BLYMYER
ENGINEERS, INC.

June 12, 2003
BEI Job No. 202016

Mr. Scott Seery
Alameda County Health Care Services Agency
Environmental Protection Division
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: **Workplan for Geoprobe® Bore Installation and Letter Report**
6393 Scarlett Court
Dublin, California
ACHCSA Site # 4322

Dear Mr. Seery:

On behalf of Mr. Michael Fitzpatrick, Executor of the Estate of Michael Dolan (Estate), Blymyer Engineers, Inc. is pleased to forward this subsurface investigation workplan. Mr. Dolan has recently placed the subject property (Figure 1) on the market for sale. Towards that effort, the Estate is attempting to place a cost through remediation on environmental issues related to the former underground storage tank (UST). As a consequence, Blymyer Engineers has been retained to better determine the lateral extent of petroleum-impacted soil around the former location of the UST. Based on the current knowledge of the site, the preference of the Estate is to conduct remediation by overexcavation; however, this may change with the generation of additional data. The specific purpose of the proposed investigation is to fill gaps in the distribution of contaminant data at the site in order to provide a better estimate of costs through remediation.

Background

A 600-gallon UST was removed in February 1990 from the subject site (Figure 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 Health Care Service Agency (ACHCSA) 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 gaps in data around the perimeter of the plume, 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 ACHCSA suggested that a health risk analysis or the installation of an oxygen releasing compound (ORC) might be appropriate for the site. The ACHCSA also stated in the August 1998 letter that groundwater sampling of wells MW-1, MW-3, MW-5, and MW-6 could be discontinued, 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 subject site.

In May 2002, Blymyer Engineers relocated and rehabilitated the wells at the site. Well MW-5 required the most extensive rehabilitation work, and will require resurveying due to a change in well casing elevation. In June 2002, wells MW-2 and MW-4 were sampled, while depth to groundwater was measured all of the wells. 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 previous sampling event in August 1997. Based upon a review of the results, the ACHCSA recommended that well MW-5 be incorporated into the sampling program, that TPH s diesel be included in the analytical suite, and that quarterly groundwater monitoring resume in order that contaminant concentrations and contaminant trends could be quickly generated for a recommended health risk assessment.

Two additional quarters were completed prior to the death of Mr. Dolan. Groundwater monitoring has been on hold since about January 2003 as the Estate has become established. During the most recent 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 methyl tert-butyl ether (MTBE) previously detected at the site have been attributed to 3-methyl-pentane, another gasoline related compound. This suggests that the release predates the use of MTBE and other fuel oxygenates as gasoline additives. All available data from the site has been tabulated on Tables I through IV.

Scope of Work

1.0 Secure all required permits

Upon acceptance of the workplan by the ACHCSA, well permits will be obtained from the Zone 7 Water Agency.

2.0 Generate a site-specific health and safety plan

A health and safety plan will be generated to outline potentially hazardous work conditions and contingencies for an emergency.

3.0 Locate utilities

Offsite utilities will be marked for location by Underground Service Alert (USA). Additionally, proposed bore locations will be marked for clearance by a private utility location service. Site utility laterals, as well as utility corridors that pass through the site will also be located at this time per the standing request of the ACHCSA.

4.0 Install approximately eight Geoprobe® bores

A Geoprobe® rig will be scheduled to drill for one full day. It is estimated that eight bores can be installed during that time period. The Geoprobe® bores will be installed as generally depicted in Figure 3, or otherwise modified. The Geoprobe® soil bores will be hydraulically pushed to a depth of approximately 15 to 20 feet below grade surface (bgs). A continuous soil core will be collected from each bore. The bores will be backfilled with concrete grout upon completion.

5.0 Field screen and collect soil samples for laboratory analysis

At a minimum of 5-foot intervals, selected soil samples will be collected from the soil cores for field screening using a photoionization detector (PID) and for lithologic description. All soil samples will be collected in accordance with the enclosed Blymyer Engineers' *Standard Operating Procedure No. 4, Soil and Grab Groundwater Sampling Using Hydraulically-Driven Sampling Equipment.*

The soil sample displaying the highest PID reading or the soil sample from the groundwater interface will be collected for laboratory analysis. Up to one additional sample will be collected from selected bores (an estimated 12 samples will be submitted in total). The soil samples will be analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline and TPH as diesel by modified EPA Method 8015; and for benzene, toluene, ethylbenzene, total xylenes, (BTEX) and MTBE by EPA Method 8021. The soil sample with the highest concentration of MTBE will be resubmitted for confirmation of the detection of MTBE and for other fuel oxygenates using EPA Method 8260B. Up to eight soil samples will be selected for analysis of total lead by EPA Method 6010. The soil samples will be submitted to a California-certified laboratory on a standard 5-day turnaround.

6.0 Soil handling

Due to the volume of soil that is anticipated to be generated, all soil cuttings will be stored in a Department of Transportation (DOT)-approved 55-gallon drum for later disposal by the owner. All decontamination water will also be stored on-site in a DOT-approved 55-gallon drum for later disposal by the owner. Should overexcavation proceed, the soil and water can be disposed of at that time for no additional cost.

7.0 Generate letter report

A letter report will be prepared for submission to the ACHCSA which will document all work performed and will include summaries of data, detailed soil bore logs, and conclusions and recommendations for further work or appropriate remedial actions, as warranted.

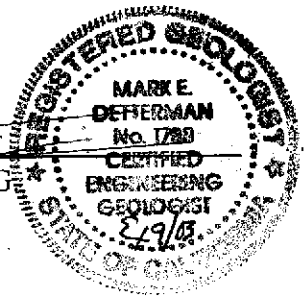
8.0 Generate a remedial workplan

Upon acceptance of the recommendations contained in the letter report by the ACHCSA, Blymyer Engineers will generate a remedial action workplan for submission to the ACHCSA to detail the remedial actions identified as appropriate for the site. It is assumed that remedial actions will proceed in part by overexcavation; however, it is possible that alternative remedial actions will be more be appropriate for the site.

Should you have any questions, please call Mark Detterman at (510) 521-3773.

Sincerely,

Blymyer Engineers, Inc.



By:_____
Mark E. Detterman, C.E.G.
Senior Geologist

By:_____
Michael S. Lewis
Vice President, Technical Services

Enclosures:

Table I:	Summary of Groundwater Elevation Measurements
Table II:	Summary of Groundwater Sample Hydrocarbon Analytical Results
Table IIB:	Summary of Miscellaneous Groundwater Sample Hydrocarbon Analytical Results
Table III:	Summary of Groundwater Sample Fuel Oxygenate Analytical Results
Table IV:	Summary of Soil Sample Hydrocarbon Analytical Results
Figure 1:	Site Location Map
Figure 2:	Site Plan and Groundwater Gradient, December 13, 2002, with proposed bore locations
Figure 3:	Site Bore Location Plan

Blymyer Engineers' *Standard Operating Procedure No. 4, Soil and Grab Groundwater Sampling Using Hydraulically-Driven Sampling Equipment.*

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Table I, 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
	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
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	324.41
	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

Table I, 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
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

Table I, 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
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

Notes: TOC = Top of casing
* = Initial data set collected under direction of Blymyer Engineers, Inc.
** = Surveyed elevation not yet available
NM = Not measured

Elevations in feet above mean sea level

Table II, 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
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]

Table II, 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
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

Table II, 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-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]
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

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
[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.
* = Initial data set collected under direction of Blymyer Engineers, Inc.
Bold results indicate detectable analyte concentrations.

Table IIB, Summary of Miscellaneous 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
D1	10/3/90	**22,000**	NA	**250**	<30	**750**	**880**	NA
D3	10/3/90	**110,000**	NA	**600**	**200**	**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**						
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
RWQCB RBSL Commercial / Industrial Land Use; Groundwater Not a Potential Source of Drinking Water		500	640	46	130	290	13	1,800

Table IIB, Summary of Miscellaneous Groundwater Sample Hydrocarbon Analytical Results; cont.

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

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

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

Sample ID	Date	EPA Method 8260B				
		TBE (μg/L)	MTBE (μg/L)	DIPE (μg/L)	ETBE (μg/L)	TAME (μg/L)
MW-2	12/13/02	<2,000	<0.50	<0.50	<0.50	<0.50

Notes: TBE = *tert*-Butyl Alcohol
MTBE = Methyl *tert*-butyl Ether
DIPE = Di-isopropyl Ether
ETBE = Ethyl *tert*-Butyl Ether
TAME = Methyl *tert*-Amyl Ether
(μg/L) = Milligrams per liter

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

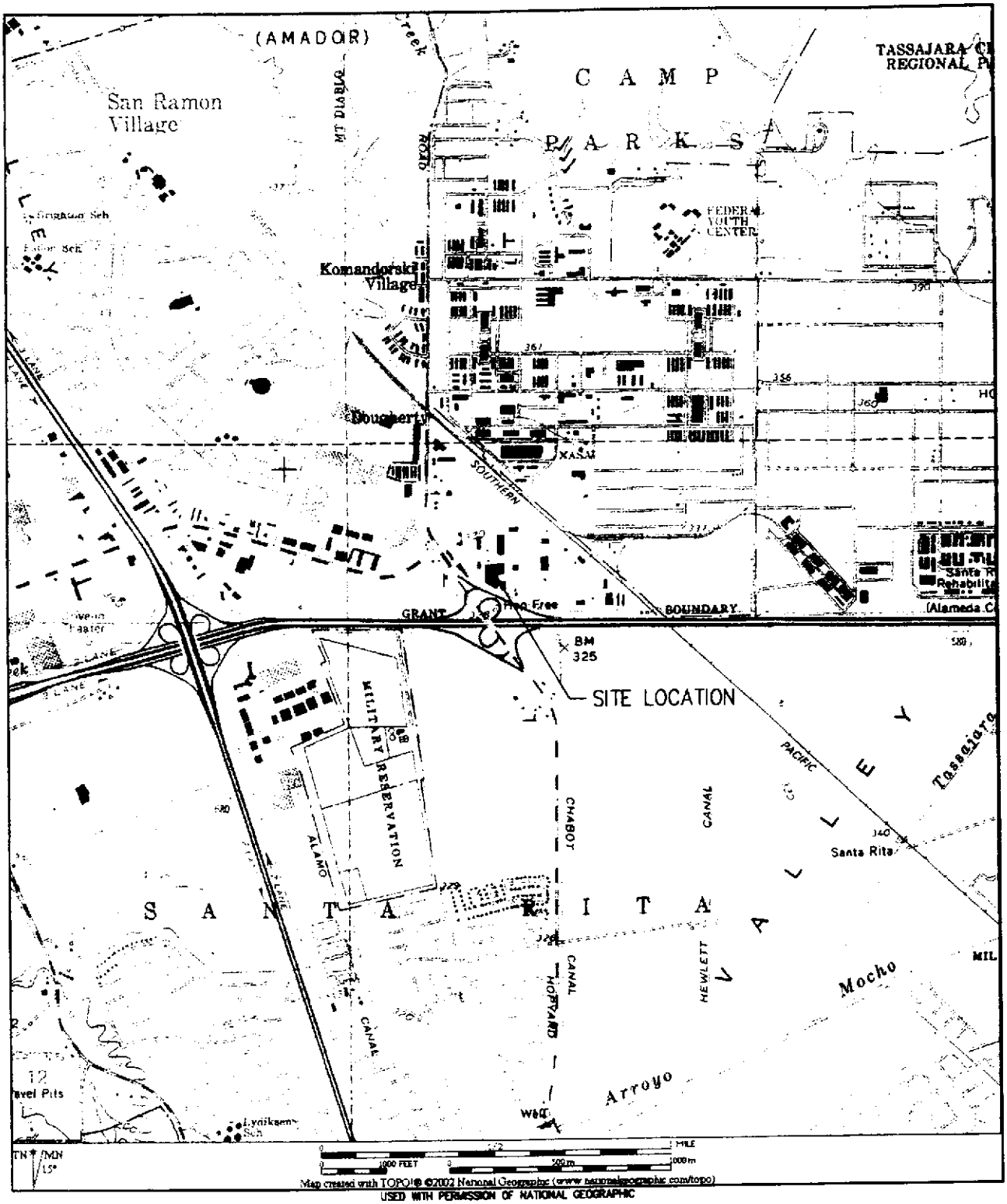
Sample ID	Depth (ft)	Date	Modified EPA Method 8015 (mg/L)		EPA Method 8020 (mg/L)				
			TPH as Gas	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
East of 600 gal tank	7	2/5/90	**740**	**1,100** [a]	**14**	**35**	**23**	**110**	NA
Dirt pile (composite)	---	2/6/90	**1,700**	**2,000** [a,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

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

Sample ID	Depth (ft)	Date	Modified EPA Method 8015 (mg/L)		EPA Method 8020 (mg/L)				
			TPH as Gas	TPH as Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
B-3	10.0	11/3/92	**42**	NA	**1.1**	**0.13**	**0.86**	**4.7**	NA
B-4	5.0	11/3/92	**470**	NA	**2.3**	**8.6**	**6.6**	**38**	NA
B-4	10.0	11/3/92	**23**	NA	**0.89**	**0.22**	**0.47**	**2.3**	NA
RWQCB RBSL Commercial / Industrial Land Use; **Surface Soil**; Groundwater Not a Potential Source of Drinking Water			400	500	0.39	8.4	24	1.0	1.0

Notes:
ft = feet
mg/Kg = Milligrams per kilogram
TPH = Total Petroleum Hydrocarbons
MTBE = Methyl *tert*-butyl ether
NA = Not analyzed
<x = Less than the analytical detection limit (x)
* = Depth mismarked in field.
EPA = Environmental Protection Agency
[a] = Laboratory note indicates the result is a hydrocarbon within the diesel range but that it appears to be the less volatile constituents of gasoline.
[b] = Also detected "High Point Hydrocarbons" calculated as oil at 300 mg/kg, and Oil and Grease at 80 mg/kg.

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



BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	6-27-02

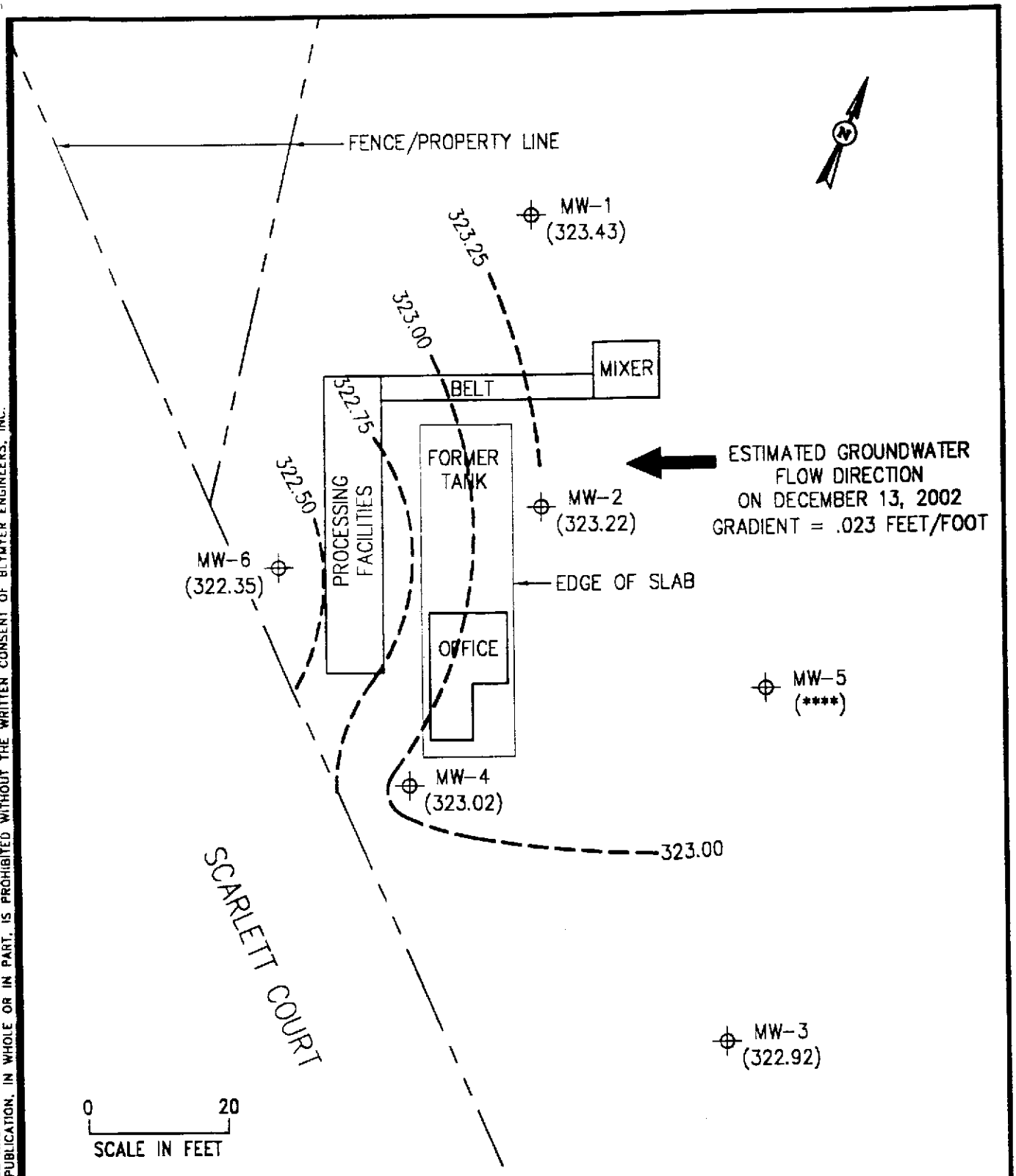
LEGEND

-

SITE LOCATION MAP

FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE 1



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

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	12-27-02

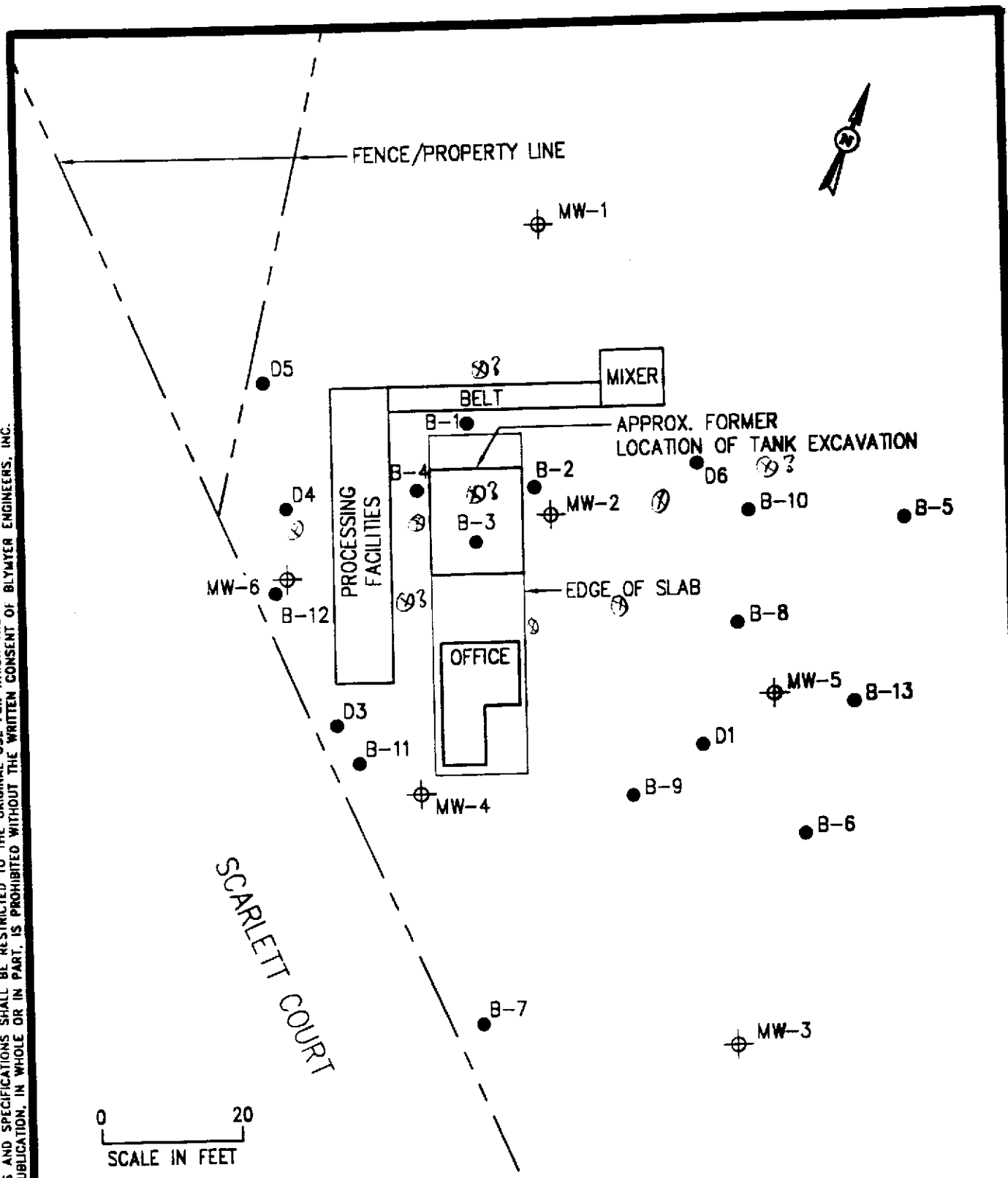
LEGEND

- ⊕ GROUNDWATER MONITORING WELL
- (323.72) GROUND WATER ELEV.
- (****) GROUNDWATER ELEV. (NOT USED FOR CONTOURING)
- GROUNDWATER ELEV. CONTOUR
- → GROUNDWATER FLOW DIRECTION

SITE PLAN AND GROUNDWATER GRADIENT DECEMBER 13, 2002
FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE 2

L:\Acad\2002dwg\202016\202016fig2b.dwg December 27, 2002 - 1:12PM lwittste



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

BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
202016	3-13-03

LEGEND
- GROUNDWATER MONITORING WELL
- SOIL BORE (BY OTHERS)
- Proposed Soil Gas

SOIL BORE LOCATION PLAN

FORMER DOLAN RENTAL PROPERTY
6393 SCARLETT COURT
DUBLIN, CA

FIGURE 3

BLYMYER
ENGINEERS, INC.

Standard Operating Procedure No. 4

Soil and Grab Groundwater Sampling Using Hydraulically-Driven Sampling Equipment

Revision No. 1

Approved By:

Michael Lewis
Quality Assurance/Quality Control Officer
Blymyer Engineers, Inc.

9/1/94
Date

Table of Contents

Attachments:

Boring and Well Construction Log
Drum Inventory Sheet

1.0 Introduction and Summary

This Standard Operating Procedure (SOP) describes methods for drilling with the use of hydraulically-driven equipment, soil sampling with the use of split-spoon samplers, and grab groundwater sampling through an open borehole. Drilling activities covered by this SOP are conducted to obtain soil and grab groundwater samples. Soil samples may be obtained to log subsurface materials, to collect samples for chemical characterization, or to collect samples for physical parameter characterization.

The soil sampling techniques described in this SOP are generally suitable for chemical characterization and physical classification tests; because a driven split-spoon sampler is employed, the resulting soil samples should generally be considered "disturbed" with respect to physical structure and may not be suitable for measuring sensitive physical parameters, such as strength and compressibility. The techniques described in this SOP generally produce a borehole with a diameter corresponding to the outside diameter of the drill rods, a relatively small annulus of remolded soil surrounding the outside diameter of the drill rods, and limited capability for cross-contamination between subsurface strata as the leading drill rods pass from contaminated strata to uncontaminated underlying strata. However, should conditions require strict measures to help prevent cross-contamination or maintain the integrity of an aquitard, consideration should be given to augmenting the procedures of this SOP, for example, by using pre-drilled and grouted isolation casing.

The procedures for hydraulically-driven soil sampling generally consist of initial decontamination, advancement of the drill rods, driving and recovery of the split-spoon sampler, logging and packaging of the soil samples, decontamination of the split-spoon and continued driving and sampling until the total depth of the borehole is reached. Withdrawal of the drill rods upon reaching the total depth requires completion of the borehole by grouting or other measures.

2.0 Equipment and Materials

- Drill rods and drive-weight assembly (hydraulic hammer or vibrator) for driving the drill rods and split-spoon sampler.

- Split-spoon sampler should conform to ASTM D 1586-Standard Method for Penetration Test and Split-Barrel Sampling of Soils, except: (1) split-spoon should be fitted with liners for collection of chemical characterization samples, and (2) allowable split-spoon diameters include nominal 1.5-inch inside diameter by nominal 2-inch outside diameter (Standard Penetration Test split-spoon), nominal 2-inch inside diameter by nominal

2.5-inch outside diameter (California Modified split-spoon), or nominal 2-1/2-inch inside diameter by nominal 3-inch outside diameter (Dames & Moore split-spoon). The split-spoon type and length of the split barrel portion of the sampler should be noted on the Boring and Well Construction Log (copy attached), as should the use of a sample catcher if employed.

- Liners should be 3- to 6-inch length, fitted with plastic end caps, brass or stainless steel, with a nominal diameter corresponding to that of the inside diameter of the split-spoon sampler. The Boring and Well Construction Log should note whether brass or stainless steel liners were used.

- Teflon® sheets, approximate 6-mil thickness, precut to a diameter or width of the liner diameter plus approximately 1 inch.

- Plastic end caps.

- Adhesiveless silicone tape.

- Disposable polyethylene bailer.

- Type I/Type II Portland cement.

- Groundwater sample containers (laboratory provided only).

- Kimwipes®, certified clean silica sand, or deionized water (for blank sample preparation).

- Sample labels, Boring and Well Construction Logs, chain-of-custody forms, drum labels, Drum Inventory Sheet (copy attached), and field notebook.

- Ziploc® plastic bags of size to accommodate a liner.

- Stainless steel spatula and knife.

- Cooler with ice or dry ice (do not use blue ice) and packing material.

- Field organic vapor monitor. The make, model, and calibration information for the field organic vapor monitor (including compound and concentration of calibration gas) should be noted in the field notebook.

- Pressure washer or steam cleaner.
- Large trough (such as a water tank for cattle), plastic-lined pit, or equivalent for decontamination of drill rod and end plug.
- Buckets and bristle brushes for decontamination of liners, split-spoon sampler, and other small gear.
- Low-residue, organic-free soap such as Liquinox® or Alconox®.
- Distilled water.
- Heavy plastic sheeting such as Visqueen.
- 55-gallon, open-top, DOT-approved, 17H drums
- 5-gallon open-top DOT-approved pails, if required.

As specified in the Site Safety Plan, additional safety and personnel decontamination equipment and materials may be needed.

3.0 Typical Procedures

The following typical procedures are intended to cover the majority of hydraulic drilling and sampling conditions. However, normal field practice requires re-evaluation of these procedures and implementation of alternate procedures upon encountering unusual or unexpected subsurface conditions. Deviations from the following typical procedures may be expected and should be noted on the Boring and Well Construction Log.

1. Investigate location of the proposed boreholes for buried utilities and obstructions. At least 48 hours before drilling, contact known or suspected utility services individually or through collective services such as "Underground Service Alert."

2. Decontaminate drill rods, split-spoon sampler, and other drilling equipment immediately prior to mobilization to the site.

3. Calibrate field organic vapor monitor equipment in accordance with the manufacturer's specifications. Note performance of the calibration in the geologist's field notebook.

4. Conduct "tail-gate" meeting and secure the work area in accordance with the Site Safety Plan.

5. Core concrete, if required.

6. Using hand-augering device, hand auger to a depth of 5 feet, if feasible, to clear underground utilities and structures not located by a utility service or on drawings. As appropriate, retain private buried utility location services or geophysical investigation services to search for buried utilities and obstructions. During initial advancement of each borehole, drill cautiously and have the driller pay particular attention to the "feel" of drilling conditions. The suspected presence of an obstruction, buried pipeline or cable, utility trench backfill, or similar may be cause for suspension of drilling, subject to further investigation.

7. Advance drill rods, or nested drill rods, to the desired sampling depth using hydraulic hammer or vibrator. Note depth interval, augering conditions, and driller's comments on Boring and Well Construction Log. Samples should be collected at intervals of 5 feet or less in homogeneous strata and at detectable changes of strata.

The sampling procedure varies depending on whether the drill rods are nesting-type. With nesting-type drill rods, the inner and outer drill rods are driven simultaneously. As they are driven, soil is forced into the lined inner drill rod. The outer drill rod is left in place and the inner drill rod is relined with sample sleeves and replaced for the next sampling segment. Where nesting-type drill rods are not used, a split-spoon sampler is used. The following sampling procedures cover sampling with a split-spoon sampler:

8. Remove drill rod and note presence of water mark on drill rod, if any. Also, monitor the top of hollow drill rods using field organic vapor monitor, as appropriate.

9. Decontaminate split-spoon sampler, liners, spatulas and knives, and other equipment that may directly contact the chemical characterization sample. Fit the split-spoon sampler with liners and attach to drill rod.

10. Lower split-spoon sampler until sampler is resting on soil. If more than 6 inches of slough exists inside the borehole, consider the conditions unsuitable and re-advance the drill rods and sampler to a new sampling depth.

11. Drive and recover split-spoon sampler. Record depth interval and sample recovery on Boring and Well Construction Log. Monitor the recovered split-spoon sampler with the field organic vapor monitor, as appropriate.

12. Remove either bottom-most or second-from-bottom liner (or both) from split-spoon sampler for purposes of chemical characterization and physical parameter testing. Observe soil at each end of liner(s) for purposes of completing sample description. Place Teflon® sheet at each end of liner, cover with plastic caps, and tape plastic caps with adhesiveless silicone tape (do not use electrical or duct tape) to further minimize potential loss of moisture or volatile compounds. Label liner(s) and place in Ziploc® bag on ice or dry ice inside cooler.

13. Extrude soil from remaining liner(s) and subsample representative 1-inch cube (approximate dimensions). Place subsample in Ziploc® bag and seal. Allow bag to equilibrate at ambient conditions for approximately 5 minutes and screen for organic vapors by inserting the probe of the field organic vapor monitor into the bag. Record depth interval, observed sample reading, and ambient (background) reading on the Boring and Well Construction Log. Discard bag and sample after use in the solid waste stockpile.

14. Classify soil sample in approximate accordance with ASTM D 2488-Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) and in accordance with the Unified Soil Classification System (USCS). Description should include moisture content, color, textural information, group symbol, group name, and odor. Optional descriptions, especially if classification is performed with protective gloves, include particle angularity and shape, clast composition, plasticity, dilatancy, dry strength, toughness, and reaction with HCl. Add notes on geologic structure of sample, as appropriate. Record depth interval, field organic vapor monitor reading, USCS classification, and other notes on the Boring and Well Construction Log.

15. Repeat steps 7 through 14 until total depth of borehole is reached.

16. If a grab groundwater sample is to be collected, slowly lower bailer through the open borehole to minimize agitation and aeration of the sampled water. Transfer the grab groundwater sample into sample container(s). Label sample container(s), place packing materials around containers, and place on ice inside cooler.

17. After drill rods are removed, complete borehole according to the requirements specified elsewhere or by abandonment in accordance with section 8.0.

18. Decontaminate drill rods between boreholes and after finishing last borehole prior to drill rig leaving site.

19. Change decontamination solutions and clean decontamination trough, buckets, and brushes between boreholes.

20. Containerize decontamination liquids in 17H steel drums. Affix completed "Caution - Analysis Pending" labels to the drums.

21. Store any excess soil sample on and cover with heavy plastic sheeting. If required by local regulations or due to site constraints, store excess soil sample in 5-gallon pails. Affix completed "Caution - Analysis Pending" labels to drums.

22. Complete Drum Inventory Sheet.

23. Complete pertinent portion of the chain-of-custody form and enter descriptions of field work performed in the field notebook.

4.0 Quality Assurance and Quality Control (QA/QC)

Optional quality control sampling consists of sequential replicates, collected at an approximate frequency of one sequential replicate for every 10 collected soil samples. Sequential replicates are collected by packaging two adjacent liners of soil from a selected split-spoon drive. Each sample is labeled according to normal requirements. The replicate samples obtained in such a manner are suitable for assessing the reproducibility of both chemical and physical parameters. Interpretations of data reproducibility should recognize the potential for significant changes in soil type, even over 6-inch intervals. Accordingly, sequential replicates do not supply the same information as normally encountered in duplicate or split samples. Duplicate or split samples are better represented by the laboratory performing replicate analyses on adjacent subsamples of soil from the same liner.

Optional quality control samples may be collected to check for cross-contamination using field blanks. Field blanks may be prepared by (1) wipe sampling decontaminated liners and split-spoon with Kimwipes®, (2) pouring clean silica sand into a decontaminated split-spoon sampler that has been fitted with liners, or (3) pouring deionized water over the decontaminated liners and split-spoon sampler and collecting the water that contacts the sampling implements for aqueous analysis. Field blanks may be prepared at the discretion of the field staff given reasonable doubt regarding the efficacy of the decontamination procedures.

The comparability of the field soil classification may be checked by conducting laboratory classification tests. Requests for laboratory testing verification of the field classification should be left to the discretion of the field staff.

Field decisions that may also affect the quality of collected data include the frequency of sampling and the thoroughness of documentation. Subject to reasonable limitations of budget and schedule, the completeness, comparability, and representativeness of data obtained using this SOP will be enhanced by decreasing the sampling interval (including collecting continuous samples with depth) and increasing the level of detail for sample classification and description of drilling conditions. More frequent sampling and more detailed documentation may be appropriate in zones of chemical concentration or in areas of critical geology (for example, zones of changing strata or cross-correlation of confining strata).

As required, rinse or wipe samples may be collected from the sampling equipment before the initial sampling is conducted to establish a baseline level of contamination present on the sampling equipment. Rinse or wipe samples may also be collected at intervals of decontamination wash and rinse events or after the final decontamination wash and rinse event.

5.0 Documentation

Observations, measurements, and other documentation of the drilling and soil sampling effort should be recorded on the following:

- Sample label
- Boring and Well Construction Log
- Field notebook
- Chain-of-custody form
- Drum Inventory Sheet

Documentation should include any deviations from this SOP, notations of unusual or unexpected conditions, and documentation of the containerization and disposal of investigation-derived waste. Information to be documented on the sample label and Boring and Well Construction Log is listed below.

5.1 Sample Label

- Project name and project number
- Borehole number
- Sample depth interval (feet below ground surface), record the depth interval using notation similar to "19.2-19.7;" generally do not record just one depth "19.2" because of uncertainty regarding the location such depth corresponds to (midpoint, top, etc.)
- Sample date and sample time
- Name of on-site geologist
- Optional designation of orientation of sample within the subsurface, for example, an arrow with "up" or "top" designated

5.2 Boring Log

- Project name, project number, and name of on-site geologist
- Borehole number
- Description of borehole location, including taped or paced measurements to noticeable topographic features (a location sketch should be considered)
- Date and time drilling started and completed
- Name of drilling company and name of drilling supervisor, optional names and responsibilities of driller's helpers
- Name of manufacturer and model number of sampling rig
- Type and size of sampler, optional description of the size of drill rod
- USCS classification
- Sampling interval and total depth of borehole

- Depth at which groundwater was first encountered with the notation "initial" and any other noted changes in groundwater movement or stabilized water level
- Field organic vapor monitor readings
- Method of boring completion
- Other notations and recordings described previously in section 2.0, Equipment and Materials, and section 3.0, Typical Procedures

6.0 Decontamination

Prior to entering the site, the sampling rig and appurtenant items (drill rods, split-spoon sampler, shovels, troughs and buckets, driller's stand, etc.) should be decontaminated by steam cleaning or pressure washing. Between each borehole, appurtenant items that contacted downhole soil (essentially all appurtenant items including drill rod, split-spoon sampler, shovels, troughs, and buckets, etc.) should be decontaminated by steam cleaning or pressure washing. The sampling rig should be steam cleaned or pressured washed as a final decontamination event. On-site decontamination should be conducted within the confines of a trough or lined pit to temporarily contain the wastewater. Between each borehole and prior to demobilization, the trough or lined pit should be decontaminated by steam cleaning or pressure washing. If a rack or other support is used to suspend appurtenant items over the trough or lined pit during decontamination, only the rack or other support needs to be decontaminated between boreholes.

Prior to collection of each sample, the split-spoon sampler, liners, sample catcher, spatulas and knives, and other equipment or materials that may directly contact the sample should be decontaminated. Decontamination for these items should consist of a soap wash (Alconox®, Liquinox®, or other organic-free, low-residue soap), followed by a clean water rinse. If testing for metals, a final rinse of deionized water should be conducted. Wastewater should be temporarily contained.

Between each borehole, buckets and brushes should be decontaminated by steam cleaning or pressure washing. Before installation of each borehole is begun, fresh decontamination solutions should be prepared. Decontaminated equipment should be kept off of the ground surface. Cleaned equipment should be placed on top of plastic sheeting, which is replaced after completion of each borehole, or on storage racks.

More rigorous decontamination procedures may be employed if necessary to meet sampling or QA/QC requirements.

7.0 Investigation-Derived Waste

Wastes resulting from the activities of this SOP may include excess soil samples, decontamination liquids, and miscellaneous waste (paper, plastic, gloves, bags, etc.).

Solid waste from each borehole should be placed on and covered with heavy plastic sheeting or containerized in DOT-approved 5-gallon pails. Solids from multiple boreholes may be combined within a single stockpile if field observations (presence or absence of chemical staining and field organic vapor monitoring) indicate the solids are similarly uncontaminated or similarly contaminated. Given sufficient space and reasonable doubt, separate stockpiles should be used for solid waste from each borehole.

Decontamination liquids for each borehole should be placed in individual 17H steel drums with completed "Caution - Analysis Pending" labels affixed. Liquids from multiple boreholes may be combined, subject to the same limitations as solids.

8.0 Borehole Abandonment

Each borehole should be completely filled with neat cement (5.5 gallons of water in proportion to one 94-pound bag of Type I/Type II Portland cement, ASTM C-150) from the bottom of the bore to grade surface. Water used to hydrate cement should be free of contaminants and organic material. Bentonite may be added to reduce shrinkage and improve fluidity. Add 3 to 5 pounds of bentonite with 6.5 gallons of water and one 94-pound bag of Type I/Type II Portland cement. The water and bentonite should be mixed first before adding the cement. The borehole should be filled from the bottom first to grade surface. A tremie pipe should be used in small diameter boreholes or in formations prone to bridging or collapse. The tremie pipe should be lifted as the cement grout is poured, but should never be lifted above the surface of the neat cement. In boreholes deeper than 50 feet, the neat cement may need to be applied with pressure.

9.0 References

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Driscoll, F.G., 1986. Groundwater and Wells. Johnson Filtration Systems Inc., St. Paul, MN, 1986.

Neilson, D.M., 1991. Practical Handbook of Ground-Water Monitoring. Lewis Publishers, Chelsea, MI, 1991.

United States Environmental Protection Agency, 1992. RCRA Ground-Water Monitoring: Draft Guidance Document. U.S. EPA, 1992.

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BORING & WELL CONSTRUCTION LOG:

Job No.:
Client:
Site:

Date Drilled:
Sample Container:

Driller:
Drilling Contractor:
Logged By:
Drilling Equipment:
Bore Diameter:
Total Depth: Ft.

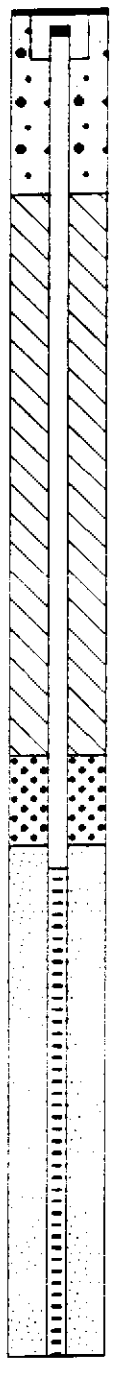
Well Completion Depth: '
Component Size/Type

Depths in Feet
From To

Initial Water Level: ▼
Stabilized water level: ▼

Surface Completion:
Blank Casing:
Slotted Casing:
Filter Pack:
Seal:
Annular Seal:
Surface Seal:
Bottom Seal:

Depth (ft)	Blows/6 In.	P.I.D. (ppm)	Samples	DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0							
5							
10							
15							
20							
25							
30							



(continued on next page)

BLYMYER ENGINEERS DRUM INVENTORY FORM

Number of Drums	Date Generated	Person on-site when generated	Soil or Groundwater	Contents (Cuttings, Purge Water, Development Water, Decon Water, PPE)	% Full	Bore or Monitoring Well ID	Do Lab Results Exist for Contents?

Date Client Informed? _____ All drums labeled? _____