

R0324



**Preliminary Soil and Groundwater Data Submittal and
Proposed Boring and Monitoring Well Locations
160 Holmes Street, Livermore, California**

Date:
December 9, 2005

Project No.:
015-01-008

Prepared For:
Manwel and Samira Shuwayhat
54 Wolfe Canyon Road
Kentfield, California 94904

Allterra Environmental, Inc.
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December 9, 2005

Project No.: 015-01-008

Jerry Wickham
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: Preliminary Soil and Groundwater Data Submittal and Proposed Boring and Monitoring Well Locations for 160 Holmes Street, Livermore, California

Dear Mr. Wickham:

On behalf of Manwel and Samira Shuwayhat, Allterra Environmental, Inc. (Allterra) has prepared this document to provide Alameda County Environmental Health – Local Oversight Program (ACEH) with preliminary soil and groundwater data from recent investigation activities and propose locations for new groundwater monitoring wells for the property located at 160 Holmes Street in Livermore, California (Site).

Should you have any questions please contact Allterra at (831) 425-2608.

Sincerely,
Allterra Environmental, Inc.

A handwritten signature in black ink, appearing to read "N. Allen", is written over the typed name.

Nathaniel Allen
Project Scientist

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ALAMEDA COUNTY



December 9, 2005
Project No.: 015-01-008

Manwel and Samira Shuwayhat
54 Wolfe Canyon Road
Kentfield, California 94904

Alameda County
DEC 15 2005

Subject: Preliminary Soil and Groundwater Data Submittal and Proposed Boring and Monitoring Well Locations for 160 Holmes Street, Livermore, California

Dear Mr. and Mrs. Shuwayhat:

On your behalf, Allterra Environmental, Inc. (Allterra) has prepared this document to provide Alameda County Environmental Health – Local Oversight Program (ACEH) with preliminary soil and groundwater data from recent investigation activities and propose locations for new groundwater monitoring wells for the property located at 160 Holmes Street in Livermore, California (Site).

Soil and Groundwater Investigation Activities

The following is a brief discussion of recent Geoprobe® drilling activities that were conducted at the Site in order to evaluate the subsurface geology and hydrology and determine the vertical and lateral extent of hydrocarbon in soil and groundwater beneath and down-gradient of the Site. The data collected during recent investigation work was reviewed and evaluated in order to determine the best groundwater monitoring well network for the Site. The data discussed herein will be formally presented in a technical report (with laboratory analytical reports, permits, boring logs, data tables, etc.) upon completion of soil and groundwater investigation activities.

Geoprobe® Borings

On November 10, 11, and 14, 2005, Allterra supervised the installation of Geoprobe® soil borings (continuous core and/or hydropunch) MB-1, MB-2, MB-3, DB-1, DB-2, DB-3, DB-4, DB-5, B-1, B-2, B-3, and HP-1. Boring locations are presented in Figure 1. Nine borings were continuously logged to approximately 32 feet below ground surface (bgs), two borings (MB-1 and MB-2) were continuously logged to approximately 52 feet bgs, and one boring (HP-1) was a hydropunch to approximately 28 feet bgs. Hydropunch borings, which were not logged, were installed at borings MB-1 through MB-3 in order to collect depth discrete groundwater samples. Groundwater samples were collected at 28 feet bgs from all borings, at approximately 52 feet bgs from borings MB-1 through MB-3, and at approximately 70 feet bgs from borings MB-1 and MB-3. A formal presentation of Geoprobe® boring installations and sample collection will be presented in a technical report following completion of investigation activities.

Soil and Groundwater Sample Analyses

Selected soil and all groundwater samples were submitted for chemical testing to McCampbell Analytical, Inc., of Pacheco, California, a state of California certified laboratory (ELAP #1644). Soil and groundwater samples collected from Geoprobe® borings were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and as diesel (TPHd) by EPA Method 8015Cm and benzene, toluene, ethylbenzene, xylenes (BTEX), and methyl tertiary butyl ether (MTBE) by EPA Method 8021b. Groundwater samples were also analyzed for MTBE, di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), and tert-butyl alcohol (TBA) by EPA Method 8260B.

Soil and Groundwater Investigation Results

Subsurface Geology and Hydrogeology

The local soil conditions encountered during drilling at the Site generally consisted of:

- Clayey silt with varying amounts of gravel and sand, from the ground surface to about 5-10 feet bgs;
- Gravel-sand-silt and gravel-sand-clay of variable composition underlying the clayey silt and generally extended to the depth of first-encountered groundwater, approximately 28 feet bgs. (However, this layer may extend to depths of up to 50 feet bgs near MW-3 and MB-2);
- Brown silty clay, with an average thickness of about 5 feet, was encountered within the above-referenced gravel-sand-silt/gravel-sand-clay layer;
- Relatively small and discontinuous lenses of clayey sand and clay were encountered in some borings near the groundwater table;
- Coarse-grained materials, generally consisting of sandy gravel with varying amounts of clay/silt, were encountered in borings logged below the uppermost groundwater table; and
- Possible clay layer at about 70 feet bgs. Water samples were collected from the bottom of two hydropunch borings that were advanced to 70 feet bgs. Although logging of soil was not possible in these borings, resistance encountered at 68-70 feet bgs by the driller in both hydropunch borings may be indicative of the clay aquitard described by other consultants in surrounding nearby areas. Furthermore, water subsequently rose within both borings, after retrieving water samples, to about 44 feet bgs, suggesting this water-bearing zone may be confined or partially confined, and distinct from the zone encountered at approximately 30 feet bgs.

Boring logs from Geoprobe® drilling are presented in Appendix A. The generalized geology and updated site conceptual model (SCM), simplified to show potentially water-bearing coarser-grained material and finer-grained material that is generally not considered water bearing, shows interlayering coarse- and fine-grained strata that are sometimes discontinuous above the water table and an upper aquifer consisting of sandy gravel with varying amounts of clay/silt. We present the hypothesis that hydropunch borings advanced to 70 feet bgs may have hit the top of a clay aquitard, and propose to confirm our hypothesis during future drilling that includes

advancement of a deep monitoring well. The generalized cross section is presented in Appendix B.

Soil and Groundwater Analytical Data

Soil and groundwater analytical results are presented in Tables 1 and 2, respectively. A formal presentation of the soil and groundwater data will be included in a technical report following completion of the soil and groundwater investigation. A general discussion of laboratory analytical results from soil and groundwater samples is presented below:

- Soil analytical results generally indicated moderate levels of hydrocarbon contamination between approximately 22 and 28 feet bgs in on-site borings adjacent to the former UST pit.
- High levels of dissolved TPHg (up to 42,000 µg/L), TPHd (up to 41,000 µg/L), and MTBE (up to 85,000 µg/L) were detected in groundwater samples collected at 28 feet bgs (initial groundwater) from borings MB-1, MB-3, B-2, and B-3. These borings were installed adjacent to the former UST pit (MB-1, B-2, and B-3) and directly down-gradient to the north (MB-3).
- Depth-discrete groundwater samples collected from borings MB-1 and MB-3 at depths of approximately 50 feet bgs indicated levels of TPHg up to 1,400 µg/L (MB-3) and MTBE up to 1,500 µg/L (MB-1).
- Depth-discrete groundwater samples collected from borings MB-1 and MB-3 at depths of approximately 70 feet bgs indicated levels of TPHg up to 990 µg/L (MB-1) and MTBE up to 1,200 µg/L (MB-1).

Conclusions

Based on field observations and laboratory data from Geoprobe® drilling activities, Allterra concludes the following:

- Subsurface soils encountered while advancing the Geoprobe® borings consisted of clayey silt, silty clay, sandy clay, gravel-sand-silt and gravel-sand-clay, and sandy gravel from near ground surface to at least the total depth of the logged portion of the borings, which ranged from 28 to 52 feet bgs.
- During drilling, initial groundwater was encountered at approximately 28 feet bgs and the static groundwater surface stabilized at approximately 22 feet bgs. The rise of groundwater surface suggests the shallow aquifer beneath the Site is locally confined to semi-confined.
- Soil types encountered from approximately 28 feet bgs (initial groundwater) to approximately 52 feet bgs consisted of coarse-grained material and no apparent aquitard (clay layer) was encountered within this interval.
- Groundwater analytical results indicate lateral definition of the dissolved hydrocarbon plume up-gradient to the south (MB-2) and cross-gradient to the west (DB-2).

- When compared to data from borings in the core of the dissolved plume (MB-1, MB-3, B-2, and B-3), concentrations of petroleum hydrocarbons are relatively low in samples from cross-gradient borings (B-1, DB-1, and DB-5 to the east and DB-2, DB-3, DB-4, and HP-1 to the west).
- In general, the highest levels of hydrocarbon concentrations in groundwater were detected at approximately 28 feet bgs and levels generally decrease with depth.
- Previously installed groundwater monitoring wells MW-1, MW-2, and MW-3 extend to approximately 30 feet bgs and have a screen interval from 15 to 30 feet bgs. These wells appear to be appropriately constructed and do not appear to have a screen interval that extends through multiple water-bearing zones.
- Previously installed groundwater monitoring wells MW-4, MW-5, and MW-6 extend to approximately 50 feet bgs and have a screen interval from 20 to 50 feet bgs. These wells appear to be appropriately constructed and do not appear to have a screen interval that extends through multiple water-bearing zones.
- Previously installed well EX-1 extends to approximately 55 feet bgs and is screened from 30 to 55 feet bgs. While well EX-1's screen interval does not appear to extend through multiple water-bearing zones, its construction is not ideal for use as an extraction well for remediation. Dual-phase extraction will likely be the best approach for cleanup of the site and, therefore, extraction wells should have a screen interval that extends above the water table.

Hypothesis and Recommended Actions Regarding Subsurface Conditions

The following discussion presents Allterra's general hypothesis for subsurface conditions beneath and down-gradient of the Site. Our hypotheses are based on previous investigative findings at the Site, discussions with ACEH, a review of files for other LUFT projects in the Livermore area, and field observations and analytical results from recent Geoprobe® drilling.

Hypothesis 1:

- Shallow groundwater (at approximately 30 feet bgs), in the immediate vicinity of the former UST pit and directly north (inferred down-gradient direction), is highly contaminated with petroleum hydrocarbons. The core of the dissolved plume extends laterally down-gradient to the north, directly toward boring MB-3, and appears to be fairly narrow (limited laterally to the east and west).
- Hydrocarbon levels within the groundwater plume generally decrease with depth; yet appear to have impacted Aquifer 1 throughout its vertical extent.
- Fourth quarter 2005 sampling data indicate TPHg and MTBE levels in well MW-1 of 58,000 µg/L and 170,000 µg/L, respectively; while TPHg and MTBE levels in well EX-1 (located approximately 5 feet from MW-1) were <50 µg/L and 31 µg/L, respectively. Allterra's hypothesis for the disparity of contaminant levels is based on each well's screen interval: Well MW-1's screen interval extends approximately 2 feet into the top

of the first aquifer and virtually “skims” LNAPL contaminants, such as hydrocarbons, off the top of the aquifer, resulting in elevated contaminant levels. By contrast, well EX-1’s screen interval extends from just below the top of the aquifer to 55 feet bgs, which appears to block off the top 2 feet of the aquifer (where it appears that the majority of the LNAPL contaminants reside) and allows the surrounding formation groundwater to dilute the hydrocarbon contaminants in the well.

Recommended Action 1:

- In order to evaluate hydrocarbons levels with depth and measure vertical hydraulic gradients, groundwater monitoring wells with depth-discrete screen intervals will be installed in two key locations. One location will be at boring MB-3 and will consist of three separate 2-inch diameter wells designated MW-7A, MW-7B, and MW-7C. Well MW-7A will be constructed with a screen interval from 15 to 30 feet bgs, MW-7B will be screened from 45 to 50 feet bgs, and MW-7C will be screened from 65 to 70 feet bgs. The other depth-discrete sampling location will be at well MW-1, and will consist of two separate 2-inch diameter wells designated MW-1B and MW-1C (MW-1 will be renamed MW-1A). Well MW-1B will be constructed with a screen interval from 45 to 50 feet bgs and MW-1C will be screened from 65 to 70 feet bgs. The new wells will allow for depth discrete data collection from within the core of the hydrocarbon plume. A typical well construction diagram for the proposed wells is presented in Figure 3.

Hypothesis 2:

- Well MW-5 is located directly down-gradient of “hot” well MW-1 and “hot” boring MB-3, yet historical groundwater monitoring data indicates relatively low levels of TPHg and MTBE (when compared to MW-1 and MB-3). Allterra’s hypothesis for the relatively low hydrocarbon levels is based on well MW-5’s screen interval and is as follows: Well MW-5 has a screen interval that extends from 20 to 50 feet bgs, which allows formation water from approximately 28 to 50 feet bgs into the well. Allterra believes that groundwater from the deeper portions of the aquifer enters the well and dilutes LNAPL hydrocarbon contaminants that enter the well from the top portion of the aquifer.

Recommended Action 2:

- In order to evaluate hydrocarbon levels in the uppermost portion of the shallow aquifer down-gradient of MB-3, Allterra recommends installing a Geoprobe® boring (MB-4) near well MW-5 (see Figure 2) and collecting a groundwater sample from the top of the aquifer (at approximately 28 feet bgs).
- In order to evaluate hydrocarbon concentrations at approximately 50 feet bgs, a hydropunch Geoprobe® boring will be installed adjacent to MB-4 in order to collect a depth discrete groundwater sample at approximately 50 feet bgs.
- Data collected from boring MB-4 will be used to evaluate the need for re-installing well MW-5 with a different screen interval.

Hypothesis 3:

- Based on the high levels for petroleum hydrocarbons observed in borings B-2, B-3, and MB-1, it appears as though the source of hydrocarbon contamination is the area surrounding the former UST pit. Therefore, in order to begin interim remediation of the suspected source area, dual-phase extraction wells should be installed in appropriate locations and an interim remediation system should be installed.

Recommended Action 3:

- Well EX-1 appears to be appropriately located; however, its screen interval is not ideal for remediation. Therefore, Allterra recommends drilling out well EW-1 and re-installing it to a depth of 40 feet bgs with a screen interval from 15 to 40 feet bgs.
- Allterra recommends installing a second extraction well (EX-2) at boring B-2. Well EX-2 will also be installed to an approximate depth of 40 feet bgs and have a screen interval from 15 to 40 feet bgs.
- After the new extraction wells are installed, Allterra recommends performing dual-phase extraction pilot testing using the new extraction wells. Pilot testing at the new extraction wells will provide Allterra with the necessary data to design, permit, and construct an interim remediation system at the Site.

Hypothesis 4:

- The first aquifer (Aquifer 1) beneath the Site begins at approximately 28 feet bgs and extends to approximately 70 feet bgs and is locally confined to semi-confined.
- An aquitard of undetermined thickness (estimated to be approximately 40 feet) exists beneath Aquifer 1 and a second aquifer (Aquifer 2) underlies the aquitard.
- Allterra hypothesizes that the hydrocarbon plume originating from the Site has not impacted Aquifer 2.

Recommended Action 4:

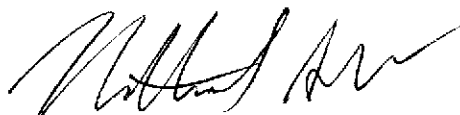
- Over the next several quarters, Allterra recommends monitoring groundwater quality at 70 feet bgs from within Aquifer 1 using data from the proposed "C-level" wells (MW-1C and MW-7C).
- If monitoring data indicates that hydrocarbons have impacted the lower portion of Aquifer 1, then it may be necessary to install a boring to the second aquifer, estimated to be approximately 110 feet bgs, and complete the boring as a groundwater monitoring well in order to monitor groundwater quality in Aquifer 2. The well will be sealed off from Aquifer 1 and be constructed with a five-foot screen interval at the top of Aquifer 2. The well will be designated MW-7D and its proposed location is presented in Figure 2.

Limitations

Allterra prepared this document for the use of Mr. Manwel and Mrs. Samira Shuwayhat and ACEH in evaluating site conditions at selected on-site locations at the time of this study. Statements, conclusions, and recommendations in this document are based solely on the field observations and analytical results related to work performed by Allterra and there is no warranty, expressed or implied. Site conditions and data can change over time; therefore, data presented in this report is only applicable to the timeframe of this study. Allterra's services have been performed in accordance with environmental principles generally accepted at this time and location.

Should you have any questions, please contact Allterra at (831) 425-2608.

Sincerely,
Allterra Environmental, Inc.



for
James Allen, R.E.A.
Project Scientist



Michael Killoran, P.G. 6670
Senior Geologist

Attachments:

- Figure 1, Site Plan
- Figure 2, Proposed Boring and Well Location Plan
- Figure 3, Typical Well Construction Diagram

- Table 1, Preliminary Soil Analytical Results
- Table 2, Preliminary Groundwater Analytical Results

- Appendix A, Boring Logs
- Appendix B, Generalized Cross Sections

cc: Mr. Jerry Wickham, ACEH

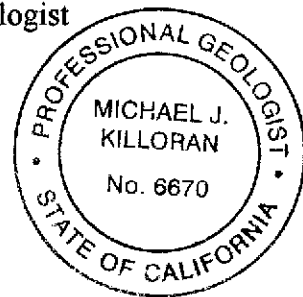


Table 2
Preliminary Groundwater Analytical Results
 160 Holmes Street, Livermore, California

Sample ID	Sample Depth (feet)	Date Collected	Total Petroleum Hydrocarbons as (µg/L)		Aromatic Volatile Organic Compounds (µg/L)				Oxygenated Volatile Organics (µg/L)				
			Gasoline	Diesel	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	DIPE	ETBE	TAME	TBA
MB-1-A**	28	11/11/05	21,000	4,300	970	<25	3,300	1200	100,000	<2,500	<2,500	<2,500	<25,000
MB-1-B	50	11/11/05	470	210	7.8	0.97	31	48	1,500	<25	<25	<25	<250
MB-1-C	70	11/11/05	990	--*	17	1.3	89	160	1,200	<25	<25	<25	<250
MB-2-A	28	11/10/05	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0
MB-2-B	50	11/11/05	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0
MB-3-A	28	11/11/05	40,000	41,000	120	130	1,700	2,800	<4,500	<50	<50	<50	2,500
MB-3-B	50	11/14/05	1,400	210	0.93	9.3	14	27	190	<50	<50	<50	6,200
MB-3-C	70	11/14/05	930	260	1.7	3.8	33	100	330	<100	<100	<100	16,000
DB-1-A	28	11/10/05	160	--*	<0.5	<0.5	<0.5	<0.5	86	<1.7	<1.7	<1.7	<17
DB-2-A	28	11/11/05	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0
DB-3-A	28	11/14/05	<50	51	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0
DB-4-A	28	11/14/05	<50	57	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0
DB-5-A	28	11/11/05	<50	910	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0
B-1-A	28	11/10/05	<50	230	<0.5	<0.5	<0.5	<0.5	28	<0.5	<0.5	<0.5	<5.0
B-2-A	28	11/10/05	25,000	6,200	900	<50	2,000	2,600	80,000	<1,700	<1,700	<1,700	<17,000
B-3-A	28	11/10/05	42,000	14,000	530	140	2,400	7,800	19,000	<500	<500	<500	<5,000
HP-1-A	28	11/14/05	<50	--*	<0.5	<0.5	<0.5	0.80	12	<50	<50	<50	24

Notes:

µg/L = micrograms per liter

NS = Not Sampled

NA = Not Analyzed

TPHg and TPHd were analyzed by EPA Method 8015CM

Benzene, toluene, ethylbenzene, and xylenes were analyzed by EPA Method 8021B

MTBE, DIPE, ETBE, TAME, and TBA were analyzed by EPA Method 8260b.

--* = insufficient groundwater available TPHd analysis

** : MB-1-A samples tested for fuel oxygenates by EPA Method 8260 were past laboratory hold time

MTBE = methyl tertiary butyl ether

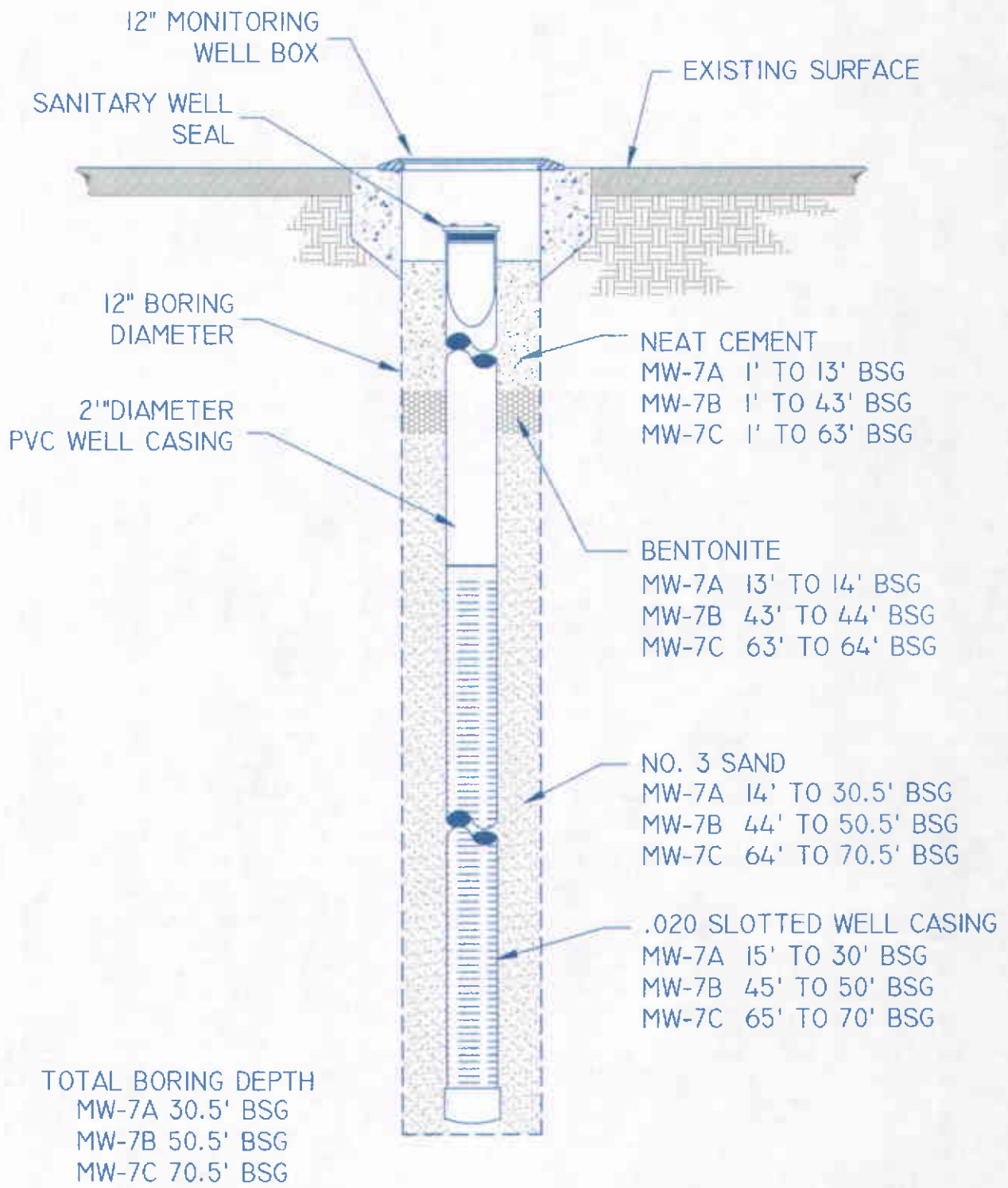
DIPE = Di-isoprpropyl Ether

ETBE = Ethyl tert-Butyl Ether

TAME - tert-Amyl Methyl Ether

TBA = tert-Butanol

APPENDIX A, Boring Logs



ALLTERRA
 849 ALMAR AVE., SUITE C, No. 281
 SANTA CRUZ, CALIFORNIA
 WWW.ALLTERRAENV.COM

TYPICAL MONITORING WELL
 CONSTRUCTION DIAGRAM
 160 HOLMES STREET
 LIVERMORE, CALIFORNIA

FIGURE 3
 12/05/05

Table 1
Preliminary Soil Analytical Results
160 Holmes Street, Livermore, California

Sample ID	Sample Depth (feet)	Sample Date	TPHg	TPHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MB-1	18	11/11/05	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
MB-1	22	11/11/05	78	23	0.028	0.073	1.0	4.8	2.3
MB-1	26	11/11/05	110	18	0.27	0.51	2.0	1.7	14
MB-3	20	11/11/05	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
MB-3	28	11/11/05	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
MB-3	32	11/11/05	1,400	100	<0.5	5.0	20	67	<5.0
B-1	28	11/10/05	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05
B-2	16	11/10/05	<1.0	-	<0.005	<0.005	<0.005	<0.005	<0.05
B-2	20	11/10/05	<1.0	-	<0.005	<0.005	<0.005	<0.005	<0.05
B-2	24	11/10/05	5.7	9.5	<0.005	0.018	0.076	0.25	1.7
B-2	28	11/10/05	11	2.4	0.075	0.073	0.26	0.14	7.2
B-3	16	11/10/05	<1.0	-	<0.005	<0.005	<0.005	<0.005	<0.05
B-3	20	11/10/05	<1.0	-	<0.005	0.0058	0.0071	0.024	<0.05
B-3	24	11/10/05	9.0	1.4	0.077	0.037	0.32	1.1	<1.0
B-3	28	11/10/05	48	6.1	0.053	0.20	0.53	0.49	<1.0
DB-1	26	11/10/05	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<0.05

Notes and Definitions:

All results are in milligrams per kilogram (mg/kg)

TPHg and TPHd were analyzed by EPA Method 8015CM

Benzene, toluene, ethylbenzene, and xylenes were analyzed by EPA Method 8021B

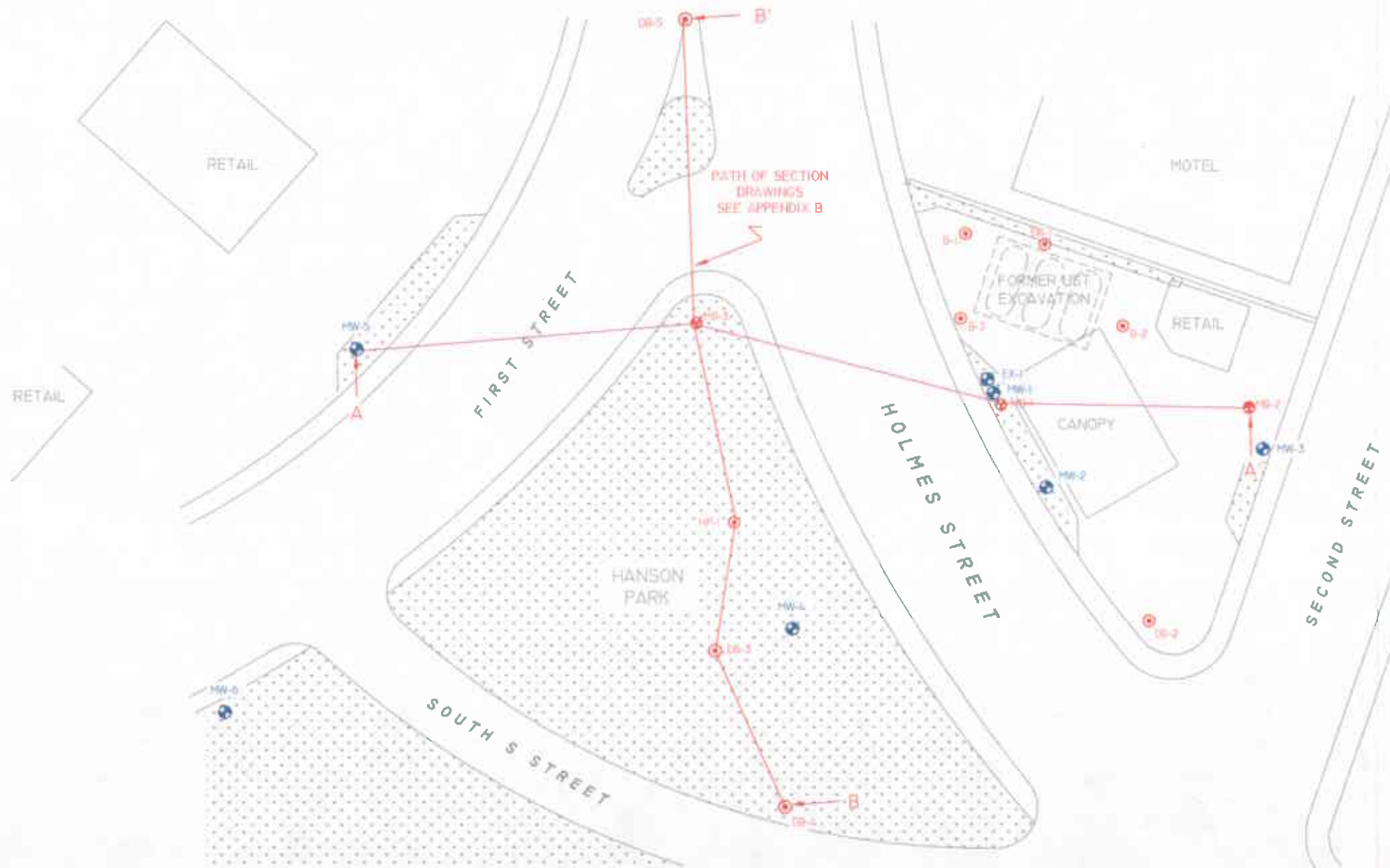
- : not analyzed

ND: Not Detected at or above laboratory reporting limits

TPHg: Total Petroleum Hydrocarbons as gasoline

TPHd: Total Petroleum Hydrocarbons as diesel

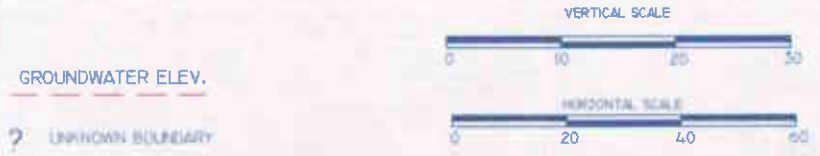
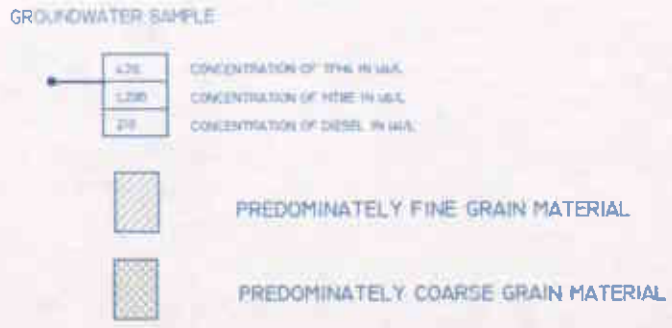
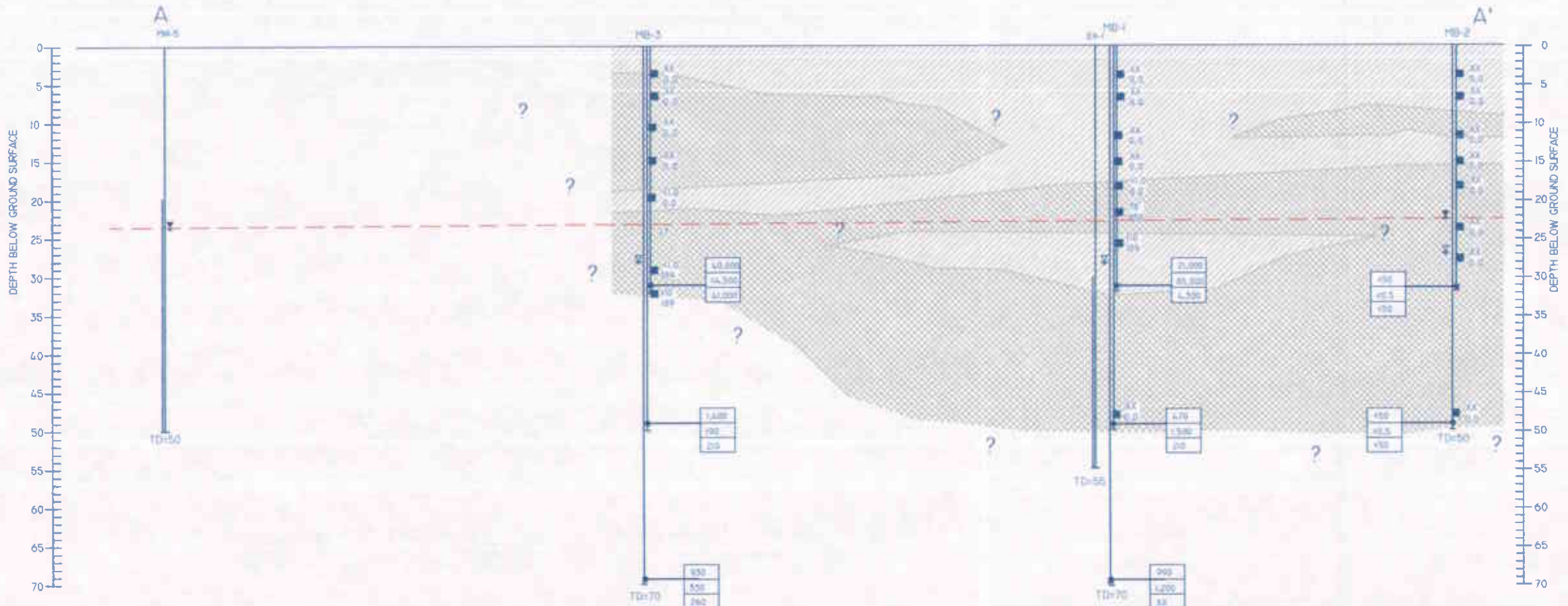
MTBE = methyl tertiary butyl ether



LEGEND:

- MW-4 MONITORING WELL LOCATION
- EX-1 EXTRACTION WELL LOCATION
- ⊙ SB-1 SOIL BORING LOCATION
- ⊙ MB-1 MULTI-POINT SOIL BORING LOCATION

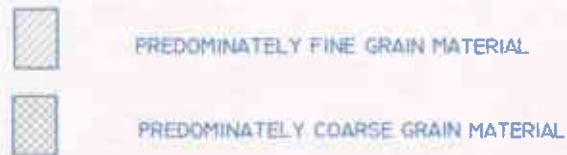
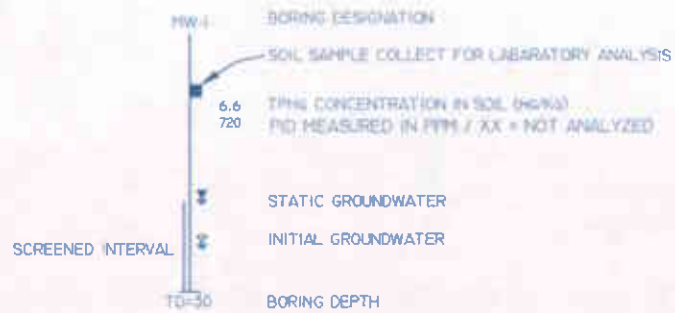
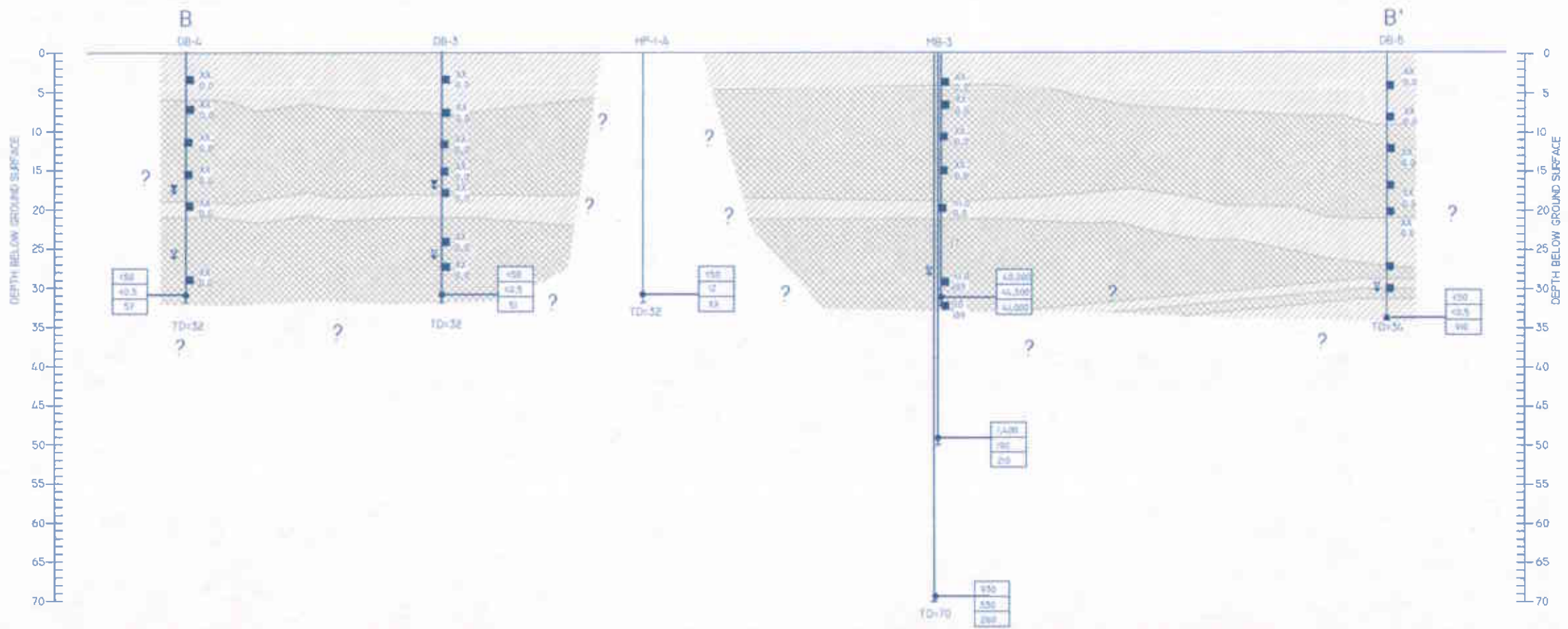
<small>140 ALPHEA AVE., SUITE C, P.O. BOX 281 SANTA CRUZ, CALIFORNIA WWW.ALLTERRAENV.COM</small>	SITE MAP <small>160 HOLMES STREET LIVERMORE, CALIFORNIA</small>	FIGURE 1 <small>12/5/05</small>
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ALLTERRA
 849 ALPINE AVE., SUITE C, NO. 28
 SANTA CRUZ, CALIFORNIA
 WWW.ALLTERRA.COM

CROSS SECTION A-A' OF THE SITE
 CONCEPTUAL MODEL
 180 HOLMES STREET
 LIVERMORE, CALIFORNIA

12/1/05



? UNKNOWN BOUNDARY

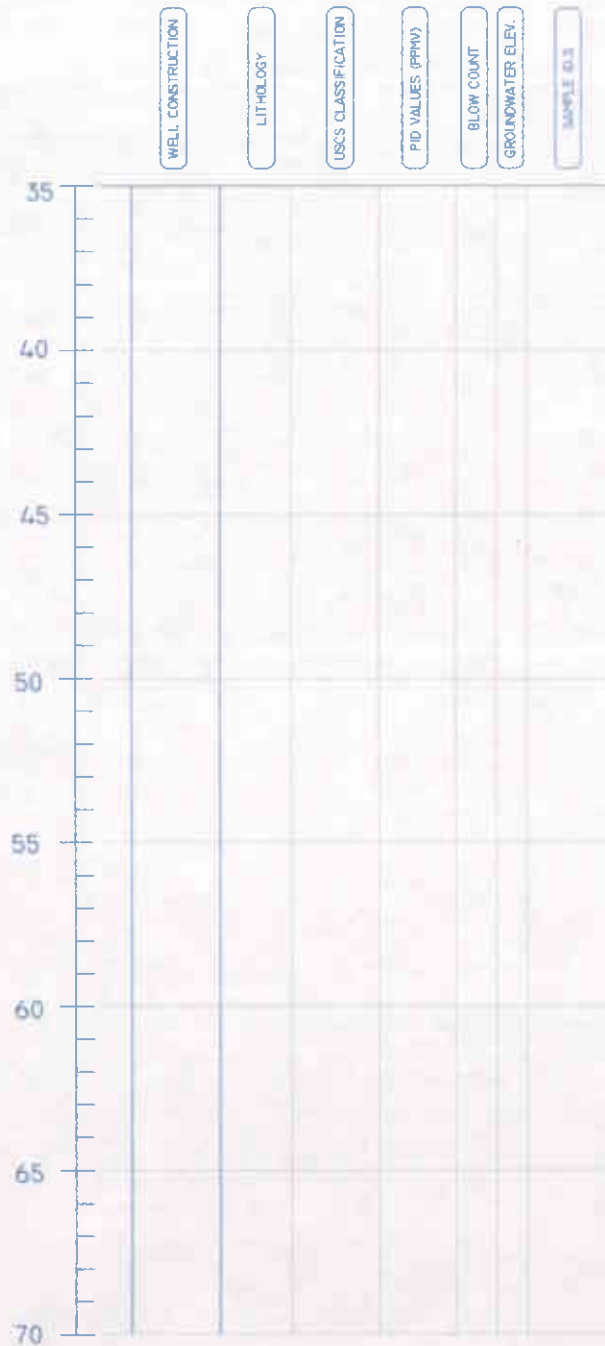
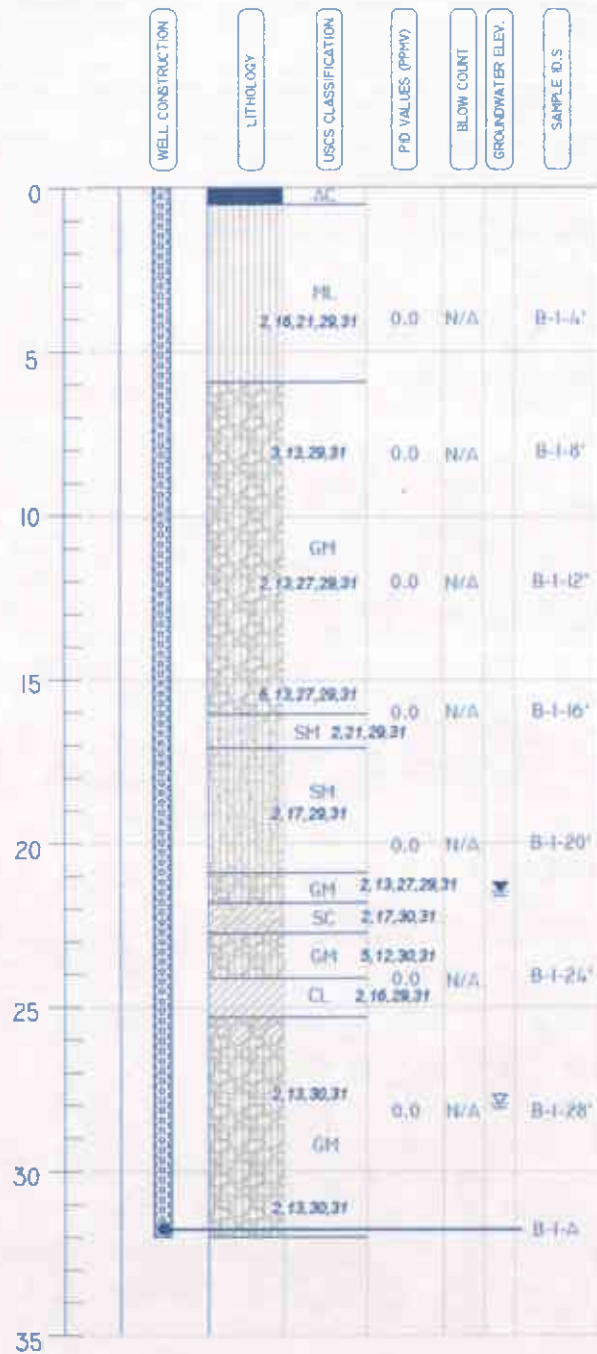


ALLTERRA
644 ALPHEA AVE., SUITE C, No. 201
SANTA CRUZ, CALIFORNIA
WWW.ALLTERRA.COM

CROSS SECTION B-B' OF THE SITE
CONCEPTUAL MODEL
160 HOLMES STREET
LIVERMORE, CALIFORNIA

12/5/05

DEPTH BELOW GROUND SURFACE



BORING INFORMATION		
WELL I.D.	B-1	TOTAL DEPTH 32'
LOGGED BY:	MICHAEL KILLORAN	CASING DIA. NONE
CONTRACTOR	ECA	DRILLED DEPTH 32'
METHODE	GEO PROBE	START DATE 11/10/05
BORING DIA.	2 1/2"	COMPLETION 11/10/05

LEGEND		
WELL CONSTRUCTION	USCS CLASSIFICATIONS	USCS CLASSIFICATIONS
BENTONITE	PT FEET	SP POORLY GRADED SAND
NO. 2 SAND	OL ORGANIC SILT OR CLAY	SW WELL GRADED SAND
CONCRETE	CL SILTY OR SANDY CLAY	GC CLAYEY GRAVEL
LANDSCAPE	ML CLAYEY SILT	GM SILTY GRAVEL
ASPHALT	SC CLAYEY SAND	GP POORLY GRADED GRAVEL
NEAT CEMENT	SM SILTY SAND	GW WELL GRADED GRAVEL

NOTE: "H" USED IN PLACE OF "L" FOR THE SECOND LETTER OF THE ABOVE DENOTES LIQUID LIMITS OF 50% OR GREATER

GROUNDWATER ELEV. (INITIAL) N/A NOT APPLICABLE
 GROUNDWATER ELEV. (STATIC) GROUNDWATER SAMPLE

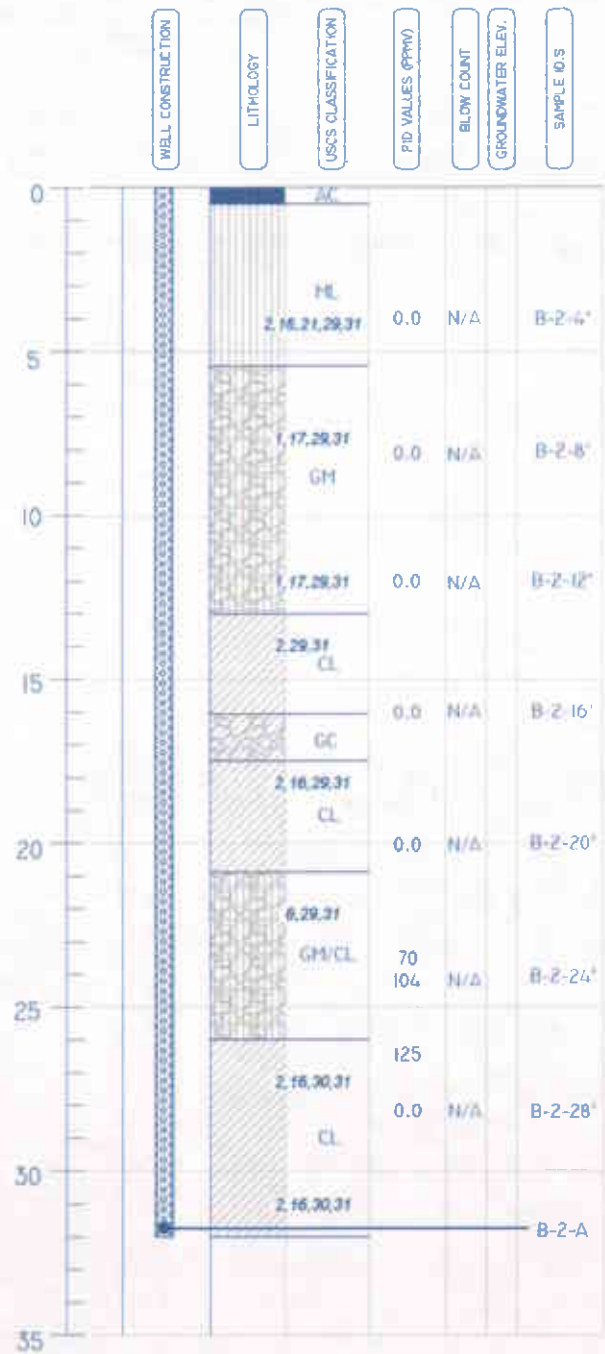
SOIL DESCRIPTION KEY		
1 DARK BROWN	12 <5% CLAY AND SILT	23 NOT USED
2 MEDIUM BROWN	13 <20% CLAY AND SILT	24 NOT USED
3 LIGHT BROWN	14 <35% CLAY AND SILT	25 NOT USED
4 LIGHT RUST	15 <45% CLAY AND SILT	26 FRACTURED ROCK
5 RUST	16 < 5% COARSE MATERIAL < 4.75 MM	27 WEATHERED ROCK
6 RUSTY BROWN	17 < 20% COARSE MATERIAL < 4.75 MM	28 DRY
7 DARK OLIVE	18 < 35% COARSE MATERIAL < 4.75 MM	29 MOIST
8 MEDIUM OLIVE	19 < 50% COARSE MATERIAL < 4.75 MM	30 WET (FREE WATER)
9 LIGHT OLIVE	20 < 5% COARSE MATERIAL > 4.75 MM	31 NO PRODUCT ODOR
10 GREY BROWN	21 < 20% COARSE MATERIAL > 4.75 MM	32 MODERATE PRODUCT ODOR
11 LT. GREY BROWN	22 < 35% COARSE MATERIAL > 4.75 MM	33 STRONG PRODUCT ODOR

ALLTERRA
 849 ALMAR AVE., SUITE C, No. 28
 SANTA CRUZ, CALIFORNIA
 WWW.ALLTERRA.COM

BORING LOG B-1
 110 HOLMES STREET
 LIVERMORE, CALIFORNIA

11/21/05

DEPTH BELOW GROUND SURFACE



BORING INFORMATION			
WELL I.D.	B-2	TOTAL DEPTH	32'
LOGGED BY:	MICHAEL KILLORAN	CASING DIA.	NONE
CONTRACTOR	ECA	DRILLED DEPTH	32'
METHODE	GEO PROBE	START DATE	11/10/05
BORING DIA.	2 1/2"	COMPLETION	11/10/05

LEGEND

WELL CONSTRUCTION	USCS CLASSIFICATIONS	USCS CLASSIFICATIONS
BENTONITE	PT FEET	SP POORLY GRADED SAND
NO. 2 SAND	OL ORGANIC SILT OR CLAY	SW WELL GRADED SAND
CONCRETE	CL SILTY OR SANDY CLAY	GC CLAYEY GRAVEL
LANDSCAPE	ML CLAYEY SILT	GM SILTY GRAVEL
ASPHALT	SC CLAYEY SAND	GP POORLY GRADED GRAVEL
NEAT CEMENT	SH SILTY SAND	GW WELL GRADED GRAVEL

NOTE: 'C' USED IN PLACE OF 'L' FOR THE SECOND LETTER OF THE ABOVE DENOTES LIQUID LIMITS OF 50% OR GREATER

GROUNDWATER ELEV. (INITIAL) N/A NOT APPLICABLE

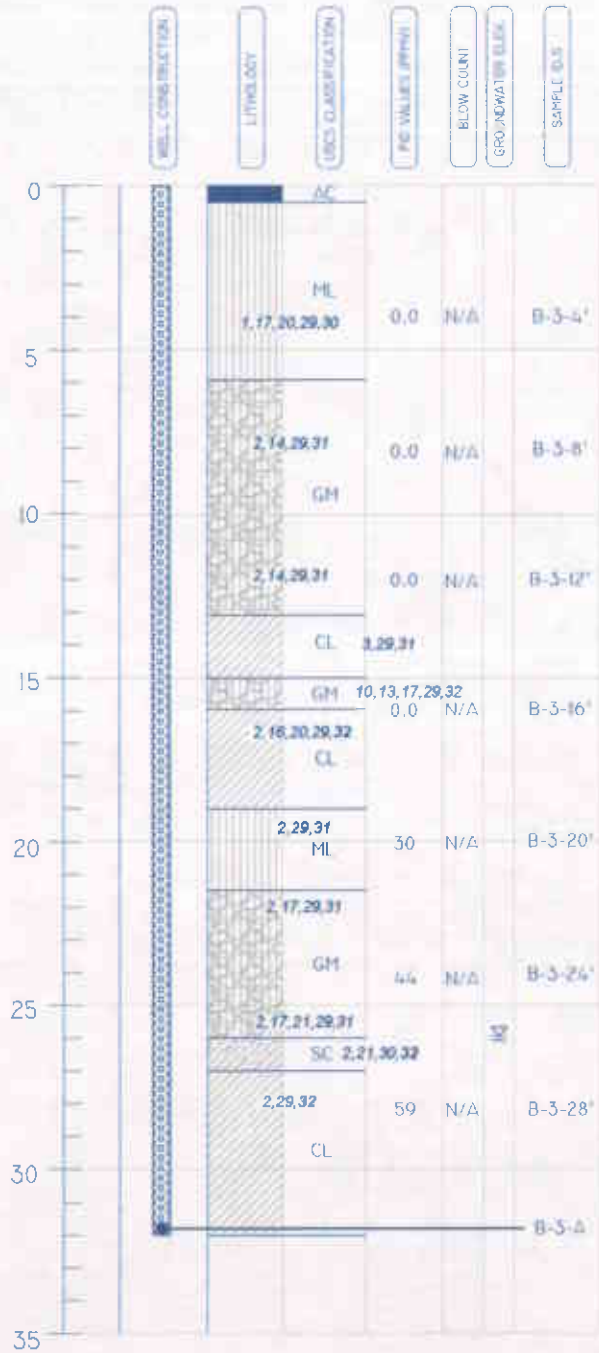
GROUNDWATER ELEV. (STATIC) GROUNDWATER SAMPLE

SOIL DESCRIPTION KEY

1 DARK BROWN	12 <5% CLAY AND SILT	23 NOT USED
2 MEDIUM BROWN	13 <20% CLAY AND SILT	24 NOT USED
3 LIGHT BROWN	14 <35% CLAY AND SILT	25 NOT USED
4 LIGHT RUST	15 <65% CLAY AND SILT	26 FRACTURED ROCK
5 RUST	16 < 5% COARSE MATERIAL < 4.75 MM	27 WEATHERED ROCK
6 RUSTY BROWN	17 < 20% COARSE MATERIAL < 4.75 MM	28 DRY
7 DARK OLIVE	18 < 30% COARSE MATERIAL < 4.75 MM	29 MOIST
8 MEDIUM OLIVE	19 < 45% COARSE MATERIAL < 4.75 MM	30 WET (FREE WATER)
9 LIGHT OLIVE	20 < 5% COARSE MATERIAL > 4.75 MM	31 NO PRODUCT ODOR
10 GREY BROWN	21 < 20% COARSE MATERIAL > 4.75 MM	32 MODERATE PRODUCT ODOR
11 LT GREY BROWN	22 < 30% COARSE MATERIAL > 4.75 MM	33 STRONG PRODUCT ODOR

ALLTERRA 849 ALMAR AVE., SUITE C, NO. 291 SANTA CRUZ, CALIFORNIA WWW.ALLTERRAENV.COM	BORING LOG B-2 150 HILFES STREET LIVERMORE, CALIFORNIA	11/21/05
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DEPTH BELOW GROUND SURFACE



BORING INFORMATION			
WELL I.D.	B-3	TOTAL DEPTH	32'
LOGGED BY:	MICHAEL KILLORAN	CASING DIA.	NONE
CONTRACTOR	ECA	DRILLED DEPTH	32'
METHOD	GEO PROBE	START DATE	11/10/05
BORING DIA.	2.1/2"	COMPLETION	11/10/05

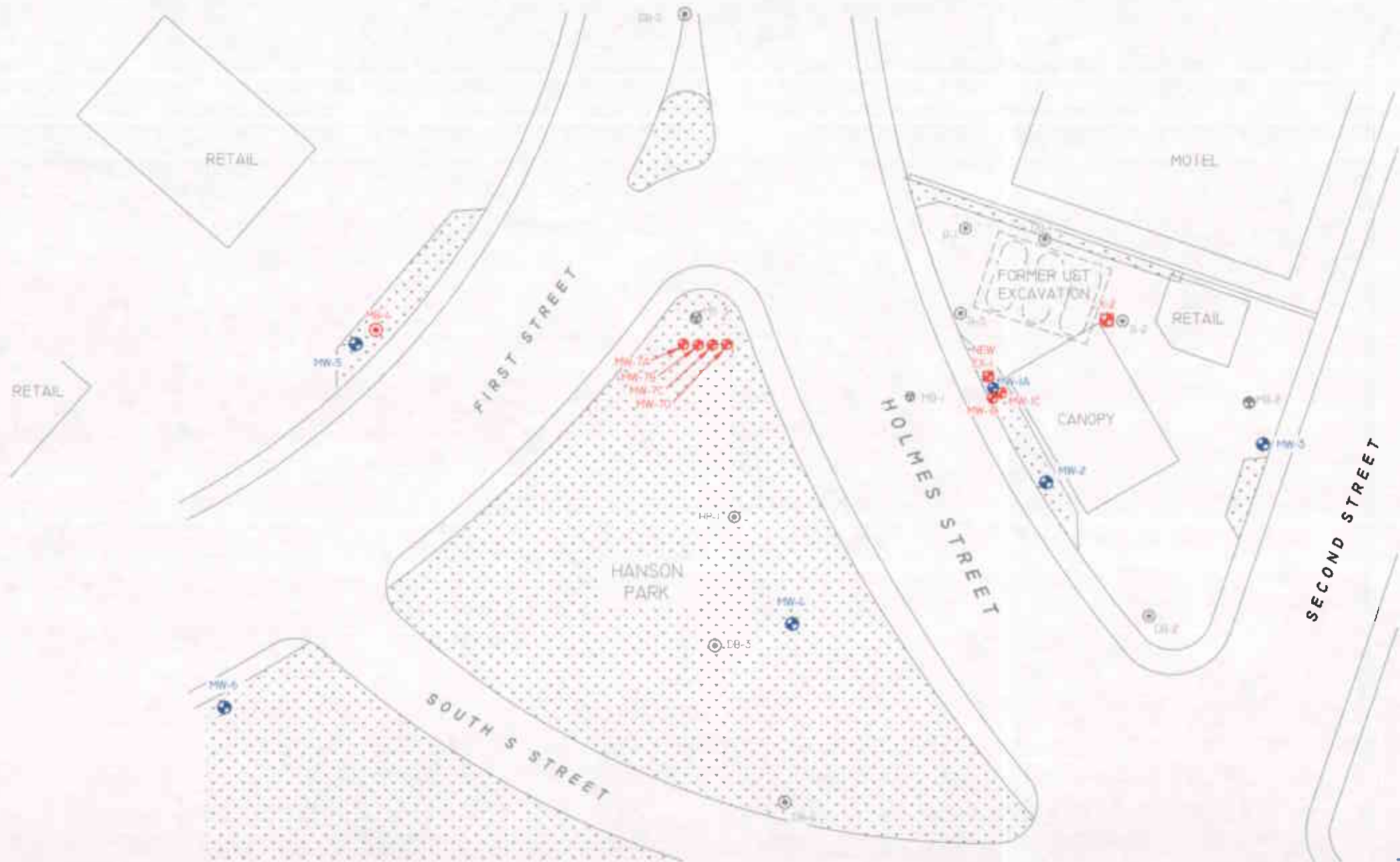
LEGEND		
WELL CONSTRUCTION	USCS CLASSIFICATIONS	USCS CLASSIFICATIONS
BENTONITE	PT FEET	SP POORLY GRADED SAND
NO. 2 SAND	OL ORGANIC SILT OR CLAY	SW WELL GRADED SAND
CONCRETE	CL SILTY OR SANDY CLAY	GC CLAYEY GRAVEL
LANDSCAPE	ML CLAYEY SILT	GM SILTY GRAVEL
ASPHALT	SC CLAYEY SAND	GP POORLY GRADED GRAVEL
NEAT CEMENT	SM SILTY SAND	GW WELL GRADED GRAVEL

NOTE: "L" USED IN PLACE OF "L" FOR THE SECOND LETTER OF THE ABOVE DENOTES LIQUID LIMITS OF 50% OR GREATER

GROUNDWATER ELEV. (INITIAL) N/A NOT APPLICABLE
 GROUNDWATER ELEV. (STATIC) GROUNDWATER SAMPLE

SOIL DESCRIPTION KEY		
1 DARK BROWN	12 <1% CLAY AND SILT	23 NOT USED
2 MEDIUM BROWN	13 <7% CLAY AND SILT	24 NOT USED
3 LIGHT BROWN	14 <30% CLAY AND SILT	25 NOT USED
4 LIGHT RUST	15 <45% CLAY AND SILT	26 FRACTURED ROCK
5 RUST	16 <5% COARSE MATERIAL < 4.75 MM	27 WEATHERED ROCK
6 RUSTY BROWN	17 <20% COARSE MATERIAL < 4.75 MM	28 DRY
7 DARK OLIVE	18 <30% COARSE MATERIAL < 4.75 MM	29 MOIST
8 MEDIUM OLIVE	19 <40% COARSE MATERIAL < 4.75 MM	30 WET (FREE WATER)
9 LIGHT OLIVE	20 <5% COARSE MATERIAL > 4.75 MM	31 NO PRODUCT ODOR
10 GREY BROWN	21 <20% COARSE MATERIAL > 4.75 MM	32 MODERATE PRODUCT ODOR
11 LT. GREY BROWN	22 <30% COARSE MATERIAL > 4.75 MM	33 STRONG PRODUCT ODOR

 849 ALVARO AVE., SUITE C, No. 201 SANTA CRUZ, CALIFORNIA WWW.ALLTERRA.COM	BORING LOG B-3 140 HOLMES STREET LIVERMORE, CALIFORNIA	11/21/05
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LEGEND:

- MW-1 MONITORING WELL LOCATION
- EX-1 EXTRACTION WELL LOCATION
- B-1 SOIL BORING LOCATION
- MB-1 MULTI-POINT SOIL BORING LOCATION

- EX-2 PROPOSED EXTRACTION WELL LOCATION
- MW-4 PROPOSED MONITORING WELL LOCATION
- MB-4 PROPOSED SOIL BORING LOCATION



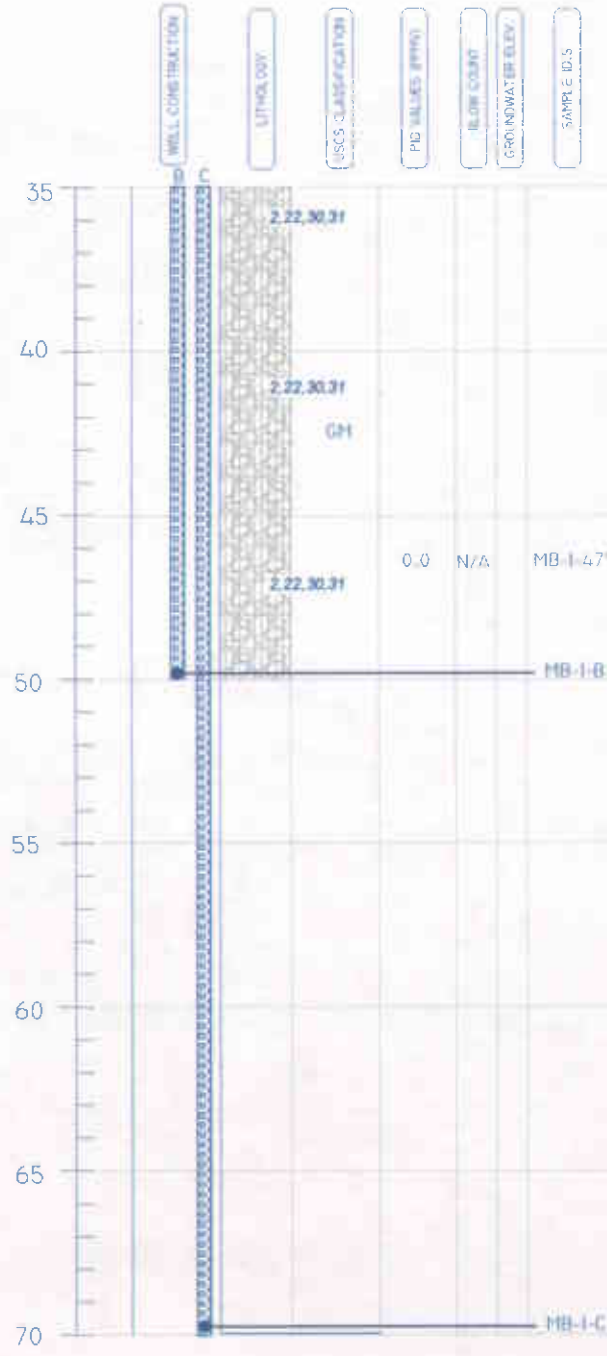
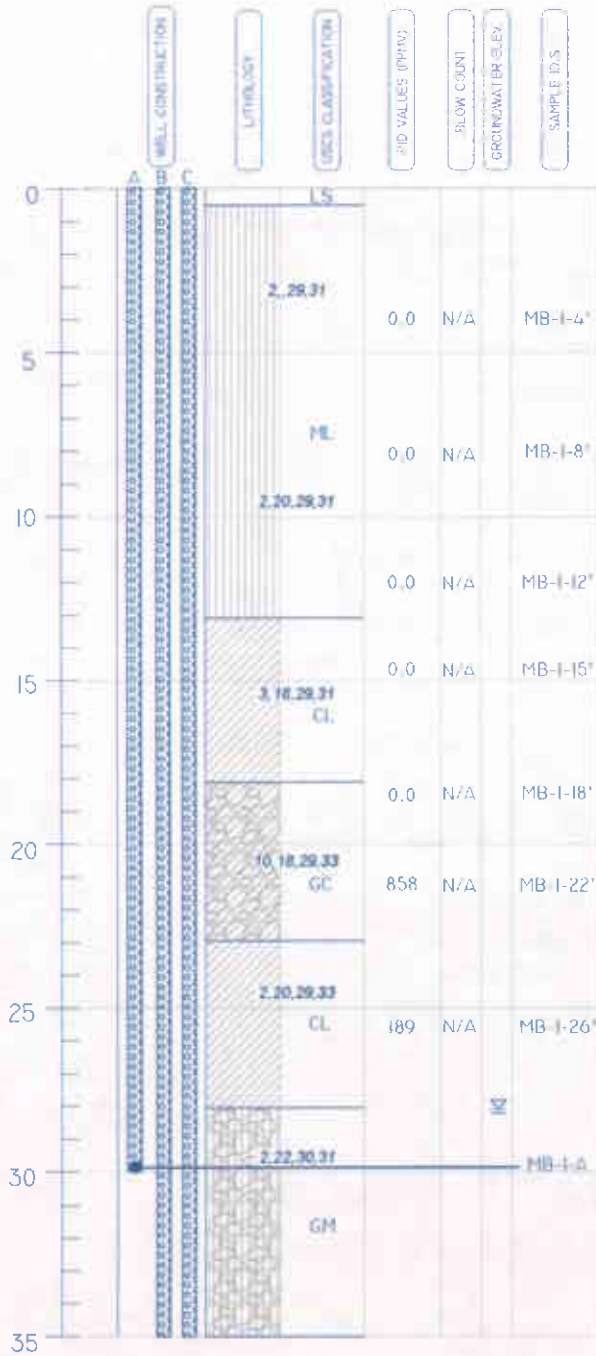
ALTERRA
 849 ALVAR AVE., SUITE C, No. 201
 SANTA CRUZ, CALIFORNIA
 WWW.ALTERRAENV.COM

PROPOSED BORING LOCATIONS
 160 HOLMES STREET
 LIVERMORE, CALIFORNIA

FIGURE 2
 12/5/05



DEPTH BELOW GROUND SURFACE



BORING INFORMATION			
WELL I.D.:	MB-IA,B,C	TOTAL DEPTH:	70'
LOGGED BY:	JAMES ALLEN	CASING DIA.:	NONE
CONTRACTOR:	ECA	DRILLED DEPTH:	52'
METHODE:	GEO PROBE	START DATE:	11/11/05
BORING DIA.:	2 1/2"	COMPLETION:	11/11/05

LEGEND

WELL CONSTRUCTION	USCS CLASSIFICATIONS	USCS CLASSIFICATIONS
BENTONITE	PT PEET	SP POORLY GRADED SAND
NO. 2 SAND	OL ORGANIC SILT OR CLAY	SW WELL GRADED SAND
CONCRETE	CL SILTY OR SANDY CLAY	GC CLAYEY GRAVEL
LANDSCAPE	ML CLAYEY SILT	GM SILTY GRAVEL
ASPHALT	SC CLAYEY SAND	GP POORLY GRADED GRAVEL
NEAT CEMENT	SM SILTY SAND	GW WELL GRADED GRAVEL

NOTE: "L" USED IN PLACE OF "LT" FOR THE SECOND LETTER OF THE ABOVE DENOTES LIQUID LIMITS OF 50% OR GREATER

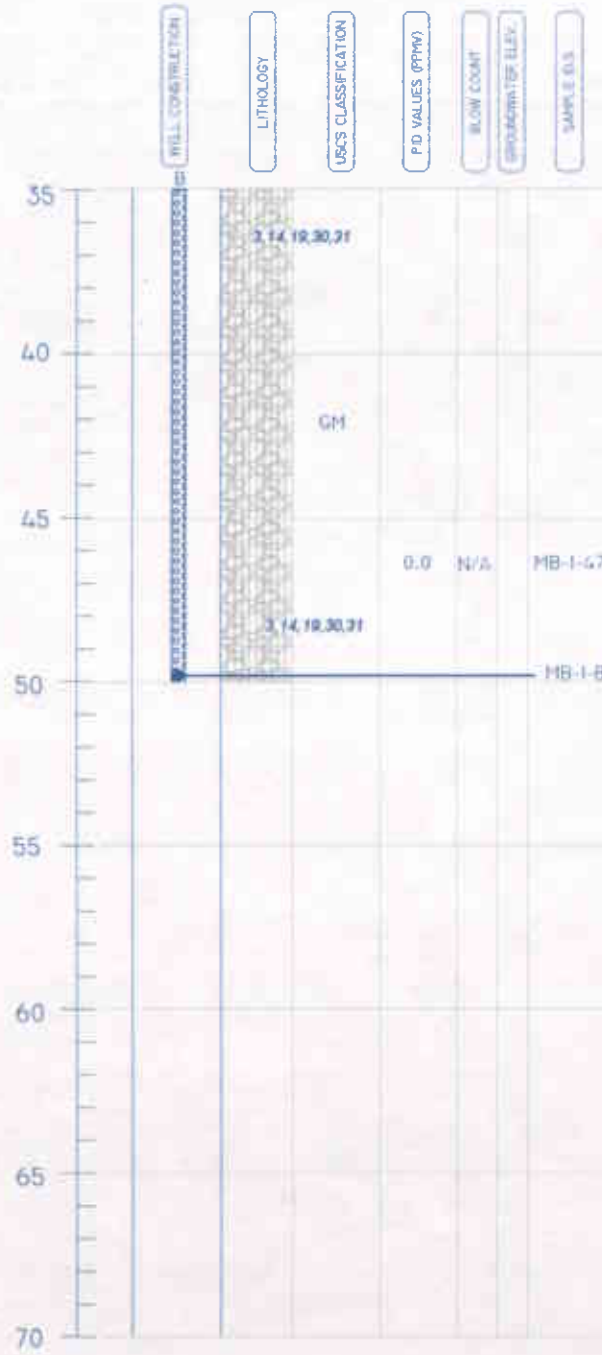
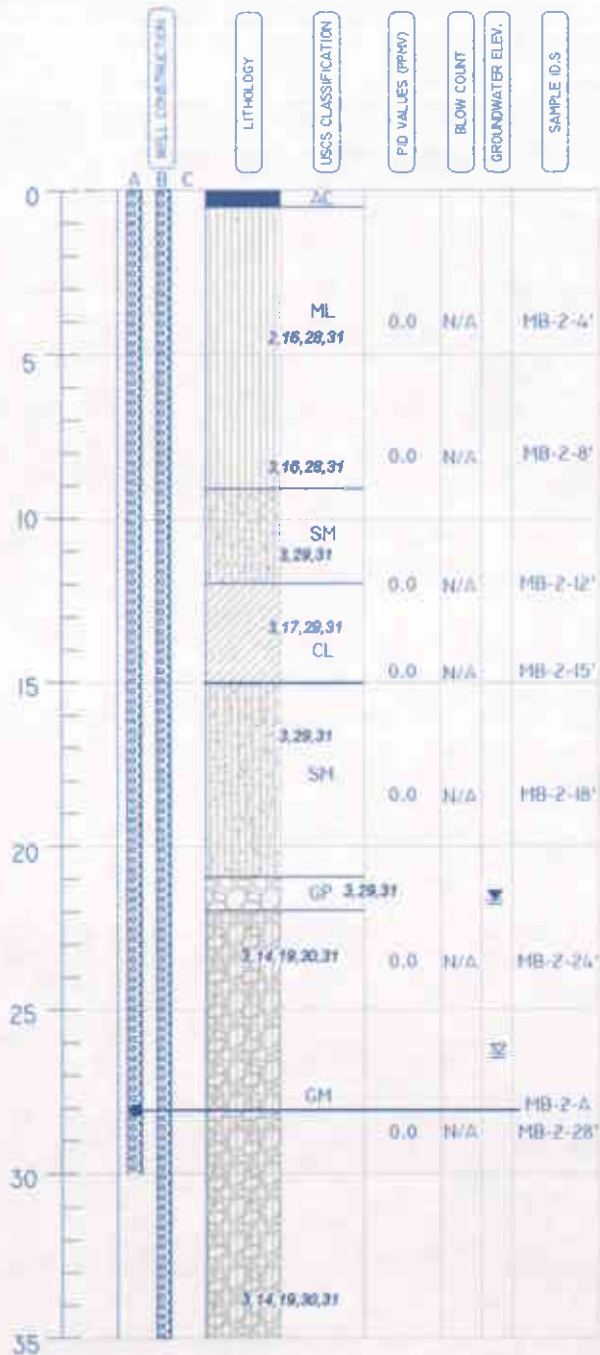
GROUNDWATER ELEV. (INITIAL) N/A NOT APPLICABLE
 GROUNDWATER ELEV. (STATIC) GROUNDWATER SAMPLE

SOIL DESCRIPTION KEY

1 DARK BROWN	12 <5% CLAY AND SILT	23 NOT USED
2 MEDIUM BROWN	13 <20% CLAY AND SILT	24 NOT USED
3 LIGHT BROWN	14 <35% CLAY AND SILT	25 NOT USED
4 LIGHT RUST	15 <65% CLAY AND SILT	26 FRACTURED ROCK
5 RUST	16 < 5% COARSE MATERIAL < 4.75 MM	27 WEATHERED ROCK
6 RUSTY BROWN	17 < 20% COARSE MATERIAL < 4.75 MM	28 DRY
7 DARK OLIVE	18 < 35% COARSE MATERIAL < 4.75 MM	29 MOIST
8 MEDIUM OLIVE	19 < 45% COARSE MATERIAL < 4.75 MM	30 WET (FREE WATER)
9 LIGHT OLIVE	20 < 5% COARSE MATERIAL > 4.75 MM	31 NO PRODUCT ODOR
10 GREY BROWN	21 < 20% COARSE MATERIAL > 4.75 MM	32 MODERATE PRODUCT ODOR
11 LT GREY BROWN	22 < 35% COARSE MATERIAL > 4.75 MM	33 STRONG PRODUCT ODOR

 149 ALHAMBRA AVE., SUITE C, NO. 201 SANTA CRUZ, CALIFORNIA WWW.ALLTERRA.COM	BORING LOG MB-I 140 HOLMES STREET LIVERMORE, CALIFORNIA	11/21/05
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DEPTH BELOW GROUND SURFACE



BORING INFORMATION			
WELL I.D.	MB-2A,B	TOTAL DEPTH	50'
LOGGED BY:	JAMES ALLEN	CASING DIA.	NONE
CONTRACTOR	ECA	DRILLED DEPTH	50'
METHODE	GEO PROBE	START DATE	11/10/05
BORING DIA.	2 1/2"	COMPLETION	11/11/05

LEGEND

WELL CONSTRUCTION	USCS CLASSIFICATIONS	USCS CLASSIFICATIONS
BENTONITE	PT FEET	SP POORLY GRADED SAND
NO. 2 SAND	OL ORGANIC SILT OR CLAY	SW WELL GRADED SAND
CONCRETE	CL SILTY OR SANDY CLAY	GC CLAYEY GRAVEL
LANDSCAPE	ML CLAYEY SILT	GM SILTY GRAVEL
ASPHALT	SC CLAYEY SAND	GP POORLY GRADED GRAVEL
NEAT CEMENT	SM SILTY SAND	GW WELL GRADED GRAVEL

NOTE: "Y" USED IN PLACE OF "L" FOR THE SECOND LETTER OF THE ABOVE DENOTES LIQUID LIMITS OF 50% OR GREATER.

GROUNDWATER ELEV. (INITIAL) N/A NOT APPLICABLE

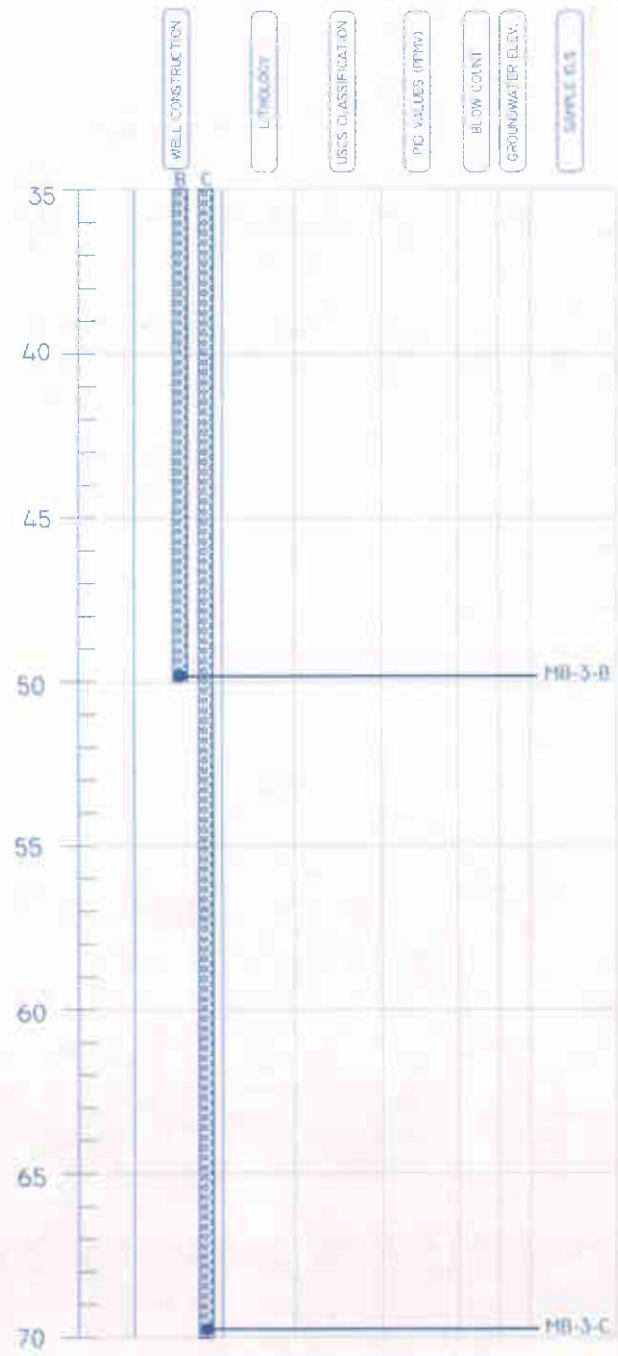
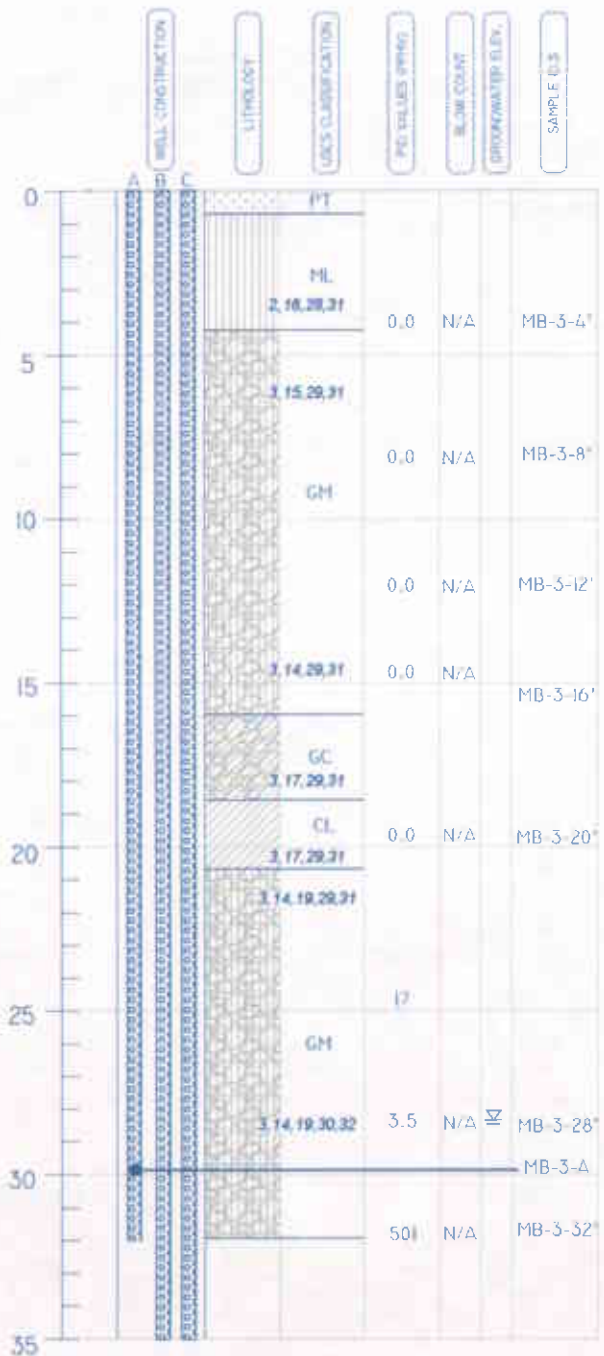
GROUNDWATER ELEV. (STATIC) GROUNDWATER SAMPLE

SOIL DESCRIPTION KEY

1 DARK BROWN	12 <5% CLAY AND SILT	23 NOT USED
2 MEDIUM BROWN	13 <20% CLAY AND SILT	24 NOT USED
3 LIGHT BROWN	14 <35% CLAY AND SILT	25 NOT USED
4 LIGHT RUST	15 <45% CLAY AND SILT	26 FRACTURED ROCK
5 RUST	16 < 5% COARSE MATERIAL < 4.75 MM	27 WEATHERED ROCK
6 RUSTY BROWN	17 < 20% COARSE MATERIAL < 4.75 MM	28 DRY
7 DARK OLIVE	18 < 35% COARSE MATERIAL < 4.75 MM	29 MOIST
8 MEDIUM OLIVE	19 < 45% COARSE MATERIAL < 4.75 MM	30 WET (FREE WATER)
9 LIGHT OLIVE	20 < 5% COARSE MATERIAL > 4.75 MM	31 NO PRODUCT ODOR
10 GREY BROWN	21 < 20% COARSE MATERIAL > 4.75 MM	32 MODERATE PRODUCT ODOR
11 LT GREY BROWN	22 < 35% COARSE MATERIAL > 4.75 MM	33 STRONG PRODUCT ODOR

 849 ALMAR AVE., SUITE C, NO. 28 SANTA CRUZ, CALIFORNIA WWW.ALLTERRAENV.COM	BORING LOG MB-2 100 HOLMES STREET LIVERMORE, CALIFORNIA	11/21/05
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DEPTH BELOW GROUND SURFACE



BORING INFORMATION		
WELL I.D.	MB-3A,B,C	TOTAL DEPTH 70'
LOGGED BY:	ERIK ALLEN	CASING DIA. NONE
CONTRACTOR	ECA	DRILLED DEPTH 70'
METHODE	GEO PROBE	START DATE 11/11/05
BORING DIA.	2 1/2"	COMPLETION 11/12/05

LEGEND

WELL CONSTRUCTION	USCS CLASSIFICATIONS	USCS CLASSIFICATIONS
BENTONITE	PT FEET	SP POORLY GRADED SAND
NO. 2 SAND	OL ORGANIC SILT OR CLAY	SW WELL GRADED SAND
CONCRETE	CL SILTY OR SANDY CLAY	GC CLAYEY GRAVEL
LANDSCAPE	ML CLAYEY SILT	GM SILTY GRAVEL
ASPHALT	SC CLAYEY SAND	GP POORLY GRADED GRAVEL
NEAT CEMENT	SH SILTY SAND	GW WELL GRADED GRAVEL

NOTE: "H" USED IN PLACE OF "L" FOR THE SECOND LETTER OF THE ABOVE DENOTES LIQUID LIMITS OF 50% OR GREATER

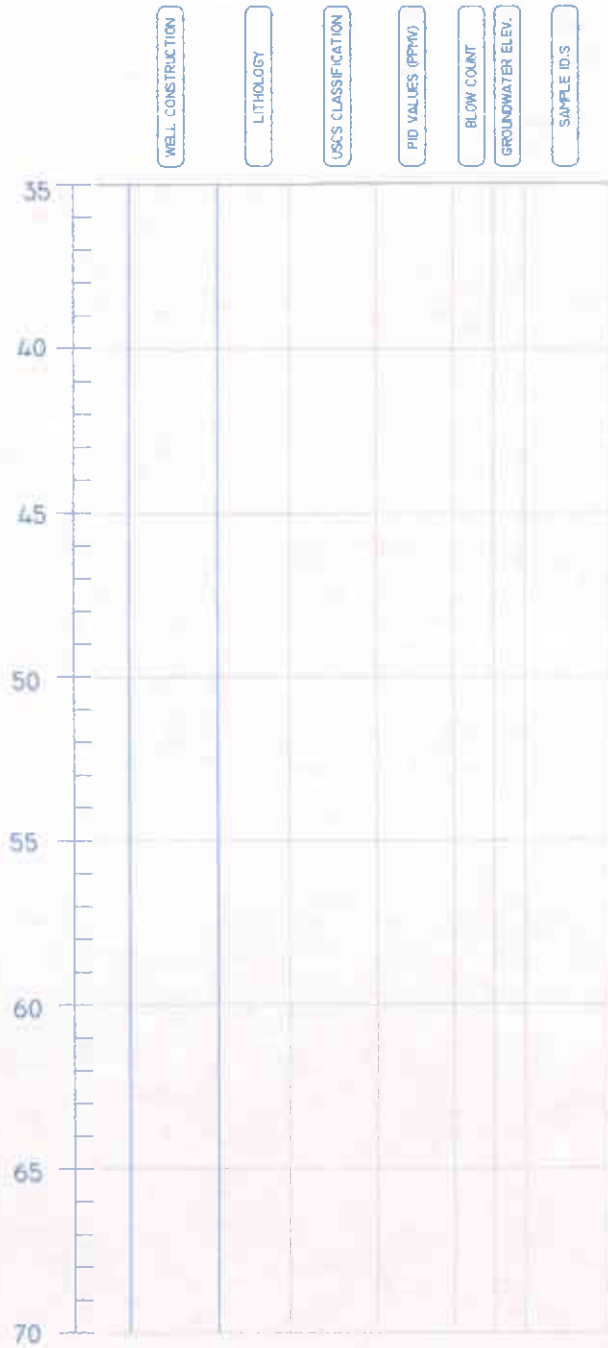
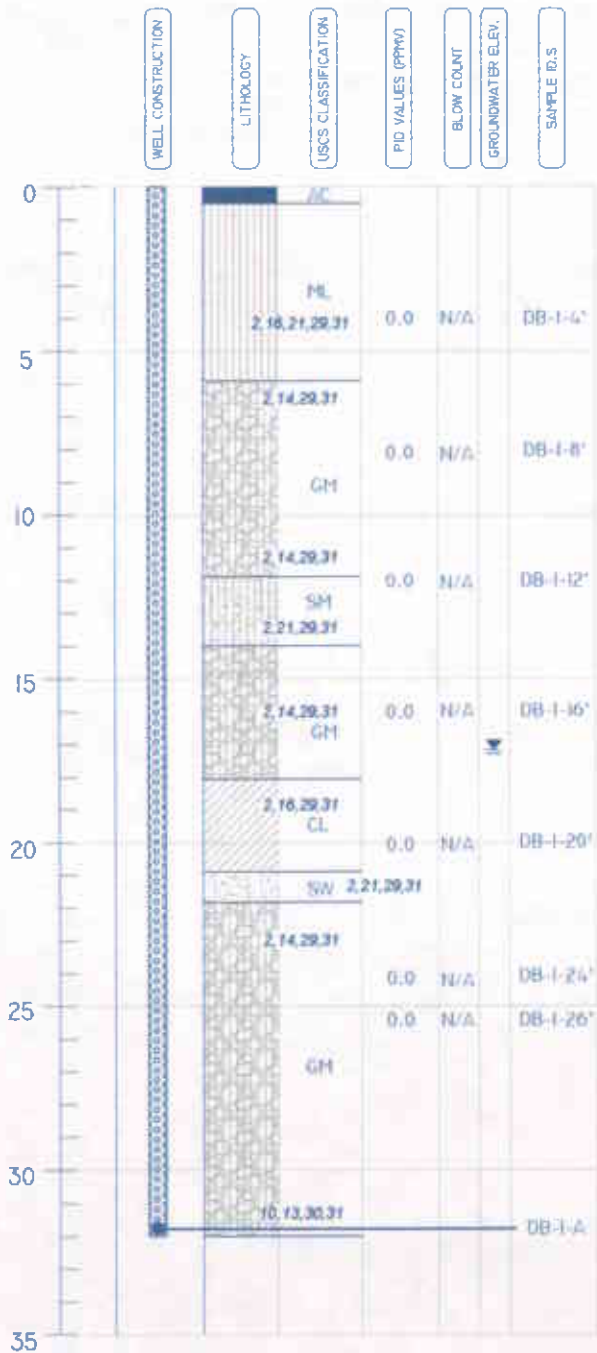
GROUNDWATER ELEV. (INITIAL)	N/A NOT APPLICABLE
GROUNDWATER ELEV. (STATIC)	GROUNDWATER SAMPLE

SOIL DESCRIPTION KEY

1 DARK BROWN	12 <5% CLAY AND SILT	23 NOT USED
2 MEDIUM BROWN	13 <20% CLAY AND SILT	24 NOT USED
3 LIGHT BROWN	14 <35% CLAY AND SILT	25 NOT USED
4 LIGHT RUST	15 <45% CLAY AND SILT	26 FRACTURED ROCK
5 RUST	16 < 5% COARSE MATERIAL < 4.75 mm	27 WEATHERED ROCK
6 RUSTY BROWN	17 < 20% COARSE MATERIAL < 4.75 mm	28 DRY
7 DARK OLIVE	18 < 35% COARSE MATERIAL < 4.75 mm	29 MOIST
8 MEDIUM OLIVE	19 < 45% COARSE MATERIAL < 4.75 mm	30 WET (FREE WATER)
9 LIGHT OLIVE	20 < 5% COARSE MATERIAL > 4.75 mm	31 NO PRODUCT ODOR
10 GREY BROWN	21 < 20% COARSE MATERIAL > 4.75 mm	32 MODERATE PRODUCT ODOR
11 LT. GREY BROWN	22 < 35% COARSE MATERIAL > 4.75 mm	33 STRONG PRODUCT ODOR

ALLTERRA 949 ALMAR AVE., SUITE C, No. 291 SANTA CRUZ, CALIFORNIA WWW.ALLTERRADVM.COM	BORING LOG MB-3 140 HOLMES STREET LIVERMORE, CALIFORNIA	11/21/05
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DEPTH BELOW GROUND SURFACE



BORING INFORMATION			
WELL I.D.	DB-1	TOTAL DEPTH	32'
LOGGED BY:	MICHAEL KILLORAN	CASING DIA.	NONE
CONTRACTOR	ECA	DRILLED DEPTH	32'
METHODE	GEO PROBE	START DATE	11/10/05
BORING DIA.	2 1/2"	COMPLETION	11/10/05

LEGEND

WELL CONSTRUCTION	USCS CLASSIFICATIONS	USCS CLASSIFICATIONS
BENTONITE	PT PEET	SP POORLY GRADED SAND
NO. 2 SAND	OL ORGANIC SILT OR CLAY	SW WELL GRADED SAND
CONCRETE	CL SILTY OR SANDY CLAY	GC CLAYEY GRAVEL
LANDSCAPE	ML CLAYEY SILT	GM SILTY GRAVEL
ASPHALT	SC CLAYEY SAND	GP POORLY GRADED GRAVEL
HEAT CEMENT	SM SILTY SAND	GW WELL GRADED GRAVEL

NOTE: "H" USED IN PLACE OF "L" FOR THE SECOND LETTER OF THE ABOVE DENOTES LIQUID LIMITS OF 50% OR GREATER

GROUNDWATER ELEV. (INITIAL) N/A NOT APPLICABLE

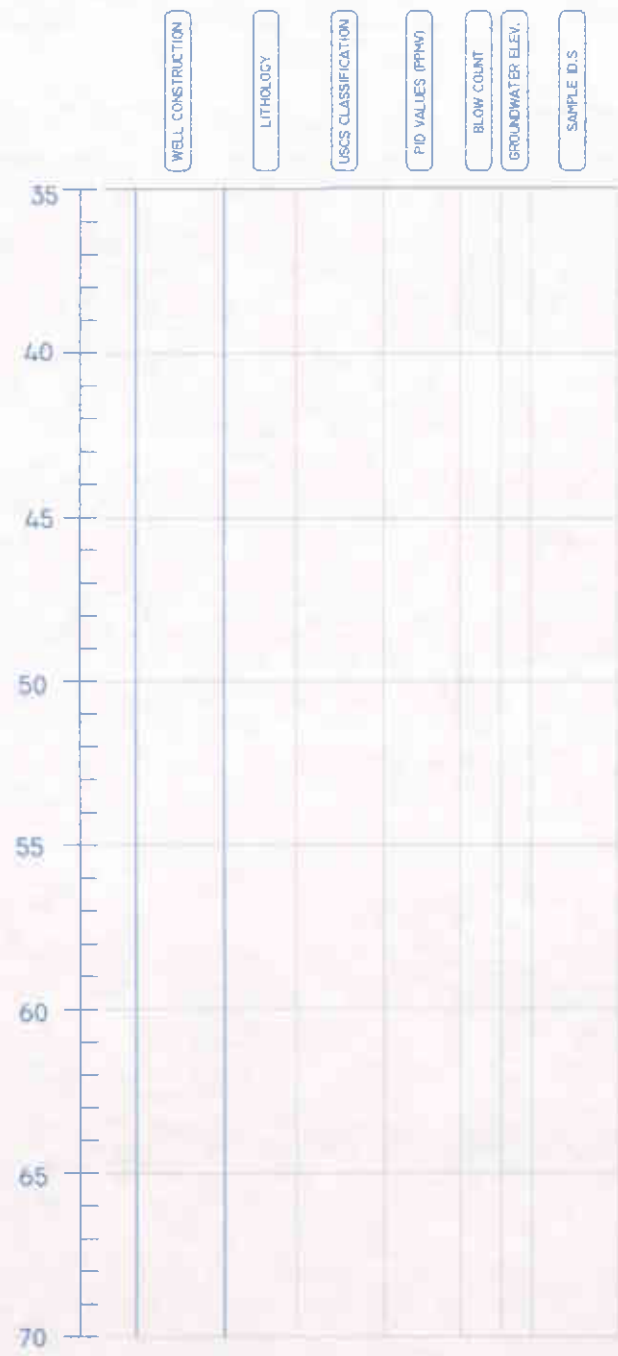
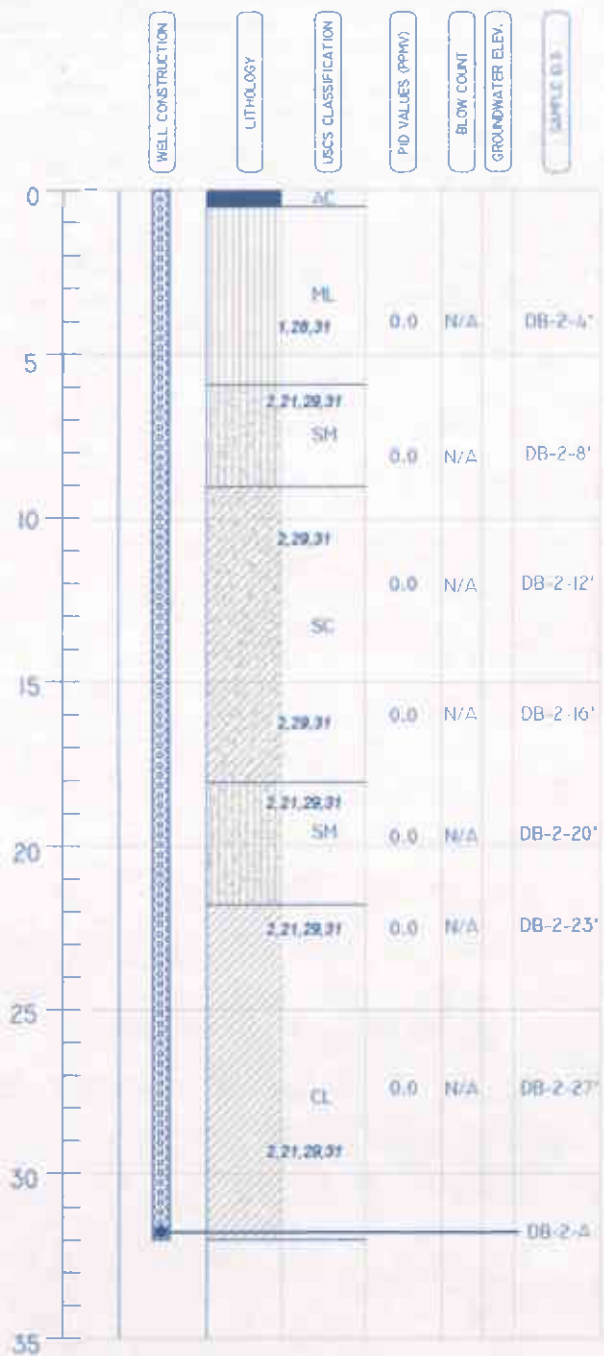
GROUNDWATER ELEV. (STATIC) GROUNDWATER SAMPLE

SOIL DESCRIPTION KEY

1 DARK BROWN	12 <5% CLAY AND SILT	23 NOT USED
2 MEDIUM BROWN	13 <20% CLAY AND SILT	24 NOT USED
3 LIGHT BROWN	14 <35% CLAY AND SILT	25 NOT USED
4 LIGHT RUST	15 <45% CLAY AND SILT	26 FRACTURED ROCK
5 RUST	16 < 5% COARSE MATERIAL < 4.75 #M	27 WEATHERED ROCK
6 RUSTY BROWN	17 < 20% COARSE MATERIAL < 4.75 #M	28 DRY
7 DARK OLIVE	18 < 50% COARSE MATERIAL < 4.75 #M	29 MOIST
8 MEDIUM OLIVE	19 < 45% COARSE MATERIAL < 4.75 #M	30 WET (FREE WATER)
9 LIGHT OLIVE	20 < 5% COARSE MATERIAL > 4.75 #M	31 NO PRODUCT ODOR
10 GREY BROWN	21 < 20% COARSE MATERIAL > 4.75 #M	32 MODERATE PRODUCT ODOR
11 LT. GREY BROWN	22 < 30% COARSE MATERIAL > 4.75 #M	33 STRONG PRODUCT ODOR

 859 ALHAR AVE., SUITE C, NO. 25 SANTA CRUZ, CALIFORNIA WWW.ALLTERRA.COM	BORING LOG DB-1 140 HOLMES STREET LIVERMORE, CALIFORNIA	11/21/05
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DEPTH BELOW GROUND SURFACE



BORING INFORMATION			
WELL I.D.	DB-2	TOTAL DEPTH	32'
LOGGED BY:	ERIK ALLEN	CASING DIA.	NONE
CONTRACTOR	ECA	DRILLED DEPTH	32'
METHODE	GEO PROBE	START DATE	11/11/05
BORING DIA.	2 1/2"	COMPLETION	11/11/05

LEGEND

WELL CONSTRUCTION	USCS CLASSIFICATIONS	USCS CLASSIFICATIONS
BENTONITE	PT PEET	SP POORLY GRADED SAND
NO. 2 SAND	OL ORGANIC SILT OR CLAY	SW WELL GRADED SAND
CONCRETE	CL SILTY OR SANDY CLAY	GC CLAYEY GRAVEL
LANDSCAPE	ML CLAYEY SILT	GM SILTY GRAVEL
ASPHALT	SC CLAYEY SAND	GP POORLY GRADED GRAVEL
NEAT CEMENT	SM SILTY SAND	GW WELL GRADED GRAVEL

NOTE: "L" USED IN PLACE OF "S" FOR THE SECOND LETTER OF THE ABOVE DENOTES LIQUID LIMITS OF 50% OR GREATER

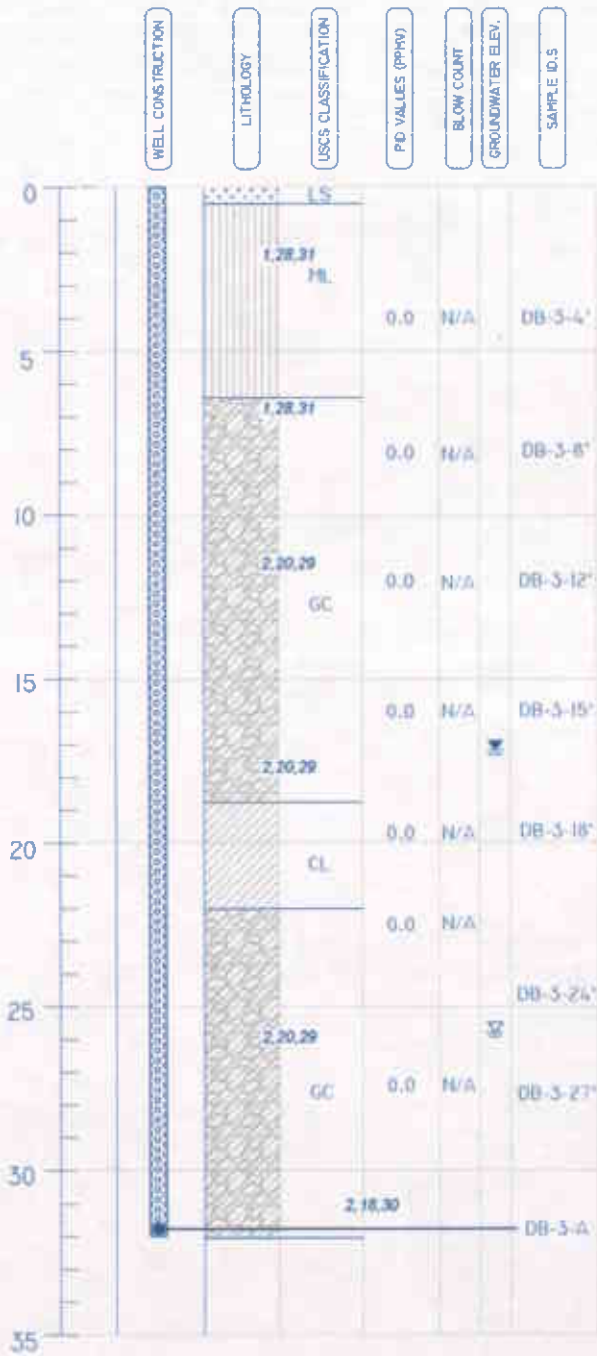
GROUNDWATER ELEV. (INITIAL)	N/A NOT APPLICABLE
GROUNDWATER ELEV. (STATIC)	GROUNDWATER SAMPLE

SOIL DESCRIPTION KEY

1 DARK BROWN	12 15% CLAY AND SILT	23 NOT USED
2 MEDIUM BROWN	13 <20% CLAY AND SILT	24 NOT USED
3 LIGHT BROWN	14 <50% CLAY AND SILT	25 NOT USED
4 LIGHT RUST	15 <10% CLAY AND SILT	26 FRACTURED ROCK
5 RUST	16 < 5% COARSE MATERIAL < 4.75 MM	27 WEATHERED ROCK
6 RUSTY BROWN	17 < 20% COARSE MATERIAL < 4.75 MM	28 DRY
7 DARK OLIVE	18 < 35% COARSE MATERIAL < 4.75 MM	29 MOIST
8 MEDIUM OLIVE	19 < 45% COARSE MATERIAL < 4.75 MM	30 WET (FREE WATER)
9 LIGHT OLIVE	20 < 5% COARSE MATERIAL > 4.75 MM	31 NO PRODUCT ODOR
10 GREY BROWN	21 < 20% COARSE MATERIAL > 4.75 MM	32 MODERATE PRODUCT ODOR
11 LT GREY BROWN	22 < 35% COARSE MATERIAL > 4.75 MM	33 STRONG PRODUCT ODOR

 849 ALMAR AVE., SUITE C, NO. 281 SANTA CRUZ, CALIFORNIA WWW.ALLTERRA.COM	BORING LOG DB-2 110 HOLMES STREET LIVERMORE, CALIFORNIA	11/21/05
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DEPTH BELOW GROUND SURFACE



BORING INFORMATION			
WELL I.D.	DB-3	TOTAL DEPTH	32'
LOGGED BY:	ERIK ALLEN	CASING DIA.	NONE
CONTRACTOR	ECA	DRILLED DEPTH	32'
METHODE	GEO PROBE	START DATE	11/14/05
BORING DIA.	2 1/2"	COMPLETION	11/14/05

LEGEND		
WELL CONSTRUCTION	USCS CLASSIFICATIONS	USCS CLASSIFICATIONS
BENTONITE	PT PEET	SP POORLY GRADED SAND
NO. 2 SAND	OL ORGANIC SILT OR CLAY	SW WELL GRADED SAND
CONCRETE	CL SILTY OR SANDY CLAY	GC CLAYEY GRAVEL
LANDSCAPE	ML CLAYEY SILT	GM SILTY GRAVEL
ASPHALT	SC CLAYEY SAND	GP POORLY GRADED GRAVEL
HEAT CEMENT	SM SILTY SAND	GW WELL GRADED GRAVEL
GROUNDWATER ELEV. (INITIAL)	N/A	NOT APPLICABLE
GROUNDWATER ELEV. (STATIC)		GROUNDWATER SAMPLE

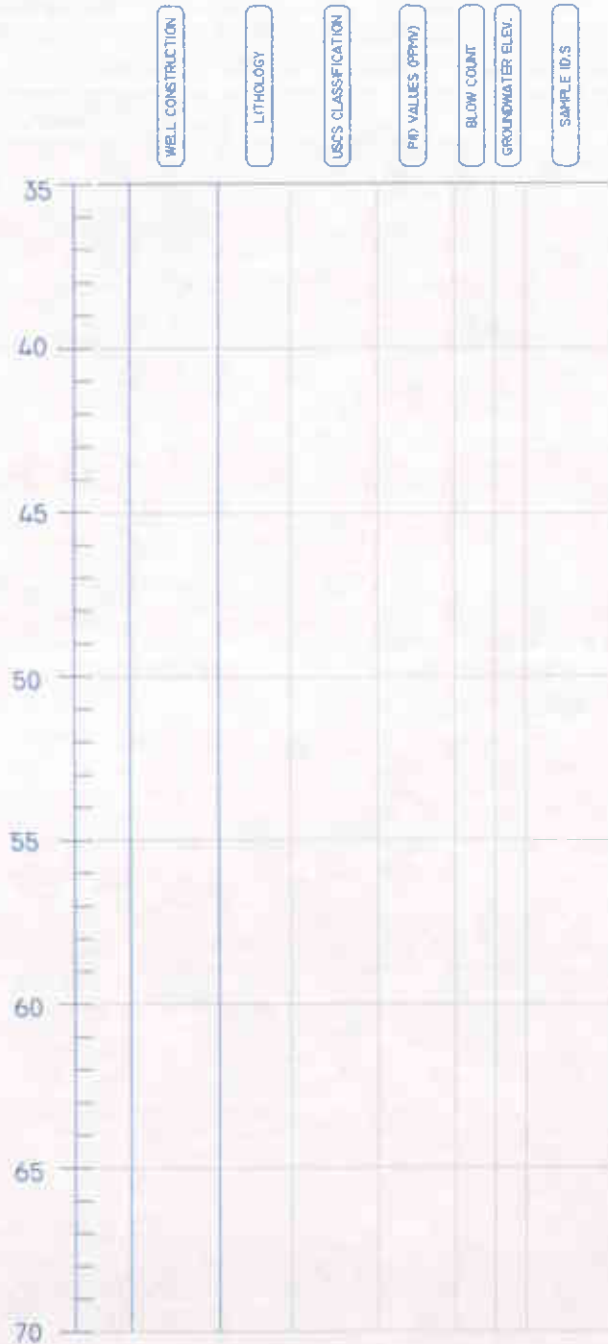
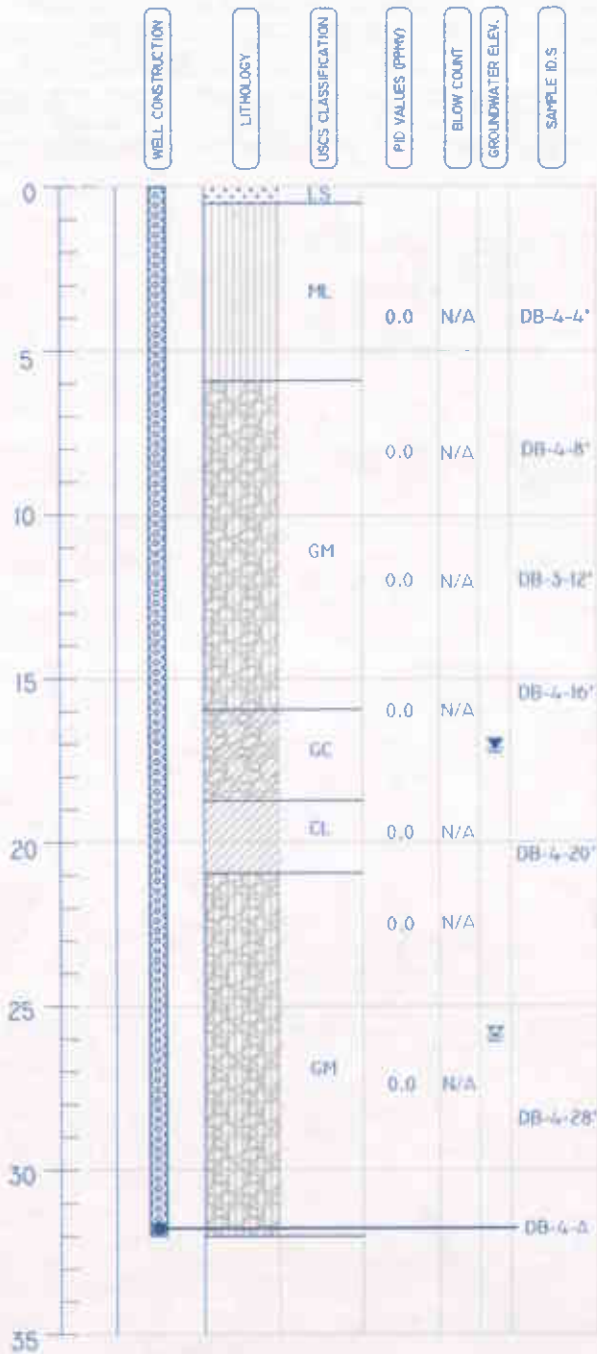
SOIL DESCRIPTION KEY		
1 DARK BROWN	12 <5% CLAY AND SILT	23 NOT USED
2 MEDIUM BROWN	13 <25% CLAY AND SILT	24 NOT USED
3 LIGHT BROWN	14 <35% CLAY AND SILT	25 NOT USED
4 LIGHT RUST	15 <45% CLAY AND SILT	26 FRACTURED ROCK
5 RUST	16 > 5% COARSE MATERIAL < 4.75 MM	27 WEATHERED ROCK
6 RUSTY BROWN	17 < 20% COARSE MATERIAL < 4.75 MM	28 DRY
7 DARK OLIVE	18 < 35% COARSE MATERIAL < 4.75 MM	29 MOIST
8 MEDIUM OLIVE	19 < 45% COARSE MATERIAL < 4.75 MM	30 WET (FREE WATER)
9 LIGHT OLIVE	20 < 5% COARSE MATERIAL > 4.75 MM	31 NO PRODUCT ODOR
10 GREY BROWN	21 < 20% COARSE MATERIAL > 4.75 MM	32 MODERATE PRODUCT ODOR
11 LT GREY BROWN	22 < 35% COARSE MATERIAL > 4.75 MM	33 STRONG PRODUCT ODOR

ALLTERRA
 859 ALMAN AVE., SUITE C, NO. 281
 SANTA CRUZ, CALIFORNIA
 WWW.ALLTERRA.COM

BORING LOG DB-3
 160 HOLMES STREET
 LIVERMORE, CALIFORNIA

11/21/05

DEPTH BELOW GROUND SURFACE



BORING INFORMATION			
WELL I.D.	DB-4	TOTAL DEPTH	32'
LOGGED BY:	JAMES ALLEN	CASING DIA.	NONE
CONTRACTOR	ECA	DRILLED DEPTH	32'
METHODE	GEO PROBE	START DATE	11/14/05
BORING DIA.	2 1/2"	COMPLETION	11/14/05

LEGEND

WELL CONSTRUCTION	USCS CLASSIFICATIONS	USCS CLASSIFICATIONS
BENTONITE	PT PEET	SP POORLY GRADED SAND
NO. 2 SAND	OL ORGANIC SILT (OR CLAY)	SW WELL GRADED SAND
CONCRETE	CL SILTY OR SANDY CLAY	GC CLAYEY GRAVEL
LANDSCAPE	ML CLAYEY SILT	GM SILTY GRAVEL
ASPHALT	SC CLAYEY SAND	GP POORLY GRADED GRAVEL
HEAT CEMENT	SM SILTY SAND	GW WELL GRADED GRAVEL

NOTE: "L" USED IN PLACE OF "C" FOR THE SECOND LETTER OF THE ABOVE DENOTES LIQUID LIMITS OF 50% OR GREATER

GROUNDWATER ELEV. (INITIAL) N/A NOT APPLICABLE

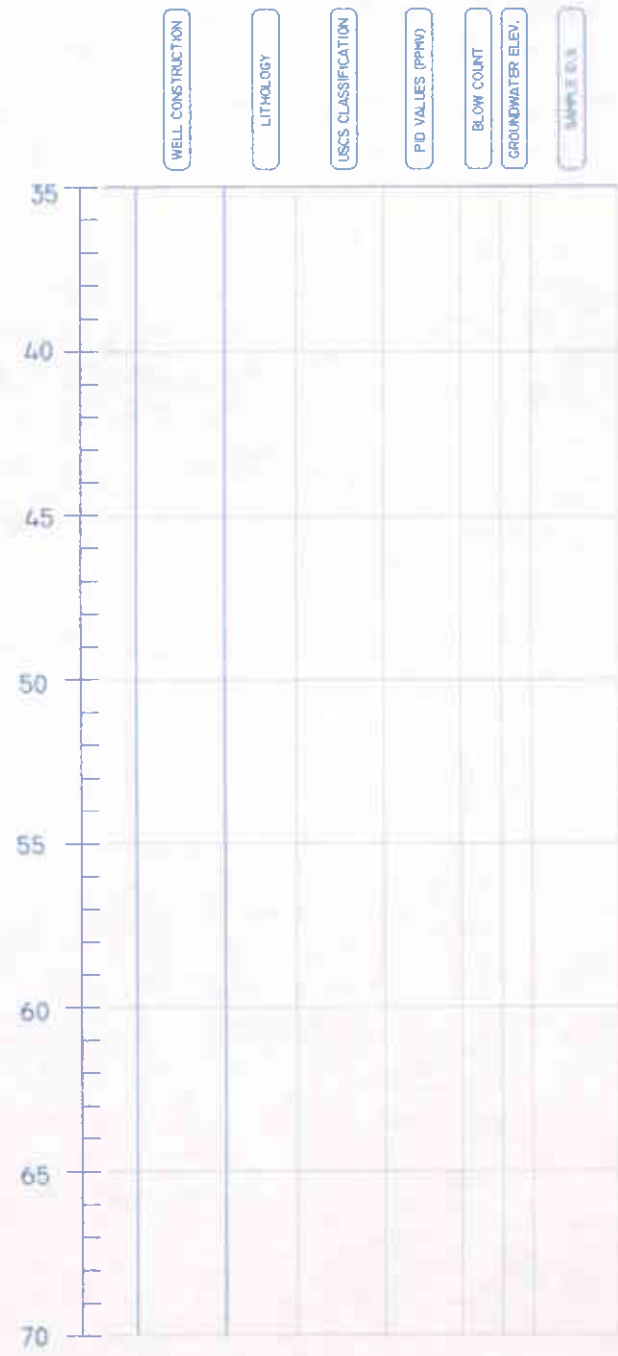
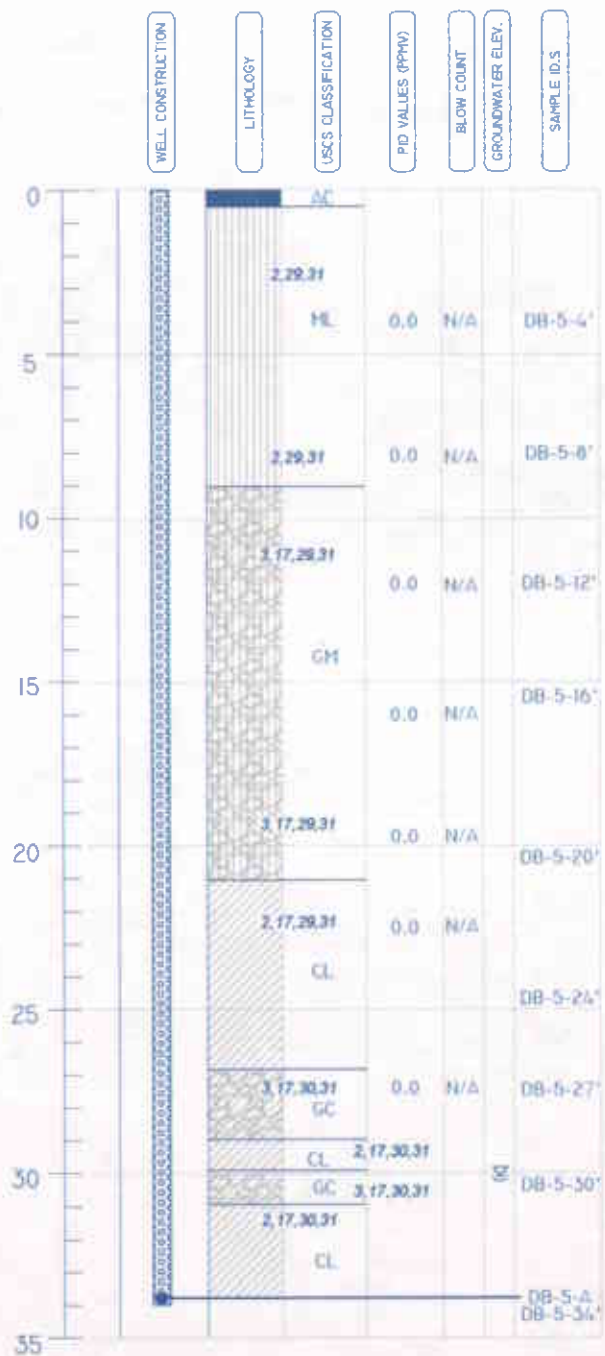
GROUNDWATER ELEV. (STATIC) GROUNDWATER SAMPLE

1, 17, 20, 28, 30

1 DARK BROWN	12 <5% CLAY AND SILT	23 NOT USED
2 MEDIUM BROWN	13 <20% CLAY AND SILT	24 NOT USED
3 LIGHT BROWN	14 <35% CLAY AND SILT	25 NOT USED
4 LIGHT RUST	15 <45% CLAY AND SILT	26 FRACTURED ROCK
5 RUST	16 < 5% COARSE MATERIAL < 4.75 MM	27 WEATHERED ROCK
6 RUSTY BROWN	17 < 20% COARSE MATERIAL < 4.75 MM	28 DRY
7 DARK OLIVE	18 < 35% COARSE MATERIAL < 4.75 MM	29 MOIST
8 MEDIUM OLIVE	19 < 45% COARSE MATERIAL < 4.75 MM	30 WET (FREE WATER)
9 LIGHT OLIVE	20 < 5% COARSE MATERIAL > 4.75 MM	31 NO PRODUCT ODOR
10 GREY BROWN	21 < 20% COARSE MATERIAL > 4.75 MM	32 MODERATE PRODUCT ODOR
11 LT. GREY BROWN	22 < 35% COARSE MATERIAL > 4.75 MM	33 STRONG PRODUCT ODOR

ALTERRA 869 ALVAR AVE., SUITE C, NO. 251 SANTA CRUZ, CALIFORNIA WWW.ALTTERRAENV.COM	BORING LOG DB-4 160 HOLMES STREET LIVERMORE, CALIFORNIA	11/21/05
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DEPTH BELOW GROUND SURFACE



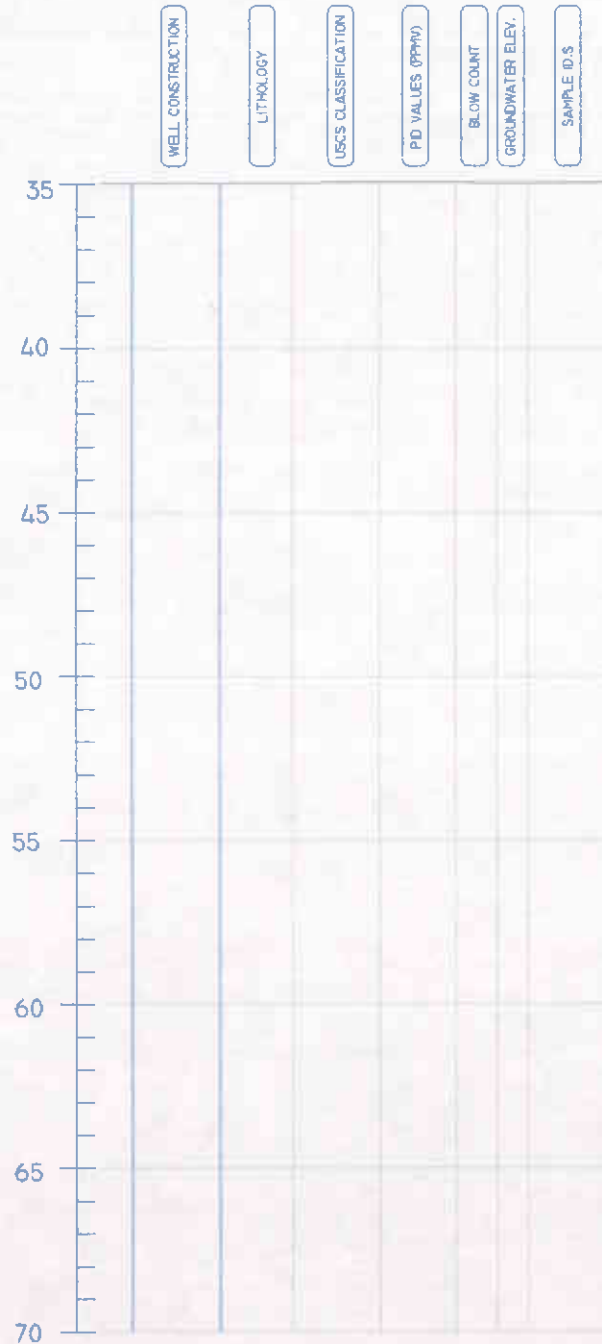
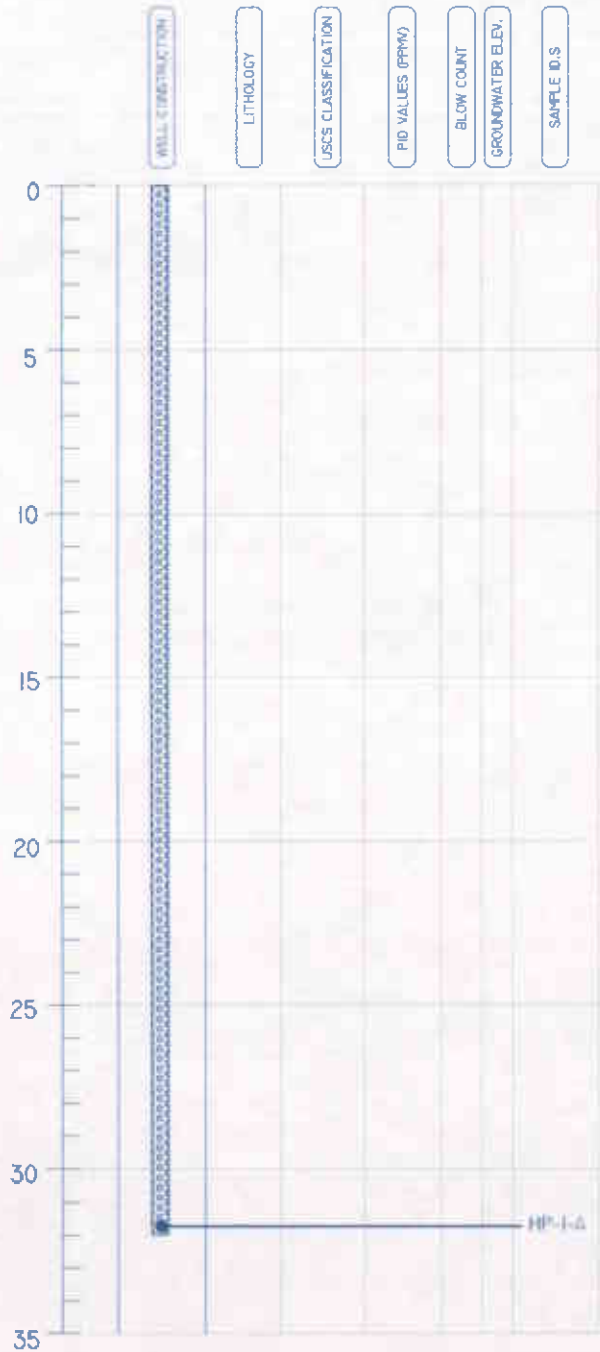
BORING INFORMATION			
WELL I.D.	DB-5	TOTAL DEPTH	34'
LOGGED BY:	MICHAEL KILLORAN	CASING DIA.	NONE
CONTRACTOR	ECA	DRILLED DEPTH	34'
METHOD	GEO PROBE	START DATE	11/11/05
BORING DIA.	2 1/2"	COMPLETION	11/11/05

LEGEND		
WELL CONSTRUCTION	USCS CLASSIFICATIONS	USCS CLASSIFICATIONS
BENTONITE	PT PEET	SP POORLY GRADED SAND
NO. 2 SAND	OL ORGANIC SILT OR CLAY	SW WELL GRADED SAND
CONCRETE	CL SILTY OR SANDY CLAY	GC CLAYEY GRAVEL
LANDSCAPE	ML CLAYEY SILT	GM SILTY GRAVEL
ASPHALT	SC CLAYEY SAND	GP POORLY GRADED GRAVEL
HEAT CEMENT	SM SILTY SAND	GW WELL GRADED GRAVEL
GROUNDWATER ELEV. (INITIAL)	N/A NOT APPLICABLE	
GROUNDWATER ELEV. (STATIC)	GROUNDWATER SAMPLE	

SOIL DESCRIPTION KEY		
1 DARK BROWN	12 15% CLAY AND SILT	23 NOT USED
2 MEDIUM BROWN	13 <20% CLAY AND SILT	24 NOT USED
3 LIGHT BROWN	14 <35% CLAY AND SILT	25 NOT USED
4 LIGHT RUST	15 <45% CLAY AND SILT	26 FRACTURED ROCK
5 RUST	16 < 5% COARSE MATERIAL < 4.75 mm	27 WEATHERED ROCK
6 RUSTY BROWN	17 < 20% COARSE MATERIAL < 4.75 mm	28 DRY
7 DARK OLIVE	18 < 35% COARSE MATERIAL < 4.75 mm	29 MOIST
8 MEDIUM OLIVE	19 < 45% COARSE MATERIAL < 4.75 mm	30 WET (FREE WATER)
9 LIGHT OLIVE	20 < 5% COARSE MATERIAL > 4.75 mm	31 NO PRODUCT ODOR
10 GREY BROWN	21 < 20% COARSE MATERIAL > 4.75 mm	32 MODERATE PRODUCT ODOR
11 LT. GREY BROWN	22 < 35% COARSE MATERIAL > 4.75 mm	33 STRONG PRODUCT ODOR

 609 ALHAR AVE., SUITE C, NO. 20 SANTA CRUZ, CALIFORNIA WWW.ALLTERRA.COM	BORING LOG DB-5 110 HOLMES STREET LIVERMORE, CALIFORNIA	11/21/05
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DEPTH BELOW GROUND SURFACE



BORING INFORMATION			
WELL I.D.	HP-1-A	TOTAL DEPTH	32'
LOGGED BY:	JAMES ALLEN	CASING DIA.	NONE
CONTRACTOR	ECA	DRILLED DEPTH	32'
METHODE	Geo-PROBE	START DATE	11/16/05
BORING DIA.	2 1/2"	COMPLETION	11/16/05

LEGEND

- | | | |
|-----------------------------|-----------------------------|-----------------------------------|
| WELL CONSTRUCTION | USCS CLASSIFICATIONS | USCS CLASSIFICATIONS CONT. |
| BENTONITE | ORGANIC SILT OR CLAY | CLAYEY SILT |
| NO. 2 SAND | SILTY OR SANDY CLAY | CLAYEY SAND |
| CONCRETE | | SILTY SAND |
| LANDSCAPED SURFACE | | POORLY GRADED SAND |
| ASPHALT | | WELL GRADED SAND |
| NEAT CEMENT | | CLAYEY GRAVEL |
| | | SILTY GRAVEL |
| | | POORLY GRADED GRAVEL |
| | | WELL GRADED GRAVEL |
| GROUNDWATER ELEV. (INITIAL) | | NOT APPLICABLE |
| GROUNDWATER ELEV. (STATIC) | | GROUNDWATER SAMPLE |

 819 ALVAR AVE., SUITE C, No. 201 SANTA CRUZ, CALIFORNIA WWW.ALLTERRA.COM	BORING LOG HP-1-A 150 HELMES STREET LIVERMORE, CALIFORNIA	11/21/05
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APPENDIX B, Generalized Cross Sections