA

California Coordinates Source _____ Accuracy± _____ ft.
CCN _____ ft. CCE _____ ft.
APN 941-0550-013-04

CLIENT
Name Estate of Michael Dolan c/o Michael Fitzpatrick
Address P.O. Box 031654 Phone 925/946-9326
City Walnut Creek, CA Zip 94598

APPLICANT
Name Blymyer Engineers, Inc.
c/o Mark Detterman Fax 510/865-2594
Address 1829 Clayton Ave. Phone 510/521-3773
City Alameda, CA Zip 94501

TYPE OF PROJECT:

Well Construction	☐	Geotechnical Investigation	☐
Well Destruction	☐	Contamination Investigation	☒
Cathodic Protection	☐	Other _____	☐

PROPOSED WELL USE:

Domestic	☐	Irrigation	☐
Municipal	☐	Remediation	☐
Industrial	☐	Groundwater Monitoring	☐
Dewatering	☐	Other _____	☐

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Hollow Stem Auger	☐
Cable Tool	☐	Direct Push	☒	Other _____	☐

DRILLING COMPANY Gregg Drilling
DRILLER'S LICENSE NO. C57 #485105

WELL SPECIFICATIONS:
Drill Hole Diameter _____ in. Maximum
Casing Diameter _____ in. Depth _____ ft.
Surface Seal Depth _____ ft. Number _____

SOIL BORINGS:
Number of Borings 2-3 Maximum
Hole Diameter 1.75 in. Depth 35 ft.

ESTIMATED STARTING DATE 2/14/05
ESTIMATED COMPLETION DATE 2/14/05

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Mark Detterman Date 2/1/05

ATTACH SITE PLAN OR SKETCH

FOR OFFICE USE

PERMIT NUMBER 25020
WELL NUMBER 941-0550-013-04
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at th Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitte work the original Department of Water Resources Water We Drillers Report or equivalent for well projects, or drilling log and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approv date.

B. WATER SUPPLY WELLS
1. Minimum surface seal diameter is four inches greater than th well casing diameter.
2. Minimum seal depth is 50 feet for municipal and industrial well or 20 feet for domestic and irrigation wells unless a lesser dept is specially approved.
3. Grout placed by tremie.
4. An access port at least 0.5 inches in diameter is required on the wellhead for water level measurements.
5. A sample port is required on the discharge pipe near the wellhead.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal diameter is four inches greater than th well or piezometer casing diameter.
2. Minimum seal depth for monitoring wells is the maximum dept practicable or 20 feet.
3. Grout placed by tremie.

(D.) GEOTECHNICAL. Backfill bore hole with compacted cuttings heavy bentonite and upper two feet with compacted material. areas of known or suspected contamination, tremied cement grou shall be used in place of compacted cuttings.

E. CATHODIC. Fill hole above anode zone with concrete placed b tremie.

F. WELL DESTRUCTION. See attached.

(G.) SPECIAL CONDITIONS:, Submit to Zone 7 within 60 days aft completion of permitted work the well installation report **including all soil and water laboratory analysis results**.

Approved Wyman Hong Date 2/7/05
Wyman Hong

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

100 NORTH CANYONS PARKWAY, LIVERMORE, CA 94551 PHONE (925) 454-5000

March 30, 2005

Mr. Mark Detterman
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501-1395

Dear Mr. Detterman:

Enclosed is drilling permit 25041 for a contamination investigation at 6393 Scarlett Court in Dublin for the Estate of Michael Dolan. Also enclosed are current drilling permit applications for your files.

Please note that permit conditions A-2 and G requires that a report be submitted after completion of the work. The report should include drilling and completion logs, location sketch, permit number and any analysis of the soil and water samples. Please submit the original of your completion report. We will forward your submittal to the California Department of Water Resources.

If you have any questions, please contact me at extension 5056 or Matt Katen at extension 5071.

Sincerely,

Wyman Hong

Wyman Hong
Water Resources Specialist

Enc.

ZONE 7 WATER AGENCY

100 N. Canyons Parkway, Livermore 94551 454-5056 (925)454-57
~~5997 PARKSIDE DRIVE PLEASANTON~~, CALIFORNIA 94588-5127 VOICE (925) ~~484-2600 X235~~ FAX ~~(925) 462-3914~~

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Dolan Property
6393 Scarlett Ct.
Dublin, CA

California Coordinates Source _____ Accuracy± _____ ft.
CCN _____ ft. CCE _____ ft.
APN 941-0550-013-04

CLIENT
Name Estate of Michael Dolan c/o Michael Fitzpatrick
Address P.O. Box 31654 Phone 925/946-7326
City Walnut Creek Zip 94598

APPLICANT
Name Blymyer Engineers, Inc
Attn: Mark Detterman Fax 510/895-2584
Address 2819 Clement Ave Phone 510/521-3773
City Alameda Zip 94501

TYPE OF PROJECT:

Well Construction	☐	Geotechnical Investigation	☐
Well Destruction	☐	Contamination Investigation	☑
Cathodic Protection	☐	Other _____	☐

PROPOSED WELL USE:

Domestic	☐	Irrigation	☐
Municipal	☐	Remediation	☐
Industrial	☐	Groundwater Monitoring	☐
Dewatering	☐	Other _____	☐

DRILLING METHOD:

Mud Rotary	☐	Air Rotary	☐	Hollow Stem Auger	☐
Cable Tool	☐	Direct Push	☐	Other CPT	☑

DRILLING COMPANY Gregg Drilling
DRILLER'S LICENSE NO. C57 - 485165

WELL SPECIFICATIONS:
Drill Hole Diameter _____ in. Maximum
Casing Diameter _____ in. Depth _____ ft.
Surface Seal Depth _____ ft. Number _____

SOIL BORINGS:
Number of Borings 2 Maximum
Hole Diameter 2 in. Depth 50 ft.

ESTIMATED STARTING DATE 3/28/05
ESTIMATED COMPLETION DATE 3/28/05

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.
APPLICANT'S SIGNATURE Mark E. Detterman Date 3/24/05

ATTACH SITE PLAN OR SKETCH

FOR OFFICE USE

PERMIT NUMBER 25041
WELL NUMBER _____
APN 941-0550-013-04

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive a Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of perm work the original Department of Water Resources Water Drillers Report or equivalent for well projects, or drilling and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of appr date.

B. WATER SUPPLY WELLS
1. Minimum surface seal diameter is four inches greater thar well casing diameter.
2. Minimum seal depth is 50 feet for municipal and industrial v or 20 feet for domestic and irrigation wells unless a lesser d is specially approved.
3. Grout placed by tremie.
4. An access port at least 0.5 inches in diameter is required on the wellhead for water level measurements.
5. A sample port is required on the discharge pipe near the wellhead.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal diameter is four inches greater thar well or piezometer casing diameter.
2. Minimum seal depth for monitoring wells is the maximum d practicable or 20 feet.
3. Grout placed by tremie.

(D.) GEOTECHNICAL. Backfill bore hole with compacted cutting heavy bentonite and upper two feet with compacted material areas of known or suspected contamination, tremied cement g shall be used in place of compacted cuttings.

E. CATHODIC. Fill hole above anode zone with concrete place tremie.

F. WELL DESTRUCTION. See attached.

(G.) SPECIAL CONDITIONS:, Submit to Zone 7 within 60 days completion of permitted work the well installation report **includ all soil and water laboratory analysis results**.

Approved Wyman Hong Date 3/25/05
Wyman Hong

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

100 NORTH CANYONS PARKWAY, LIVERMORE, CA 94551 PHONE (925) 454-5000

July 7, 2005

Mr. Mark Detterman
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501

Dear Mr. Detterman:

Enclosed is drilling permit 25105 for a contamination investigation at 6393 Scarlett Court in Dublin for Dolan Rental Properties. Also enclosed are current drilling permit applications for your files.

Please note that permit conditions A-2 and G requires that a report be submitted after completion of the work. The report should include drilling and completion logs, location sketch, permit number and any analysis of the soil and water samples. Please submit the original of your completion report. We will forward your submittal to the California Department of Water Resources.

If you have any questions, please contact me at extension 5056 or Matt Katen at extension 5071.

Sincerely,

Wyman Hong
Water Resources Specialist

Enc.

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588-5127 VOICE (925) ~~484-2600 X235~~ FAX (925) ~~462-391~~ 451-5

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Dolan Pleasanton Properties
6393 Scarlett Court
Dublin, CA

California Coordinates Source _____ Accuracy± _____ ft.
CCN _____ ft. CCE _____ ft.
APN 941-0520-013-04

CLIENT
Name The Estate of Michael Dolan c/o Michael Fitzpatrick
Address 3215 Dolan Park Dr. Phone 925/946-9720
City Walnut Creek, CA Zip 94598

APPLICANT
Name Blymyer Engineers, Inc
c/o Mark Detterman Fax 510/~~568~~ 865-2594
Address 1829 Clement Ave Phone 510/521-3773
City Alameda, CA Zip 94501

TYPE OF PROJECT:
Well Construction ☒ Geotechnical Investigation ☐
Well Destruction ☐ Contamination Investigation ☐
Cathodic Protection ☐ Other _____ ☐

PROPOSED WELL USE:
Domestic ☐ Irrigation ☐
Municipal ☐ Remediation ☐
Industrial ☐ Groundwater Monitoring ☒
Dewatering ☐ Other _____ ☐

DRILLING METHOD:
Mud Rotary ☒ Air Rotary ☐ Hollow Stem Auger ☒
Cable Tool ☐ Direct Push ☐ Other _____ ☐

DRILLING COMPANY Gregg Drilling
DRILLER'S LICENSE NO. C57 485165

WELL SPECIFICATIONS: 0-30' conductor casing 30-40': 6"
Drill Hole Diameter 12 in. Maximum
Casing Diameter 2 in. Depth 40 ft.
Surface Seal Depth 5+ ft. Number 1

SOIL BORINGS:
Number of Borings _____ Maximum
Hole Diameter _____ in. Depth _____ ft.

ESTIMATED STARTING DATE 7/5/05
ESTIMATED COMPLETION DATE 7/8/05

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Mark E. Detterman Date 6/28/05

ATTACH SITE PLAN OR SKETCH

FOR OFFICE USE

PERMIT NUMBER 25105
WELL NUMBER 3S/1E 6F40
APN _____

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of per work the original Department of Water Resources Wate Drillers Report or equivalent for well projects, or drilling and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of ap date.

B. WATER SUPPLY WELLS
1. Minimum surface seal diameter is four inches greater tha well casing diameter.
2. Minimum seal depth is 50 feet for municipal and industrial or 20 feet for domestic and irrigation wells unless a lesser is specially approved.
3. Grout placed by tremie.
4. An access port at least 0.5 inches in diameter is required on the wellhead for water level measurements.
5. A sample port is required on the discharge pipe near the wellhead.

(C.) GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal diameter is four inches greater tha well or piezometer casing diameter.
2. Minimum seal depth for monitoring wells is the maximum practicable or 20 feet.
3. Grout placed by tremie.

D. GEOTECHNICAL. Backfill bore hole with compacted cutting heavy bentonite and upper two feet with compacted materia areas of known or suspected contamination, tremied cement shall be used in place of compacted cuttings.

E. CATHODIC. Fill hole above anode zone with concrete place tremie.

F. WELL DESTRUCTION. See attached.

(G.) SPECIAL CONDITIONS:, Submit to Zone 7 within 60 days completion of permitted work the well installation report **inclu all soil and water laboratory analysis results**.

Approved Wyman Hong for Wyman Hong Date 7/1/05

Appendix B

Soil Bore Logs and Well Construction Details

KEY TO SOIL BORE AND WELL CONSTRUCTION LOGS

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS				TYPICAL NAMES
COARSE GRAINED SOILS (MORE THAN HALF IS LARGER THAN NO. 200 SIEVE)	GRAVEL (MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE)	CLEAN GRAVEL WITH LESS THAN 5% FINES	GW	WELL GRADED GRAVEL, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURES
		GRAVEL WITH OVER 12% FINES	GM	SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVEL, GRAVEL-SAND-CLAY MIXTURES
	SAND (MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE)	CLEAN SAND WITH LESS THAN 5% FINES	SW	WELL GRADED SAND, GRAVELLY SAND
			SP	POORLY GRADED SAND, GRAVELLY SAND
		SAND WITH OVER 12% FINES	SM	SILTY SAND, SAND-SILT MIXTURES
			SC	CLAYEY SAND, SAND-CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN HALF IS SMALLER THAN NO. 200 SIEVE)	SILT AND CLAY (LIQUID LIMIT LESS THAN 50)		ML	INORGANIC SILT, ROCK FLOUR, SANDY OR CLAYEY SILT OF LOW PLASTICITY
			CL	INORGANIC CLAY OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAY (LEAN)
			OL	ORGANIC SILT AND ORGANIC SILTY CLAY OF LOW PLASTICITY
	SILT AND CLAY (LIQUID LIMIT GREATER THAN 50)		MH	INORGANIC SILT, MICACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOIL, ELASTIC SILT
			CH	INORGANIC CLAY OF HIGH PLASTICITY, GRAVELLY, SANDY OR SILTY CLAY (FAT)
			OH	ORGANIC CLAY, ORGANIC SILT OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS

FILL MATERIALS

C	CONCRETE
F	FILL
A	ASPHALT

WELL CONSTRUCTION MATERIALS

CEMENT GROUT	
BENTONITE	
FILTER SAND	SEE ABOVE FOR CONCRETE SYMBOL

SOIL CONSISTENCY FROM DRIVE SAMPLER

NON-COHESIVE SOILS*		COHESIVE SOILS*		UNCONFINED COMPRESSIVE STRENGTH
SANDS & GRAVELS	BLOWS PER FOOT	SILTS AND CLAYS	BLOWS PER FOOT	STRENGTH, TONS/SQ. FT.
VERY LOOSE	0 - 4	VERY SOFT	0 - 2	0 - 1/4
LOOSE	4 - 10	SOFT	2 - 4	1/4 - 1/2
MED. DENSE	10 - 30	MEDIUM STIFF	4 - 8	1/2 - 1
DENSE	30 - 50	STIFF	8 - 16	1 - 2
VERY DENSE	OVER 50	VERY STIFF	16 - 32	2 - 4
		HARD	OVER 32	OVER 4

* = STANDARD PENETRATION RESISTANCE IS THE NUMBER OF BLOWS REQUIRED TO DRIVE A 2-INCH O.D. (1-3/8-INCH I.D.) SPLIT BARREL SAMPLER 12 INCHES USING A 140-POUND HAMMER FALLING FREELY THROUGH 30 INCHES. THE SAMPLER IS DRIVEN 18 INCHES AND THE NUMBER OF BLOWS ARE RECORDED FOR EACH 6-INCH INTERVAL. THE SUMMATION OF THE FINAL TWO INTERVALS IS THE STANDARD PENETRATION RESISTANCE.

SAMPLE INTERVAL SYMBOLS

	CORED/RECOVERED		CORED/RECOVERED/SAMPLED/ANALYZED
	CORED/ NO RECOVERY	N/A	NON APPLICABLE/NOT AVAILABLE
	CORED/RECOVERED/SAMPLED		

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BLYMYER ENGINEERS, INC.

Soil Bore Log: SB-J

Dolan Property
6393 Scarlett Court, Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Dual-Walled Probe
Date Drilled:	: February 18, 2005	Sample Method	: Dual-Walled Probe
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.25 inch
Drilling Company	: Gregg Drilling	Total Drilled Depth	: 20.0 feet
Driller	: Chris / Marco		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: 3.0 feet

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					6 inches (raised) concrete slab.	GR	
1					No recovery 0.5 to 4 feet (Trace medium gray to dark gray CLEAN SAND; medium to course grained; (UST backfill))	SP	
4					Medium gray to dark gray; CLEAN SAND; medium to course grained; UST backfill; soft; wet	SP	
5					Odor noted at 5.5 feet		
6		107					
7		231			Dark to medium grey SILTY CLAY; wet; odor	CL	
8				SB-J-7.5	with caliche nodules; 1/8 inch rounded pebbles	CL	
9					No recovery 9 to 14 feet.		
14					Medium greenish-gray SILTY CLAY; wet	CL	
16		238			No Recovery 16 to 19 feet		
19					Medium to dark greenish-gray SILTY CLAY; wet (In place?)	CL	
20					Bore Terminated at 20 feet.		
21							

(Grouted upon completion)

PROFESSIONAL GEOLOGIST
MARK E. DETTERMAN
No. 1788
CERTIFIED ENGINEERING GEOLOGIST
Exp 9/07
STATE OF CALIFORNIA

08-25-2005 H:\Blymyer_Jobs\2002\202016 dolan\202016.dot\Bore Logs\SB-J.bor

BLYMYER ENGINEERS, INC.

Soil Bore Log: SB-K

Dolan Property
6393 Scarlett Court, Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Dual-Walled Probe
Date Drilled:	: February 18, 2005	Sample Method	: Dual-Walled Probe
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.25 inch
Drilling Company	: Gregg Drilling	Total Drilled Depth	: 36 feet
Driller	: Chris / Marco		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: ▼ 4.0 feet

(Grouted upon completion)

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0–1					2 inches asphalt.		
1–5					Medium gray to greenish-gray SILTY CLAY; with 20% fine grained sand; sand decreasing at 2 ft bgs.	CL	
5		575			Medium gray CLAYEY SAND; fine to medium grained; odor; wet	SC	
6				SB-K-4W	Medium gray SILTY CLAY; odor; wet.	CL	
8		499					
9				SB-K-9			
10		296					
14					Light brown color mottling within medium greenish-gray SILTY CLAY; wet	CL	
15		446					
19							
20		22		SB-K-19.5	Medium greenish-gray CLAYEY SAND; medium grained; wet.	SC	
20					No Recovery		
28		82			Brown SILTY CLAY; wet.	CL	
29					No Recovery; soft		
32		22			Brown SILTY CLAY; with native organic carbon flecks	CL	
33					No Recovery; firmer		
36					Light brown SILTY SAND; course grained, with 20% course gravel; wet.	SP	
36					Bore Terminated at 36.0 feet.		

PROFESSIONAL GEOLOGIST
MARK E. DETTERMAN
No. 1788
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

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BLYMYER ENGINEERS, INC.

Soil Bore Log: CPT-1

Dolan Property
6393 Scarlett Court,
Dublin, CA

Job Number:	: 202016	Drilling Equipment	: CPT Rig
Date Drilled:	: March 28, 2005	Sample Method	: Retractable Piston
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.25
Drilling Company	: Gregg Drilling	Total Drilled Depth	: 50.0 feet
Driller	: John & Tony		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: Not available; 3 feet

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					3 inches Asphalt / Base Course; damp	Asphalt	
1					See CPT Printout.		
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12					See CPT Printout		
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24		1.3		CPT1-23.5	Medium green SANDY SILT; 20% fine sand, with 5 to 10% clay (est.), odor??	ML	
25					See CPT Printout		
26							
27							
28							
29							
30		4.6			As above, light brown.	ML	
31					See CPT Printout		
32							
33							
34							
35							
36							
37							
38							
39							
40							
41		0.6					
42				CPT1-41.5	Medium to organce brown SANDY SILT, with clay, 10 to 15% fine sand; caliche nodules to 1/8 inch	ML	
43					See CPT Printout		
44							
45							
46							
47							
48							
49							
50							
51					Bottom of bore at 50 feet bgs.		

(Grouted upon completion)

PROFESSIONAL GEOLOGIST
MARK L. DETTERMAN
No. 1788
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

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BLYMYER ENGINEERS, INC.

Soil Bore Log: CPT-2

Dolan Property
6393 Scarlett Court,
Dublin, CA

Job Number:	: 202016	Drilling Equipment	: CPT Rig
Date Drilled:	: March 28, 2005	Sample Method	: Retractable Piston
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.25
Drilling Company	: Gregg Drilling	Total Drilled Depth	: 50.0 feet
Driller	: John & Tony		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: Not available; 3 feet

(Grouted upon completion)

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					3 inches Asphalt / Base Course; damp	Asphalt	
1					Dark Gray SILTY SAND, fine to medium grained, <10% fines, slight odor.	SM	
2					See CPT Printout		
3							
4							
5							
6							
7							
8		2.0		CPT2-8	Olive drab with orange mottling CLAYEY SILT to SILTY CLAY, with caliche nodules (1/8 inch), no odor.	CL	
9					See CPT Printout		
10							
11							
12							
13		1.6		CPT2-13	As above, no odor	CL	
14					See CPT Printout		
15							
16							
17							
18				CPT2-17			
19				CPT2-18	Olive drab SILTY CLAY, with caliche nodules to 1/8 inch; damp	CL	
20					See CPT Printout		
21							
22							
23		3.0		CPT2-23	Olive drab SANDY SILT, with clay, damp to moist	ML	
24					See CPT Printout		
25							
26							
27							
28		4.7		CPT2-28	Light brownish gray with orange mottling SILTY CLAY, with 10 to 15% fine sand, no odor, very moist	CL	
29					See CPT Printout		
30							
31							
32							
33		4.3		CPT2-33	Light brown SANDY SILT, fine grained, no odor, wet	ML	
34					See CPT Printout		
35							
36							
37							
38							
39							
40							
41							
42							
43				CPT2-43	Light gray brown SILTY SAND, fine grained, loose, wet	SM	
44					See CPT Printout		
45							
46							
47							
48							
49							
50							
51					Bottom of bore at 50 feet bgs.		

PROFESSIONAL GEOLOGIST
MARK E. DETTERMAN
No. 1788
CERTIFIED ENGINEERING GEOLOGIST
5/1/07
STATE OF CALIFORNIA

08-26-2005 H:\Blymyer_Jobs\2002\202016.ddan\202016.dat\Bore Logs\CPT2.bor

BLYMYER ENGINEERS, INC.

Soil Bore and Well Log: MW-7

Dolan Properties
6393 Scarlett Court
Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Mud Rotary & HSA
Date Drilled:	: July 5 and 8, 2005	Sample Method	: CA Modified Split Spoon
Logged By	: Mark Detterman	Soil Bore Diameter	: 15 & 8 inch
Drilling Company	: Gregg Drilling	Total Drilled Depth	: 40.0 feet
Driller	: Robert / Trevor / Marco	Bore Angle	: No

Sample Recovery: Cuttings Examined; Retained; Analyzed; Unrecovered

Water Level: 11.9 feet; 34.25 feet; 1.0 feet

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS
0					Poorly graded GRAVEL fines; concrete chips, Fill	GP
1					Medium brown SILTY SAND, fine grained, 20 - 25% silt, native, very moist to wet	SM
2					Grades Olive green, wet	SM
3					Dark Brown to dark greyish black SILTY CLAY, no odor	CL
4					Dark brown SAND, medium to course grained, wet	SP
5					Grades to SILTY SAND, fine grained, wet	SM
6						
7						
8						
9						
10	2				Dark Greyish black with dark olive green mottling, SILTY CLAY, fine root hairs, no odor, wet?	CL
11	3	1.6				
12	3			MW7-11	Dark olive green CLAYEY GRAVEL, angular gravel to 3/4 inch, no odor, very moist	GC
13					Dark Graeyish black with dark olive green mottling on rootlets SILTY CLAY, moist, no odor	CL
14						
15	4				Dark olive green SILTY CLAY, with caliche nodules, odor, moist	
16	5	80				
17	7			MW7-16		CL
18						
19						
20	3				Olive green SILTY CLAY, with caliche nodules to 1/2 inch, stiff, mottled medium brown along rootlets, moist	
21	5	0				CL
22	7			MW7-21		

SOIL GRAPHIC

Stove Top w/ Locking Cover
Concrete
10 Inch Conductor Casing
2-inch PVC Blank Casing
Grout

PROFESSIONAL GEOLOGIST
MARK E. DETTERMAN
No. 1788
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

08-25-2005 H:\Blymyer_Jobs\2002\202016 dolan\202016.dol\Bore Logs\MW7.bor

Soil Bore and Well Log: MW-7

BLYMYER ENGINEERS, INC.

Soil Bore and Well Log: MW-7

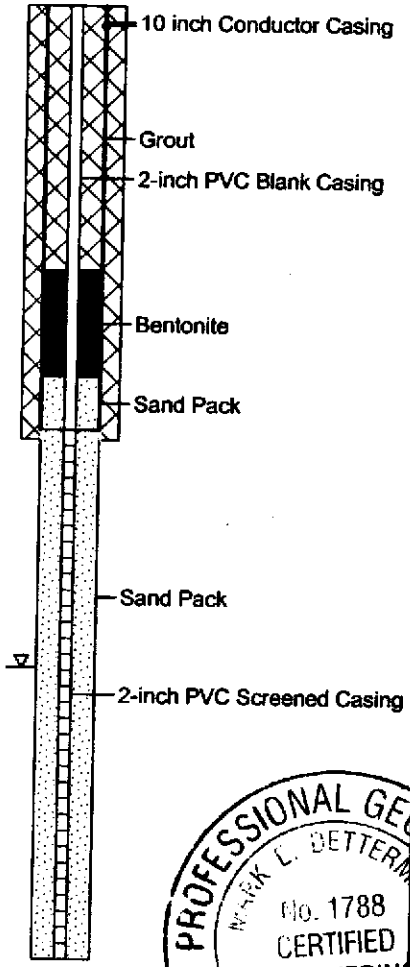
Dolan Properties
6393 Scarlett Court
Dublin, CA

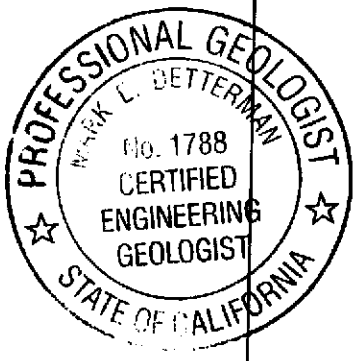
Job Number:	: 202016	Drilling Equipment	: Mud Rotary & HSA
Date Drilled:	: July 5 and 8, 2005	Sample Method	: CA Modified Split Spoon
Logged By	: Mark Detterman	Soil Bore Diameter	: 15 & 8 inch
Drilling Company	: Gregg Drilling	Total Drilled Depth	: 40.0 feet
Driller	: Robert / Trevor / Marco	Bore Angle	: No

Sample Recovery: Cuttings Examined; Retained; Analyzed; Unrecovered

Water Level: 11.9 feet; 34.25 feet; 1.0 feet

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	SOIL GRAPHIC
22–44	5, 7, 8	0		MW7-26	Olive green SILTY CLAY with caliche nodules to 1/2 inch, mottled medium brown along rootlets, stiff, moist	CL	
					As above, moist to very moist. Conductor casing set between 1 and 30 feet below grade surface.	CL	
	5, 8, 12	0		MW7-34.0	Light olive brown SANDY CLAY, 30% fine grained, with diffuse caliche nodules, very moist to wet	CL	
					Light olive brown CLAYEY SAND, 70% fine grained sand, no odor, wet	SC	
					Light olive brown SILTY SAND, 95% medium to course grained, with rare subangular gravel to 1/2 inch, hard, wet	SW	
	12, 26, 32	0		MW7-39.5	Light olive brown SILTY SAND, 70% fine grained, interbeded with SAND, medium to cource grained, no odor, wet	SM	
					Light olive brown SAND, medium to cource grained, interbeded with 1/2 inch thick SILTY CLAY, wet	SW	
					Bottom of bore: 40.0 feet		



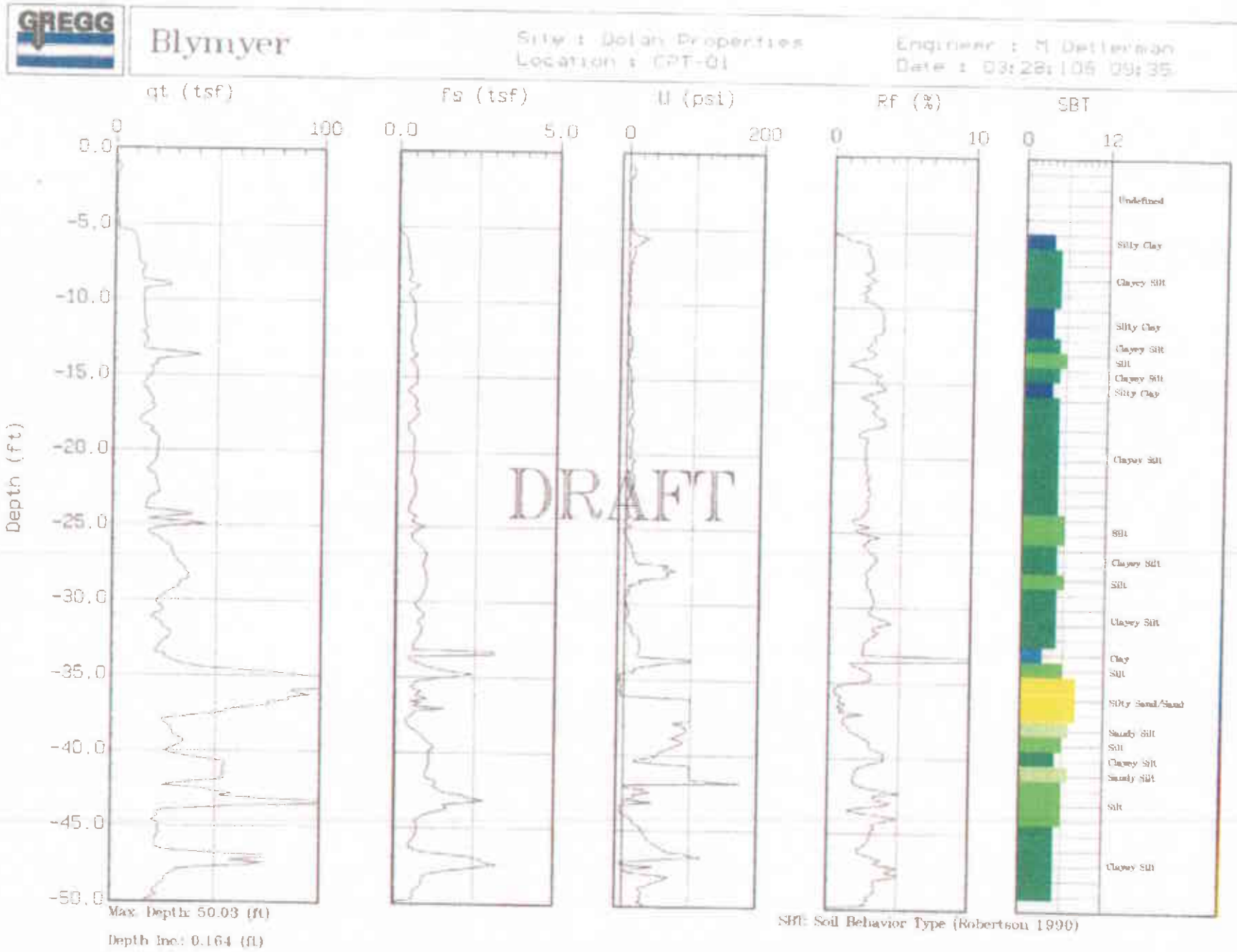


Soil Bore and Well Log: MW-7

08-25-2005 H:\Blymyer_Jobs\2002\202016 dolan\202016.dol\Bore Logs\MW7.bor

Appendix C

Gregg Drilling, *CPT Site Investigation* Drilling Report, March 30, 2005

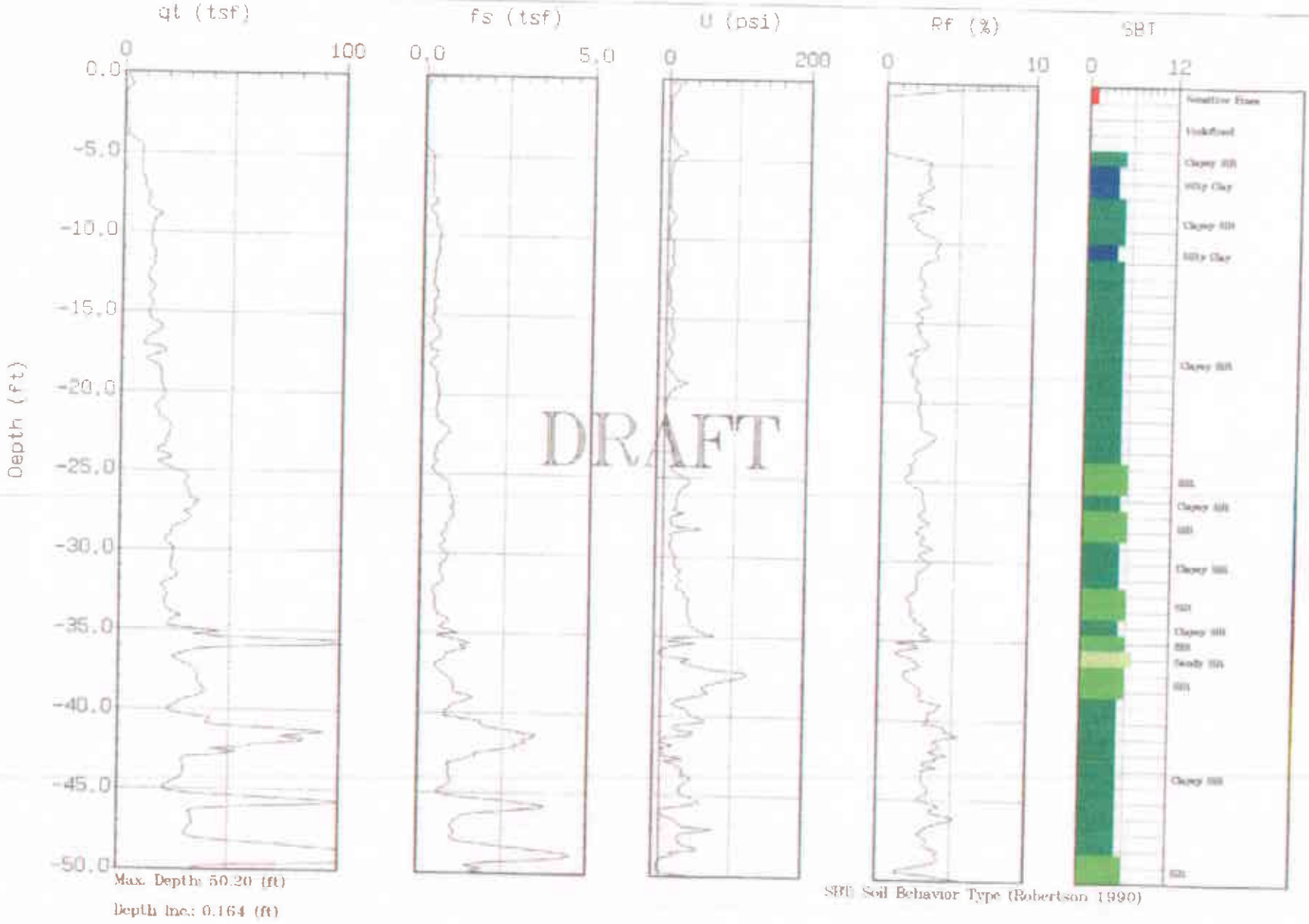

GREGG
Blymyer
Site : Dolan Properties
Location : CPT-01
Engineer : M Dettenman
Date : 03:28:06 09:35
qt (tsf)
fs (tsf)
U (psi)
Rf (%)
SBT
Depth (ft)
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-45.0
-50.0
0
100
0.0
5.0
0
200
0
10
0
12
Undefined
Silty Clay
Clayey Silt
Silty Clay
Clayey Silt
Silt
Clayey Silt
Silty Clay
Clayey Silt
Silt
Clayey Silt
Silt
Clayey Silt
Clay
Silt
Silty Sand/Sand
Sandy Silt
Silt
Clayey Silt
Sandy Silt
Silt
Clayey Silt
DRAFT
Max. Depth: 50.03 (ft)
Depth Incr: 0.164 (ft)
SBT: Soil Behavior Type (Robertson 1990)

GREGG

Blymyer

Site : Dolan Properties
Location : CPT-02 UOIF

Engineer : M. Dettenmaier
Date : 03/28/05 13:41



GREGG DRILLING AND TESTING, INC.
GREGG IN SITU, INC.
ENVIRONMENTAL AND GEOTECHNICAL INVESTIGATION SERVICES

March 30, 2005

Blymyer Engineers
Attn: Mark Detterman
1829 Clenet Ave
Alameda, California 94501

Subject: CPT Site Investigation
Dolan Properties
Dublin, California
GREGG Project Number: 05-107MA

Dear Mr. Detterman:

The following report presents the results of GREGG IN SITU's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☒
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	Resistivity Cone Penetration Tests	(RCPTU)	☐
5	UVIF Cone Penetration Tests	(UVIFCPTU)	☒
6	Groundwater Sampling	(GWS)	☒
7	Soil Sampling	(SS)	☒
8	Vapor Sampling	(VS)	☐
9	Vane Shear Testing	(VST)	☐
10	SPT Energy Calibration	(SPTE)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (562) 427-6899.

Sincerely,
GREGG IN SITU, Inc.

Mary Walden
Operations Manager

Bibliography

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pp. 791-803.

Robertson, P.K., T. Lunne and J.J.M. Powell, "Geo-Environmental Application of Penetration Testing", Geotechnical Site Characterization, Robertson & Mayne (editors), 1998 Balkema, Rotterdam, ISBN 90 5410 939 4 pp 35-47.

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Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

Copies of ASTM Standards are available through www.astm.org

APPENDIX CPT

Cone Penetration Testing Procedure (CPT)

Gregg In Situ, Inc. carries out all Cone Penetration Tests (CPT) using an integrated electronic cone system, *Figure CPT*. The soundings were conducted using a 20 ton capacity cone with a tip area of 15 cm^2 and a friction sleeve area of 225 cm^2. The cone is designed with an equal end area friction sleeve and a tip end area ratio of 0.85.

The cone takes measurements of cone bearing (q_c), sleeve friction (f_s) and dynamic pore water pressure (u_2) at 5-cm intervals during penetration to provide a nearly continuous hydrogeologic log. CPT data reduction and interpretation is performed in real time facilitating on-site decision making. The above mentioned parameters are stored on disk for further analysis and reference. All CPT soundings are performed in accordance with revised (2002) ASTM standards (D 5778-95).

The cone also contains a porous filter element located directly behind the cone tip (u_2), *Figure CPT*. It consists of porous plastic and is 5.0mm thick. The filter element is used to obtain dynamic pore pressure as the cone is advanced as well as Pore Pressure Dissipation Tests (PPDT's) during appropriate pauses in penetration. It should be noted that prior to penetration, the element is fully saturated with silicon oil under vacuum pressure to ensure accurate and fast dissipation.

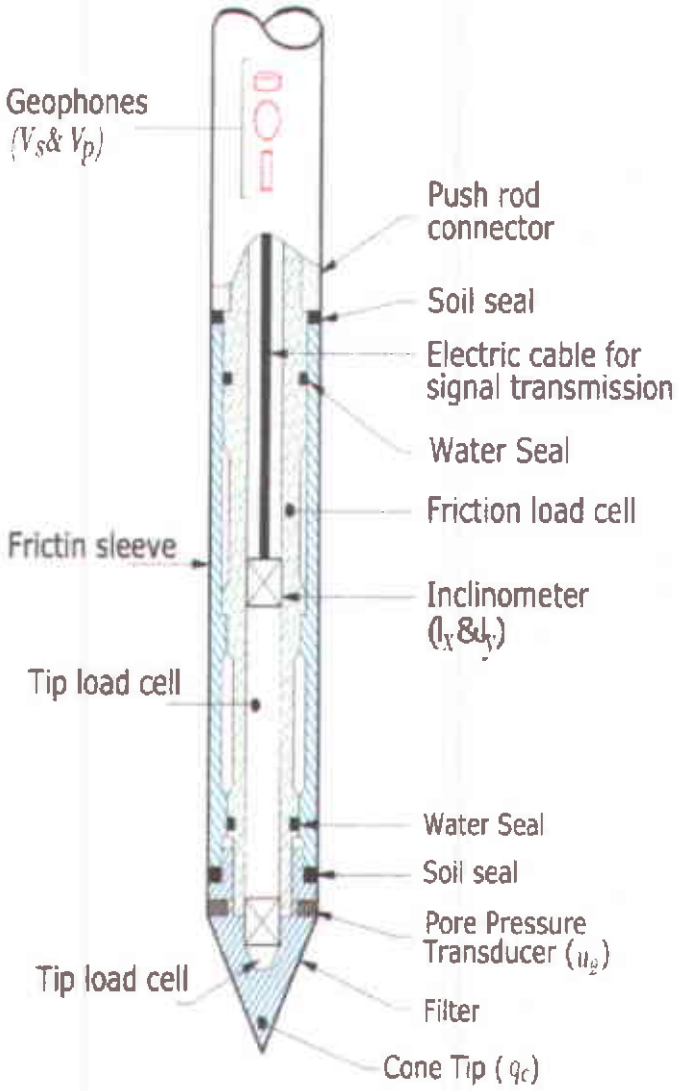


Figure CPT

When the soundings are complete, the test holes are grouted using a Gregg In Situ support rig. The grouting procedure consists of pushing a hollow CPT rod with a "knock out" plug to the termination depth of the test hole. Grout is then pumped under pressure as the tremie pipe is pulled from the hole. Disruption or further contamination to the site is therefore minimized.

Cone Penetration Test Data & Interpretation

Soil behavior type and stratigraphic interpretation is based on relationships between cone bearing (q_c), sleeve friction (f_s), and pore water pressure (u_2). The friction ratio (R_f) is a calculated parameter defined by $100 f_s/q_c$ and is used to infer soil behavior type. Generally:
Cohesive soils (clays)

- High friction ratio (R_f) due to small cone bearing (q_c)
- Generate large excess pore water pressures (u_2)

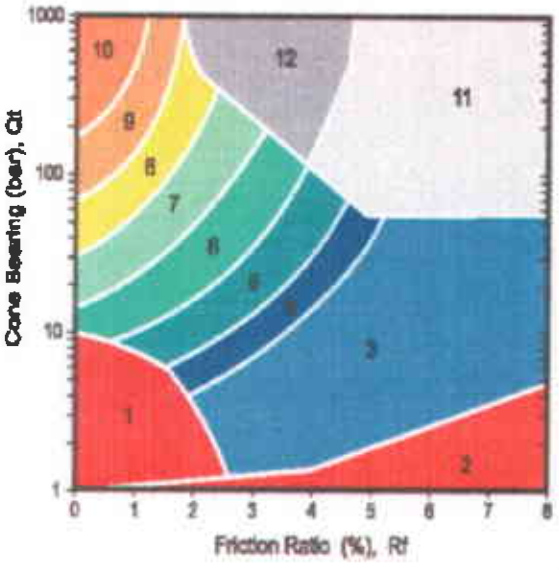
Cohesionless soils (sands)

- Low friction ratio (R_f) due to large cone bearing (q_c)
- Generate very little excess pore water pressures (u_2)

A complete set of baseline readings are taken prior to and at the completion of each sounding to determine temperature shifts and any zero load offsets. Corrections for temperature shifts and zero load offsets can be extremely important, especially when the recorded loads are relatively small. In sandy soils, however, these corrections are generally negligible.

The cone penetration test data collected from your site is presented in graphical form in Appendix CPT. The data includes CPT logs of measured soil parameters, computer calculations of interpreted soil behavior types (SBT), and additional geotechnical parameters. A summary of locations and depths is available in Table 1. Note that all penetration depths referenced in the data are with respect to the existing ground surface.

Soil interpretation for this project was conducted using recent correlations developed by Robertson et al, 1990, *Figure SBT*. Note that it is not always possible to clearly identify a soil type based solely on q_c, f_s, and u_2. In these situations, experience, judgment, and an assessment of the pore pressure dissipation data should be used to infer the soil behavior type.



ZONE	Qt/N	SBT
1	2	Sensitive, fine grained
2	1	Organic materials
3	1	Clay
4	1.5	Silty clay to clay
5	2	Clayey silt to silty clay
6	2.5	Sandy silt to clayey silt
7	3	Silty sand to sandy silt
8	4	Sand to silty sand
9	5	Sand
10	6	Gravely sand to sand
11	1	Very stiff fine grained*
12	2	Sand to clayey sand*

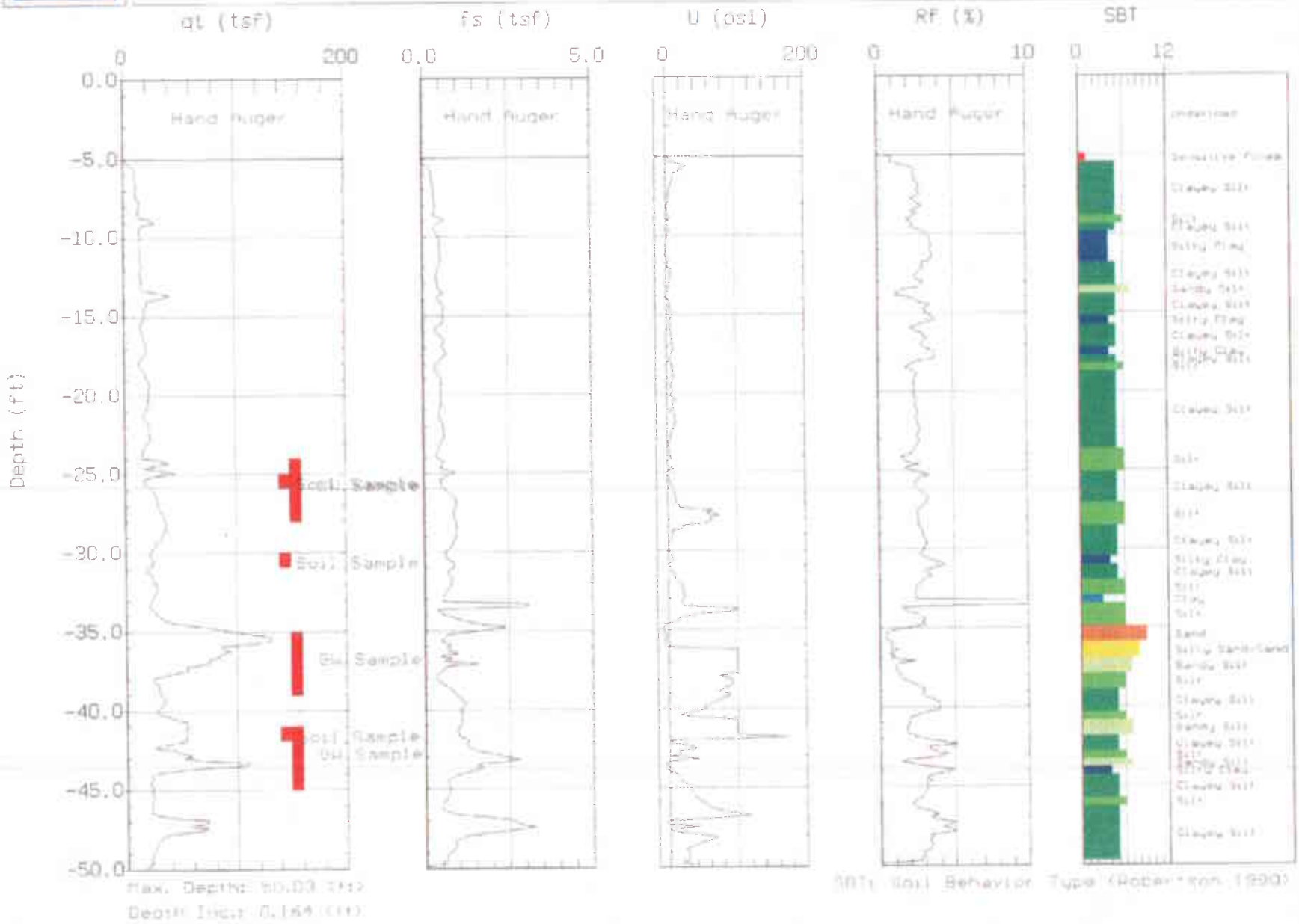
*over consolidated or cemented

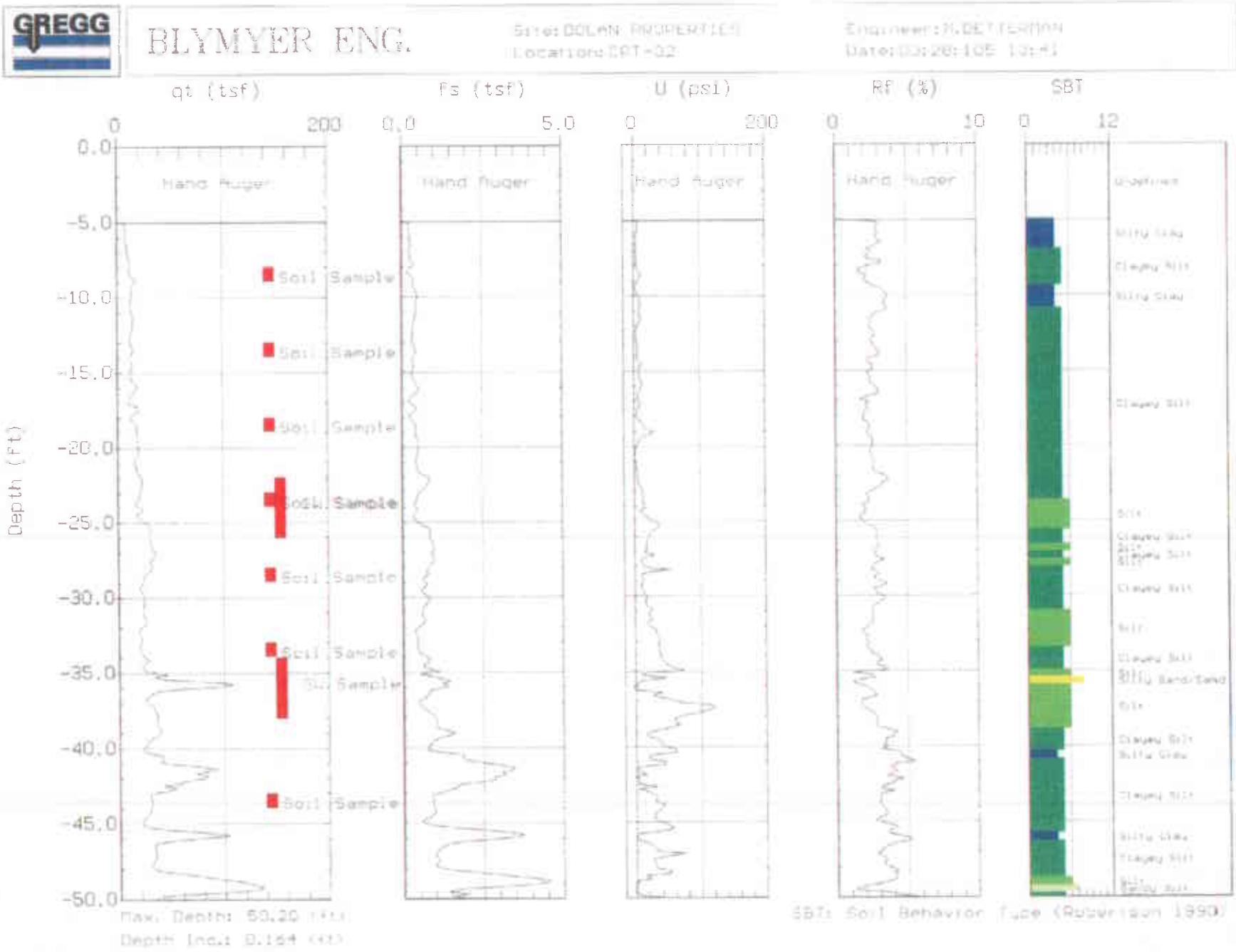
Figure SBT

GREGG

BLYMYER ENG.

Site: DOLAN PROPERTIES
Location: CPT-01
Engineer: J. BITTERMAN
Date: 03:29:10




GREGG
BLYMYER ENG.
qt (tsf)
Fs (tsf)
U (psi)
Rf (%)
SBT
Depth (Ft)
Hand Auger
Soil Sample
Max. Depth: 50.20 (ft)
Depth Incr: 0.164 (ft)
SBT: Soil Behavior Type (Robertson 1990)

APPENDIX PPDT

Pore Pressure Dissipation Tests (PPDT)

Pore Pressure Dissipation Tests (PPDT's) conducted at various intervals measured hydrostatic water pressures and determined the approximate depth of the ground water table. A PPDT is conducted when the cone is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (u) with time is measured behind the tip of the cone and recorded by a computer system.

Pore pressure dissipation data can be interpreted to provide estimates of:

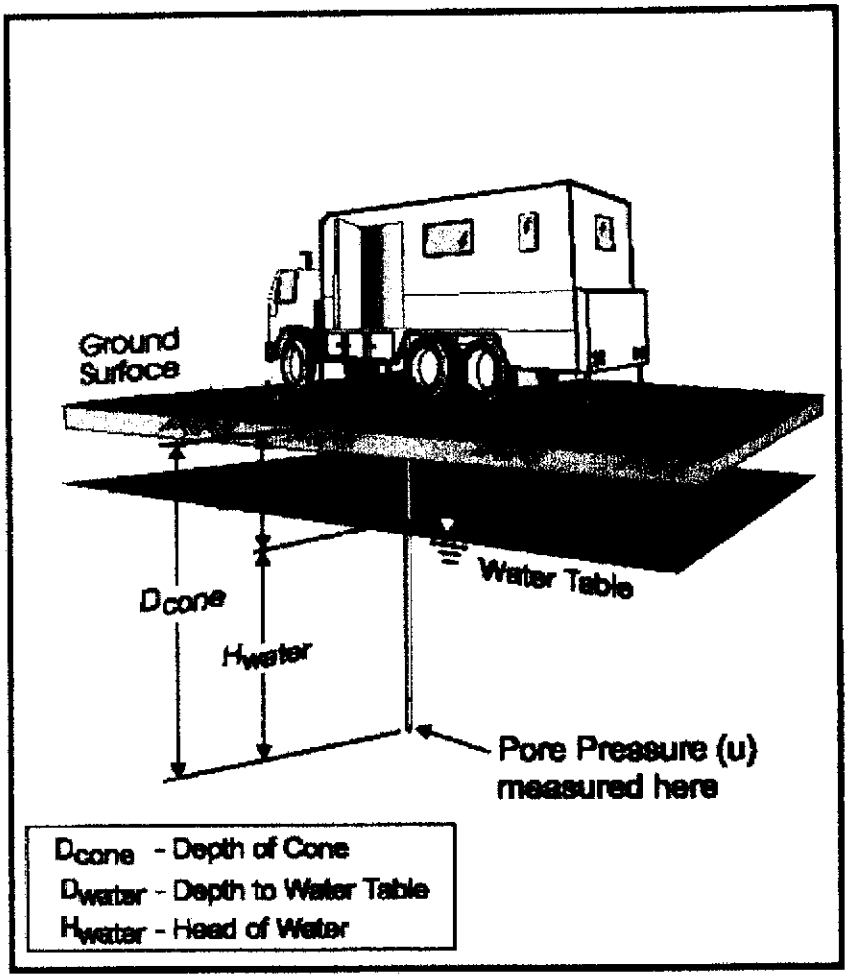
- Equilibrium piezometric pressure
- Phreatic Surface
- In situ horizontal coefficient of consolidation (c_h)
- In situ horizontal coefficient of permability (k_h)

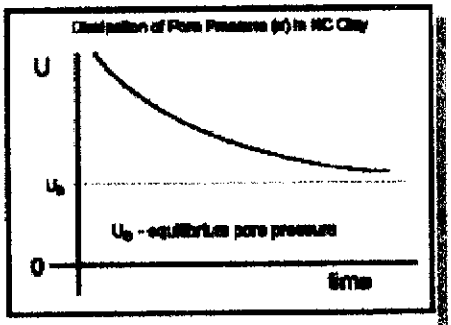
In order to correctly interpret the equilibrium piezometric pressure and/or the phreatic surface, the pore pressure must be monitored until such time as there is no variation in pore pressure with time (refer to Figure PPD). This time is commonly referred to as t_{100}, the point at which 100% of the excess pore pressure has dissipated.

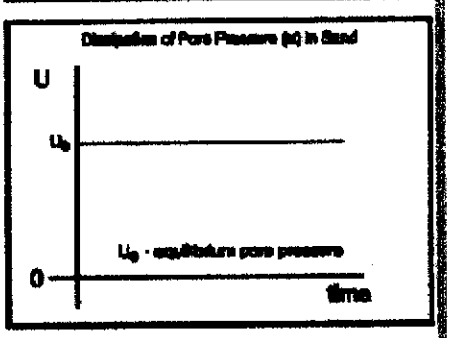
Interpretation of either c_h and k_h from dissipation results can be most easily achieved using either of two analytical approaches: cavity-expansion theory or the strain-path approach. Comparisons of the available solutions and results from field studies suggest that the cavity-expansion method of Torstensson (1977) and the strain-path approaches of Levadous (1980) and Teh (1987) all provide similar predications of consolidation parameters from CPTU dissipation data (Gillespie 1981; Kabir and Lutenegger 1990; Robertson et al. (1991). Robertson et al. (1991) have shown that these methods, although developed for normally consolidated soils, can be equally applied to overconsolidated soils. Furthermore, comparisons of field and laboratory data indicate that the trends in the measured (laboratory) and predicated (CPTU) data are consistent provided the micro fabric and nature of the soils being tested are taken into consideration. (Danziger 1990; Robertson et al. 1991).

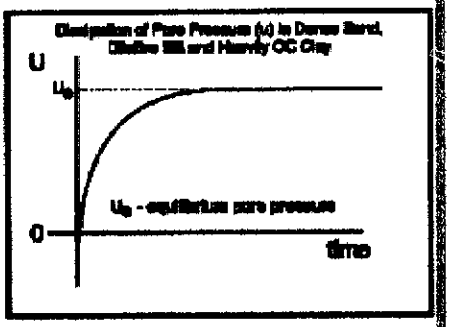
A complete reference on pore pressure dissipation tests is presented by Robertson et al. 1991.

A summary of the pore pressure dissipation tests is summarized in Table 1.
Pore pressure dissipation data is presented in graphical form in Appendix PPDT.









Water Table Calculation

$$D_{water} = D_{cone} - H_{water}$$

where $H_{water} = U_e$ (depth units)

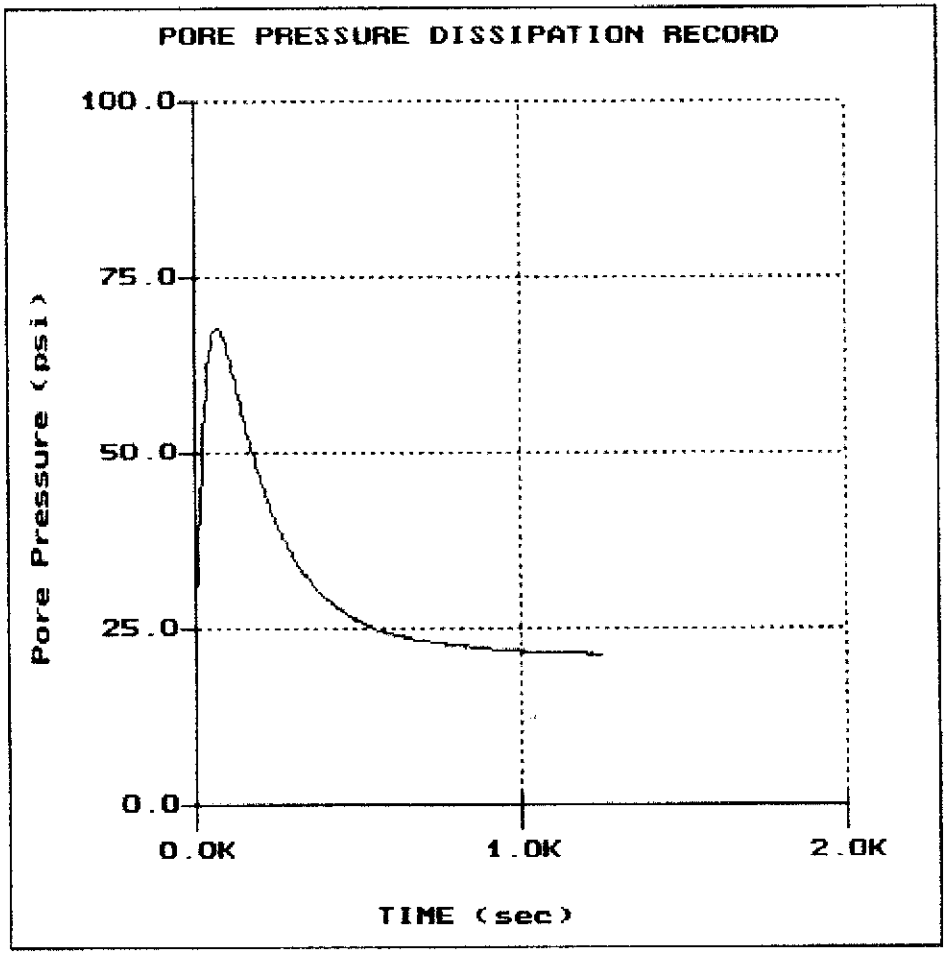
Useful Conversion Factors: 1psi = 0.704m = 2.31 feet (water)
1tsf = 0.958 bar = 13.9 psi
1m = 3.28 feet

Figure PPD

BLYMYER ENG

Site: DOLAN PROPERTIES
Location: CPT-01

Engineer: M.DETTERMAN
Date: 03:28:105 09:35



File: 107C01.PPC
Depth (m): 15.25
(ft): 50.03
Duration : 1245.0s
U-min: 21.30 1245.0s
U-max: 67.80 70.0s

APPENDIX U.V.I.F.

Ultra Violet Induced Flourescence (UVIFCPTu)

Gregg In Situ, Inc. conducts Ultra Violet Induced Fluorescence (UVIF) Cone Penetration Tests using a UVIF module that is located behind the standard piezocone, *Figure UVIF*. The ultra violet induced fluorescence cone works on the principle that polyaromatic hydrocarbons (PAH's), mixed with soil and groundwater, fluoresce when irradiated by ultra violet light. Therefore, by measuring the UVIF intensity of the soil and groundwater the lateral and vertical extent of polyaromatic hydrocarbon contamination in the ground can be determined.

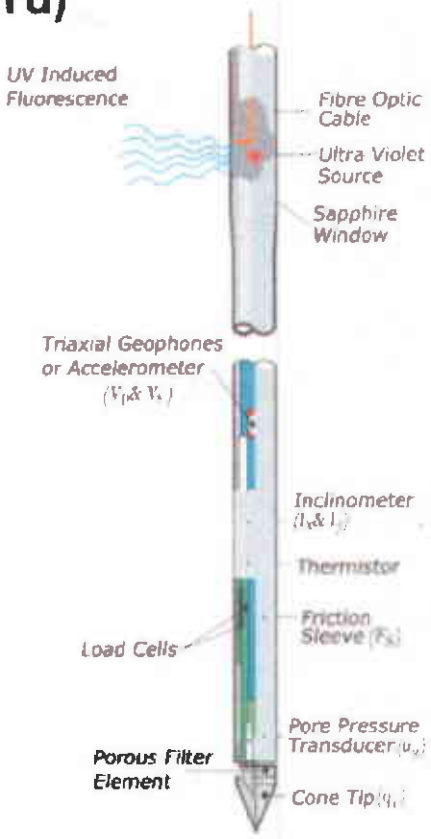


Figure UVIF

The UVIF module uses principles of fluorescence spectrometry by irradiating the soil with ultra violet light. The hydrocarbon molecules absorb the UV light energy during radiation and immediately re-emit the light at a longer wavelength. This re-emission is termed fluorescence. The difference between the excitation (250 nm) and emission (275-550 nm) wavelengths is called the Stokes shift. Specific hydrocarbon compounds can be identified by the magnitude of their Stokes shift refer to Figure EWL.

In general, as the number of aromatic rings increase the fluorescent response shifts toward longer wavelengths. Therefore, lighter compounds tend to fluoresce at shorter wavelengths and heavier compounds fluoresce at longer wavelengths.

The UVIF module contains a fiber optic cable that captures the emitted radiation and sends it to an amplifier at the surface so the intensity can be recorded.

The UVIF data is displayed in graphical form along with soil behavior type and other calculated parameters with the corresponding CPT plot.

For a detailed reference on UVIF cone testing, refer to Woeller et. al., 2000.

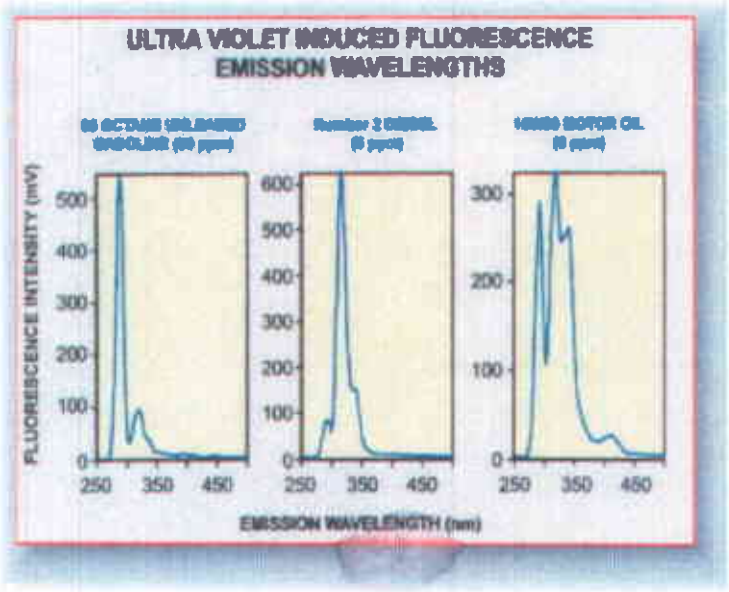
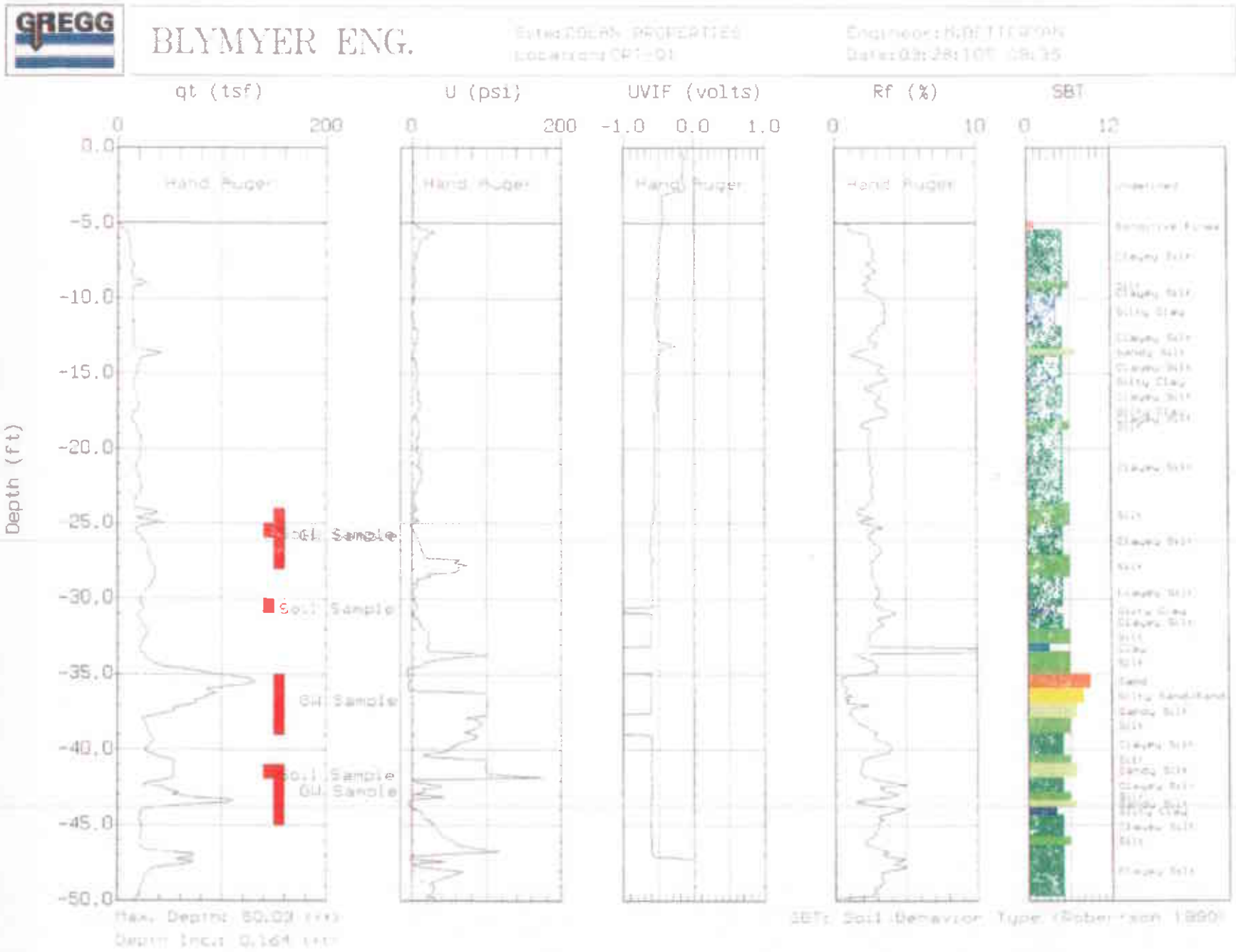
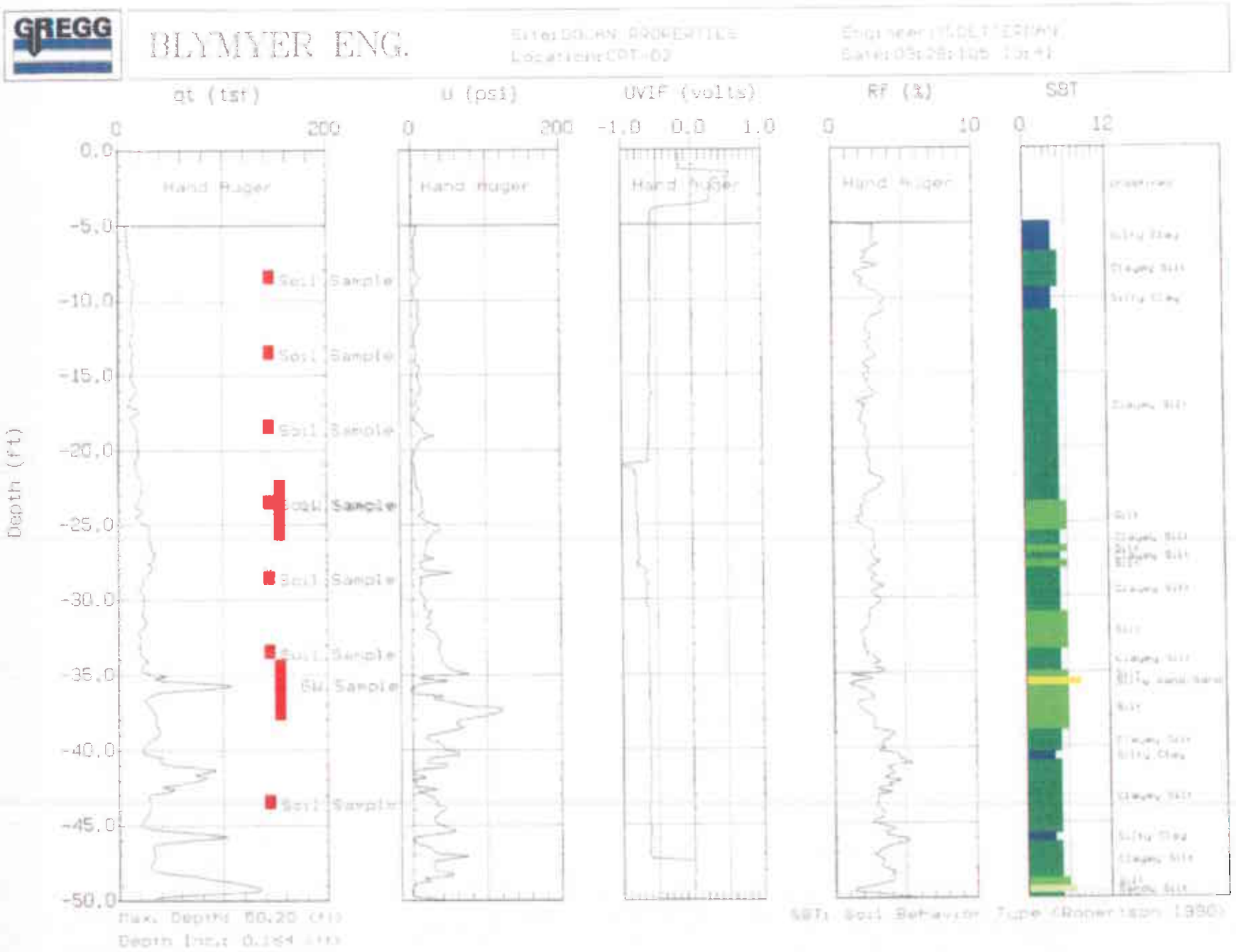


Figure EWL (After Fontana, 1994)


GREGG
BLYMYER ENG.
qt (tsf)
U (psi)
UVIF (volts)
Rf (%)
SBT
0
200
-1.0
0.0
1.0
10
12
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
-35.0
-40.0
-45.0
-50.0
Depth (ft)
Hand Auger
Soil Sample
GW Sample
Max. Depth: 50.03 (ft)
Depth Incr: 0.164 (ft)


GREGG
BLYMYER ENG.
qt (tsf)
u (psi)
UVIF (volts)
RF (%)
SBT
Depth (ft)
Hand Auger
Soil Sample
SBT: Soil Behavior Type (Robertson 1990)

Groundwater Sampling (GWS)

Gregg In Situ, Inc. conducts groundwater sampling using a Hydropunch® type groundwater sampler, *Figure GWS*. The groundwater sampler has a retrievable stainless steel or disposable PVC screen with steel drop off tip. This allows for samples to be taken at multiple depth intervals within the same sounding location. In areas of slower water recharge, provisions may be made to set temporary PVC well screens during sampling to allow the drill rig to advance to the next sample location while the groundwater is allowed to infiltrate.

The groundwater sampler operates by advancing 1 ¾ inch hollow push rods with the filter tip in a closed configuration to the base of the desired sampling interval. Once at the desired sample depth, the push rods are retracted; exposing the encased filter screen and allowing groundwater to infiltrate hydrostatically from the formation into the inlet screen. A small diameter bailer (approximately ½ or ¾ inch) is lowered through the push rods into the screen section for sample collection. The number of downhole trips with the bailer and time necessary to complete the sample collection at each depth interval is a function of sampling protocols, volume requirements, and the yield characteristics and storage capacity of the formation. Upon completion of sample collection, the push rods and sampler, with the exception of the PVC screen and steel drop off tip are retrieved to the ground surface, decontaminated and prepared for the next sampling event.

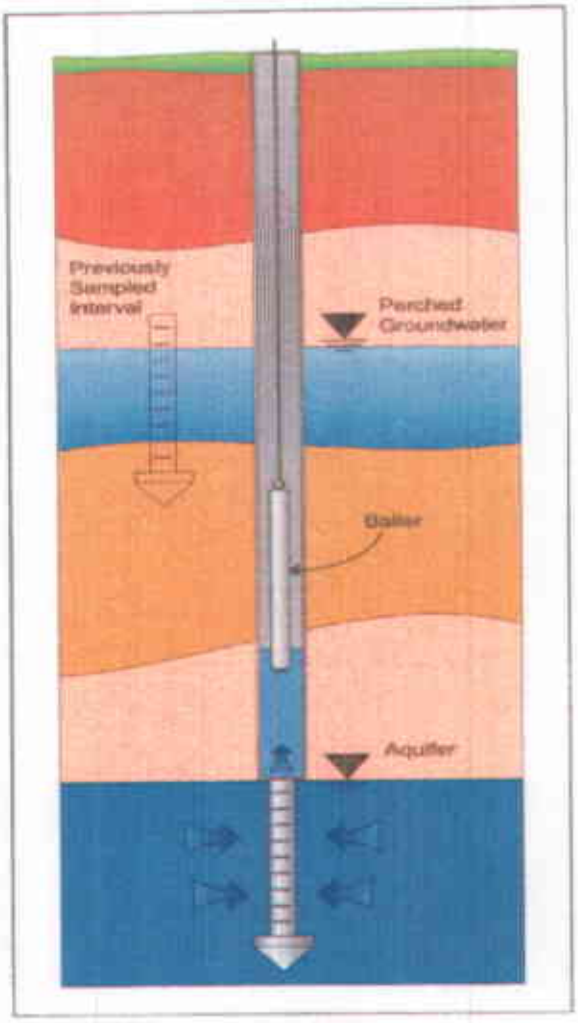


Figure GWS

A summary of the groundwater samples collected, including the sampling date, depth and location identification, is presented in Table 1 and the corresponding CPT plot .

For a detailed reference on direct push groundwater sampling, refer to Zemo et. al , 1992.

Soil Sampling (SS)

Gregg In Situ, Inc. uses a piston-type sampler to obtain relatively undisturbed soil samples without generating any soil cuttings, *Figure SS*. Two different types of samplers (12 and 18 inch) are used depending on the soil type and density. The soil sampler is initially pushed in a "closed" position to the desired sampling interval using our hydraulic rig. Keeping the sampler closed minimizes the potential of cross contamination caused by sloughing. The inner tip of the sampler is then retracted 12 inches (or 18 inches if using the longer sampler) leaving a hollow soil sampler with two inner 1¼ inch diameter by 6 inch or four 3 inch long soil sample tubes. If using the 18 inch sampler, two 1½ inch diameter by 6 inch long tubes will be exposed. The hollow sampler is then pushed in a locked "open" position to collect a soil sample. The filled sampler and push rods are then retrieved to the ground surface. Because the soil enters the sampler at a constant rate, the opportunity for 100% recovery is increased. For environmental analysis, the soil sample tube ends are sealed with Teflon and plastic caps. Often, a longer "split tube" can be used for geotechnical sampling.

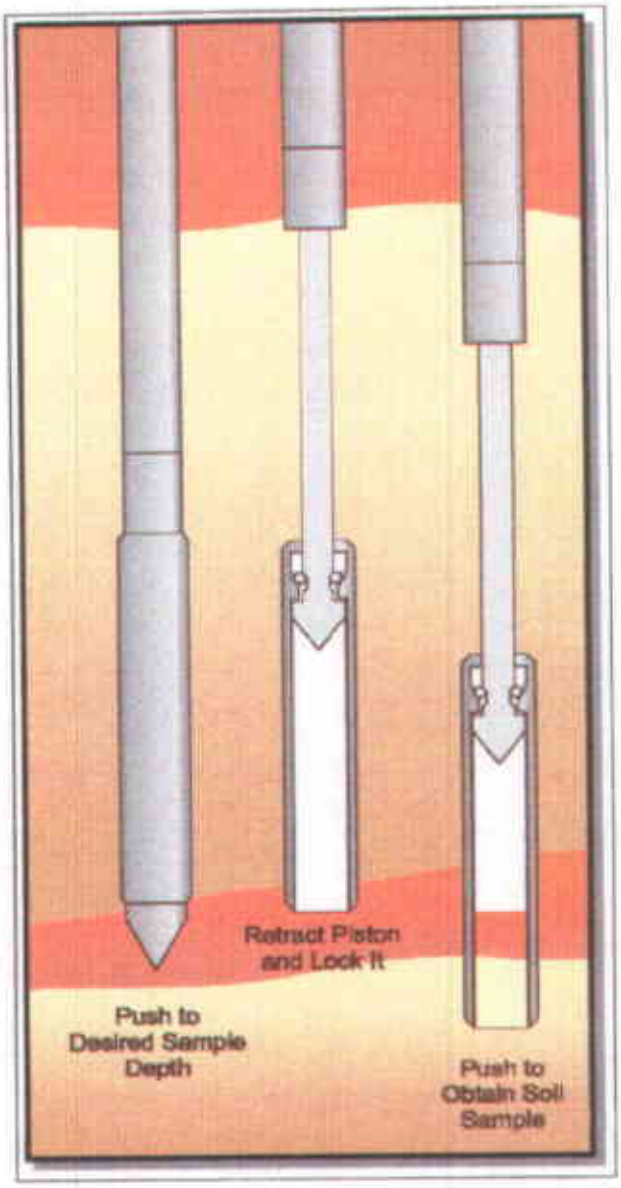


Figure SS

For a detailed reference on direct push soil sampling, refer to Robertson et al, 1998.

A summary of the soil samples collected, including the sampling date, depth and location identification, is presented in Table 1.

Gregg In Situ

Environmental and Geotechnical Site Investigation Contractors

Gregg In Situ Interpretations as of June 30, 2004 (Release 1.22A)

Gregg In Situ's interpretation routine provides a tabular output of geotechnical parameters based on current published CPT correlations and is subject to change to reflect the current state of practice. The interpreted values are not considered valid for all soil types. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design. Reference to current literature is strongly recommended. Gregg In Situ does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the program and does not assume liability for any use of the results in any design or review. Representative hand calculations should be made for any parameter that is critical for design purposes. The end user of the interpreted output should also be fully aware of the techniques and the limitations of any method used in this program. The purpose of this document is to inform the user as to which methods were used and what the appropriate papers and/or publications are for further reference.

The CPT interpretations are based on values of tip, sleeve friction and pore pressure averaged over a user specified interval (e.g. 0.20m). Note that q_t is the tip resistance corrected for pore pressure effects and q_c is the recorded tip resistance. Since all Gregg In Situ cones have equal end area friction sleeves, pore pressure corrections to sleeve friction, f_s, are not required.

The tip correction is: $q_t = q_c + (1-a) * u_2$

where: q_t is the corrected tip resistance
q_c is the recorded tip resistance
u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)
a is the Net Area Ratio for the cone (typically 0.85 for Gregg In Situ cones)

The total stress calculations are based on soil unit weights that have been assigned to the Soil Behavior Type zones, from a user defined unit weight profile or by using a single value throughout the profile. Effective vertical overburden stresses are calculated based on a hydrostatic distribution of equilibrium pore pressures below the water table or from a user defined equilibrium pore pressure profile (this can be obtained from CPT dissipation tests). For over water projects the effects of the column of water have been taken into account as has the appropriate unit weight of water. How this is done depends on where the instruments were zeroed (i.e. on deck or at mud line).

Details regarding the interpretation methods for all of the interpreted parameters are provided in Table 1. The appropriate references cited in Table 1 are listed in Table 2. Where methods are based on charts or techniques that are too complex to describe in this summary the user should refer to the cited material.

The estimated Soil Behavior Types (normalized and non-normalized) are based on the charts developed by Robertson and Campanella shown in Figures 1 and 2. The Bq classification charts are not reproduced in this document but can be reviewed in Lunne, Robertson and Powell (1997) or Robertson (1990).

Where the results of a calculation/interpretation are declared *'invalid'* the value will be represented by the text strings "-9999" or "-9999.0". In some cases the value 0 will be used. Invalid results will occur because of (and not limited to) one or a combination of:

1. Invalid or undefined CPT data (e.g. drilled out section or data gap).

2. Where the interpretation method is inappropriate, for example, drained parameters in an undrained material (and vice versa). The user must evaluate the site specific soil conditions and characteristics to properly apply the appropriate interpretation method.

3. Where interpretation input values are beyond the range of the referenced charts or specified limitations of the interpretation method.

4. Where pre-requisite or intermediate interpretation calculations are invalid.

The parameters selected for output from the program are often specific to a particular project. As such, not all of the interpreted parameters listed in Table 1 may be included in the output files delivered with this report.

The output files are in one format:

File Type	Typical Extensions	Description
Spreadsheet	XLS	IFI, NLI files exported directly to Excel format. Column and cell formatting has been done. Header information is exported to start in Column C allowing the depth columns A and/or B to be duplicated on each printed page without repetition of part of the header information.

Table 1
CPT Interpretation Methods

Interpreted Parameter	Description	Equation	Ref
Depth	Mid Layer Depth *(where interpretations are done at each point then Mid Layer Depth = Recorded Depth)*	*Depth (Layer Top) + Depth (Layer Bottom) / 2.0*	
Elevation	Elevation of Mid Layer based on sounding collar elevation supplied by client	Elevation = Collar Elevation – Depth	
Avgqc	Averaged recorded tip value (q_c)	$Avgqc = \frac{1}{n}\sum_{i=1}^{n} q_c$ *n=1 when interpretations are done at each point*	
Avgqt	Averaged corrected tip (q_t) where: $q_t = q_c + (1 - a) * u$	$Avgqt = \frac{1}{n}\sum_{i=1}^{n} q_t$ *n=1 when interpretations are done at each point*	
Avgfs	Averaged sleeve friction (f_s)	$Avgfs = \frac{1}{n}\sum_{i=1}^{n} f_s$ *n=1 when interpretations are done at each point*	
AvgRf	Averaged friction ratio (Rf) where friction ratio is defined as: $Rf = 100\% * \frac{f_s}{qt}$	$AvgRf = 100\% * \frac{Avgfs}{Avgqt}$ *n=1 when interpretations are done at each point*	
Avgu	Averaged dynamic pore pressure *(u)*	$Avgu = \frac{1}{n}\sum_{i=1}^{n} u_i$ *n=1 when interpretations are done at each point*	
AvgRes	Averaged Resistivity (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} RESISTIVITY_i$ *n=1 when interpretations are done at each point*	
AvgUVIF	Averaged UVIF ultra-violet induced fluorescence (this data is not always available since it is a specialized test requiring an additional module)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} UVIF_i$ *n=1 when interpretations are done at each point*	
AvgTemp	Averaged Temperature (this data is not always available since it is a specialized test)	$Avgu = \frac{1}{n}\sum_{i=1}^{n} TEMPERATURE_i$ *n=1 when interpretations are done at each point*	

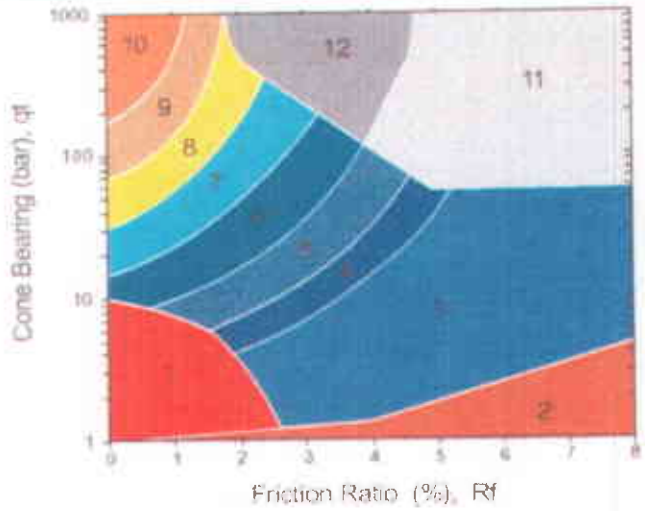
Interpreted Parameter	Description	Equation	Ref
AvgGamma	Averaged Gamma Counts (this data is not always available since it is a specialized test requiring an additional module)	$Avgga = \frac{1}{n}\sum GAMMA$ *n=1 when interpretations are done at each point*	
SBT	Soil Behavior Type as defined by Robertson and Campanella	See Figure 1	2, 5
SBTn	Normalized Soil Behavior Type as defined by Robertson and Campanella	See Figure 2	2, 5
SBT-BQ	Non-normalized soil behavior type based on the Bq parameter	See Figure 5.7 (reference 5)	2, 5
SBT-BQn	Normalized Soil Behavior base on the Bq parameter	See Figure 5.8 (reference 5) or Figure 3 (reference 2)	2, 5
k	Coefficient of permeability (assigned to each SBT zone)		5
U.Wt	Unit Weight of soil determined from one of the following user selectable options: 1) uniform value 2) value assigned to each SBT zone 3) user supplied unit weight profile	See references	5
T. Stress σ_v	Total vertical overburden stress at Mid Layer Depth *A layer is defined as the averaging interval specified by the user. For data interpreted at each point the Mid Layer Depth is the same as the recorded depth.*	$Tstress = \sum \gamma_i h_i$ where γ_i is layer unit weight h_i is layer thickness	
Ueq	Equilibrium pore pressure determined from one of the following user selectable options: 1) hydrostatic from water table depth 2) user supplied profile	For hydrostatic option: $u_{eq} = \gamma_w * (D - D_w)$ where u_{eq} is equilibrium pore pressure γ_w is unit weight of water D is the current depth D_w is the depth to the water table	
E. Stress σ'_v	Effective vertical overburden stress at Mid Layer Depth	$Estress = Tstress - u_{eq}$	
Cn	SPT N_{60} overburden correction factor	$Cn = (\sigma'_v)^{-0.5}$ where σ'_v is in tsf $0.5 < C_n < 2.0$	
N_{60}	SPT N value at 60% energy calculated from qt/N ratios assigned to each SBT zone. This method has abrupt N value changes at zone boundaries	*See Figure 1*	4, 5
$(N_1)_{60}$	SPT N_{60} value corrected for overburden pressure	$(N_1)_{60} = Cn * N_{60}$	4
N_{60}cl	SPT N_{60} values based on the Ic parameter	(qt/pa)/ N_{60} = 8.5 (1 – Ic/4.6)	5
$(N_1)_{60}$cIc	SPT N_{60} value corrected for overburden pressure (using N_{60}cl) User has 2 options.	1) $(N_1)_{60}$cIc= Cn * (N_{60}cl) 2) q_{t_1N}/ $(N_1)_{60}$cIc = 8.5 (1 – Ic/4.6)	4 5
$(N_1)_{60cs}$Ic	Clean sand equivalent SPT $(N_1)_{60}$Ic. User has 3 options.	1) $(N_1)_{60cs}$Ic = a + B/$(N_1)_{60}$Ic) 2) $(N_1)_{60cs}$Ic = K_{corr} * $(N_1)_{60}$Ic) 3) q_{t_1N}/ $(N_1)_{60cs}$Ic = 8.5 (1 – Ic/4.6) FC = 5%: a = 0, B=1.0 FC = 35% a = 5.0, B=1.2 5% < FC < 35% a = exp[1.76 – (190/FC²)] B = [0.99 + (FC$^{1.5}$/1000)]	10 10 5

Interpreted Parameter	Description	Equation	Ref
Q_t	Normalized q_t for Soil Behavior Type classification as defined by Robertson, 1990	$Qt = \frac{qt - \sigma_{vo}}{\sigma_{vo}}$	2, 5
F_r	Normalized Friction Ratio for Soil Behavior Type classification as defined by Robertson, 1990	$Fr = 100\% * \frac{fs}{qt - \sigma_{vo}}$	2, 5
Bq	Pore pressure parameter	$Bq = \frac{\Delta u}{qt - \sigma_{vo}}$ where: $\Delta u = u - u_{eq}$ and u = dynamic pore pressure u_{eq} = equilibrium pore pressure	1, 5
I_c	Soil index for estimating grain characteristics	$Ic = [(3.47 - \log_{10} Q)^2 + (\log_{10} Fr + 1.22)^2]^{0.5}$ Where: $Q = \left(\frac{qt - \sigma_{vo}}{P_a}\right)\left(\frac{P_a}{\sigma_{vo}}\right)^n$ And Fr is in percent P_a = atmospheric pressure P_{at} = atmospheric pressure n varies from 0.5 to 1.0 and is selected in an iterative manner based on the resulting I_c	3, 8
FC	Apparent fines content (%)	$FC = 1.75(Ic^{3.25}) - 3.7$ $FC = 100$ for $Ic > 3.5$ $FC = 0$ for $Ic < 1.26$ $FC = 5\%$ if $1.64 < Ic < 2.36$ AND $Fr < 0.5$	3
Ic Zone	This parameter is the Soil Behavior Type zone based on the Ic parameter (valid for zones 2 through 7 on SBTn chart)	Ic < 1.31 Zone = 7 1.31 < Ic < 2.05 Zone = 6 2.05 < Ic < 2.60 Zone = 5 2.60 < Ic < 2.95 Zone = 4 2.95 < Ic < 3.60 Zone = 3 Ic > 3.60 Zone = 2	3
Dr	Relative Density determined from one of the following user selectable options: a) Ticino Sand b) Hokksund Sand c) Schmertmann 1976 d) Jamiolkowski - All Sands	See reference	5
PHI ϕ	Friction Angle determined from one of the following user selectable options: a) Campanella and Robertson b) Durgunoglu and Mitchel c) Jonbu	See reference	5
State Parameter	The state parameter is used to describe whether a soil is contractive (SP is positive) or dilative (SP is negative) at large strains based on the work by Been and Jefferies	See reference	8, 6, 5
Es/qt	Intermediate parameter for calculating Youngs Modulus, E, in sands. It is the Y axis of the reference chart.	Based on Figure 5.59 in the reference	5

Interpreted Parameter	Description	Equation	Ref
Youngs Modulus E	Youngs Modulus based on the work by Baldi. There are three types of sands considered in this technique. The user selects the appropriate type for the site from: a) OC Sands b) Aged NC Sands c) Recent NC Sands Each sand type has a family of curves that depend on mean normal stress. The program calculates mean normal stress and linearly interpolates between the two extremes provided in Baldi's chart.	Mean normal stress is evaluated from: $\sigma'_m = \frac{1}{3} \cdot (\sigma'_v + \sigma'_h + \sigma'_h)$ where σ'_v = vertical effective stress σ'_h = horizontal effective stress and $\sigma'_h = K_o \cdot \sigma'_v$ with Ko assumed to be 0.5	5
Su	Undrained shear strength - N_{kt} is user selectable	$Su = \frac{qt - \sigma_v}{N_{kt}}$	1, 5
OCR	Over Consolidation Ratio	a) Based on Schmertmann's method involving a plot of $S_u/\sigma_v' / (S_u/\sigma_v')_{NC}$ and OCR where the Su/p' ratio for NC clay is user selectable	9

The following parameters are not presented but may be interpreted for use in liquefaction analysis. Further detailed interpretation may be completed by using the Liquefaction Spreadsheet following the committee recommendations of the NCEER. This Spreadsheet is available for purchase. A promotional document is presented in the Interpretations directory on the Data Disk with this report.

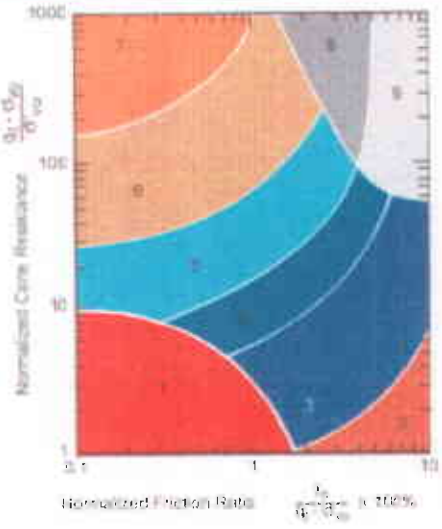
Interpreted Parameter	Description	Equation	Ref
q_{c1}	q_c normalized for overburden stress used for seismic analysis	$q_{c1} = q_c * (Pa/\sigma_v')^{n}$ where: Pa = atm. Pressure q_c is in Mpa	3
q_{c1n}	q_{c1} in dimensionless form used for seismic analysis	$q_{c1n} = (q_{c1} / Pa)(Pa/\sigma_v')$ where: Pa = atm. Pressure and n ranges from 0.5 to 0.75 based on Ic.	3
K_{sat}	Equivalent clean sand factor for $(N_1)60$	$K_{sat} = 1 + ((0.75/30) * (FC - 5))$	10
K_{cor}	Equivalent clean sand correction for q_{c1N}	$K_{cor} = 1.0$ for $I_c \leq 1.64$ $K_{cor} = f(I_c)$ for $I_c > 1.64$ (see reference)	10
q_{c1ncs}	Clean sand equivalent q_{c1n}	$q_{c1ncs} = q_{c1N} * K_{cor}$	3
CRR	Cyclic Resistance Ratio (for Magnitude 7.5)	$q_{c1ncs} < 50$: $CRR_{7.5} = 0.833 [(q_{c1ncs}/1000)] + 0.05$ $50 \leq q_{c1ncs} < 160$: $CRR_{7.5} = 93 [(q_{c1ncs}/1000)^3] + 0.08$	10
CSR	Cyclic Stress Ratio	$CSR = (\tau_{av}/\sigma_v') = 0.65 (a_{max} / g) (\sigma_v / \sigma_v') r_d$ $r_d = 1.0 - 0.00765\ z$ $z \leq 9.15m$ $r_d = 1.174 - 0.0267\ z$ $9.15 < z \leq 23m$ $r_d = 0.744 - 0.008\ z$ $23 < z \leq 30m$ $r_d = 0.50$ $z > 30m$	10
MSF	Magnitude Scaling Factor	See Reference	10
FofS	Factor of Safety against Liquefaction	$FS = (CRR_{7.5} / CSR)\ MSF$	10
Liquefaction Status	Statement indicating possible liquefaction	Takes into account FofS and limitations based I_c and q_{c1ncs}	10



Zone	qt / N	Soil Behavior Type
1	2	sensitive fine grained
2	1	organic material
3	1	clay
4	1.5	silty clay to clay
5	2	clayey silt to silty clay
6	2.5	sandy silt to clayey silt
7	3	silty sand to sandy silt
8	4	sand to silty sand
9	5	sand
10	6	gravelly sand to sand
11	1	very stiff fine grained *
12	2	sand to clayey sand *

* overconsolidated or cemented

Figure 1 Non-Normalized Behavior Type Classification Chart



Zone	Normalized Soil Behavior Type
1	sensitive fine grained
2	organic material
3	clay to silty clay
4	clayey silt to silty clay
5	silty sand to sandy silt
6	clean sands to silty sands
7	gravelly sand to sand
8	very stiff sand to clayey sand
9	very stiff fine grained

Figure 2 Normalized Behavior Type Classification Chart

Table 2 References

No.	References
1	Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986. "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.
2	Robertson, P.K., 1990. "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27
3	Robertson, P.K. and Fear, C.E., 1998. "Evaluating cyclic liquefaction potential using the cone penetration test", Canadian Geotechnical Journal, 35 442-459.
4	Robertson, P.K. and Wride, C.E., 1998. "Cyclic Liquefaction and its Evaluation Based on SPT and CPT", NCEER Workshop Paper, January 22, 1997
5	Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, " Cone Penetration Testing in Geotechnical Practice," Blackie Academic and Professional.
6	Plewes, H.D., Davies, M.P. and Jefferies, M.G., 1992. "CPT Based Screening Procedure for Evaluating Liquefaction Susceptibility", 45th Canadian Geotechnical Conference, Toronto, Ontario, October 1992.
7	Jefferies, M.G. and Davies, M.P., 1993. "Use of CPTu to Estimate equivalent N_{60}", Geotechnical Testing Journal, 16(4): 458-467.
8	Been, K. and Jefferies, M.P., 1985, "A state parameter for sands", Geotechnique, 35(2), 99-112.
9	Schmertmann, 1977, "Guidelines for Cone Penetration Test Performance and Design", Federal Highway Administration Report FHWA-TS-78-209, U.S. Department of Transportation
10	Proceedings of theNCEER Workshop on Evaluation of Liquefaction Resistance of Soils, Salt LakeCity, 1996. Chaired by Leslie Youd.

Appendix D

Blaine Tech Services, Inc.
Standard Operating Procedures

Blaine Tech Services, Inc.
Standard Operating Procedure

WELL DEVELOPMENT

Use Swab as a plunger to flush out debris from the slots of the screen. Run the Swab up and down through the entire screen interval. The recommended amount of time spent swabbing depends on the length of the screen, usually one minute per foot. If no screened interval is provided, then swab well for 15 minutes.

Using a stainless steel (1.75" diameter) pneumatic pump begin purging at 0.5 – 1.0 GPM. Place the pump near the well bottom and remove the accumulated sediment until the well bottom feels hard and clean. During purging, move pump up and down through the screen interval, continuing to agitate the pump until all the sediment is removed.

Take the required water quality parameter readings at each casing volume removed. At a minimum, water quality measurements include pH, temperature, electrical conductivity (EC), and turbidity (NTU). Measure Depth to Water (DTW) while purging to confirm the height of the water column. If the well begins to de-water, then the pump may have to be slowed or shut off until enough water recharges into the well. Make notes of the recharge rate. Remove the required number of casing volumes. At a minimum, remove at least 10 case volumes of purge-water. After the minimum volume of water has been purged and all the sediment has been removed from the well, take a final Total Depth measurement. If a required turbidity level must be reached, continue purging until the desired reading has been attained.

Blaine Tech Services, Inc.
Standard Operating Procedure

WATER LEVEL, SEPARATE PHASE LEVEL AND TOTAL WELL DEPTH MEASUREMENTS (GAUGING)

Routine Water Level Measurements

1. Establish that water or debris will not enter the well box upon removal of the cover.
2. Remove the cover using the appropriate tools.
3. Inspect the wellhead (see Wellhead Inspections).
4. Establish that water or debris will not enter the well upon removal of the well cap.
5. Unlock and remove the well cap lock (if applicable). If lock is not functional cut it off.
6. Loosen and remove the well cap. CAUTION: DO NOT PLACE YOUR FACE OR HEAD DIRECTLY OVER WELLHEAD WHEN REMOVING THE WELL CAP. WELL CAP MAY BE UNDER PRESSURE AND/OR MAY RELEASE ACCUMULATED AND POTENTIALLY HARMFULL VAPORS.
7. Verify and identify survey point as written on S.O.W.
   TOC: If survey point is listed as Top of Casing (TOC), look for the exact survey point in the form of a notch or mark on the top of the casing. If no mark is present, use the north side of the casing as the measuring point.
   TOB: If survey point is listed as Top of Box (TOB), the measuring point will be established manually. Place the inverted wellbox lid halfway across the wellbox opening and directly over the casing. The lower edge of the inverted cover directly over the casing will be the measuring point.
8. Put new Latex or Nitrile gloves on your hands.
9. Slowly lower the Water Level Meter probe into the well until it signals contact with water with a tone and/or flashing a light.
10. Gently raise the probe tip slightly above the water and hold it there. Wait momentarily to see if the meter emits a tone, signaling rising water in the casing. Gently lower the probe tip slightly below the water. Wait momentarily to see if the meter stops emitting a tone, signaling dropping water in the casing. Continue process until water level stabilizes indicating that the well has equilibrated.
11. While holding the probe at first contact with water and the tape against the measuring point, note depth. Repeat twice to verify accuracy. Write down measurement on Well Gauging Sheet under Depth to Water column.
12. Recover probe, replace and tighten well cap, replace lock (if applicable), replace well box cover and tighten hardware (if applicable)

Water Level and Separate Phase Thickness Measurements in Wells Suspected of Containing Separate Phase

1. Establish that water or debris will not enter the well box upon removal of the cover.
2. Remove the cover using the appropriate tools.
3. Inspect the wellhead (see Wellhead Inspections).
4. Establish that water or debris will not enter the well upon removal of the well cap.

5. Unlock and remove the well cap lock (if applicable). If lock is not functional cut it off.
6. Loosen and remove the well cap. CAUTION: DO NOT PLACE YOUR FACE OR HEAD DIRECTLY OVER WELLHEAD WHEN REMOVING THE WELL CAP. WELL CAP MAY BE UNDER PRESSURE AND/OR MAY RELEASE ACCUMULATED AND POTENTIALLY HARMFULL VAPORS.
7. Verify and identify survey point as written on S.O.W.
   TOC: If survey point is listed as Top of Casing (TOC), look for the exact survey point in the form of a notch or mark on the top of the casing. If no mark is present, use the north side of the casing as the measuring point.
   TOB: If survey point is listed as Top of Box (TOB), the measuring point will be established manually. Place the inverted well box lid halfway across the well box opening and directly over the casing. The lower edge of the inverted cover directly over the casing will be the measuring point.
8. Put new Nitrile gloves on your hands.
9. Slowly lower the tip of the Interface Probe into the well until it emits either a solid or broken tone.
   BROKEN TONE: Separate phase layer is not present. Go to Step 8 of Routine Water Level Measurements shown above to complete gauging process using the Interface probe as you would a Water Level Meter.
   SOLID TONE: Separate phase layer is present. Go to the next step.
10. Gently raise the probe tip slightly above the separate phase layer and hold it there. Wait momentarily to see if the meter emits a tone, signaling rising water in the casing. Gently lower the probe tip slightly below the separate phase layer. Wait momentarily to see if the meter stops emitting a tone, signaling dropping water in the casing. Continue process until water level stabilizes indicating that the well has equilibrated.
11. While holding the probe at first contact with the separate phase layer and the tape against the measuring point, note depth. Repeat twice to verify accuracy. Write down measurement on Well Gauging Sheet under Depth to Product column.
12. Gently lower the probe tip until it emits a broken tone signifying contact with water. While holding the probe at first contact with water and the tape against the measuring point, note depth. Repeat twice to verify accuracy. Write down measurement on Well Gauging Sheet under Depth to Water column.
13. Recover probe, replace and tighten well cap, replace lock (if applicable), replace well box cover and tighten hardware (if applicable).

Routine Total Well Depth Measurements

1. Lower the Water Level Meter probe into the well until it lightens in your hands, indicating that the probe is resting at the bottom of well.
2. Gently raise the tape until the weight of the probe increases, indicating that the probe has lifted off the well bottom.
3. While holding the probe at first contact with the well bottom and the tape against the well measuring point, note depth. Repeat twice to verify accuracy. Write down measurement on Well Gauging Sheet under Total Well Depth column.

4. Recover probe, replace and tighten well cap, replace lock (if applicable), replace well box cover and tighten hardware (if applicable).

Blaine Tech Services, Inc.
Standard Operating Procedure

WELL WATER EVACUATION (PURGING)

Purpose
Evacuation of a predetermined minimum volume of water from a well (purging) while *simultaneously* measuring water quality parameters is typically required prior to sampling. Purging a minimum volume guarantees that actual formation water is drawn into the well. Measuring water quality parameters either verifies that the water is stable and suitable for sampling or shows that the water remains unstable, indicating the need for continued purging. Both the minimum volume and the stable parameter qualifications need to be met prior to sampling. This assures that the subsequent sample will be representative of the formation water surrounding the well screen and not of the water standing in the well.

Defining Casing Volumes
The predetermined minimum quantity of water to be purged is based on the wells' casing volume. A casing volume is the volume of water presently standing within the casing of the well. This is calculated as follows:

Casing Volume = (TD – DTW) VCF

1. Subtract the wells' depth to water (DTW) measurement from its total depth (TD) measurement. This is the height of the water column in feet.
2. Determine the well casings' volume conversion factor (VCF). The VCF is based on the diameter of the well casing and represents the volume, in gallons, that is contained in one (1) foot of a particular diameter of well casing. The common VCF's are listed on our Well Purge Data Sheets.
3. Multiply the VCF by the calculated height of the water column. This is the casing volume, the amount of water in gallons standing in the well.

Remove Three to Five Casing Volumes
Prior to sampling, an attempt will be made to purge all wells of a minimum of three casing volumes and a maximum of five casing volumes except where regulations mandate the minimum removal of four casing volumes.

Choose the Appropriate Evacuation Device Based on Efficiency
In the absence of instructions on the SOW to the contrary, selection of evacuation device will be based on efficiency.

Measure Water Quality Parameters at Each Casing Volume
At a minimum, water quality measurements include pH, temperature and electrical conductivity (EC). Measurements are made and recorded at least once every casing volume. They are considered stable when all parameters are within 10% of their previous measurement.

Note: The following instructions assume that well has already been properly located, accessed, inspected and gauged.

Prior to Purging a Well
1. Confirm that the well is to be purged and sampled per the SOW.
2. Confirm that the well is suitable based on the conditions set by the client relative to separate phase.
3. Calculate the wells' casing volume.
4. Put new Latex or Nitrile gloves on your hands.

Purging With a Bailer (Stainless Steel, Teflon or Disposable)
1. Attach bailer cord or string to bailer. Leave other end attached to spool.
2. Gently lower empty bailer into well until well bottom is reached.
3. Cut cord from spool. Tie end of cord to hand.
4. Gently raise full bailer out of well and clear of well head. Do not let the bailer or cord touch the ground.
5. Pour contents into graduated 5-gallon bucket or other graduated receptacle.
6. Repeat purging process.
7. Upon removal of first casing volume, fill clean parameter cup with purgewater, empty the remainder of the purgewater into the bucket, lower the bailer back into the well and secure the cord on the Sampling Vehicle.
8. Use the water in the cup to collect and record parameter measurements.
9. Continue purging until second casing volume is removed.
10. Collect parameter measurements.
11. Continue purging until third casing volume is removed.
12. Collect parameter measurements. If parameters are stable, stop purging. If parameters remain unstable, continue purging until stabilization occurs or the fifth casing volume is removed.

Purging With a Pneumatic Pump
1. Position Pneumatic pump hose reel over the top of the well.
2. Gently unreel and lower the pump into the well. Do not contact the well bottom.
3. Secure the hose reel.
4. Begin purging into graduated 5-gallon bucket or other graduated receptacle.
5. Adjust water recharge duration and air pulse duration for maximum efficiency.
6. Upon removal of first casing volume, fill clean parameter cup with water.
7. Use the water in the cup to collect and record parameter measurements.
8. Continue purging until second casing volume is removed.

9. Collect parameter measurements.
10. Continue purging until third casing volume is removed.
11. Collect parameter measurements. If parameters are stable, stop purging. If parameters remain unstable, continue purging until stabilization occurs or the fifth casing volume is removed.
12. Upon completion of purging, gently recover the pump and secure the reel.

Purging With a Fixed Speed Electric Submersible Pump

1. Position Electric Submersible hose reel over the top of the well.
2. Gently unreel and lower the pump to the well bottom.
3. Raise the pump 5 feet off the bottom.
4. Secure the hose reel.
5. Begin purging.
6. Verify pump rate with flow meter or graduated 5-gallon bucket
7. Upon removal of first casing volume, fill clean parameter cup with water.
8. Use the water in the cup to collect and record parameter measurements.
9. Continue purging until second casing volume is removed.
10. Collect parameter measurements.
11. Continue purging until third casing volume is removed.
12. Collect parameter measurements. If parameters are stable, stop purging. If parameters remain unstable, continue purging until stabilization occurs or the fifth casing volume is removed.
13. Upon completion of purging, gently recover the pump and secure the reel.

Blaine Tech Services, Inc.
Standard Operating Procedure

SAMPLE COLLECTION FROM GROUNDWATER WELLS USING BAILERS

Sampling with a Bailer (Stainless Steel, Teflon or Disposable)

1. Put new Latex or Nitrile gloves on your hands.
2. Determine required bottle set.
3. Fill out sample labels completely and attach to bottles.
4. Arrange bottles in filling order and loosen caps (see Determine Collection Order below).
5. Attach bailer cord or string to bailer. Leave other end attached to spool.
6. Gently lower empty bailer into well until water is reached.
7. As bailer fills, cut cord from spool and tie end of cord to hand.
8. Gently raise full bailer out of well and clear of well head. Do not let the bailer or cord touch the ground. If a set of parameter measurements is required, go to step 9. If no additional measurements are required, go to step 11.
9. Fill a clean parameter cup, empty the remainder contained in the bailer into the sink, lower the bailer back into the well and secure the cord on the Sampling Vehicle. Use the water in the cup to collect and record parameter measurements.
10. Fill bailer again and carefully remove it from the well.
11. Slowly fill and cap sample bottles. Fill and cap volatile compounds first, then semi-volatile, then inorganic. Return to the well as needed for additional sample material.

    Fill 40-milliliter vials for volatile compounds as follows: Slowly pour water down the inside on the vial. Carefully pour the last drops creating a convex or positive meniscus on the surface. Gently screw the cap on eliminating any air space in the vial. Turn the vial over, tap several times and check for trapped bubbles. If bubbles are present, repeat process.

    Fill 1 liter amber bottles for semi-volatile compounds as follows: Slowly pour water into the bottle. Leave approximately 1 inch of headspace in the bottle. Cap bottle.

    Field filtering of inorganic samples using a stainless steel bailer is performed as follows: Attach filter connector to top of full stainless steel bailer. Attach 0.45 micron filter to connector. Flip bailer over and let water gravity feed through the filter and into the sample bottle. If high turbidity level of water clogs filter, repeat process with new filter until bottle is filled. Leave headspace in the bottle. Cap bottle.

    Field filtering of inorganic samples using a disposable bailer is performed as follows: Attach 0.45 micron filter to connector plug. Attach connector plug to bottom of full disposable bailer. Water will gravity feed through the filter and into the sample bottle. If high turbidity level of water clogs filter, repeat process with new filter until bottle is filled. Leave headspace in the bottle. Cap bottle.

12. Bag samples and place in ice chest.
13. Note sample collection details on well data sheet and Chain of Custody.

Blaine Tech Services, Inc.
Standard Operating Procedure

WATER LEVEL, SEPARATE PHASE LEVEL AND TOTAL WELL DEPTH MEASUREMENTS (GAUGING)

Routine Water Level Measurements

1. Establish that water or debris will not enter the well box upon removal of the cover.
2. Remove the cover using the appropriate tools.
3. Inspect the wellhead (see Wellhead Inspections).
4. Establish that water or debris will not enter the well upon removal of the well cap.
5. Unlock and remove the well cap lock (if applicable). If lock is not functional cut it off.
6. Loosen and remove the well cap. CAUTION: DO NOT PLACE YOUR FACE OR HEAD DIRECTLY OVER WELLHEAD WHEN REMOVING THE WELL CAP. WELL CAP MAY BE UNDER PRESSURE AND/OR MAY RELEASE ACCUMULATED AND POTENTIALLY HARMFULL VAPORS.
7. Verify and identify survey point as written on S.O.W.
   TOC: If survey point is listed as Top of Casing (TOC), look for the exact survey point in the form of a notch or mark on the top of the casing. If no mark is present, use the north side of the casing as the measuring point.
   TOB: If survey point is listed as Top of Box (TOB), the measuring point will be established manually. Place the inverted wellbox lid halfway across the wellbox opening and directly over the casing. The lower edge of the inverted cover directly over the casing will be the measuring point.
8. Put new Latex or Nitrile gloves on your hands.
9. Slowly lower the Water Level Meter probe into the well until it signals contact with water with a tone and/or flashing a light.
10. Gently raise the probe tip slightly above the water and hold it there. Wait momentarily to see if the meter emits a tone, signaling rising water in the casing. Gently lower the probe tip slightly below the water. Wait momentarily to see if the meter stops emitting a tone, signaling dropping water in the casing. Continue process until water level stabilizes indicating that the well has equilibrated.
11. While holding the probe at first contact with water and the tape against the measuring point, note depth. Repeat twice to verify accuracy. Write down measurement on Well Gauging Sheet under Depth to Water column.
12. Recover probe, replace and tighten well cap, replace lock (if applicable), replace well box cover and tighten hardware (if applicable)

Water Level and Separate Phase Thickness Measurements in Wells Suspected of Containing Separate Phase

1. Establish that water or debris will not enter the well box upon removal of the cover.
2. Remove the cover using the appropriate tools.
3. Inspect the wellhead (see Wellhead Inspections).
4. Establish that water or debris will not enter the well upon removal of the well cap.

5. Unlock and remove the well cap lock (if applicable). If lock is not functional cut it off.
6. Loosen and remove the well cap. CAUTION: DO NOT PLACE YOUR FACE OR HEAD DIRECTLY OVER WELLHEAD WHEN REMOVING THE WELL CAP. WELL CAP MAY BE UNDER PRESSURE AND/OR MAY RELEASE ACCUMULATED AND POTENTIALLY HARMFULL VAPORS.
7. Verify and identify survey point as written on S.O.W.
   TOC: If survey point is listed as Top of Casing (TOC), look for the exact survey point in the form of a notch or mark on the top of the casing. If no mark is present, use the north side of the casing as the measuring point.
   TOB: If survey point is listed as Top of Box (TOB), the measuring point will be established manually. Place the inverted well box lid halfway across the well box opening and directly over the casing. The lower edge of the inverted cover directly over the casing will be the measuring point.
8. Put new Nitrile gloves on your hands.
9. Slowly lower the tip of the Interface Probe into the well until it emits either a solid or broken tone.
   BROKEN TONE: Separate phase layer is not present. Go to Step 8 of Routine Water Level Measurements shown above to complete gauging process using the Interface probe as you would a Water Level Meter.
   SOLID TONE: Separate phase layer is present. Go to the next step.
10. Gently raise the probe tip slightly above the separate phase layer and hold it there. Wait momentarily to see if the meter emits a tone, signaling rising water in the casing. Gently lower the probe tip slightly below the separate phase layer. Wait momentarily to see if the meter stops emitting a tone, signaling dropping water in the casing. Continue process until water level stabilizes indicating that the well has equilibrated.
11. While holding the probe at first contact with the separate phase layer and the tape against the measuring point, note depth. Repeat twice to verify accuracy. Write down measurement on Well Gauging Sheet under Depth to Product column.
12. Gently lower the probe tip until it emits a broken tone signifying contact with water. While holding the probe at first contact with water and the tape against the measuring point, note depth. Repeat twice to verify accuracy. Write down measurement on Well Gauging Sheet under Depth to Water column.
13. Recover probe, replace and tighten well cap, replace lock (if applicable), replace well box cover and tighten hardware (if applicable).

Routine Total Well Depth Measurements

1. Lower the Water Level Meter probe into the well until it lightens in your hands, indicating that the probe is resting at the bottom of well.
2. Gently raise the tape until the weight of the probe increases, indicating that the probe has lifted off the well bottom.
3. While holding the probe at first contact with the well bottom and the tape against the well measuring point, note depth. Repeat twice to verify accuracy. Write down measurement on Well Gauging Sheet under Total Well Depth column.

4. Recover probe, replace and tighten well cap, replace lock (if applicable), replace well box cover and tighten hardware (if applicable).

Blaine Tech Services, Inc.
Standard Operating Procedure

WELL WATER EVACUATION (PURGING)

Purpose
Evacuation of a predetermined minimum volume of water from a well (purging) while *simultaneously* measuring water quality parameters is typically required prior to sampling. Purging a minimum volume guarantees that actual formation water is drawn into the well. Measuring water quality parameters either verifies that the water is stable and suitable for sampling or shows that the water remains unstable, indicating the need for continued purging. Both the minimum volume and the stable parameter qualifications need to be met prior to sampling. This assures that the subsequent sample will be representative of the formation water surrounding the well screen and not of the water standing in the well.

Defining Casing Volumes
The predetermined minimum quantity of water to be purged is based on the wells' casing volume. A casing volume is the volume of water presently standing within the casing of the well. This is calculated as follows:

Casing Volume = (TD – DTW) VCF

1. Subtract the wells' depth to water (DTW) measurement from its total depth (TD) measurement. This is the height of the water column in feet.
2. Determine the well casings' volume conversion factor (VCF). The VCF is based on the diameter of the well casing and represents the volume, in gallons, that is contained in one (1) foot of a particular diameter of well casing. The common VCF's are listed on our Well Purge Data Sheets.
3. Multiply the VCF by the calculated height of the water column. This is the casing volume, the amount of water in gallons standing in the well.

Remove Three to Five Casing Volumes
Prior to sampling, an attempt will be made to purge all wells of a minimum of three casing volumes and a maximum of five casing volumes except where regulations mandate the minimum removal of four casing volumes.

Choose the Appropriate Evacuation Device Based on Efficiency
In the absence of instructions on the SOW to the contrary, selection of evacuation device will be based on efficiency.

Measure Water Quality Parameters at Each Casing Volume
At a minimum, water quality measurements include pH, temperature and electrical conductivity (EC). Measurements are made and recorded at least once every casing volume. They are considered stable when all parameters are within 10% of their previous measurement.

Note: The following instructions assume that well has already been properly located, accessed, inspected and gauged.

Prior to Purging a Well
1. Confirm that the well is to be purged and sampled per the SOW.
2. Confirm that the well is suitable based on the conditions set by the client relative to separate phase.
3. Calculate the wells' casing volume.
4. Put new Latex or Nitrile gloves on your hands.

Purging With a Bailer (Stainless Steel, Teflon or Disposable)
1. Attach bailer cord or string to bailer. Leave other end attached to spool.
2. Gently lower empty bailer into well until well bottom is reached.
3. Cut cord from spool. Tie end of cord to hand.
4. Gently raise full bailer out of well and clear of well head. Do not let the bailer or cord touch the ground.
5. Pour contents into graduated 5-gallon bucket or other graduated receptacle.
6. Repeat purging process.
7. Upon removal of first casing volume, fill clean parameter cup with purgewater, empty the remainder of the purgewater into the bucket, lower the bailer back into the well and secure the cord on the Sampling Vehicle.
8. Use the water in the cup to collect and record parameter measurements.
9. Continue purging until second casing volume is removed.
10. Collect parameter measurements.
11. Continue purging until third casing volume is removed.
12. Collect parameter measurements. If parameters are stable, stop purging. If parameters remain unstable, continue purging until stabilization occurs or the fifth casing volume is removed.

Purging With a Pneumatic Pump
1. Position Pneumatic pump hose reel over the top of the well.
2. Gently unreel and lower the pump into the well. Do not contact the well bottom.
3. Secure the hose reel.
4. Begin purging into graduated 5-gallon bucket or other graduated receptacle.
5. Adjust water recharge duration and air pulse duration for maximum efficiency.
6. Upon removal of first casing volume, fill clean parameter cup with water.
7. Use the water in the cup to collect and record parameter measurements.
8. Continue purging until second casing volume is removed.

9. Collect parameter measurements.
10. Continue purging until third casing volume is removed.
11. Collect parameter measurements. If parameters are stable, stop purging. If parameters remain unstable, continue purging until stabilization occurs or the fifth casing volume is removed.
12. Upon completion of purging, gently recover the pump and secure the reel.

Purging With a Fixed Speed Electric Submersible Pump

1. Position Electric Submersible hose reel over the top of the well.
2. Gently unreel and lower the pump to the well bottom.
3. Raise the pump 5 feet off the bottom.
4. Secure the hose reel.
5. Begin purging.
6. Verify pump rate with flow meter or graduated 5-gallon bucket
7. Upon removal of first casing volume, fill clean parameter cup with water.
8. Use the water in the cup to collect and record parameter measurements.
9. Continue purging until second casing volume is removed.
10. Collect parameter measurements.
11. Continue purging until third casing volume is removed.
12. Collect parameter measurements. If parameters are stable, stop purging. If parameters remain unstable, continue purging until stabilization occurs or the fifth casing volume is removed.
13. Upon completion of purging, gently recover the pump and secure the reel.

Blaine Tech Services, Inc.
Standard Operating Procedure

SAMPLE COLLECTION FROM GROUNDWATER WELLS USING BAILERS

Sampling with a Bailer (Stainless Steel, Teflon or Disposable)

1. Put new Latex or Nitrile gloves on your hands.
2. Determine required bottle set.
3. Fill out sample labels completely and attach to bottles.
4. Arrange bottles in filling order and loosen caps (see Determine Collection Order below).
5. Attach bailer cord or string to bailer. Leave other end attached to spool.
6. Gently lower empty bailer into well until water is reached.
7. As bailer fills, cut cord from spool and tie end of cord to hand.
8. Gently raise full bailer out of well and clear of well head. Do not let the bailer or cord touch the ground. If a set of parameter measurements is required, go to step 9. If no additional measurements are required, go to step 11.
9. Fill a clean parameter cup, empty the remainder contained in the bailer into the sink, lower the bailer back into the well and secure the cord on the Sampling Vehicle. Use the water in the cup to collect and record parameter measurements.
10. Fill bailer again and carefully remove it from the well.
11. Slowly fill and cap sample bottles. Fill and cap volatile compounds first, then semi-volatile, then inorganic. Return to the well as needed for additional sample material.

    Fill 40-milliliter vials for volatile compounds as follows: Slowly pour water down the inside on the vial. Carefully pour the last drops creating a convex or positive meniscus on the surface. Gently screw the cap on eliminating any air space in the vial. Turn the vial over, tap several times and check for trapped bubbles. If bubbles are present, repeat process.

    Fill 1 liter amber bottles for semi-volatile compounds as follows: Slowly pour water into the bottle. Leave approximately 1 inch of headspace in the bottle. Cap bottle.

    Field filtering of inorganic samples using a stainless steel bailer is performed as follows: Attach filter connector to top of full stainless steel bailer. Attach 0.45 micron filter to connector. Flip bailer over and let water gravity feed through the filter and into the sample bottle. If high turbidity level of water clogs filter, repeat process with new filter until bottle is filled. Leave headspace in the bottle. Cap bottle.

    Field filtering of inorganic samples using a disposable bailer is performed as follows: Attach 0.45 micron filter to connector plug. Attach connector plug to bottom of full disposable bailer. Water will gravity feed through the filter and into the sample bottle. If high turbidity level of water clogs filter, repeat process with new filter until bottle is filled. Leave headspace in the bottle. Cap bottle.

12. Bag samples and place in ice chest.
13. Note sample collection details on well data sheet and Chain of Custody.

Appendix E

Blaine Tech Services, Inc.
Well Development and Sampling Field Forms;
July 15 and 18, 2005

WELLHEAD INSPECTION CHECKLIST

Page ____ of ____

Date 7/15/05 Client Blymyer

Site Address 6393 Scarlett Ct., Dublin

Job Number 050715-MP1 Technician MM

Well ID	Well Inspected - No Corrective Action Required	Water Bailed From Wellbox	Wellbox Components Cleaned	Cap Replaced	Debris Removed From Wellbox	Lock Replaced	Other Action Taken (explain below)	Well Not Inspected (explain below)
MW-7	✓						(1)	

NOTES: (1) Poured 1ct bags of Sand B/w Casing & Standpipe.

WELL GAUGING DATA

Project # 050715-MW1 Date 7/15/05 Client Blymyer

Site 6393 Scarlett Ct, Dublin

Well ID	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	
MW-7	2					6.35	42.60	TOC	

WELL DEVELOPMENT DATA SHEET

Project #: 050715-MW1	Client: Dolan Rentals @ 6393 Scarlett Ct. Dublin
Developer: MW	Date Developed: 7/15/05
Well I.D. MW-7	Well Diameter: (circle one) (2) 3 4 6
Total Well Depth: Before 42.60 After 42.64	Depth to Water: Before 6.35 After 7.10
Reason not developed:	If Free Product, thickness:
Additional Notations: Surged for 15min. prior to purging	

Volume Conversion Factor (VCF):
(12 x (d^2/4) x π) /231
where
12 = in / foot
d = diameter (in.)
π = 3.1416
231 = in 3/gal

Well dia.		VCF
2"	=	0.16
3"	=	0.37
4"	=	0.65
6"	=	1.47
10"	=	4.08
12"	=	6.87

5.8	X	10	=	58
1 Case Volume		Specified Volumes		gallons

Purging Device:
- ☐ Bailer
- ☐ Suction Pump
- ☐ Electric Submersible
- ☑ Positive Air Displacement

Type of Installed Pump
Other equipment used 2" Surge Block

0934 Began Purging

TIME	TEMP (F)	pH	Cond. (mS or µS)	TURBIDITY (NTUs)	VOLUME REMOVED:	NOTATIONS:
0741	67.2	7.5	2977	7000	58	cloudy, silt, fine grey, Brown
0748	66.8	7.3	3213	>1000	11.6	need pump around bottom
0755	66.3	7.2	3343	7000	17.4	hard bottom, less turbid
0801	66.4	7.3	3375	>1000	23.2	turbid, tan
0807	66.3	7.3	3357	7000	29	" "
0814	66.3	7.3	3356	>1000	34.8	" "
0821	66.3	7.3	3348	>1000	40.6	less turbid
0828	66.3	7.3	3338	>1000	46.4	cloudy
0835	66.4	7.3	3355	964	52.2	cloudy
0842	66.3	7.3	3351	801	58	cloudy

Did Well Dewater? No | If yes, note above. | Gallons Actually Evacuated: 58

WELLHEAD INSPECTION CHECKLIST

Date 7/18/05 Client Blymer

Site Address 6893 Scarlett Ct, Dublin

Job Number 050718-MD1 Technician MT

Well ID	Well Inspected - No Corrective Action Required	Water Bailed From Wellbox	Wellbox Components Cleaned	Cap Replaced	Debris Removed From Wellbox	Lock Replaced	Other Action Taken (explain below)	Well Not Inspected (explain below)
MW-1	✓							
MW-2	✓							
MW-3	✓							
MW-4	✓							
MW-5	✓							
MW-6	✓							
MW-7	✓							

NOTES:

WELL GAUGING DATA

Project # 050718-MD1 Date 7/18/05 Client Blymer

Site 6393 Scarlett Ct., Dublin

Well ID	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	
MW1	2					2.21	19.35		
MW-2	2					3.55	19.80		
MW-3	2					3.60	18.50		
MW-4	2					3.69	18.80		2
MW-5	2					3.39	9.80		
MW-6	2					2.65	9.90		
MW-7	2					6.38	12.65		

WELL MONITORING DATA SHEET

Project #: 050718-MT1	Client: Blymyer @ Dolan Rexroth
Sampler: MT	Date: 7/18/05
Well I.D.: MW-7	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth (TD): 42.65	Depth to Water (DTW): 6.38
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 13.63	

Purge Method: Bailer; Disposable Bailer; Positive Air Displacement; ~~Electric Submersible~~; Waterra; Peristaltic; Extraction Pump; Other_____

Sampling Method: Bailer; (Disposable Bailer); Extraction Port; Dedicated Tubing; Other:_____

5.0 (Gals.) X	3	= 17.4 Gals.
1 Case Volume	Specified Volumes	Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1005	68.7	7.0	1276	11	5.8	
1012	69.6	7.0	1292	26	11.6	
1019	69.4	7.0	1300	30	17.4	

Did well dewater? Yes (No) Gallons actually evacuated: 17.4

Sampling Date: 7/18/05 Sampling Time: 1025 Depth to Water: 13.00

Sample I.D.: MW-7 Laboratory: Kiff CalScience Other Hercander

Analyzed for: (TPH-G) (BTEX) (MTBE) (TPH-D) Oxygenates (5) Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

Appendix F

Previous Bore Logs and Groundwater Monitoring Well Construction Details,

Table F-1: Well Construction Details

Table F-1, Summary of Groundwater Well Construction Details
BEI Job No. 202016, Dolan Rentals
6393 Scarlett Court, Dublin, California

Well Number	Installation Date	Bore Depth (feet, bgs)	Well Completion Depth (feet, bgs)	Screen Interval (feet, bgs)	Casing Diameter / Slot Size (inches)	Measured Depth March 23, 2005 (feet, bgs)	DTW March 23, 2005 (feet, bgs)	Consultant
MW-1	11/22/91	20	20	5 - 20	2 / 0.020	19.34	1.14	PES
MW-2	11/21/91	20	20	5 - 20	2 / 0.020	19.76	1.83	PES
MW-3	11/21/91	20	20	5 - 20	2 / 0.020	18.41	1.83	PES
MW-4	11/21/91	20	20	5 - 20	2 / 0.020	18.64	1.93	PES
MW-5	2/23/95	10	10	3 - 10	2 / 0.020	9.83	2.39	PES
MW-6	3/14/95	10	10	3 - 10	2 / 0.020	9.90	3.40	PES
MW-7	7/8/05	40	40	30 - 40	2 / 0.010	42.60*	6.35*	BEI

Notes:
bgs = Below grade surface
PES = PES Environmental, Inc.
* = Above grade completion (approximately 2.6 feet)

PES Environmental, Inc.
Engineering & Environmental Services

LOG OF WELL MW-1

PAGE 1 OF 1

WELL CONSTRUCTION DETAIL	PID (PPM)	BLOWS/6"	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
Christy Box					CONCRETE
2" dia. PVC blank casing					GRAY BROWN SILTY SAND (SM) loose, wet, very fine-grained sand
cement/bentonite					grades to
					GRAY SILTY SAND (SM) WITH CLAY loose, wet
	0	2 3 4			grades to
bentonite seal					DARK GRAY TO BLACK SILTY CLAY (CL/CH) soft, moist to wet
			5		grades to
	0	1 2 3			INTERBEDDED GRAY AND LIGHT YELLOWISH BROWN SILTY CLAY (CL/CH) - soft, moist and GRAY SILTY SAND (SM) WITH CLAY loose, wet, very fine-grained to fine-grained sand.
		3 4 6			
2" dia. PVC 0.020 slotted screen					GRAY AND LIGHT YELLOWISH BROWN SILTY CLAY (CL/CH) soft to medium stiff, moist to wet.
Monterey #3 sand			10		
	0	2 4 5			Becomes saturated.
			15		
	0	3 4 6			
			20		*Bottom of Boring 20 feet below ground surface.*
			25		
			30		

CLIENT	Dolan Rental Company	DIAMETER OF HOLE	7.25 inches	PLATE
LOCATION	6393 Scarlett Court, Dublin, CA	TOTAL DEPTH OF HOLE	20.0 feet	
JOB NUMBER	102.01.001	TOP OF CASING ELEVATION	0.25 feet below ground surface	4
GEOLOGIST/ENGINEER	D. Trumbly	DATE STARTED	11/22/91	
DRILL RIG	CME-75	DATE COMPLETED	11/22/91	

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LOG OF WELL MW-2

PAGE 1 OF 1

WELL CONSTRUCTION DETAIL	PID (PPM)	BLOWS/6"	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
Christy Box					PAVEMENT SECTION DARK BROWN GRAVELLY SAND (SW) loose to medium dense, moist, gravel to 3-inch diameter, mild hydrocarbon odor.
2" dia. PVC blank casing; cement/bentonite; bentonite seal	720	2 3 3			INTERBEDDED DARK GREEN GRAY SILTY CLAY (CL/CH) soft, moist to wet, and GRAY SAND (SP) loose, moist to wet, sand interbeds from 3 to 9 inches thick, clays predominant, strong hydrocarbon odor.
	514	2 4 4	5		
	301	3 5 7			GRAY GREEN SILTY CLAYEY SAND (SM) loose, moist, and DARK GRAY SILTY CLAY (CL/CH) with interbedded GRAY SAND (SP) layers to 1/4-inch thick.
	98	2 4 6	10		YELLOWISH GRAY SILTY CLAY (CH) WITH VERY FINE-GRAINED SAND - medium stiff, slight hydrocarbon odor.
	90	3 6 8			Becomes yellowish gray brown.
2" dia. PVC 0.020 slotted screen; Monterey #3 sand			15		
	249	3 7 8	20		Bottom of Boring 20 feet below ground surface.
			25		
			30		

				PLATE
CLIENT	Dolan Rental Company	DIAMETER OF HOLE	7.25 inches	
LOCATION	6385 Scarlett Court, Dublin, CA	TOTAL DEPTH OF HOLE	20.0 feet	
JOB NUMBER	102.01.001	TOP OF CASING ELEVATION	0.25 feet below ground surface	5
GEOLOGIST/ENGINEER	D. Trumbly	DATE STARTED	11/21/91	
DRILL RIG	CME-75	DATE COMPLETED	11/21/91	

PES Environmental, Inc.
Engineering & Environmental Services

LOG OF WELL MW-3

WELL CONSTRUCTION DETAIL	PID (PPM)	BLOWS/6"	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
Christy Box					PAVEMENT SECTION
2" dia. PVC blank casing					BLACK SILTY SANDY CLAY WITH GRAVEL (CH) soft, moist.
cement/bentonite					GRAY SILTY SANDY CLAY (CL) soft, moist, very fine-grained sand.
	9	1 2 4			
bentonite seal					INTERBEDDED BLACK SILTY CLAY (CL/CH) soft, moist and GRAY SAND (SP) loose, moist to wet, sand interbeds from 2 to 12 inches thick.
	1.2	1 3 4	5		
		3			YELLOW BROWN AND GRAY SANDY SILTY CLAY (CL) medium stiff,moist.
	0	3 6			
Monterey #3 sand		1	10		
	0	3 5			*Plasticity and moisture increase.*
2" dia. PVC 0.020 slotted screen		3 5 7	15		OLIVE SILTY CLAY (CL/CH) WITH FINE-GRAINED SAND medium stiff, saturated.
			20		*Bottom of Boring 20 feet below ground surface.*
			25		
			30		

				PLATE
CLIENT	Dolan Rental Company	DIAMETER OF HOLE	7.25 inches	
LOCATION	6363 Scarlett Court, Dublin, CA	TOTAL DEPTH OF HOLE	20.0 feet	
JOB NUMBER	102.01.001	TOP OF CASING ELEVATION	0.25 feet below ground surface	**6**
GEOLOGIST/ENGINEER	D. Trumbly	DATE STARTED	11/21/91	
DRILL RIG	CME-75	DATE COMPLETED	11/21/91	

PES Environmental, Inc.
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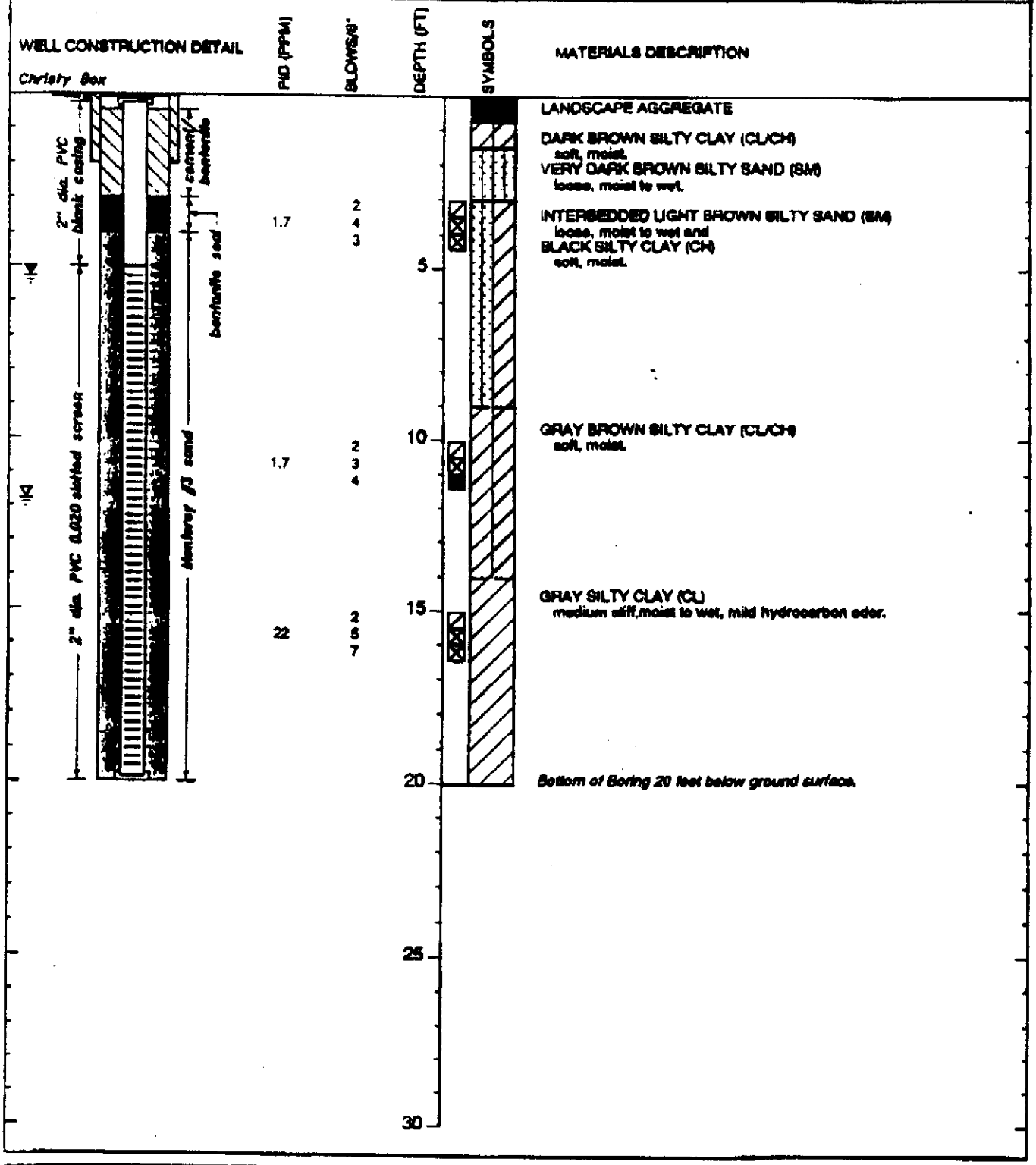
LOG OF WELL MW-4



CLIENT	Dolan Rental Company	DIAMETER OF HOLE	7.25 inches	PLATE
LOCATION	6393 Scarlett Court, Dublin, CA	TOTAL DEPTH OF HOLE	20.0 feet	
JOB NUMBER	102.01.001	TOP OF CASING ELEVATION	0.25 feet below ground surface	7
GEOLOGIST/ENGINEER	D. Trumbly	DATE STARTED	11/21/91	
DRILL RIG	CME-75	DATE COMPLETED	11/21/91	

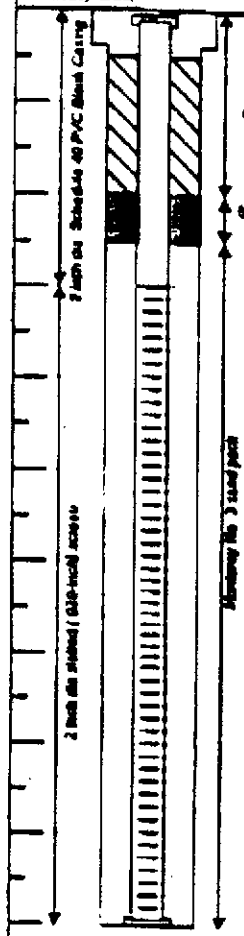
PES Environmental, Inc.
Engineering & Environmental Services

LOG OF MW-5

PAGE 1 OF 1

WELL CONSTRUCTION DETAIL

Christy Box



DEPTH (FT)	FID (PPM)	SYMBOLS	MATERIALS DESCRIPTION
	ND		ASPHALT WITH CONCRETE VERY DARK GRAY CLAY (CL) 2.5YR 3/1, soft, moist, ~5% fine-grained sand. fill material.
	ND		
	ND		DARK GRAY CLAYEY SAND (SC) 2.5Y 4/1, medium dense, wet, ~10% clay fines.
5	ND		VERY DARK GRAY CLAY (CL) 2.5Y 3/1, soft, moist, ~5% fine-grained sand.
	ND		GRAYISH BROWN CLAY (CL) 2.5Y 5/2, soft, moist, ~10% fine-grained to medium-grained sand.
10			*Bottom of boring at 10 feet below ground surface.*
15			

DRAFT

CLIENT	DOLAN RENTAL COMPANY	DIAMETER OF HOLE	8 inches
LOCATION	Dublin, California	TOTAL DEPTH OF HOLE	10 feet bgs
JOB NUMBER	102.0100.003	TOP OF CASING ELEVATION	328.60 feet MSL
GEOLOGIST/ENGINEER	Alicia Arrowsmith	DATE STARTED	2/23/96
DRILL RIG	CME 45	DATE COMPLETED	2/23/96

PLATE 4

PES Environmental, Inc.
Engineering & Environmental Services

LOG OF MW-6

PAGE 1 OF 1

WELL CONSTRUCTION DETAIL

Christy Box

DEPTH (FT)	FID (PPM)	SYMBOLS	MATERIALS DESCRIPTION
			GRAVEL AT SURFACE
			SANDY FILL MATERIAL
	ND		OLIVE SANDY CLAY (CL) 5Y 4/3, firm, damp, ~40% poorly graded medium-grained sand, no odors.
5	ND		DARK OLIVE GRAY SANDY CLAY (CL) 5Y 3/2, soft, moist, ~30% poorly graded medium-grained sand, no odors.
	ND		DARK GRAY CLAY (CL) 5Y 4/1, soft, moist, ~20% fine-grained sand, no odors.
10			*Bottom of boring at 10 feet below ground surface.*
15			

DRAFT

CLIENT	DOLAN RENTAL COMPANY	DIAMETER OF HOLE	8 inches
LOCATION	Dublin, California	TOTAL DEPTH OF HOLE	10 feet bgs
JOB NUMBER	102.0100.009	TOP OF CASING ELEVATION	327.23 feet MSL
GEOLOGIST/ENGINEER	Alida Andrews	DATE STARTED	3/14/96
DRILL RIG	Simco 2400	DATE COMPLETED	3/14/96

PLATE 5

BLOWS/6"	☐ FID ☒ PID ☐ PPS ☒ PPM	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
		0		CONCRETE
		1		Very Dark Gray Sandy CLAY (CL) moist, stiff (7.5YRN3/), slight hydrocarbon odor.
		2		
		3		
		4		
4		5		
6	162	6		
7		7		
		8		
		9		Dark Gray Sandy CLAY (CL) moist, stiff (10YR4/1), hydrocarbon odor.
		10		
10		11		*Bottom of Boring @ 11.5 feet bgs.*
		12		
		13		
		14		
		15		

PES Environmental, Inc.
Engineering & Environmental Services

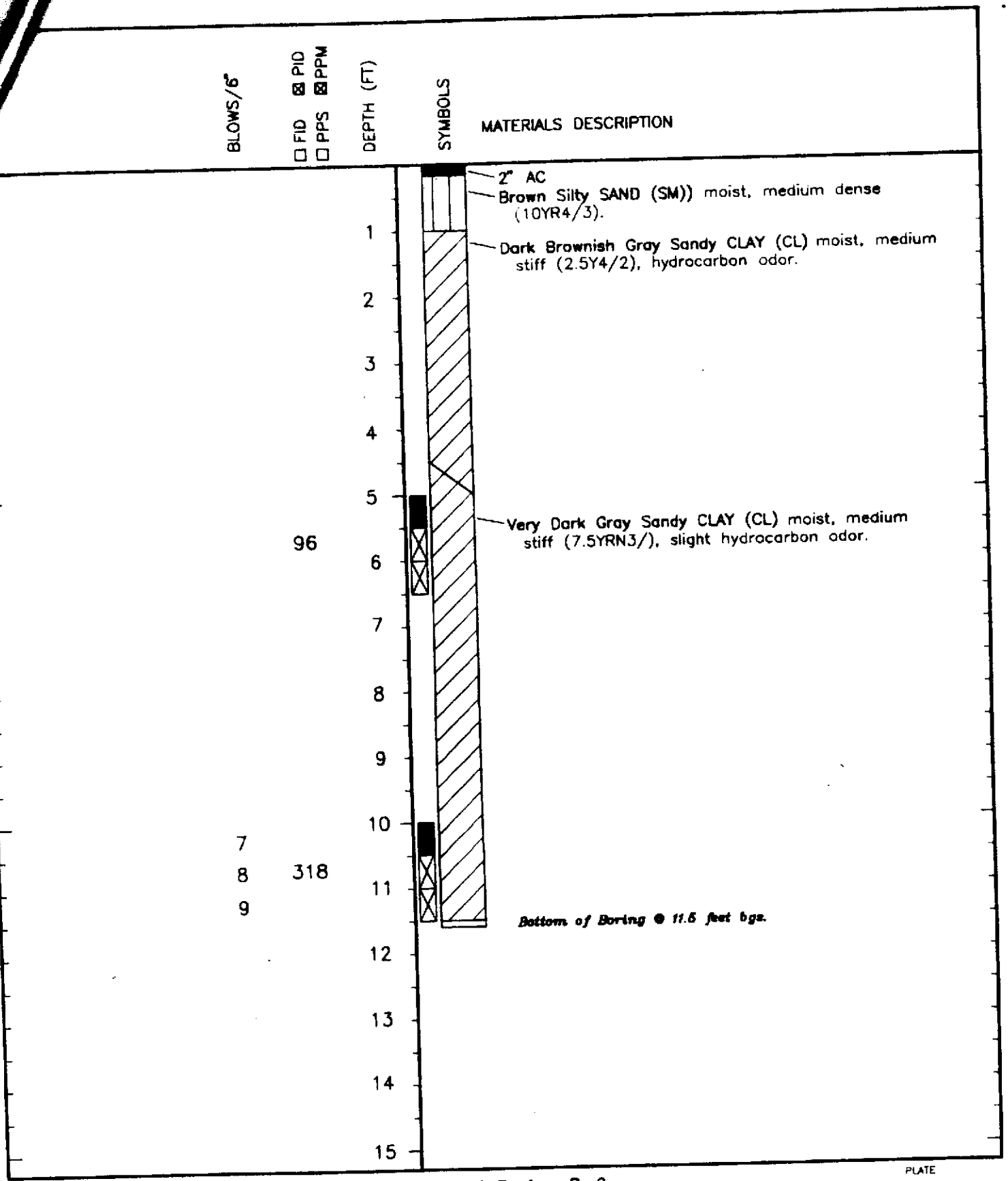
Log of Boring B-1
Dublin Rock and Ready Mix
Dublin, California

PLATE
A-2

102.01.002
DET, MKH, PL
SH

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered.

DATE 5/93



PLATE

A-3

PES Environmental, Inc.
Engineering & Environmental Services

Log of Boring B-2
Dublin Rock and Ready Mix
Dublin, California

102.01.002
OET, MKH, PL
SH

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered

3/93

BLOWS/6"	☐ FID ☐ PID ☐ PPS ☐ PPM	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
		0		CONCRETE
		1		Dark Gray SAND (SP) moist to wet, medium dense (10YR4/1) coarse-grained sand, occasional cobbles, (excavation backfill.)
		2		
		3		
		4		
5		5		
8	0.4	6		
11		7		
		8		Gray Sandy CLAY (CL) medium stiff, saturated, (10YR5/1), hydrocarbon odor.
		9		
		10		
52		11		*Bottom of Boring @ 11.5 feet bgs.*
		12		
		13		
		14		
		15		

PES Environmental, Inc.
Engineering & Environmental Services

Log of Boring B-3
Dublin Rock and Ready Mix
Dublin, California

PLATE
A-4

102.01.002
DET, MGH, PL
SH

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered

3/93

BLOWS/6"	☐ FID ☒ PID ☐ PPS ☒ PPM	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
		1		Dark Brown gravelly SAND (SW) moist, loose to medium dense (10YR3/3).
		2		Very Dark Gray Silty CLAY (CL/CH) moist, medium stiff (10YR3/1).
		3		
		4		
		5		
407		6		
		7		
		8		
		9		Dark Grayish Brown Silty CLAY (CL) moist, stiff (2.5Y4/2).
		10		
330		11		*Bottom of Boring @ 11.5 feet bgs.*
		12		
		13		
		14		
		15		

PLATE

PES Environmental, Inc.
Engineering & Environmental Services

Log of Boring B-4
Dublin Rock and Ready Mix
Dublin, California

A-5

102.01.002
DET, MKH, PL
SH

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered

3/93

BLOWS/6"	☐ FID ☒ PID ☐ PPS ☒ PPM	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
		0		2" AC
		1		Gray Silty SAND (SM) moist, medium dense (10YR5/1).
		2		Very Dark Gray Silty CLAY (CL/CH) moist, medium stiff (2.5YN3/).
		3		
		4		
4	0.0	5		
5		6		
7		7		
		8		Olive Clayey SAND (SC) wet, medium dense (5Y5/3).
		9		
		10		Olive Sandy CLAY (CL) saturated, medium stiff (5Y4/3).
3				
5		11		Olive Silty CLAY (CL) moist to wet, medium stiff (5Y4/3).
6				*Bottom of Boring @ 11.6 feet bgs.*
		12		
		13		
		14		
		15		

PLATE

PES Environmental, Inc.
Engineering & Environmental Services

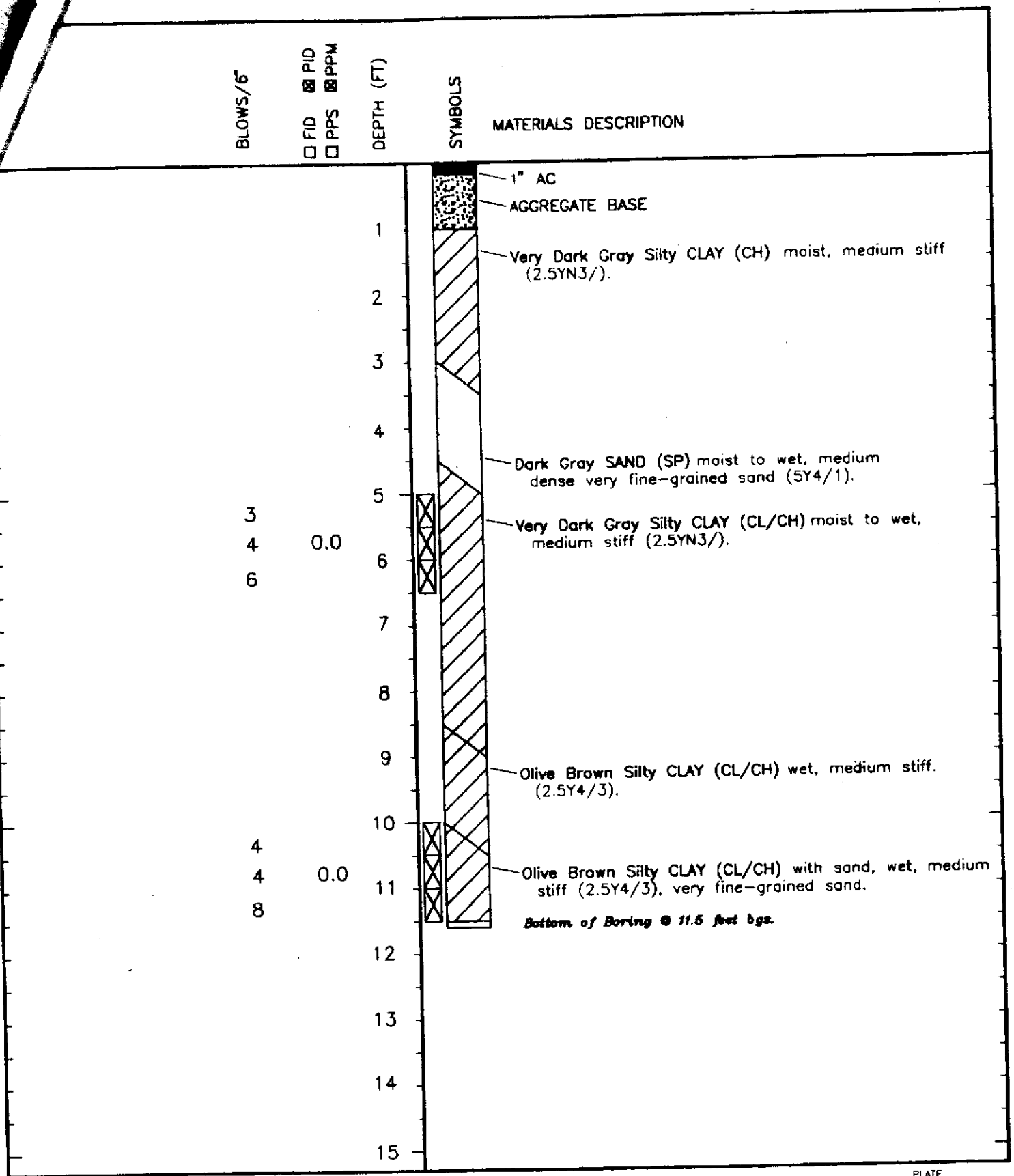
Log of Boring B-5
Dublin Rock and Ready Mix
Dublin, California

A-6

JOB NUMBER 102.01.002
LOGGED BY DET, MBH, PL
DRAWN SN

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered

DATE 3/93



PES Environmental, Inc.
Engineering & Environmental Services

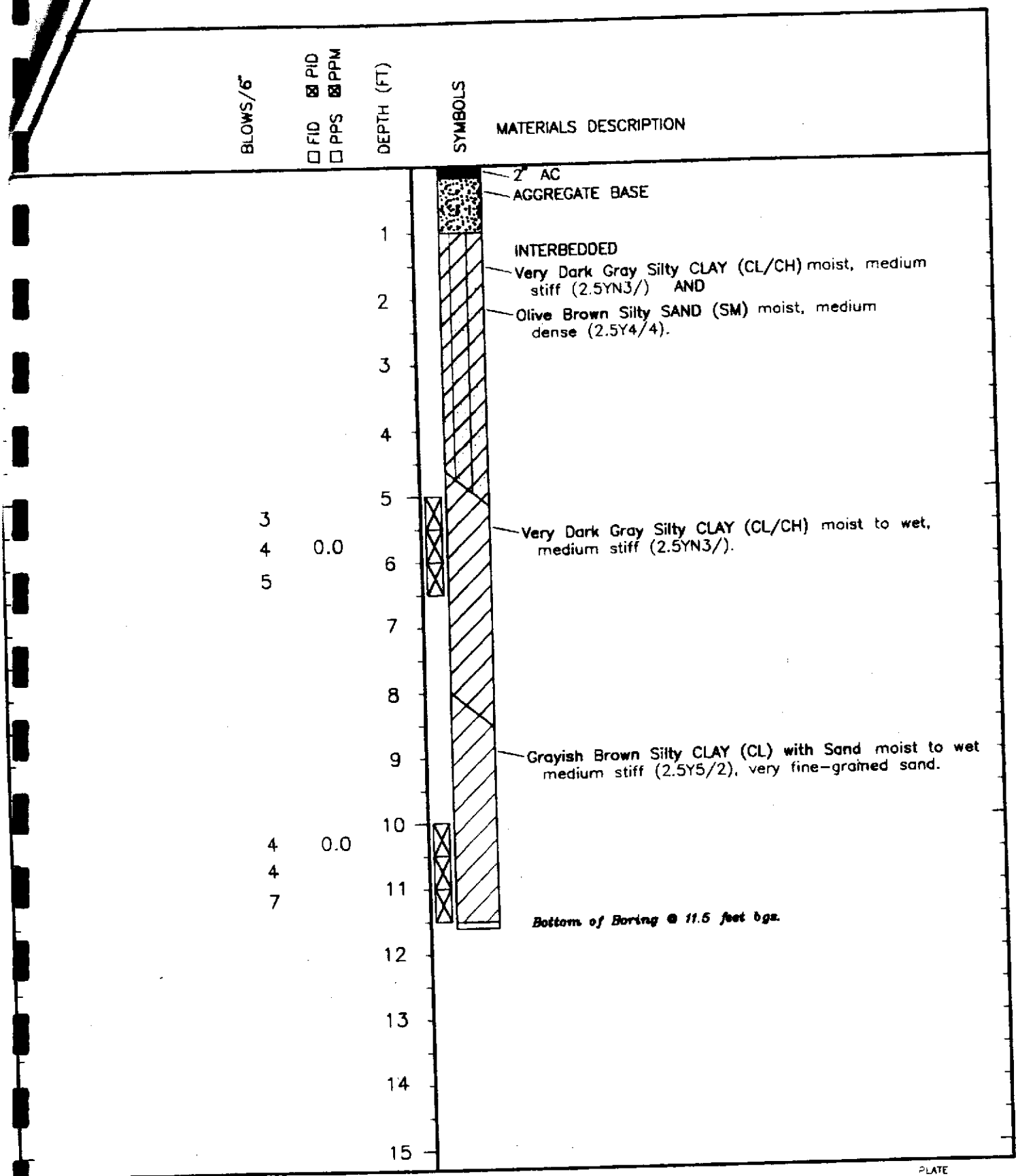
Log of Boring B-6
Dublin Rock and Ready Mix
Dublin, California

PLATE
A-7

102.01.002
DET, MSH, PL
SH

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered

3/93



PES Environmental, Inc.
Engineering & Environmental Services

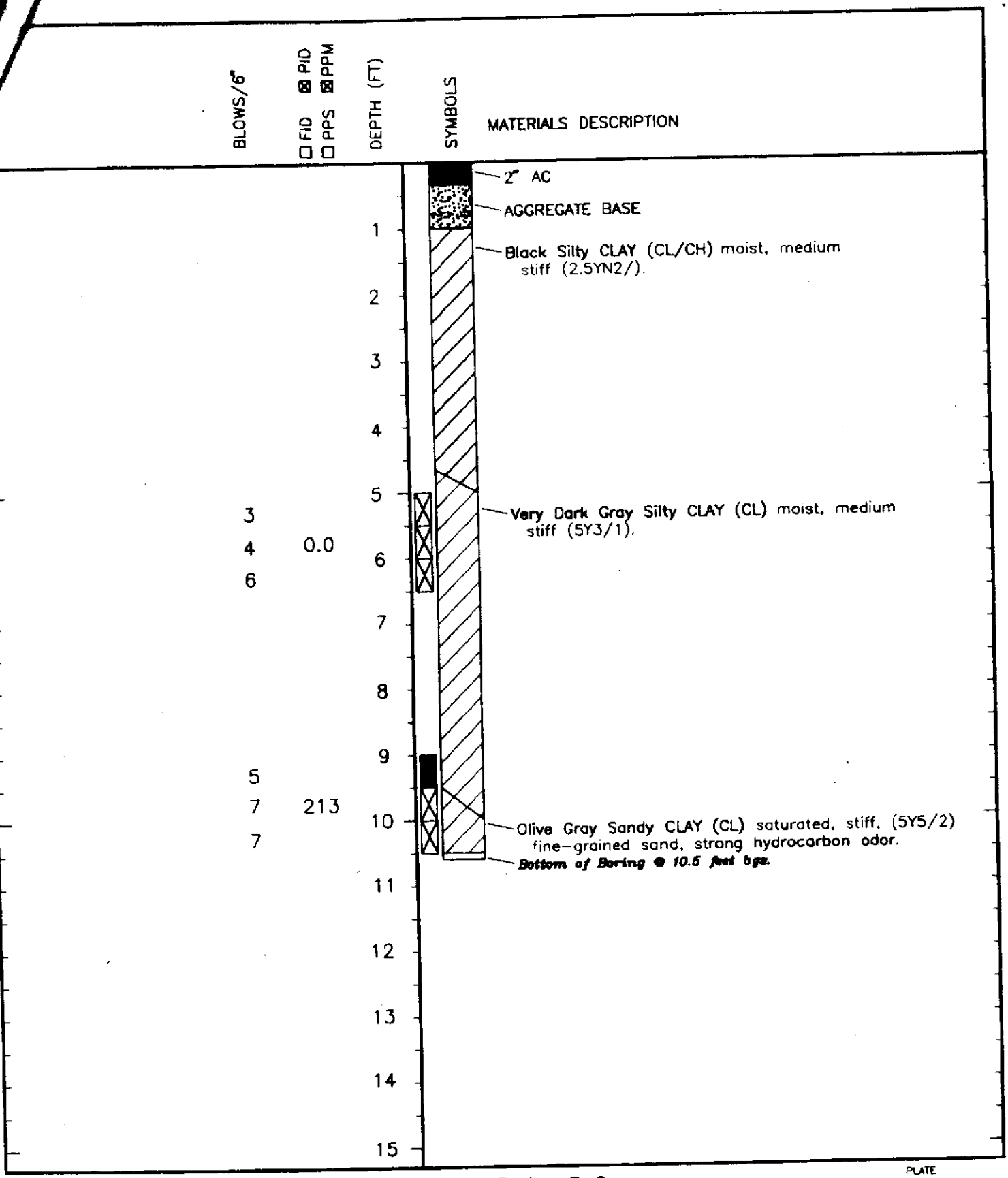
Log of Boring B-7
Dublin Rock and Ready Mix
Dublin, California

PLATE
A-8

JOB NUMBER 102.01.002
LOGGED BY DET, MKH, PL
DRAWN SH

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered

DATE 3/93
REVISED DATE



PLATE

A-9

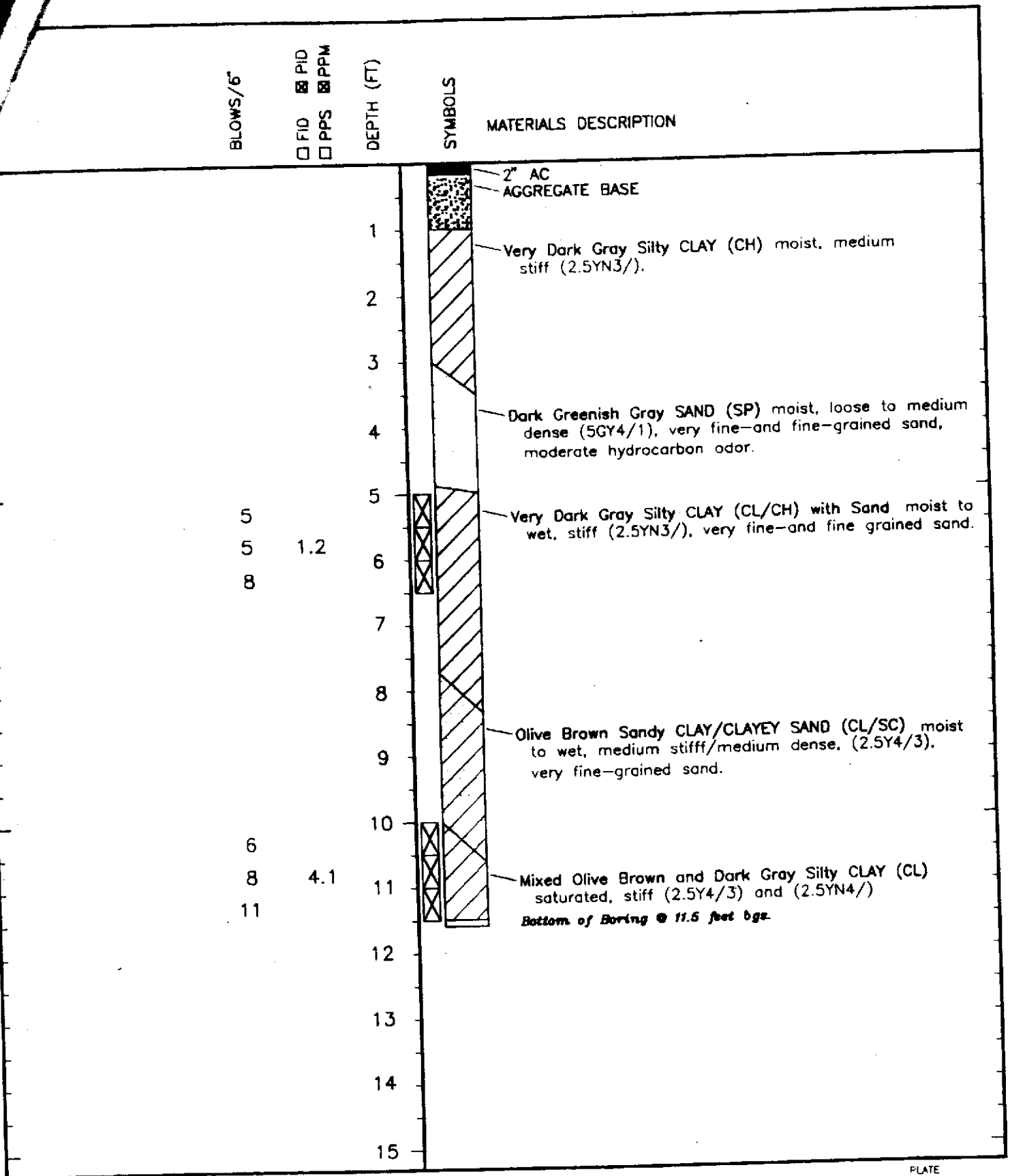
PES Environmental, Inc.
Engineering & Environmental Services

Log of Boring B-8
Dublin Rock and Ready Mix
Dublin, California

102.01.002
DET, MKH, PL
SH

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered

DATE 3/93



PLATE

PES Environmental, Inc.
Engineering & Environmental Services

Log of Boring B-9
Dublin Rock and Ready Mix
Dublin, California

A-10

102.01.002
DET, MKH, PL
SM

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered

5/93

BLOWS/6"	☐ FID ☒ PID ☐ PPS ☒ PPM	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
		0		AC
		1		Gray to Dark Grayish Brown Silty CLAY (CL/CH) moist, stiff (2.5Y5/ to 4/2).
		2		
		3		
		4		
4		5		
6	0.0	6		
7		7		
		8		Grayish Brown to Olive Gray Sandy CLAY (CL) wet, stiff (2.5Y5/2 to 5Y5/2).
		9		
		10		
5				
5	4.1	11		
10				
		12		*Bottom of Boring @ 11.5 feet bgs.*
		13		
		14		
		15		

PES Environmental, Inc.
Engineering & Environmental Services

Log of Boring B-10
Dublin Rock and Ready Mix
Dublin, California

PLATE
A-11

102.01.002
DET, MRH, PL
SH

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered

3/93

BLOWS/6"	☐ FID ☒ PID ☐ PPS ☒ PPM	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
		0		LANDSCAPING AGGREGATE
		1		Dark Brown Silty CLAY (CL/CH) moist, medium stiff (10YR3/3).
		2		
		3		Dark Brown Silty CLAY (CL/CH) moist, medium stiff fine-grained sand (2.5YN5/).
		4		Gray Silty SAND (SM) moist, medium dense (2.5YN5/).
		5		Light Olive Brown CLAY (CL/CH) with Sand moist to wet, (2.5Y5/3).
		6		
		7		*Bottom of Boring @ 6.7 feet bgs.*
		8		
		9		
		10		
		11		
		12		
		13		
		14		
		15		

PES Environmental, Inc.
Engineering & Environmental Services

Log of Boring B-11
Dublin Rock and Ready Mix
Dublin, California

PLATE
A-12

102.01.002
DET, MKH, PL
SH

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered

3/93

BLOWS/6"	☐ FID ☐ PID ☐ PPS ☐ PPM	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
		1		LANDSCAPE AGGREGATE Dark Brown Silty CLAY (CL/CH) moist, medium stiff (10YR3/3).
		2		
		3		
		4		INTERBEDDED Gray Silty CLAY (CL/CH) moist, medium stiff (2.5YN5/). AND
		5		Dark Gray SAND (SP) moist to wet, medium dense (2.5YN4/), fine-grained sand.
		6		
		7		*Bottom of Boring @ 6.7 feet bgs.*
		8		
		9		
		10		
		11		
		12		
		13		
		14		
		15		

PES Environmental, Inc.
Engineering & Environmental Services

Log of Boring B-12
Dublin Rock and Ready Mix
Dublin, California

PLATE
A-13

102.01.002
DET, MICH, FL
DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered
3/93

BLOWS/6"	☐ FID ☒ PID ☐ PPS ☒ PPM	DEPTH (FT)	SYMBOLS	MATERIALS DESCRIPTION
		0		2" AC
				Aggregate Base
		1		
		2		Dark Gray SAND (SP), moist, loose to medium dense, fine-grained sand (5Y4/1).
	4.0	3		
		4		Very Dark Gray Sandy CLAY (CL), moist, medium stiff, (5Y3/1), fine-grained sand.
		5		
	0.0	6		Very Dark Gray Silty CLAY (CL) with SAND, moist, to wet, medium stiff: (2.5YN3/), fine-and medium grained sand, trace fine-grained gravel.
		7		
		8		
	0.0	9		Dark Grayish Brown Silty CLAY (CL/CH), wet to, saturated, medium stiff (2.5Y4/2).
				Bottom of Boring @ 9.0 feet bgs.
		10		
		11		
		12		
		13		
		14		
		15		

PES Environmental, Inc.
Engineering & Environmental Services

Log of Boring B-13
Dublin Rock and Ready Mix
Dublin, California

PLATE
A-14

102.01.002
DET, MKH, PL
SN

DIAMETER OF HOLE 4"
TOTAL DEPTH OF HOLE 9.0'
DRILL RIG Hand Augered

3/93

BLYMYER ENGINEERS, INC.

Soil Bore Log: SB-A

Dolan Property
6393 Scarlett Court, Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Geoprobe
Date Drilled:	: September 19, 2003	Sample Method	: Continuous Sleeve
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.75 inch
Drilling Company	: Environmental Control Assoc.	Total Drilled Depth	: 12.0 feet
Driller	: Tim Tyler		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: Not available; 8.0 feet

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					3 inches Asphalt / Base Course; dry	Asphalt	
1					Dark brown to black SILTY CLAY; damp;	CL	
2					Dark green SAND; fine grained; gradational contact; damp to moist; noticable odor	SP	
3		1.5					
4				SB-A-3.5	Increase in clay content	SC	
				SB-A-4	Black SILTY CLAY; moist; gradational contact		
5		0				CL	
6							
7							
8		0			Dark grey SILTY SAND; fine to medium grained; gradational contact; wet, no noticable odor	SM	
9							
10					Dark grey, SILTY CLAY, moist	CL	
11							
12					Bottom of Hole: 12 feet		
13							
14							
15							
16							
17							
18							
19							
20							

(Grouted upon completion)

PROFESSIONAL GEOLOGIST
MARK E. DETTERMAN
No. 1788
CERTIFIED ENGINEERING GEOLOGIST
8/9/05
STATE OF CALIFORNIA

08-25-2005 H:\Blymyer_Jobs\2002\202016 dolan\202016.dot\Bore Logs\SB-A1.bor

BLYMYER ENGINEERS, INC.

Soil Bore Log: SB-B

Dolan Property
6393 Scarlett Court, Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Geoprobe
Date Drilled:	: September 19, 2003	Sample Method	: Continuous Sleeve
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.75 inch
Drilling Company	: Environmental Control Assoc.	Total Drilled Depth	: 20.0 feet
Driller	: Tim Tyler		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: Not available; 8.0 feet

(Grouted upon completion)

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					3 inches Asphalt / Base Course; damp	Asphalt	
1					Dark Olive grey SILTY CLAY; damp;	CL	
2							
3		11					
4				SB-B-3.5	Dark Olive grey SAND; medium to course grained; gradational contact; damp to moist; trace odor	SP	
5					Black SILTY CLAY; moist	CL	
6					SILTY CLAY; grades light olive grey; with caliche nodules; moist	CL	
7							
8				SB-B-7.5			
9		20		SB-B-8.0	Dark grey SILTY SAND; fine grained; wet, stronger odor	SM	
10					Dark olive grey, SILTY CLAY, gradational contact; moist	CL	
11							
12					Approximately 25% fine sand	SC	
13					Dark olive grey SAND; fine grained; wet; with odor	SM	
14					Dark olive grey CLAYEY SAND; wet; stronger odor	SC	
15							
16		226					
17		435		SB-B-17	Dark Grey SILTY SAND; wet; strong odor	SM	
18							
19							
20					Light brown SILTY CLAY; no odor?	CL	
21					Bottom of bore: 20 feet		

PROFESSIONAL GEOLOGIST
MARK E. DETTERMAN
No. 1788
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA
8-1-05

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BLYMYER ENGINEERS, INC.

Soil Bore Log: SB-C

Dolan Property
6393 Scarlett Court, Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Geoprobe
Date Drilled:	: September 19, 2003	Sample Method	: Continuous Sleeve
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.75 inch
Drilling Company	: Environmental Control Assoc.	Total Drilled Depth	: 20.0 feet
Driller	: Tim Tyler		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: Not available; 8.5 feet

(Grouted upon completion)

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					3 inches Asphalt / Base Course; damp	Asphalt	
1					Dark Olive grey SILTY CLAY; 15% fine to medium grained Sand; moist	CL	
2							
3							
4		8			Dark olive grey SAND; medium to course grained; moist	SP	
5				SB-C-4.5	Dark olive grey SILTY CLAY; moist	CL	
6					SILTY CLAY; grades black; with caliche nodules; moist	CL	
7							
8							
9				SB-C-8.5	Dark grey SILTY SAND; fine grained; wet, strong odor	SM	
10					Dark olive grey, SILTY CLAY; moist	CL	
11							
12		89		SB-C-11.5	Dark olive grey SILTY SAND; fine grained; wet; stronger odor	SC	
13							
14					Dark olive grey SILTY CLAY; moist; more plastic	CL	
15							
16		388			Dark olive green SILTY SAND; fine to medium grained; wet; very strong odor; 50% recovery	SM	
17				SB-C-17			
18				SB-C-18			
19		111			Dark olive green SILTY CLAY; moist; slight odor	CL	
20					Light tan SILTY CLAY; with caliche nodules; no odor?	CL	
					Bottom of bore: 20 feet		
21							

PROFESSIONAL GEOLOGIST
MARK E. DETTERMAN
No. 1788
CERTIFIED ENGINEERING GEOLOGIST
6/1/05
STATE OF CALIFORNIA

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BLYMYER ENGINEERS, INC.

Soil Bore Log: SB-D

Dolan Property
6393 Scarlett Court, Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Geoprobe
Date Drilled:	: September 19, 2003	Sample Method	: Continuous Sleeve
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.75 inch
Drilling Company	: Environmental Control Assoc.	Total Drilled Depth	: 20.0 feet
Driller	: Tim Tyler		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: Not available; 12.25 feet

(Grouted upon completion)

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					3 inches Asphalt / Base Course; damp	Asphalt	
1					Black SILTY CLAY; 15% fine to medium grained Sand; moist	CL	
3					Dark olive green SAND; medium to course grained; moist; with petroleum odor	SP	
4		2			Black SILTY CLAY; damp to moist	CL	
8					Grades greyer; no odor; grades light olive green at 9.5 feet; damp to moist	CL	
9		0.3			Increase in sand content	CL	
10				SB-S-10	with caliche nodules	CL	
12		0.5			Light olive green SILTY SAND; fine grained; wet, odor	SM	
13		4.5		SB-D-13			
15		20			Light olive green SILTY CLAY; with caliche nodules; moist; slight odor	CL	
17		96			Light olive green SILTY SAND; fine grained (liquified); wet; stronger odor	SM	
19					Light olive grey SILTY CLAY; grades light brown at 19.5 feet; moist	CL	
20					Bottom of bore: 20 feet		
21							

PROFESSIONAL GEOLOGIST
MARK E. DETTERMAN
No. 1788
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

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BLYMYER ENGINEERS, INC.

Soil Bore Log: SB-E

Dolan Property
6393 Scarlett Court, Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Geoprobe
Date Drilled:	: September 19, 2003	Sample Method	: Continuous Sleeve
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.75 inch
Drilling Company	: Environmental Control Assoc.	Total Drilled Depth	: 20.0 feet
Driller	: Tim Tyler		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: Not available; 13.25 feet

(Grouted upon completion)

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					Light brown dry concrete mix over 3 inches Asphalt / Base Course; dry	Asphalt	
1					Olive grey SILTY CLAY; damp	CL	
2							
3					Dark olive gray SAND; fine to medium grained; moist; odor not noted	SP	
4				SB-E-3.5			
5		0			Black SILTY CLAY; gradational contact; moist; fine sand layer at 6 feet (3 inch) and at 6.5 to 7.0 feet; very moist	CL	
6							
7		0.5					
8					Mottled light tan and olive grey SILTY CLAY; with caliche nodules; moist	CL	
9							
10							
11							
12							
13		1			Dark olive grey SILTY SAND; fine to medium grained; wet to moist	SM	
14				SB-E-13.5	Dark olive grey SILTY CLAY; damp	CL	
15							
16					Bottom of bore: 16 feet		
17							
18							
19							
20							
21							

PROFESSIONAL GEOLOGIST
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BLYMYER ENGINEERS, INC.

Soil Bore Log: SB-F

Dolan Property
6393 Scarlett Court, Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Geoprobe
Date Drilled:	: September 19, 2003	Sample Method	: Continuous Sleeve
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.75 inch
Drilling Company	: Environmental Control Assoc.	Total Drilled Depth	: 20.0 feet
Driller	: Tim Tyler		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: Not available; 16.0 feet

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					3 inches Asphalt / Base Course; damp	Asphalt	
1					Light brown SILTY SAND; medium to coarse grained; damp	SM	
2							
3		2.8					
4							
5					Light brown SANDY CLAY; moist; odor not noted	CL	
		0			Light brown SILTY SAND; moist to wet	SM	
6					Light brown SILTY CLAY; moist	CL	
7					Grades black	CL	
8					Mottled light brown and olive grey SILTY CLAY; with rounded 1/4-inch pebbles; moist; odor	CL	
9							
10		9					
11							
12							
13							
14							
15							
16					Light brown Silty CLAYEY SAND; fine to medium grained; wet; stronger odor	SC	
17							
18			SB-F-17.75		Light brown SILTY CLAY; with sand; wet	CL	
		372			Olive grey SILTY SAND; fine grained; liquified; wet; stronger oder	SM	
19					Olive grey Sandy SILTY CLAY; wet	CL	
20					Bottom of bore: 20 feet		
21							

(Grouted upon completion)

PROFESSIONAL GEOLOGIST
MARK E. DETTERMAN
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BLYMYER ENGINEERS, INC.

Soil Bore Log: SB-G

Dolan Property
6393 Scarlett Court, Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Geoprobe
Date Drilled:	: September 19, 2003	Sample Method	: Continuous Sleeve
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.75 inch
Drilling Company	: Environmental Control Assoc.	Total Drilled Depth	: 20.0 feet
Driller	: Tim Tyler		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: Not available; 8.5 feet

(Grouted upon completion)

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					3 inches Asphalt / Base Course; damp	Asphalt	
1					Light brown SILTY SAND; medium to coarse grained; damp	SM	
2		2					
3				SB-G-3.5	Olive grey SILTY SAND; medium to coarse grained; moist; slight odor; wet	SP	
4							
5					Black SILTY CLAY; gradational contact; moist	CL	
6							
7							
8		0			grades light brown SILTY CLAY; moist	CL	
				SB-G-8	grades olive grey SILTY CLAY; moist	CL	
9		0			Light grey SILTY SAND; fine grained; wet; liquified	SM	
10							
11					Light brown SILTY CLAY; gradational contact; moist	CL	
12					Light brown SILTY CLAY; 20% fine grained sand at top of section; very moist to moist	CL	
13		0			Lightolive grey SILTY SAND; fine grained; liquified; wet; increase in clay content with depth; color grades to light brown with increase in clay content	SM	
14					Light brown silty CLAYEY SAND; fine grained; liquified; wet	SC	
15							
16					Light brown SILTY CLAY; moist to wet with depth; interlayered with multiple 3 inch fine SILTY SAND layers; wet	CL	
17							
18							
19							
20					Bottom of bore: 20 feet		
21							

PROFESSIONAL GEOLOGIST
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No. 1788
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STATE OF CALIFORNIA

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BLYMYER ENGINEERS, INC.

Soil Bore Log: SB-H

Dolan Property
6393 Scarlett Court, Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Geoprobe
Date Drilled:	: September 19, 2003	Sample Method	: Continuous Sleeve
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.75 inch
Drilling Company	: Environmental Control Assoc.	Total Drilled Depth	: 20.0 feet
Driller	: Tim Tyler		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: Not available; 8.5 feet

(Grouted upon completion)

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					3 inches Asphalt / Base Course; moist	Asphalt	
1					Grey brown black SILTY CLAY; moist	CL	
2							
3		0			Grey brown black SILTY SAND; fine to coarse grained; wet	SM	
4					Grey brown black SILTY CLAY; moist grades to black at 4.5 feet	CL	
5							
6							
7							
8		0		SB-H-8	Grades medium brown; becomes mottled with trace olive grey at 8 feet	CL	
9		0			Dark grey SILTY SAND; fine grained; liquified; wet	SM	
10					Grades light brown; with increasing clay content with depth; wet to moist with depth	SC	
11					Light brown SILTY CLAY; moist	CL	
12				SB-H-12	Grades olive grey at 12 feet	CL	
13		38			Dark olive grey SILTY SAND; fine grained; liquified; wet; with petroleum odor	SM	
14					Light Olive grey SILTY CLAY; gradational contact; moist	CL	
15							
16					Grades lighter color; olive brown	CL	
					Bottom of bore: 16 feet		
17							
18							
19							
20							
21							

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STATE OF CALIFORNIA

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BLYMYER ENGINEERS, INC.

Soil Bore Log: SB-I

Dolan Property
6393 Scarlett Court, Dublin, CA

Job Number:	: 202016	Drilling Equipment	: Geoprobe
Date Drilled:	: September 19, 2003	Sample Method	: Continuous Sleeve
Logged By	: Mark Detterman	Soil Bore Diameter	: 1.75 inch
Drilling Company	: Environmental Control Assoc.	Total Drilled Depth	: 20.0 feet
Driller	: Tim Tyler		

Sample Recovery: Collected; Retained; Analyzed; Unrecovered

Water Level: Not available; 8.5 feet

(Grouted upon completion)

Depth in Feet	Blow Count	PID	Sample Recovery	Sample No.	DESCRIPTION	USCS	GRAPHIC
0					3 inches Asphalt / Base Course; damp	Asphalt	
1					Dark grey black SILTY CLAY; moist	CL	
2							
3		398			Olive grey brown SILTY SAND; medium to coarse grained; moist to wet; strong odor	SP	
4				SB-I-3.5			
5					Dark grey black SILTY CLAY; moist; with odor	CL	
6		395					
7							
8							
9		604		SB-I-8.25	Olive grey brown SILTY SAND; fine to medium grained; free product globules; wet; strong odor	SM	
10					Dark olive grey SILTY CLAY; moist	CL	
11							
12							
13					Dark olive grey SILTY SAND; fine grained; free product globules; wet	SM	
14		121		SB-I-13.5			
15					Olive grey SILTY CLAY; moist	CL	
16				SB-I-16			
17		494			Olive grey SILTY SAND; fine grained; free product globules; very strong odor; wet	SM	
18					Olive grey SILTY CLAY; moist	CL	
19							
20					Bottom of bore: 20 feet		
21							

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STATE OF CALIFORNIA

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Appendix G

Laboratory Analytical Reports,
McCampbell Analytical, Inc.
February 25, 2005, April 5, 2005,
July 12, 2005, and July 25, 2005

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501-1395	Client Project ID: #202016; Dolan Properties	Date Sampled: 02/18/05
		Date Received: 02/18/05
	Client Contact: Mark Detterman	Date Reported: 02/25/05
	Client P.O.:	Date Completed: 02/25/05

WorkOrder: 0502303

February 25, 2005

Dear Mark:

Enclosed are:

1). the results of **5** analyzed samples from your **#202016; Dolan Properties project,**

2). a QC report for the above samples

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc.	Client Project ID: #202016; Dolan Properties	Date Sampled: 02/18/05
1829 Clement Avenue		Date Received: 02/18/05
Alameda, CA 94501-1395	Client Contact: Mark Detterman	Date Extracted: 02/19/05-02/23/05
	Client P.O.:	Date Analyzed: 02/19/05-02/23/05

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0502303

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
002A	SBK-4W	W	74,000,a,h,i	---	9100	840	4200	11,000	100	97
005A	SBK-19.5W	W	5600,a,i	---	210	140	160	550	10	116
Reporting Limit for DF = 1; ND means not detected at or above the reporting limit	W	50	5.0	0.5	0.5	0.5	0.5	1	µg/L
	S	NA	NA	NA	NA	NA	NA	1	mg/Kg

* water and vapor samples and all TCLP & SPLP extracts are reported in ug/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

- The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present. i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) range non-target isolated peaks subtracted out of the TPH(g) concentration at the client's request.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone: 925-798-1620 Fax: 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc.	Client Project ID: #202016; Dolan Properties	Date Sampled: 02/18/05
1829 Clement Avenue		Date Received: 02/18/05
Alameda, CA 94501-1395	Client Contact: Mark Detterman	Date Extracted: 02/18/05
	Client P.O.:	Date Analyzed: 02/19/05-02/22/05

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0502303

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	SBJ-7.5	S	550,a	---	2.8	0.83	8.5	13	100	101
003A	SBK-9	S	130,a	---	4.8	1.7	2.3	8.6	20	101
004A	SBK-19.5	S	130,a	---	0.48	1.2	1.6	6.2	10	104
Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	NA	NA	NA	NA	NA	NA	1	ug/L
	S	1.0	0.05	0.005	0.005	0.005	0.005	1	mg/Kg

* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

-The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas); m) no recognizable pattern; n) results are reported by dry weight.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

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Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc.	Client Project ID: #202016; Dolan Properties	Date Sampled: 02/18/05
1829 Clement Avenue		Date Received: 02/18/05
Alameda, CA 94501-1395	Client Contact: Mark Detterman	Date Extracted: 02/18/05-02/22/05
	Client P.O.:	Date Analyzed: 02/20/05-02/23/05

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel*

Extraction method: SW3510C/SW3550C Analytical methods: SW8015C Work Order: 0502303

Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0502303-001A	SBJ-7.5	S	33,d,b	1	114
0502303-002B	SBK-4W	W	47,000,d,b,h,i	10	98
0502303-003A	SBK-9	S	8.8,d,b	1	104
0502303-004A	SBK-19.5	S	4.4,d,b	1	117
0502303-005B	SBK-19.5W	W	2400,d,b,g,i	1	106

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	µg/L
	S	1.0	mg/Kg

* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel is significant; d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent/mineral spirit.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

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Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501-1395	Client Project ID: #202016; Dolan Properties	Date Sampled: 02/18/05
		Date Received: 02/18/05
	Client Contact: Mark Detterman	Date Extracted: 02/24/05
	Client P.O.:	Date Analyzed: 02/26/05

Oxygenated Volatile Organics + EDB and 1,2-DCA by P&T and GC/MS*

Extraction Method: SW5030B Analytical Method: SW8260B Work Order: 0502303

		Reporting Limit for DF =1	
Lab ID	0502303-001A		
Client ID	SBJ-7.5		
Matrix	S		
DF	1	S	W
Compound	**Concentration**	mg/kg	ug/L
tert-Amyl methyl ether (TAME)	ND	0.005	NA
t-Butyl alcohol (TBA)	ND	0.025	NA
1,2-Dibromoethane (EDB)	ND	0.005	NA
1,2-Dichloroethane (1,2-DCA)	ND	0.005	NA
Diisopropyl ether (DIPE)	ND	0.005	NA
Ethyl tert-butyl ether (ETBE)	ND	0.005	NA
Methyl-t-butyl ether (MTBE)	ND	0.005	NA
Surrogate Recoveries (%)			
%SS:	98.6		
Comments			

* water and vapor samples are reported in µg/L, soil/sludge/solid samples in mg/kg, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L, wipe samples in µg/wipe.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

surrogate diluted out of range or surrogate coelutes with another peak.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) sample diluted due to high organic content/matrix interference; k) reporting limit near, but not identical to our standard reporting limit due to variable Encore sample weight; m) reporting limit raised due to insufficient sample amount; n) results are reported on a dry weight basis; p) see attached narrative.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

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QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0502303

EPA Method: SW8021B/8015Cm Extraction: SW5030B BatchID: 15089 Spiked Sample ID: 0502277-006A

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(btex)£	ND	0.60	88.8	87.9	1.04	90	95.1	5.52	70 - 130	70 - 130
MTBE	ND	0.10	84.5	84.1	0.451	80.5	92.7	14.1	70 - 130	70 - 130
Benzene	ND	0.10	87	101	14.7	89.8	90.4	0.648	70 - 130	70 - 130
Toluene	ND	0.10	90.1	101	11.4	91.9	88.5	3.77	70 - 130	70 - 130
Ethylbenzene	ND	0.10	94.1	102	8.13	95.8	99.9	4.15	70 - 130	70 - 130
Xylenes	ND	0.30	95	103	8.40	95.3	90.3	5.39	70 - 130	70 - 130
%SS:	107	0.10	88	101	14.1	104	101	2.93	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0502303

EPA Method: SW8015C Extraction: SW3550C BatchID: 15103 Spiked Sample ID: 0502316-004A

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	ND	150	105	104	1.24	104	107	3.12	70 - 130	70 - 130
%SS:	109	50	115	116	0.825	115	117	1.63	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0502303

EPA Method: SW8015C Extraction: SW3550C BatchID: 15088 Spiked Sample ID: 0502277-006A

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	ND	150	102	101	0.673	104	103	0.220	70 - 130	70 - 130
%SS:	91	50	114	115	0.167	112	114	1.66	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

McCampbell Analytical, Inc.

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Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder: 0502303

EPA Method: SW8015C Extraction: SW3510C BatchID: 15100 Spiked Sample ID: N/A

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	N/A	7500	N/A	N/A	N/A	107	109	1.36	N/A	70 - 130
%SS:	N/A	2500	N/A	N/A	N/A	116	118	1.66	N/A	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder: 0502303

EPA Method: SW8015C Extraction: SW3510C BatchID: 15108 Spiked Sample ID: N/A

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	N/A	7500	N/A	N/A	N/A	114	114	0	N/A	70 - 130
%SS:	N/A	2500	N/A	N/A	N/A	118	119	0.984	N/A	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

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QC SUMMARY REPORT FOR SW8260B

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0502303

EPA Method: SW8260B Extraction: SW5030B BatchID: 15142 Spiked Sample ID: 0502368-029A

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/kg	mg/kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
tert-Amyl methyl ether (TAME)	ND	0.050	86.5	86.6	0.116	85.4	85	0.513	70 - 130	70 - 130
t-Butyl alcohol (TBA)	ND	0.25	93.3	90.9	2.54	91.5	91.6	0.0663	70 - 130	70 - 130
1,2-Dibromoethane (EDB)	ND	0.050	111	109	1.96	115	107	7.09	70 - 130	70 - 130
1,2-Dichloroethane (1,2-DCA)	ND	0.050	93.2	94.8	1.69	94.5	91.4	3.26	70 - 130	70 - 130
Diisopropyl ether (DIPE)	ND	0.050	87.8	87.6	0.190	85.4	85.6	0.187	70 - 130	70 - 130
Ethyl tert-butyl ether (ETBE)	ND	0.050	87.8	88.3	0.575	88.8	86.8	2.31	70 - 130	70 - 130
Methyl-t-butyl ether (MTBE)	ND	0.050	89.8	89.4	0.360	93.3	89	4.75	70 - 130	70 - 130
%SS1:	105	0.050	101	101	0	103	101	1.79	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.

DHS Certification No. 1644

QA/QC Officer

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Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0502303 **ClientID: BEIA**

Report to:
Mark Detterman
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501-1395

TEL: (510) 521-3773
FAX: (510) 865-2594
ProjectNo: #202016; Dolan Properties
PO:

Bill to:
Blymyer Engineers, Inc.
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501-1395

Requested TAT: 5 days
Date Received: 02/18/2005
Date Printed: 02/25/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0502303-001	SBJ-7.5	Soil	2/18/05 9:20:00 AM	☐	A	A		A											
0502303-002	SBK-4W	Water	2/18/05 10:50:00	☐			A		B										
0502303-003	SBK-9	Soil	2/18/05 11:05:00	☐		A		A											
0502303-004	SBK-19.5	Soil	2/18/05 11:35:00	☐		A		A											
0502303-005	SBK-19.5W	Water	2/18/05 11:45:00	☐			A		B										

Test Legend:

1	5-OXYS+PBSCV_S	2	G-MBTEX_S	3	G-MBTEX_W	4	TPH(D)_S	5	TPH(D)_W
6		7		8		9		10	
11		12		13		14		15	

Prepared by: Elisa Venegas

Comments: add on smps 003 & 005 per M.D. 5 oxys+pb scavs added 2/25/05 per note

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

BLYMYER ENGINEERS, INC.
1829 Clement Avenue
Alameda, CA 94501 (510) 521-3773 FAX (510) 865-2594

CHAIN OF CUSTODY RECORD

JOB #: 202016

PROJECT NAME/LOCATION: Dolan Properties

SAMPLERS (SIGNATURE): Mark E. Detterman

TURNAROUND TIME: 5/Std DAY(S)

2/22 5 std per M

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTXE (MOD EPA 8015/8020)	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)	Oxy's + EDB + 12DCA 2-25-05 per note				HOLD	REMARKS
2/18/05	920			SBJ-7.5	1	X	X					(X)					~~Request for Soil~~
	1050			SBK-4W	5 glass	X	X										~~Re analyze for~~
	1105			SBK-9		X	X										~~Fuel oxygenates~~
	1135			SBK-19.5		X	X										EDB + 1,2-DCA
	1145			SBK-19.5W	5 glass	~~X~~	~~X~~	(HOLD) off hold 2/22/05 per fax									

REQUESTED BY: Mark Detterman

RESULTS AND INVOICE TO: Mark @ Blymyer Eng.

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Mark Detterman	2/18/05 2:11 PM	Mul Vall			

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE / TIME	REMARKS
				ICE/t° ✓ GOOD CONDITION ✓ HEAD SPACE ABSENT ✓ DECHLORINATED IN LAB ___ APPROPRIATE CONTAINERS ✓ PRESERVED IN LAB ___ PRESERVATION: VOAS ✓ / O&G / METALS / OTHER

WHITE: Accompany Sample YELLOW: BEI, After Lab Signs PINK: Original Sampler

McCampbell Analytical, Inc.

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Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501-1395	Client Project ID: #202016; Dolan Properties	Date Sampled: 03/28/05
		Date Received: 03/29/05
	Client Contact: Mark Detterman	Date Reported: 04/05/05
	Client P.O.:	Date Completed: 04/05/05

WorkOrder: 0503520

April 05, 2005

Dear Mark:

Enclosed are:

1). the results of **10** analyzed samples from your **#202016; Dolan Properties project,**

2). a QC report for the above samples

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

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Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc.	Client Project ID: #202016; Dolan Properties	Date Sampled: 03/28/05
1829 Clement Avenue		Date Received: 03/29/05
Alameda, CA 94501-1395	Client Contact: Mark Detterman	Date Extracted: 03/29/05-04/01/05
	Client P.O.:	Date Analyzed: 03/30/05-04/01/05

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0503520

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	CPT1-23.5	S	ND	---	ND	ND	ND	ND	1	109
002A	CPT1-29.5	S	ND	---	ND	ND	ND	ND	1	88
003A	CPT1-41.5	S	ND	---	ND	ND	ND	ND	1	97
004A	CPT2-8.0	S	ND	---	ND	ND	ND	ND	1	93
009A	CPT2-28	S	ND	---	ND	ND	ND	ND	1	98
011A	CPT2-43	S	ND	---	ND	ND	ND	ND	1	87
012A	CPT1-34W	W	150,a,i	---	11	6.5	5.3	17	1	110
013A	CPT1-40W	W	320,a	---	33	23	15	46	1	116
014A	CPT2-23W	W	ND,i	---	ND	ND	ND	ND	1	114
015A	CPT2-35W	W	ND,i	---	ND	ND	ND	ND	1	108
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	50	5.0	0.5	0.5	0.5	0.5	1	µg/L
		S	1.0	0.05	0.005	0.005	0.005	0.005	1	mg/Kg

* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) range non-target isolated peaks subtracted out of the TPH(g) concentration at the client's request.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

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Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc.	Client Project ID: #202016; Dolan Properties	Date Sampled: 03/28/05
1829 Clement Avenue		Date Received: 03/29/05
Alameda, CA 94501-1395	Client Contact: Mark Detterman	Date Extracted: 03/29/05
	Client P.O.:	Date Analyzed: 03/30/05-03/31/05

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel*

Extraction method: SW3510C/SW3550C Analytical methods: SW8015C Work Order: 0503520

Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0503520-001A	CPT1-23.5	S	ND	1	102
0503520-002A	CPT1-29.5	S	ND	1	102
0503520-003A	CPT1-41.5	S	ND	1	102
0503520-004A	CPT2-8.0	S	ND	1	116
0503520-009A	CPT2-28	S	ND	1	100
0503520-011A	CPT2-43	S	ND	1	84
0503520-012B	CPT1-34W	W	ND,i	1	101
0503520-013B	CPT1-40W	W	61,d	1	101
0503520-014B	CPT2-23W	W	ND,i	1	104
0503520-015B	CPT2-35W	W	60,b,i	1	105

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	µg/L
	S	1.0	mg/Kg

* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; k) kerosene/kerosene range/jet fuel range; l) bunker oil; m) fuel oil; n) stoddard solvent/mineral spirit.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

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QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0503520

EPA Method: SW8021B/8015Cm **Extraction: SW5030B** **BatchID: 15639** **Spiked Sample ID: 0503519-002A**

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(btex) £	ND	0.60	102	103	0.856	102	108	5.69	70 - 130	70 - 130
MTBE	ND	0.10	96.1	97.2	1.16	92.7	93	0.292	70 - 130	70 - 130
Benzene	ND	0.10	104	104	0	98.5	99	0.502	70 - 130	70 - 130
Toluene	ND	0.10	87.2	88.3	1.18	85.6	86.1	0.614	70 - 130	70 - 130
Ethylbenzene	ND	0.10	104	105	0.731	102	104	2.31	70 - 130	70 - 130
Xylenes	ND	0.30	95.3	96	0.697	91.3	95.3	4.29	70 - 130	70 - 130
%SS:	89	0.10	100	97	2.63	97	104	6.76	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 15639 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0503520-001A	3/28/05 9:35 AM	3/29/05 5:34 PM	3/30/05 7:22 AM	0503520-002A	3/28/05 9:45 AM	3/29/05 5:34 PM	3/31/05 6:23 PM
0503520-003A	3/28/05 11:50 AM	3/29/05 5:34 PM	3/30/05 10:19 AM	0503520-004A	3/28/05 12:50 PM	3/29/05 5:34 PM	3/30/05 11:19 AM
0503520-009A	3/28/05 2:30 PM	3/29/05 5:34 PM	3/30/05 11:49 AM	0503520-011A	3/28/05 3:00 PM	3/29/05 5:34 PM	3/30/05 3:29 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

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QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Water | QC Matrix: Water | WorkOrder: 0503520

EPA Method: SW8021B/8015Cm | **Extraction: SW5030B** | **BatchID: 15640** | **Spiked Sample ID: 0503518-012A**

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(btex)£	ND	60	97.3	96.8	0.501	96.4	98.6	2.28	70 - 130	70 - 130
MTBE	ND	10	91.2	86.6	5.14	90.4	94.7	4.69	70 - 130	70 - 130
Benzene	ND	10	108	107	1.41	102	105	2.68	70 - 130	70 - 130
Toluene	ND	10	106	104	1.57	99.3	102	3.10	70 - 130	70 - 130
Ethylbenzene	ND	10	108	108	0	103	106	3.00	70 - 130	70 - 130
Xylenes	ND	30	96	95.7	0.348	91	95	4.30	70 - 130	70 - 130
%SS:	105	10	112	112	0	110	110	0	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 15640 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0503520-012A	3/28/05 10:15 AM	4/01/05 4:02 PM	4/01/05 4:02 PM	0503520-013A	3/28/05 12:15 PM	4/01/05 4:17 PM	4/01/05 4:17 PM
0503520-014A	3/28/05 1:45 PM	4/01/05 4:47 PM	4/01/05 4:47 PM	0503520-015A	3/28/05 2:50 PM	4/01/05 5:17 PM	4/01/05 5:17 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not applicable or not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0503520

EPA Method: SW8015C	Extraction: SW3550C	BatchID: 15621	Spiked Sample ID: 0503496-003a

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	3.5	20	94.9	94.1	0.708	99.5	101	1.17	70 - 130	70 - 130
%SS:	99	50	101	100	1.46	97	97	0	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 15621 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0503520-001A	3/28/05 9:35 AM	3/29/05 5:35 PM	3/31/05 1:50 AM	0503520-002A	3/28/05 9:45 AM	3/29/05 5:35 PM	3/31/05 2:58 AM
0503520-003A	3/28/05 11:50 AM	3/29/05 5:35 PM	3/31/05 4:07 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

McCampbell Analytical, Inc.

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Website: www.mccampbell.com E-mail: main@mccampbell.com

QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0503520

EPA Method: SW8015C	Extraction: SW3550C	BatchID: 15644	Spiked Sample ID: 0503520-011A

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	ND	20	101	101	0	101	110	8.41	70 - 130	70 - 130
%SS:	84	50	95	96	0.247	99	97	2.03	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 15644 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0503520-004A	3/28/05 12:50 PM	3/29/05 5:36 PM	3/31/05 5:15 AM	0503520-009A	3/28/05 2:30 PM	3/29/05 5:36 PM	3/31/05 6:23 AM
0503520-011A	3/28/05 3:00 PM	3/29/05 5:36 PM	3/30/05 12:06 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder: 0503520

EPA Method: SW8015C **Extraction: SW3510C** **BatchID: 15645** **Spiked Sample ID: N/A**

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	N/A	1000	N/A	N/A	N/A	117	117	0	N/A	70 - 130
%SS:	N/A	2500	N/A	N/A	N/A	96	97	1.41	N/A	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 15645 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0503520-014B	3/28/05 1:45 PM	3/29/05 5:38 PM	3/30/05 8:08 PM	0503520-015B	3/28/05 2:50 PM	3/29/05 5:38 PM	3/31/05 8:40 AM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder: 0503520

EPA Method: SW8015C **Extraction: SW3510C** **BatchID: 15634** **Spiked Sample ID: N/A**

Analyte	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	N/A	1000	N/A	N/A	N/A	109	109	0	N/A	70 - 130
%SS:	N/A	2500	N/A	N/A	N/A	102	98	3.35	N/A	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 15634 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0503520-012B	3/28/05 10:15 AM	3/29/05 5:37 PM	3/30/05 6:59 PM	0503520-013B	3/28/05 12:15 PM	3/29/05 5:37 PM	3/30/05 9:16 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

* MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

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110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0503520 **ClientID: BEIA**

Report to:
Mark Detterman
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501-1395
TEL: (510) 521-3773
FAX: (510) 865-2594
ProjectNo: #202016; Dolan Properties
PO:

Bill to:
Blymyer Engineers, Inc.
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501-1395

Requested TAT: 5 days
Date Received: 03/29/2005
Date Printed: 03/29/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0503520-001	CPT1-23.5	Soil	03/28/2005	☐	A		A												
0503520-002	CPT1-29.5	Soil	03/28/2005	☐	A		A												
0503520-003	CPT1-41.5	Soil	03/28/2005	☐	A		A												
0503520-004	CPT2-8.0	Soil	03/28/2005	☐	A		A												
0503520-005	CPT2-13.0	Soil	03/28/2005	☑	A		A												
0503520-006	CPT2-17.5	Soil	03/28/2005	☑	A		A												
0503520-007	CPT2-18	Soil	03/28/2005	☑	A		A												
0503520-008	CPT2-23	Soil	03/28/2005	☑	A		A												
0503520-009	CPT2-28	Soil	03/28/2005	☐	A		A												
0503520-010	CPT2-33	Soil	03/28/2005	☑	A		A												
0503520-011	CPT2-43	Soil	03/28/2005	☐	A		A												
0503520-012	CPT1-34W	Water	03/28/2005	☐		A		B											
0503520-013	CPT1-40W	Water	03/28/2005	☐		A		B											
0503520-014	CPT2-23W	Water	03/28/2005	☐		A		B											
0503520-015	CPT2-35W	Water	03/28/2005	☐		A		B											

Test Legend:

1	G-MBTEX_S	2	G-MBTEX_W	3	TPH(D)_S	4	TPH(D)_W	5	
6		7		8		9		10	
11		12		13		14		15	

Prepared by: Elisa Venegas

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

BEI 050520

BLYMYER ENGINEERS, INC.

1829 Clement Avenue
Alameda, CA 94501 (510) 521-3773 FAX (510) 865-2594

CHAIN OF CUSTODY RECORD

PAGE 1 OF 2

JOB #	PROJECT NAME/LOCATION
202016	Dekon Properties

SAMPLERS (SIGNATURE): Mark Detterman

TURNAROUND TIME: 5/Std DAY(S)

REMARKS:

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTXE (MOD EPA 8015/8020)	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)	HOLD
3/28/05	~~935~~ 945		X	CPT1-23.5	1 sleeve	↓	↓					
	945			CPT1-29.5								
	1150			CPT1-41.0								
	1250			CPT2-8.0		X	X					
	100			CPT2-13.0								
	115			CPT2-17.5								
	130			CPT2-18								
	210			CPT2-23								
	230			CPT2-28		X	X					
	245			CPT2-33								
↓	300		X	CPT2-43	↓	X	X					

ICE/t° ✓
GOOD CONDITION ✓
HEADSPACE ABSENT
DECHLORINATED IN LAB
PRESERVATION

APPROPRIATE CONTAINERS ✓
PRESERVED IN LAB

VOAS	O&G	METALS	OTHER

REQUESTED BY: Mark Detterman

RESULTS AND INVOICE TO: Mark Detterman / Blymyer Eng.

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Mark Detterman	3/21/05 1010	D. Koszowski
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)
	3/29/05 430	
D. Koszowski	3/29/05 1250	
	DATE / TIME	REMARKS:
	3/29 4:50	

WHITE: Accompany Sample YELLOW: BEI, After Lab Signs PINK: Original Sampler

BLYMYER ENGINEERS, INC.
1829 Clement Avenue
Alameda, CA 94501 (510) 521-3773 FAX (510) 865-2594

CHAIN OF CUSTODY RECORD

JOB # 202016 | PROJECT NAME/LOCATION: Dolan Properties

SAMPLERS (SIGNATURE): Mark Detterman

TURNAROUND TIME: 5/5 fd DAY(S)

REMARKS:

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTXE (MOD EPA 8015/8020)	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)	HOLD	
+5 3/28/05	1015		X	CPT1-34W	4 VOA 1 Amb	X	X						34/37
+	1215			CPT1-40W									40/45
+2	145			CPT2-23W									23/26
+5	250			CPT2-35W									35/39

ICE/T
GOOD CONDITION ✓
HEAD SPACE ABSENT
DECHLORINATED IN LAB
APPROPRIATE CONTAINERS ✓
PRESERVED IN LAB
PRESERVATION: VOAS | O&G | METALS | OTHER

REQUESTED BY: Mark Detterman

RESULTS AND INVOICE TO: Mark Detterman / Blymyer Eng

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Mark Detterman	3/29/05 1010	D. Negrowski
D. Negrowski	3/29/05 1250	
	3/29/05 1430	RECEIVED FOR LABORATORY BY: (SIGNATURE)

DATE / TIME: 3/29/05 21:30

REMARKS:

WHITE: Accompany Sample YELLOW: BEI, After Lab Signs PINK: Original Sampler

McCampbell Analytical, Inc.

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Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501-1395	Client Project ID: #202016; Dolan Properties	Date Sampled: 07/05/05
		Date Received: 07/06/05
	Client Contact: Mark Detterman	Date Reported: 07/12/05
	Client P.O.:	Date Completed: 07/12/05

WorkOrder: 0507063

July 12, 2005

Dear Mark:

Enclosed are:

1). the results of **2** analyzed samples from your **#202016; Dolan Properties project,**

2). a QC report for the above samples

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

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Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc.	Client Project ID: #202016; Dolan Properties	Date Sampled: 07/05/05
1829 Clement Avenue		Date Received: 07/06/05
Alameda, CA 94501-1395	Client Contact: Mark Detterman	Date Extracted: 07/06/05
	Client P.O.:	Date Analyzed: 07/08/05

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0507063

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
002A	MW7-16	S	38,m	ND<0.50	ND<0.050	0.62	0.078	0.056	10	84
003A	MW7-21	S	ND	ND	ND	ND	ND	ND	1	99
Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	NA	NA	NA	NA	NA	NA	1	ug/L
	S	1.0	0.05	0.005	0.005	0.005	0.005	1	mg/Kg

* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) range non-target isolated peaks subtracted out of the TPH(g) concentration at the client's request.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

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Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc.	Client Project ID: #202016; Dolan Properties	Date Sampled: 07/05/05
1829 Clement Avenue		Date Received: 07/06/05
Alameda, CA 94501-1395	Client Contact: Mark Detterman	Date Extracted: 07/06/05
	Client P.O.:	Date Analyzed: 07/07/05-07/11/05

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel*

Extraction method: SW3550C Analytical methods: SW8015C Work Order: 0507063

Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0507063-002A	MW7-16	S	4.2,n,b	1	105
0507063-003A	MW7-21	S	ND	1	95
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	NA	NA	
		S	1.0	mg/Kg	

* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel is significant; d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil; n) stoddard solvent/mineral spirit.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

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QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0507063

EPA Method: SW8021B/8015Cm **Extraction: SW5030B** **BatchID: 17015** **Spiked Sample ID: 0507056-001A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(btex) £	ND	0.60	97.9	91.2	7.12	106	97.2	8.73	70 - 130	70 - 130
MTBE	ND	0.10	94.5	93.3	1.19	93.4	90.1	3.62	70 - 130	70 - 130
Benzene	ND	0.10	92.1	83.8	9.45	92.8	89.9	3.09	70 - 130	70 - 130
Toluene	ND	0.10	92.6	85.8	7.62	93	90.5	2.74	70 - 130	70 - 130
Ethylbenzene	ND	0.10	95.6	93.7	2.00	97.3	94.3	3.14	70 - 130	70 - 130
Xylenes	ND	0.30	95.7	91.7	4.27	98.3	95.3	3.10	70 - 130	70 - 130
%SS:	90	0.10	98	90	8.29	97	95	1.88	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 17015 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0507063-002A	7/05/05 12:05 PM	7/06/05	7/08/05 8:14 PM	0507063-003A	7/05/05 1:40 PM	7/06/05	7/08/05 7:08 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0507063

EPA Method: SW8015C	Extraction: SW3550C	BatchID: 17002	Spiked Sample ID: 0507044-017A

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	ND	20	111	111	0	111	112	0.693	70 - 130	70 - 130
%SS:	92	50	98	97	0.973	97	98	0.367	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 17002 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0507063-002A	7/05/05 12:05 PM	7/06/05	7/11/05 1:32 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

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QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0507063

EPA Method: SW8015C	Extraction: SW3550C	BatchID: 17021	Spiked Sample ID: 0507063-003A

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	ND	20	113	112	1.66	114	114	0	70 - 130	70 - 130
%SS:	95	50	96	95	0.645	96	96	0	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 17021 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0507063-003A	7/05/05 1:40 PM	7/06/05	7/07/05 3:50 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

BLYMYER ENGINEERS, INC.

1829 Clement Avenue
Alameda, CA 94501 (510) 521-3773 FAX (510) 865-2594

BEI 0507063

ICE/
GOOD CONDITION
HEAD SPACE ABSENT
DECHLORINATED IN LAB
PRESERVATION

APPROPRIATE /
CONTAINERS
PRESERVED IN LAB

VOAS	O&G	METALS	OTHER

CHAIN OF CUSTODY RECORD

JOB # 20.2016

PROJECT NAME/LOCATION Dolan Properties

SAMPLERS (SIGNATURE) Mark E. Jefferson

TURNAROUND TIME: 5 (std) DAY(S)

REMARKS: EDF Format

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	TPH AS GASOLINE + BTXE (MOD EPA 8015/8020) / MTBE	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)						HOLD	
7/5/05	745		↓	MW7-11	1 brass													Hold
	1305			MW7-16		X	X											
	140			MW7-~~20.5~~ 21		X	X											
				~~MW7~~														

REQUESTED BY: Mark E. Jefferson

RESULTS AND INVOICE TO: Mark E. Jefferson / Blymyer Engineers

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
Mark E. Jefferson	7/6/05 1238			7/6/05 1420	
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE / TIME	REMARKS:	

WHITE: Accompany Sample YELLOW: BEI, After Lab Signs PINK: Original Sampler

McCampbell Analytical, Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0507063 **ClientID: BEIA**

Report to:
Mark Detterman
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501-1395
TEL: (510) 521-3773
FAX: (510) 865-2594
ProjectNo: #202016; Dolan Properties
PO:

Bill to:
Blymyer Engineers, Inc.
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501-1395

Requested TAT: 5 days
Date Received: 07/06/2005
Date Printed: 07/06/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0507063-002	MW7-16	Soil	07/05/2005	☐	A	A	A												
0507063-003	MW7-21	Soil	07/05/2005	☐	A		A												

Test Legend:

1	G-MBTEX_S	2	PREDF REPORT	3	TPH(D)_S	4		5	
6		7		8		9		10	
11		12		13		14		15	

Prepared by: Rosa Venegas

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc. 1829 Clement Avenue Alameda, CA 94501-1395	Client Project ID: Dolan Rentals	Date Sampled: 07/18/05
		Date Received: 07/19/05
	Client Contact: Mark Detterman	Date Reported: 07/25/05
	Client P.O.:	Date Completed: 07/25/05

WorkOrder: 0507291

July 25, 2005

Dear Mark:

Enclosed are:

1). the results of 1 analyzed sample from your **Dolan Rentals project,**

2). a QC report for the above sample

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc.	Client Project ID: Dolan Rentals	Date Sampled: 07/18/05
1829 Clement Avenue		Date Received: 07/19/05
Alameda, CA 94501-1395	Client Contact: Mark Detterman	Date Extracted: 07/24/05
	Client P.O.:	Date Analyzed: 07/24/05

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0507291

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	MW-7	W	ND	ND	ND	ND	ND	ND	1	119
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	50	5.0	0.5	0.5	0.5	0.5	1	µg/L
		S	NA	NA	NA	NA	NA	NA	1	mg/Kg

* water and vapor samples and all TCLP & SPLP extracts are reported in ug/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) range non-target isolated peaks subtracted out of the TPH(g) concentration at the client's request.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

Blymyer Engineers, Inc.	Client Project ID: Dolan Rentals	Date Sampled: 07/18/05
1829 Clement Avenue		Date Received: 07/19/05
Alameda, CA 94501-1395	Client Contact: Mark Detterman	Date Extracted: 07/19/05
	Client P.O.:	Date Analyzed: 07/19/05

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel*

Extraction method: SW3510C Analytical methods: SW8015C Work Order: 0507291

Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0507291-001B	MW-7	W	ND	1	92

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	µg/L
	S	NA	NA

* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; k) kerosene/kerosene range/jet fuel range; l) bunker oil; m) fuel oil; n) stoddard solvent/mineral spirit.

DHS Certification No. 1644

Angela Rydelius, Lab Manager

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder: 0507291

EPA Method: SW8021B/8015Cm **Extraction: SW5030B** **BatchID: 17203** **Spiked Sample ID: 0507291-001A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(btex)£	ND	60	99.3	92.2	7.43	95.9	95.7	0.301	70 - 130	70 - 130
MTBE	ND	10	113	105	7.78	95.6	101	5.03	70 - 130	70 - 130
Benzene	ND	10	92.7	93.1	0.444	92.8	94.7	2.02	70 - 130	70 - 130
Toluene	ND	10	95.3	95.6	0.274	98	99.5	1.51	70 - 130	70 - 130
Ethylbenzene	ND	10	99.9	100	0.320	103	105	1.72	70 - 130	70 - 130
Xylenes	ND	30	103	100	3.28	107	107	0	70 - 130	70 - 130
%SS:	119	10	98	96	2.07	97	97	0	70 - 130	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 17203 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0507291-001A	7/18/05 10:25 AM	7/24/05	7/24/05 2:18 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not applicable or not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

McCampbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
Website: www.mccampbell.com E-mail: main@mccampbell.com

QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Water QC Matrix: Water WorkOrder: 0507291

EPA Method: SW8015C **Extraction: SW3510C** **BatchID: 17205** **Spiked Sample ID: N/A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	LCS / LCSD
TPH(d)	N/A	1000	N/A	N/A	N/A	92.9	94.8	1.98	N/A	70 - 130
%SS:	N/A	2500	N/A	N/A	N/A	88	95	7.40	N/A	70 - 130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 17205 SUMMARY

Sample ID	Date Sampled	Date Extracted	Date Analyzed	Sample ID	Date Sampled	Date Extracted	Date Analyzed
0507291-001B	7/18/05 10:25 AM	7/19/05	7/19/05 11:38 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

QA/QC Officer

BLAINE
TECH SERVICES, INC.

1680 ROGERS AVENUE
SAN JOSE, CALIFORNIA 95112-1105
FAX (408) 573-7771
PHONE (408) 573-0555

CHAIN OF CUSTODY

BTS # 050718-MT7

CLIENT: Blymyer Engineers, Inc.

SITE: Dolan Rentals
6393 Scarlett Ct.
Dublin, CA

LAB: McCampbell

DHS #

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND
☐ EPA
☐ LIA
☐ OTHER
☐ RWQCB REGION

SPECIAL INSTRUCTIONS

Invoice and Report to : Blymyer Engineers, Inc.
Attn: Mark Detterman
EDF Format Required.

ICE/t ✓
GOOD CONDITION ✓
HEAD SPACE ABSENT
DECHLORINATED IN LAB
APPROPRIATE CONTAINERS ✓
PRESERVED IN LAB
ADD'L INFORMATION
PRESERVATION

SAMPLE I.D.	DATE	TIME	MATRIX S= SOIL W=H_2O	CONTAINERS TOTAL		C = COMPOSITE ALL CONTAINERS	CONDUCT ANALYSIS TO DETECT: TPH-G (8015M)	BTEX & MTBE (8020)	TPH-D (8015m)	STATUS	METHOD	CONDITION	LAB SAMPLE #
MW-7@	7/18/05	1025	W	5	Hcl preserved		X	X	X				

SAMPLING COMPLETED: DATE 7/18/05 TIME

SAMPLING PERFORMED BY: M. La Toll

RESULTS NEEDED NO LATER THAN: As contracted

	DATE	TIME		DATE	TIME
RELEASED BY			RECEIVED BY	7/18/05	1455
RELEASED BY			RECEIVED BY (Sample Custodian)	7/18/05	1455
RELEASED BY Sample Custodian	7/19/05	1338	RECEIVED BY	7/19/05	138
	7/19/05	500	RECEIVED BY	7/19/05	1700

SHIPPED VIA

DATE SENT

TIME SENT

COOLER #

McCampbell Analytical, Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0507291 **ClientID: BEIA** **EDF: YES**

Report to:
Mark Detterman
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501-1395

TEL: (510) 521-3773
FAX: (510) 865-2594
ProjectNo: Dolan Rentals
PO:

Bill to:
Blymyer Engineers, Inc.
Blymyer Engineers, Inc.
1829 Clement Avenue
Alameda, CA 94501-1395

Requested TAT: 5 days
Date Received: 07/19/2005
Date Printed: 07/19/2005

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0507291-001	MW-7	Water	7/18/05 10:25:00		A	B													

Test Legend:

1	G-MBTEX_W	2	TPH(D)_W	3		4		5	
6		7		8		9		10	
11		12		13		14		15	

Prepared by: Rosa Venegas

Comments:

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

Appendix H

Well Survey,
CSS Environmental Services, Inc.
April 13, 2005

C S S

CSS ENVIRONMENTAL SERVICES, INC.
Managing Cost, Scope and Schedule
95 Belvedere Street, Suite 2
San Rafael, CA 94901
Telephone: (415) 457-9551
Facsimile: (415) 457-9261

MONITORING WELL SURVEY RESULTS

Blymyer Engineers, Inc.: Dublin
Site Address: 6393 Scarlett Court
Dublin, CA 94568
Global ID: T0600101601
CSS Job: 6306

Units: Int. Feet
Coordinate System: North American Datum of 1983-CONUS (NAD83)
Height System: North American Vertical Datum of 1988-GEOID 99 (NAVD88)
Survey Date: 4/13/2005

Location Information:

MW-2
Coordinates: 37.7041266° -121.9079392°
Orthometric Height: 329.46 ft

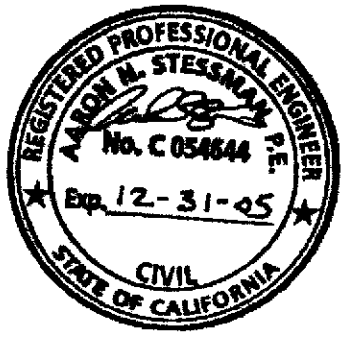
MW-5
Coordinates: 37.7041056° -121.9078006°
Orthometric Height: 329.16 ft

MW-1
Coordinates: 37.7042595° -121.9079665°
Orthometric Height: 329.41 ft

MW-6
Coordinates: 37.7040729° -121.9080664°
Orthometric Height: 330.02 ft

MW-4
Coordinates: 37.7040215° -121.9080085°
Orthometric Height: 329.70 ft

MW-3
Coordinates: 37.7039230° -121.9078597°
Orthometric Height: 329.37 ft



Appendix I

Remedial Alternative Cost Estimate Worksheets

COST ESTIMATE SUMMARY

Dolan Estate
6393 Scarlett Court, Dublin, California

MONITORED NATURAL ATTENUATION

Task	Supplier	Quantity	Unit Cost	Units	Total Cost
SEMI_ANNUAL MONITORING, REPORTING AND CLOSURE COSTS					
Semi-Annual Monitoring (2 events per year)					
Staff Professional	Blymyer	20	$80	hrs.	$1,600
Sampling Equipment and Supplies, Travel, Shipping	Vendor	2	$350	LS	$700
Purge Water Disposal (4-drums)	Vendor	1	$600	LS	$600
Analytical - GW (7 wells: 8260 & 8015/8020 &EDF)	Vendor	2	$1,155	LS	$2,310
Semi-Annual GW Reports	Blymyer	2	$3,500	LS	$7,000
					$12,210
Thirty Three Years Semi-Annual Groundwater Monitoring					$672,500
Site Closure					
Closure Report	Blymyer	1	$4,000	LS	$4,000
Agency Consultation	Blymyer	24	$150	LS	$3,600
					$7,600
Groundwater Monitoring Well Abandonment					
Well Destruction	Sub	1	$10,000	LS	$10,000
Disposal Cost	Ven/Sub	1	$5,000	LS	$5,000
					$15,000
Monitoring Natural Attenuation				**Total Cost**	**$695,100**

TOTAL ESTIMATED COST (No Contingency) **$695,100**

Time to closure based on Benzene fate estimation,
Groundwater MCL will be reached in 33-years from present

COST ESTIMATE SUMMARY

Dolan Estate
6393 Scarlett Court, Dublin, California

MONITORED NATURAL ATTENUATION

Cost of Groundwater Monitoring Index for Inflation
Cumulative Cost with 3% Inflation

Year	Cost	Cumulative Cost
1	12,210.00	12,210.00
2	12,576.30	24,786.30
3	12,953.59	37,739.89
4	13,342.20	51,082.09
5	13,742.46	64,824.55
6	14,154.74	78,979.28
7	14,579.38	93,558.66
8	15,016.76	108,575.42
9	15,467.26	124,042.69
10	15,931.28	139,973.97
11	16,409.22	156,383.19
12	16,901.50	173,284.68
13	17,408.54	190,693.22
14	17,930.80	208,624.02
15	18,468.72	227,092.74
16	19,022.78	246,115.52
17	19,593.47	265,708.99
18	20,181.27	285,890.26
19	20,786.71	306,676.96
20	21,410.31	328,087.27
21	22,052.62	350,139.89
22	22,714.20	372,854.09
23	23,395.62	396,249.71
24	24,097.49	420,347.20
25	24,820.42	445,167.62
26	25,565.03	470,732.65
27	26,331.98	497,064.63
28	27,121.94	524,186.56
29	27,935.60	552,122.16
30	28,773.66	580,895.83
31	29,636.87	610,532.70
32	30,525.98	641,058.68
33	**31,441.76**	**672,500.44**
34	32,385.01	704,885.46
35	33,356.56	738,242.02

COST ESTIMATE SUMMARY

Dolan Estate
6393 Scarlett Court, Dublin, California

DUAL PHASE EXTRACTION

TASK		Estimated Cost
Preconstruction		
Design Plans, Bid Documents		$33,400
Work Plan		$7,920
Permitting (RWQCB, Bldg.Dept, Utility Dist.)		$37,000
	Subtotal	**$78,320**
Costruction		
DPE system- Plant		$86,500
System Installation		$42,000
Trenching, Utility Connection and Security		$38,100
System Start-up		$11,300
Construction Oversight		$32,500
	Subtotal	**$210,400**
System Operation and Maintenance		
Labor & Utilities		$107,625
Maintenance Equipment and Carbon		$39,200
	Subtotal	**$146,825**
Reporting		
DPE Monitoring		$84,600
Closure Report and Agency Consultation		$5,000
DPE System and Well Abandonment		$27,500
	Subtotal	**$117,100**

Estimated Cost: Dual Phase Extraction System	**$552,645**
Total Estimated Cost with Contingency at 15%	**$635,542**

6-DPE wells to 25-feet bgs

COST ESTIMATE SUMMARY

Dolan Estate
6393 Scarlett Court, Dublin, California

Soil Source Excavation

TASK		Estimated Cost
Preconstruction		
Design Plans, Bid Documents		$16,900
Work Plan		$7,920
Permitting (RWQCB, Bldg.Dept, Utility Dist.)		$3,000
	Subtotal	**$27,820**
Construction		
Excavation and Dewatering, Backfill		$289,420
Construction Oversight		$30,625
ORC Placement		$34,100
	Subtotal	**$354,145**
Site Restoration and Reporting		
Confirmation Sampling		$18,300
Report and Agency Consultation		$5,000
Site Restoration		$20,000
	Subtotal	**$43,300**

Estimated Cost: Soil Source Excavation	**$425,265**
Total Estimated Cost with Contingency at 15%	**$489,055**

excavation will require shoring and dewatering.
40-ft x 40-ft x 20-ft deep excavation
160 wall feet of 30-foot sheet piles
sealant cost not included.
Cost include Groundwater ORC remedial effort