August 29, 2016

RECEIVED
By Alameda County Environmental Health 12:17 pm, Sep 01, 2016

Rita and Tony Sullins
Don Sul Inc.
187 North L Street
Livermore, CA 94550

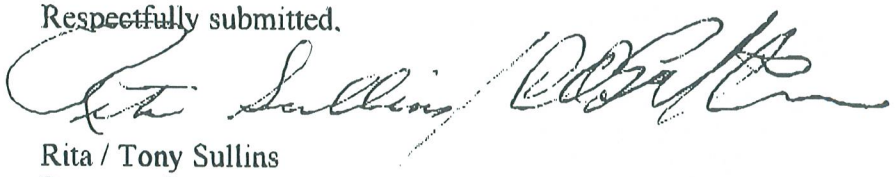
Re: Transmittal Letter
Site Location: Arrow Rentals
187 North L Street, Livermore, CA 94550

Dear Ms Roe:

On behalf of Rita and Tony Sullins, Don Sul Inc., Ground Zero Analysis, Inc. (GZA) prepared the August 29, 2016 Well Receptor Report that was sent to your office via electronic delivery per Alameda County's guidelines and uploaded into the CA State Water Resources Control Board's Geotracker database.

I declare under penalty of law that the information and/or recommendations contained in the above referenced document or report is true and correct to the best of my knowledge.

Respectfully submitted,



Rita / Tony Sullins
Property Owner
Don Sul Inc.
187 North L Street
Livermore, CA 94550

GROUND ZERO
ANALYSIS, INC.

1172 Kansas Avenue, Suite A
Modesto, CA 95351
209.522.4119 – PH
209.522.4227 - FAX
groundzeroanalysis.com

August 29, 2016

Project No.: 1262.2
Project Name: Sullins (L St.)

Tony & Rita Sullins
Arrow Rentals Service
187 North L Street
Livermore, CA 94550

RE: Report: Well Receptor Report
Location: 187 North L Street, Livermore, CA 94550
(ACEH Fuel Leak Case No. RO0000394)

Dear Mr. & Ms. Sullins:

In response for clarification by the Alameda County Department of Environmental Health (ACDEH), Ground Zero Analysis, Inc. (Ground Zero) has prepared the Well Receptor Report for the Arrow Rentals Site located at 187 North L Street in Livermore, California. A site vicinity map is included as Figure 1. A detailed site map is included as Figure 2.

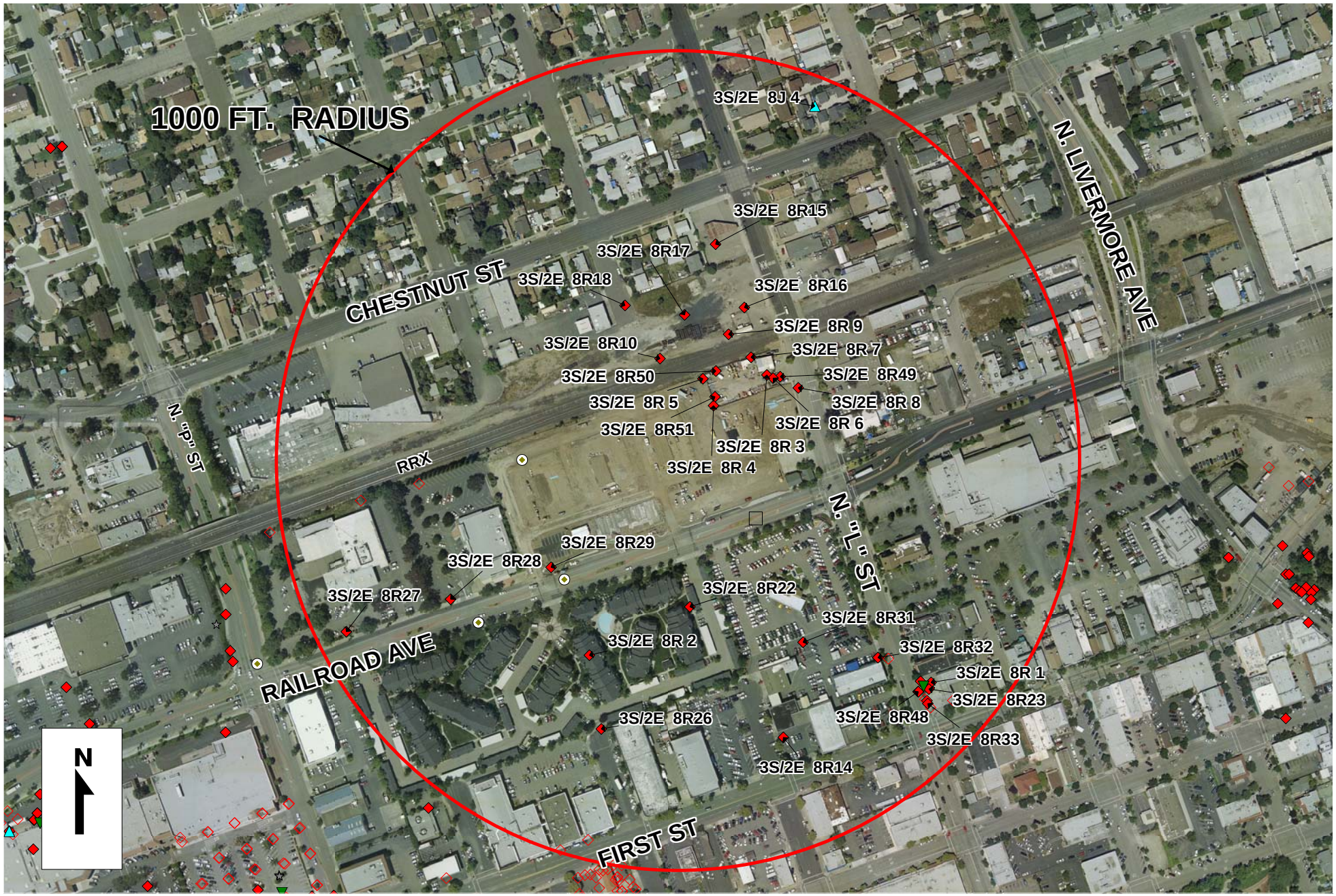
The Zone 7 Water Agency provided a well location map (Figure 3) that shows the well locations within a 1,000-foot radius of the Arrow Rentals Site. Table 1 lists the location, use, completion date and whether the well is active or has been destroyed. A large majority of the wells listed within 1,000 feet of the Site are groundwater monitoring wells, remediation wells and/or borings that have been backfilled with grout. There is one supply well listed at approximately 600 feet to the north of the Site. The northern supply well is not located down-gradient from the Site and should not be affected by the groundwater contaminant plume. There is one well listed without an address and the use is "unknown". Well/boring logs are included as Attachment A.

In addition, Ground Zero performed a 500-foot radius door-to-door survey of the residential and commercial properties surrounding the Site on May 3, 2016. There was no indication of supply wells during the door-to-door search. It was noted that all of the residential and commercial properties located within 500-feet down-gradient of the Site were being provided with city water service.

Eric L. Price, PG #8414

cc: Kit Soo – ACDEH (Via FTP site)

Figures



	ZONE 7 WATER AGENCY **100 NORTH CANYONS PARKWAY** **LIVERMORE, CA 94551**	**WELL LOCATION MAP**	**SCALE: 1"= 325 ft** **DATE: 2/3/16** **187 N. "L" ST, LIVERMORE**

N

0 20

SCALE 1"=20'

FUTURE OAK STREET

WESTERN PACIFIC R.R.

NORTH L STREET

W-B

SHEDS

W-Bs

MW-8/108/208/308

COVERED STORAGE

SHOP/ OFFICE

FORMER DISPENSER

MW-6/106/206/306

W-1

MW-4/104/204/304/404

EW-1

W-1s

W-A

MW-9

W-3

W-3s

MW-7/107/207/307

EW-2

MW-5/105/205/305

SHED

EXTENT OF REMEDIAL COMPOUND

MW-10

W-2

W-C

LEGEND

- MONITORING WELL
- EXTRACTION WELL
- MONITORING WELL (NO ACCESS)
- MONITORING WELL (DESTROYED/MISSING)
- DESTROYED MONITORING WELL
- FORMER UST
- FENCE

NOTE:
PROPERTY LINES ARE SHOWN FOR REFERENCE ONLY, NOT INTENDED TO IMPLY DIVISION OF PROPERTY.

STREET RIGHT OF WAY IS APPROXIMATE, BASED ON ASSESSOR'S PARCEL MAPS AND INFORMATION PROVIDED BY WOODWARD-CLYDE CONSULTANTS

FIGURE 2

Sullins (Arrow Rentals)
187 North L Street
Livermore, California

GROUND ZERO ANALYSIS, INC.

DETAILED SITE MAP

Summary Tables

TABLE 1

WELL INFORMATION PROVIDED BY ZONE 7 WATER AGENCY

Sullins (Arrow Rentals)
187 North L Street
Livermore, California

WELL_NUMBER	USE	ADDRESS	CITY	OWNER	DATE_COMPL	DATE_DESTR	REMARK	LONGITUDE	LATITUDE	DEPTH	DIAM	PERF_U	PERF_L	DATE_COMPL
3S/2E 8J 4	supply	309 N. "K" St	LIVERMORE	JOE HERNANDEZ	00000000	6/15/1988		-121.772242768	37.685168519	0.00	0.00	0.00	0.00	00000000
3S/2E 8K 1	unknown		LIVERMORE		00000000	00000000	ENT'D FR WELL LIST	-121.774988592	37.684067810	0.00	0.00	0.00	0.00	00000000
3S/2E 8Q 4	boring	2008 FIRST ST	LIVERMORE	B&C GAS	9/10/1997	9/10/1997	BACKFILLED W/GROUT	-121.774717364	37.682725575	55.00	0.00	0.00	0.00	9/10/1997
3S/2E 8Q 6	boring	2008 FIRST ST	LIVERMORE	B&C GAS	9/10/1997	9/10/1997	BACKFILLED W/GROUT	-121.775073515	37.681611098	55.00	0.00	0.00	0.00	9/10/1997
3S/2E 8Q16	monitor	1784 RAILROAD AVE	LIVERMORE	B&C GAS	8/13/2003	2/12/2015	MULTI LEVEL	-121.775598802	37.682552931	155.00	1.70	44.00	155.00	8/13/2003
3S/2E 8R 1	monitor	2008 FIRST ST	LIVERMORE	DESERT PETROLEUM	6/22/1988	00000000	MW1 DESERT PET SITE	-121.771177895	37.681243921	77.00	2.00	27.00	77.00	6/22/1988
3S/2E 8R 2	monitor	1799 RAILROAD AVE	LIVERMORE	BARNETT-RANGE	4/20/1989	00000000		-121.774116105	37.681398561	60.00	2.00	30.00	60.00	4/20/1989
3S/2E 8R 3	monitor	187 NORTH L ST	LIVERMORE	ARROW RENTALS	5/26/1989	00000000		-121.772624664	37.683328375	55.00	2.00	0.00	0.00	5/26/1989
3S/2E 8R 4	monitor	187 NORTH L ST	LIVERMORE	ARROW RENTALS	5/26/1989	00000000		-121.773079319	37.683113762	49.00	2.00	0.00	0.00	5/26/1989
3S/2E 8R 5	monitor	187 NORTH L ST	LIVERMORE	ARROW RENTALS	5/26/1989	00000000		-121.773173336	37.683296814	48.00	2.00	0.00	0.00	5/26/1989
3S/2E 8R 6	monitor	187 NORTH L ST.	LIVERMORE	ARROW RENTALS	7/12/1990	00000000	RP FROM QUAD	-121.772570554	37.683307213	63.00	4.00	0.00	0.00	7/12/1990
3S/2E 8R 7	monitor	187 NORTH L ST.	LIVERMORE	ARROW RENTALS	7/12/1990	00000000	RP FROM QUAD	-121.772763513	37.683447256	55.00	4.00	0.00	0.00	7/12/1990
3S/2E 8R 8	monitor	187 NORTH L ST.	LIVERMORE	ARROW RENTALS	7/12/1990	00000000	RP FROM QUAD	-121.772353480	37.683242766	55.00	2.00	0.00	0.00	7/12/1990
3S/2E 8R 9	monitor	187 NORTH L ST.	LIVERMORE	ARROW RENTALS	7/12/1990	00000000	RP FROM QUAD	-121.772958680	37.683602031	58.00	4.00	42.00	55.00	7/12/1990
3S/2E 8R10	monitor	187 NORTH L ST.	LIVERMORE	ARROW RENTALS	7/12/1990	00000000	RP FROM QUAD	-121.773544042	37.683430273	61.00	2.00	41.00	60.00	7/12/1990
3S/2E 8R11	monitor	2008 FIRST ST	LIVERMORE	DESERT PETROLEUM	6/18/1994	00000000	DTW37'1STW40'	-121.771267929	37.681251492	60.00	4.00	30.00	60.00	6/18/1994
3S/2E 8R12	monitor	2008 FIRST ST	LIVERMORE	DESERT PETROLEUM	6/17/1994	4/3/2015	DTW37'1STW40'	-121.771179846	37.681072258	60.00	4.00	30.00	60.00	6/17/1994
3S/2E 8R13	monitor	2008 FIRST ST	LIVERMORE	DESERT PETROLEUM	6/16/1994	4/3/2015	DTW37'1STW40'	-121.770989184	37.681123246	60.00	4.00	30.00	60.00	6/16/1994
3S/2E 8R14	monitor	1934 FIRST ST	LIVERMORE	GROTH BROTHERS	4/26/1994	00000000		-121.772440662	37.680855932	45.00	2.00	34.50	45.00	4/26/1994
3S/2E 8R15	monitor	187 NORTH "L" STREET	LIVERMORE	DON-SUL, INC	3/11/1996	00000000		-121.773080593	37.684215825	45.00	6.00	20.00	45.00	3/11/1996
3S/2E 8R16	monitor	187 NORTH "L" STREET	LIVERMORE	DON-SUL, INC	3/12/1996	00000000		-121.772826003	37.683786756	45.00	6.00	20.00	45.00	3/12/1996
3S/2E 8R17	monitor	187 NORTH "L" STREET	LIVERMORE	DON-SUL, INC	3/12/1996	00000000		-121.773338101	37.683730737	45.00	4.00	20.00	45.00	3/12/1996
3S/2E 8R18	monitor	187 NORTH "L" STREET	LIVERMORE	DON-SUL, INC	3/13/1996	00000000		-121.773851189	37.683789650	45.00	2.00	20.00	45.00	3/13/1996
3S/2E 8R19	boring	2008 FIRST ST	LIVERMORE	B&C GAS	9/10/1997	9/10/1997	DTW-50',BACKFILLED W	-121.774339902	37.681912616	55.00	2.00	0.00	0.00	9/10/1997
3S/2E 8R21	monitor	2008 FIRST ST	LIVERMORE	B&C GAS	10/15/1995	4/3/2015	added by CJM 3-01	-121.771548035	37.681402246	40.00	4.00	15.00	40.00	10/15/1995
3S/2E 8R22	monitor	RAILROAD AVE & S. "L" ST	LIVERMORE	B&C GAS	6/17/1999	00000000		-121.773259030	37.681737912	49.00	2.00	29.00	49.00	6/17/1999
3S/2E 8R23	monitor	2008 FIRST ST	LIVERMORE	B&C GAS	10/15/1995	00000000	MW-6	-121.771195689	37.681198683	40.00	4.00	15.00	40.00	10/15/1995
3S/2E 8R26	monitor	2008 FIRST ST	LIVERMORE	B&C GAS	6/15/1999	00000000		-121.774005860	37.680895702	45.00	2.00	25.00	45.00	6/15/1999
3S/2E 8R28	monitor	1784 RAILROAD AVE	LIVERMORE	B&C GAS	6/15/1999	00000000		-121.775314643	37.681767701	54.00	2.00	34.00	54.00	6/15/1999
3S/2E 8R29	monitor	RAILROAD AVE & N. "N" ST	LIVERMORE	B&C GAS	7/1/1999	00000000		-121.774455653	37.681995243	55.00	2.00	35.00	55.00	7/1/1999
3S/2E 8R30	monitor	2008 FIRST ST	LIVERMORE	B&C GAS	7/14/2003	2/18/2015	MULTI LEVEL	-121.771229667	37.681128416	136.00	1.70	26.00	136.00	7/14/2003
3S/2E 8R31	monitor	2008 FIRST ST	LIVERMORE	BALAGI ANGLE	00000000	00000000		-121.772282740	37.681506925	0.00	0.00	0.00	0.00	00000000
3S/2E 8R32	monitor	2008 FIRST ST	LIVERMORE	BALAGI ANGLE	00000000	00000000		-121.771638056	37.681409040	0.00	0.00	0.00	0.00	00000000
3S/2E 8R33	monitor	2008 FIRST ST	LIVERMORE	BALAGI ANGLE	00000000	00000000		-121.771203760	37.681099183	0.00	0.00	0.00	0.00	00000000
3S/2E 8R34	sparge	2008 FIRST ST	LIVERMORE	B&C GAS	00000000	00000000		-121.771241928	37.681216823	0.00	0.00	0.00	0.00	00000000

Attachment A

Well and Boring Logs

Woodward-Clyde Consultants

PROJECT NAME Livermore NO. 8810220A

BORING LOCATION	Livermore W-1	ELEVATION AND DATUM	
DRILLING AGENCY	Datum Exploration	DRILLER Dennis Vernon	DATE STARTED / DATE FINISHED May 26, 1989
DRILLING EQUIPMENT	CME 75	COMPLETION DEPTH 56 5'	SAMPLER 2" Modified California Type
DRILLING METHOD	8" Hollowstem Augers	DRILL BIT	NO. OF SAMPLES DIST. NA UNDIST. 11
SIZE AND TYPE OF CASING	2" Schedule 40 PVC	WATER LEVEL FIRST 50'	COMPL. NA 24 HRS. NA
TYPE OF PERFORATION	0.010" Slotted PVC	FROM 45.5 TO 55.5 Ft.	LOGGED BY: E. Gonzalez / CHECKED BY: N. Gorczyca
SIZE AND TYPE OF PACK	#2/12 Monterey Type Sand	FROM 41.5 TO 55.5 Ft.	
TYPE OF SEAL NO. 1	3/8" Bentonite Pellets	FROM 39 TO 41.5 Ft.	
TYPE OF SEAL NO. 2	Cement Grout	FROM 1 TO 39 Ft.	

DEPTH (feet)	DESCRIPTION	GRAPHIC LOG / Piezometer Installation	Water Content	DEPTH (feet)	SAMPLES: Drive Number	Sample Number	Recov. (Feet)	Blow Counts	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
	CONCRETE								christy box
	SILTY GRAVEL (GM): grey (fill)								
	CLAYEY GRAVEL (GC)								
	- very dark brown with granules (0.25-0.5" diameter), moist, very loose, plastic clay								
5				5	1	1-A		2, 2, 5/C	- OVA = 1 2 ppm
	- medium dense								
10				10	2	2-A		18, 19, 18	- OVA = 7 0 ppm
	SILTY GRAVEL (GM)								
	- light grey to greenish grey, medium dense; gravel may be decomposed serpentine bedrock; angular and fragmented								
15				15	3	3-A		17, 33, 37	- OVA = 0 ppm
	- mottled green-grey, yellowish green, grey and brown; moist								
20				20	4	4-A		17, 18, 32	-OVA > 1000 ppm gasoline odor
	- cuttings become more clayey								
25	- SILTY to CLAYEY GRAVEL (GM/GC) - greenish grey to tan; gravels range in size from coarse sand to fine gravel, moist			25	5	5-A		16, 27, 33	- OVA > 1000 ppm slight gasoline odor
30				30	6	6-A		16, 31, 38	- OVA > 1000 ppm slight gasoline odor
	- cuttings become more clayey								
35				35					

Woodward-Clyde Consultants

PROJECT NAME: Livermore NO. 8810220A

DEPTH (feet)	DESCRIPTION	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Drive Number	Sample Number	Recov. (feet)	Blow Counts	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
35	CLAYEY GRAVEL (GC) - mottled greenish grey; brown and tan, fine gravel			35	7	7-A		12 23 27	- OVA > 1000 ppm slight gasoline odor
40	SILTY CLAY (CH) - medium brown, trace fine sand to very fine gravel, firm, plastic, very moist			40	8	8-A		3 15 13	- OVA > 1000 ppm gasoline odor
45				45	9	9-A		3 4 8	- OVA > 1000 ppm gasoline odor
50	CLAYEY GRAVEL (GC) - greyish brown to yellowish brown; fine gravel in clayey matrix; medium dense		ATD	50	10	10-A		19 36 28	- OVA > 1000 ppm trace gasoline odor
55	SANDY CLAY (SC) - medium brown			55	11	11-A		2 9 15	- OVA > 1000 ppm gasoline odor
60	CLAY (CL) - medium brown silty clay, firm, slight plasticity. Bottom of Boring at 56 5'			60					
65				65					
70				70					
75				75					
80				80					

FIELD LOG OF BORING NO W-1 SHEET 2 OF 2

Woodward-Clyde Consultants PROJECT NAME Livermore NO. 8810220A

BORING LOCATION	Livermore W-2			ELEVATION AND DATUM	
DRILLING AGENCY	Datum Exploration	DRILLER	Dennis Vernon	DATE STARTED / DATE FINISHED	May 24, 1989 / May 26, 1989
DRILLING EQUIPMENT	CME 75			COMPLETION DEPTH	49'
DRILLING METHOD	8" Hollowstem Augers	DRILL BIT		NO. OF SAMPLES / DIST.	NA / UNDIST. 9
SIZE AND TYPE OF CASING	2" PVC			WATER LEVEL / FIRST	49? / COMPL. NA / 24 HRS. NA
TYPE OF PERFORATION	0.010" Slotted PVC	FROM 39 TO 49 FL		SAMPLER	2" Modified California Type
SIZE AND TYPE OF PACK	#2/12 Monterey Type Sand	FROM 36 TO 49 FL		LOGGED BY: E. Gonzalez	CHECKED BY: N. Gorczyca
TYPE OF SEAL NO. 1	3/8" Bentonite Pellets	FROM 22.5 TO 36 FL			
TYPE OF SEAL NO. 2	Cement-Bentonite Grout	FROM 0 TO 32.5			

DEPTH (feet)	DESCRIPTION	Water Content	SAMPLES: Drive Number	Sample Number	Recov. (Feet)	Blow Counts	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
0	SILTY CLAY (CL) - dark brown, with gravel, dry						- background OVA = 0.2 ppm
5	SILTY GRAVEL (GM) - dark brown, with silty clay and gravel (0.5-2" diameter); loose to medium dense, dry		1	1-A		25 14 19	- OVA = 5.6 ppm
10			2	2-A		40 24 28	- OVA = 6.2 ppm
15	GRAVEL (GP) - dark grey SILTY GRAVEL (GM): grey, with some orange-brown clay and light grey gravel, medium dense		3	3-A		28 32 41	- OVA = 6.9 ppm
20	CLAYEY GRAVEL (GC) - medium grey with fine gravel (0.125-0.25" diameter), medium dense		4	4-A		17 20 26	- OVA = 7.6 ppm
25	GRAVELLY CLAY (CL) to CLAYEY GRAVEL (GC) - yellowish brown to tan - cuttings become more gravelly		5	5-A		13 14 20	- OVA = 12 ppm
30	CLAYEY GRAVEL (GC) - yellowish grey to brown with some orange-brown areas; fine gravel (0.125 - 0.5" diameter), loose, clay moist and plastic		6	6-A		4 2 19	- OVA = 9.2 ppm
35							

GRAPHIC LOG: Piezometer Installation

Woodward-Clyde Consultants

PROJECT NAME: Livermore NO. 8810220A

DEPTH (feet)	DESCRIPTION	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Drive Number	Sample Number	Recov. (feet)	Blow Counts	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
35				35	7	7-A		16 23 25/7"	- OVA =24 ppm
	SANDY CLAY (CL) - grey								- slow, hard drilling 38-42' - no sample @ 40'
40	- clayey gravel ?			40	8	8-A		50/4" NC NC	- OVA =8.8 ppm
	CLAYEY GRAVEL and CLAYEY SAND (GC/SC) - greyish brown; gravel to 0.125" diameter, medium dense								
45				45	9	9-A		28 39 25/7"	- OVA = 18 ppm
									- hard drilling 45-50'
50			ATD	50	10	10-A		NC 10 25/7"	- OVA = 9 8 ppm
	Bottom of Boring 51 5'								- Note: sand and pellets emplaced 5/24/89; grout seal emplaced 5/26/89
55				55					
60				60					
65				65					
70				70					
75				75					
80				80					

FIELD LOG OF BORING NO. W-2 SHEET 2 OF 2

Woodward-Clyde Consultants

PROJECT NAME Livermore NO 8810220A

BORING LOCATION	Livermore W-3	ELEVATION AND DATUM	
DRILLING AGENCY	Datum Exploration	DRILLER Dennis Vernon	DATE STARTED May 25, 1988 / DATE FINISHED May 26, 1988
DRILLING EQUIPMENT	CME 75	COMPLETION DEPTH 48'	SAMPLER 2" Modified California Type
DRILLING METHOD	8" Hollowstem Augers	DRILL BIT	NO. OF SAMPLES DIST. NA / UNDIST. 10
SIZE AND TYPE OF CASING	2" Schedule 40 PVC	WATER LEVEL FIRST 45'	COMPL. NA / 24 HRS. NA
TYPE OF PERFORATION	0.010" Slotted PVC	FROM 38 TO 48 FL	LOGGED BY: E. Gonzalez / CHECKED BY: N. Gorczyca
SIZE AND TYPE OF PACK	#2/12 Monterey Type Sand	FROM 34.5 TO 48 FL	
TYPE OF SEAL NO. 1	3/8" Bentonite Pellets	FROM 32.5 TO 34.5 FL	
TYPE OF SEAL NO. 2	Cement-Bentonite Grout	FROM 0 TO 32.5 FL	

DEPTH (feet)	DESCRIPTION	GRAPHIC LOG / Piezometer Installation	Water Content	DEPTH (feet)	SAMPLES: Drive Number	Sample Number	Recov. (Feet)	Blow Counts	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
	CLAYEY to SILTY GRAVEL (GC) - medium brown, dry								-Note: sample OVA readings are head-space measurements
	GRAVEL (GP) - subrounded pebbles (0.5-2" diameter)								
5	CLAYEY GRAVEL (GC) - greyish brown, silty, loose, dry			5	1	1-A		4 5 7	- OVA = 3 0 ppm
	GRAVEL (GP) - subrounded pebbles (0.125-2" diameter)								
10	CLAYEY GRAVEL (GC) - greyish brown, slightly moist, moderately pebble size 1/16-1/2" diameter, fractured clayey matrix, loose to medium dense			10	2	2-B		7 15 19	- OVA = 3 6 ppm
15	SILTY to CLAYEY GRAVEL (GM / GC) - greyish brown, some tan to brown clay; coarse sand and granules (up to 0.5" diameter), moist to very moist, clay slightly plastic, medium dense			15	3	3-A		20 27 29	- OVA = 4 4 ppm
20	-brown clay matrix with some silt, medium dense			20	4	4-A		20 33 37	- OVA = 8 8 ppm
25	- yellowish grey to greyish brown			25	5	5-A		22 37 48	- OVA = 7 6 ppm
	GRAVEL (GP) - contains subrounded pebbles (0.125-2" diameter)								
30	CLAYEY GRAVEL (GC) - pebbles in brown to greyish brown clay matrix; stiff, plastic, moist			30	6	6-A		17 27 30	- OVA = 22 ppm
35				35					

Woodward-Clyde Consultants

PROJECT NAME Livermore NO. 8810220A

DEPTH (feet)	DESCRIPTION	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Drive Number	SAMPLES: Sample Number	SAMPLES: Recov. (feet.)	SAMPLES: Blow Counts	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
35	CLAY (CH) - mottled medium brown, yellowish to dark yellowish brown with grey zones; firm, moist, plastic				7	7-A		7 7 11	- OVA = 48 ppm
40					8	8-A		7 4 3	-OVA = 23 ppm
45	SILTY GRAVEL (GM) - medium brown to grey matrix; wet; gravel to 0.5" diameter, medium dense		ATD		9	9-A		13 28 38	- OVA = 64 ppm
50	SILTY COARSE SAND (SM) to GRAVEL (GW) - medium grey, gravel has some silt and sand, wet CLAYEY GRAVEL (GC) - greenish brown, with green clay matrix; gravel to 0.25" diameter, medium dense				10	10-C		17 32 29	- OVA = 54 ppm
55	Bottom of Boring 51.5'								
60									
65									
70									
75									
80									

FIELD LOG OF BORING NO. W-3 SHEET 2 OF 2

-----Original Message-----
From: Yuko Mamiya [mailto:YMamiya@eticeng.com]
Sent: Monday, October 30, 2006 11:27 AM
To: Ted Moise
Subject: 99-LIV screened intervals

Ted,
Attached are the scanned well log of W-1, W-2, and W-3.
It looks that they were installed in 1989.

The screened intervals are indicated:
W-1 [45.5-55.5 ft]
W-2 [39-49 ft]
W-3 [38-48 ft]

Please get well soon,
Yuko

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 90C0321A

BORING LOCATION 187 N. L Street, Livermore, CA		ELEVATION AND DATUM	
DRILLING AGENCY Kvilhaug	DRILLER Mike Crocker, Joel Vigil	DATE STARTED 7/10/90 → DATE FINISHED 7/10/90	
DRILLING EQUIPMENT B 53 Mobile Drill		COMPLETION DEPTH 50	SAMPLER 2 in.
DRILLING METHOD Hollow Stem Auger	DRILL BIT	NO. OF SAMPLES DIST.	UNDIST. 10
SIZE AND TYPE OF CASING None		WATER LEVEL FIRST 47 ft.	COMPL. 24 HRS.
TYPE OF PERFORATION None	FROM TO FT	LOGGED BY: Lois Gruenberg	CHECKED BY:
SIZE AND TYPE OF PACK None	FROM TO FT		
TYPE OF SEAL NO. 1 None	FROM TO FT		
NO. 2 Grout	FROM 51-1/2 TO 0 FT		

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
	Asphalt Concrete - 4 inches				
	Cuttings- SILT (ML), brown with orange, gravels to 1/2 ", loose.				
5	SANDY, SILTLY GRAVEL (GM), brown-gray and black gravels, very coarse, moist, gravels to 1/2", loose.		5	7 13 15	Sample: B-1-5 HNU= no response
10	Grades to more silt, some clay, slightly wet.		10	10 19 23	Sample: B-1-10 HNU= 10 ppm
15	Grades to moist with pockets of wet clay.		15	35 50 50	Sample: B-1-15 HNU= no response
20	Noticeable odor and sheen in pockets of moisture.		20	20 40 36	Sample: B-1-20 HNU= 50 ppm
25	CLAYEY SILT (CL), brown, gravels to 1/2 ", some very coarse sand, loose, moist to wet.		25	20 35 35	Sample: B-1-25 HNU= 25 ppm
30	SILTY SAND (SM), brown-gray, very coarse sand, gravels to 1/2 ", trace clay, moist to wet, loose to medium dense.		30	12 17 27	Sample B-1-30 HNU = 50 ppm

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 90C0321A

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW-COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
35	CLAYEY, SANDY SILT (SM-CL), brown-gray with some orange, coarse sand, wet.		35	5 12 5	Sample: B-1-35 HNU = 130 ppm
	Very easy drilling encountered.				
40	CLAYEY SILT (CL), homogenous brown, noticeable hydrocarbon odor soft, wet.		40	4 5 5	Sample : B-1-40 HNU =225 ppm
45	Grades to mottled with some, small, white and black pebbles, odor.		45	2 3 3	Sample: B-1-45 HNU= 180 ppm
50	Grades to gray with rare layer of coarse sand, odor, saturated.		50	10 15 17	Sample: B-1-50 HNU= 110 ppm
					Boring terminates at approximately 51-1/2 feet below grade.
55			55		
60			60		

FIELD LOG OF BORING NO. B-1A SHEET 2 OF 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 90C0321A

BORING LOCATION W-A, between W-1 and tank			ELEVATION AND DATUM
DRILLING AGENCY Kvilhaug	DRILLER Rod Furlow, Brian Vincent		DATE STARTED 7/12/90 → DATE FINISHED 7/12/90
DRILLING EQUIPMENT B 61 Mobile Drill			COMPLETION DEPTH 63 ft. / SAMPLER 2 in.
DRILLING METHOD Hollow Stem Auger	DRILL BIT		NO. OF SAMPLES / DIST. / UNDIST. 8
SIZE AND TYPE OF CASING 4 "-diameter Schedule 40 PVC			WATER LEVEL / FIRST 50 ft. / COMPL. 24 HRS, 44.25
TYPE OF PERFORATION 0.010 Slotted PVC	FROM 57 -1/2 TO 42 FT		LOGGED BY: Lois Gruenberg / CHECKED BY:
SIZE AND TYPE OF PACK Monterey Sand # 2/12	FROM 63 TO 40 FT		
TYPE OF SEAL NO. 1 Bentonite Pellets	FROM 40 TO 36 -1/2 FT		
NO. 2 5 sack, 3/4" agg. - Grout/ Quick mix to set Christy box	FROM 36 - 1/2 TO 0 FT		

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW-COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
	Asphalt Concrete - 4 inches				
5	Cuttings-Gravel (GP), some silt, much resistance.		5		No sample taken
10	Grades to more silty		10	35 50/ 6	Sample: W-A-10 HNU = 1 ppm
15			15	50/ 6	little recovery no sample
20	SILTY, GRAVELLY SAND (GM), gray brown, gravels to 1/2 ", very coarse to coarse sand, trace clay, wet, loose, odor.		20	35 50/ 6	Sample: W-A-20 HNU= 15 ppm
25			25	50/ 6	Sample: W-A-25 HNU = 110 ppm
30			30	45 50/ 6	Sample: W-A-25 Very strong odor in borehole

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 90C0321A

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW-COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
35			35	50/6	Sample: W-A-35 HNU > 200 ppm
40	SILT (ML), brown with black patches, with some clay, some coarse sand, soft to medium stiff, moist.		40	5 9 20	Sample : W-A-40 HNU = 250 ppm
45	Grades to homogenous brown, abundant clay, no sand, medium stiff to stiff, moist		45	35 30 35	Sample: W-A-45 HNU = 150 ppm
50	Grades to saturated		50	25 25 25	Sample: W-A-50 HNU = 100 ppm
55			55		
60			60		Boring terminated at approximately 63 ft. below grade.

FIELD LOG OF BORING NO. W-A SHEET 2 OF 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 90C0321A

BORING LOCATION W-B			ELEVATION AND DATUM
DRILLING AGENCY Kvilhaug	DRILLER Rod Furlow, Brian Vincent		DATE STARTED 7/12/90 → DATE FINISHED 7/13/90
DRILLING EQUIPMENT B 61 Mobile Drill			COMPLETION DEPTH 55 / SAMPLER
DRILLING METHOD Hollow Stem Auger	DRILL BIT		NO. OF SAMPLES / DIST. / UNDIST. 6
SIZE AND TYPE OF CASING 4 "-diameter Schedule 40 PVC			WATER LEVEL FIRST 48 ft. / COMPL. 24 HRS. 44.62
TYPE OF PERFORATION 0.010 Slotted PVC	FROM 55 TO 40 FT		LOGGED BY: Lois Gruenberg / CHECKED BY:
SIZE AND TYPE OF PACK Monterey Sand # 2/12	FROM 55 TO 32 FT		
TYPE OF SEAL NO. 1 Bentonite Pellets	FROM 32 TO 30 FT		
TYPE OF SEAL NO. 2 Grout/Quick mix to set Christy box	FROM 30 TO 0 FT		

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW-COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
	Cement Concrete - 4 inches				
5	SILTY GRAVELS (GM), brown to dark brown, trace clay, damp, loose.		5	12 25 50	No recovery
	Gravels 1/2 to 2 "				
10	Grades to more silty, moist.		10		No sample taken
15	Grades to gray brown with orange patches more silt, some clay, moist		15	50/ 6	Little recovery, 2" gravel stuck in sampler HNU = 10 ppm
20			20	40 50/ 6	Little recovery HNU= 15 ppm
25			25	50/ 6	Sample: W-B-25 HNU = 2 ppm
30			30	50/ 6	Sample: W-B-30 HNU = 2 ppm

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PROJECT NAME ARROW RENTALS NO. 90C0321A

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW-COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
35			35	50/6	Sample : W-B-35 HNU >20 ppm
40	SILT (ML), brown with black patterns, some clay, medium-low plasticity, moderately soft, damp to moist		40	8 12 15	Sample : W-B-40 HNU = 2 ppm
45	Grades to brown with green-yellow and gray, black patches, mottling		45	17 19 26	Sample: W-B-45 HNU = 30 ppm
50			50	5 25 40	Sample: W-B-50
55			55		Boring terminated at approximately 55 feet below grade.
60			60		

FIELD LOG OF BORING NO. W-B SHEET 2 OF 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 90C0321A

BORING LOCATION: Across Arrow Rentals on North L St		ELEVATION AND DATUM	
DRILLING AGENCY: Kvilhaug	DRILLER: Mike Crocker, Joel Vigil	DATE STARTED / DATE FINISHED: 7/11/90 → 7/11/90	
DRILLING EQUIPMENT: B 53 Mobile Drill		COMPLETION DEPTH: 55 ft.	SAMPLER: 2 in.
DRILLING METHOD: Hollow Stem Auger	DRILL BIT	NO. OF SAMPLES: DIST.	UNDIST.: 6
SIZE AND TYPE OF CASING: 2 "-diameter Schedule 40 PVC		WATER LEVEL: FIRST 47 ft.	COMPL.: 24 HRS. 43.34
TYPE OF PERFORATION: 0.010 Slotted PVC	FROM 55 TO 45 FT	LOGGED BY: Lois Gruenberg	CHECKED BY:
SIZE AND TYPE OF PACK: Monterey Sand # 2	FROM 55 TO 37 - 1/2 FT		
TYPE OF SEAL: NO. 1 Bentonite Pellets	FROM 37 - 1/2 TO 35 FT		
NO. 2 Grout/ Quick mix to set Christy box	FROM 35 TO 0 FT		

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW-COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
	Asphalt Concrete - 6 inches Gravel base to 1/2 "-diameter, silty, brown, dry.				
5	SILTY GRAVEL/GRAVELLY SILT (GM) brown, some silt, some very large rocks, dry to slightly damp, loose.		5		No sample taken.
10			10		No sample taken.
15			15		No sample taken.
20			20	20 40 35	Sample: W-C-20 HNU= no response
25	Grades to more silt with trace clay, moderately stiff.		25	17 18 20	Sample: W-C-25 HNU= no response
30			30	20 35 40	Sample: W-C-30 HNU = no response

FIELD LOG OF BORING NO. W-C SHEET 1 OF 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 90C0321A

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW-COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
35	CLAYEY SILT (ML-CL), brown with dark brown and orange blotches, some gravels to 3/8", moist to wet, moderately stiff.		35	8 18 23	Sample: W-C-35 HNU = no response
40	Grades to brown-gray, less gravels, stiff.		40	20 35 35	Sample : W-C-40 HNU < 1 ppm
45			45	18 20 22	Sample: W-C-45
50	Grades to saturated.		50	8 20 25	Sample not taken No recovery
55			55		Boring terminated at approximately 55 feet below grade.
60			60		

FIELD LOG OF BORING NO. W-C SHEET 2 OF 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 90C0321A

BORING LOCATION 1951 Chestnut, Livermore, CA (in backyard of residence of William Armstrong)			ELEVATION AND DATUM
DRILLING AGENCY Kvilhaug	DRILLER Rod Furlow, Brian Vincent		DATE STARTED 7/12/90 → DATE FINISHED 7/12/90
DRILLING EQUIPMENT B 61 Mobile Drill			COMPLETION DEPTH 57 - 1/2 ft. / SAMPLER 2 in.
DRILLING METHOD Hollow Stem Auger	DRILL BIT		NO. OF SAMPLES / DIST. / UNDIST. 6
SIZE AND TYPE OF CASING 4 "-diameter Schedule 40 PVC			WATER LEVEL / FIRST 46 ft. / COMPL. 24 HRS. 42.19
TYPE OF PERFORATION 0.010 Slotted PVC	FROM 57 - 1/2 TO 42 FT		LOGGED BY: Lois Gruenberg / CHECKED BY:
SIZE AND TYPE OF PACK Monterey Sand # 2/12	FROM 57 - 1/2 TO 39 - 1/2 FT		
TYPE OF SEAL NO. 1 Bentonite Pellets	FROM 34 TO 32 FT		
NO. 2 Grout	FROM 32 TO 0 FT		

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW-COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
	Some grass and dry, silty soil in backyard.				
5	Cuttings - SILTY (GM), brown, gravels to 3/8 ", dry.		5	50/ 6	Sample not taken HNU < 1 ppm
10	GRAVELLY SILT (GM), brown with black and orange blotches, fractured gravels to 1/2 ", trace clay, moist, very dense.		10	30 25 28	Little recovery HNU < 1 ppm
15			15	25 50/ 6	Sample: W-D-15 HNU = 1 ppm
20	SILTY GRAVEL (GM), brown, gravels to 1", trace clay, loose, moist, very dense .		20	50/ 6	Sample not taken HNU= 1.5 ppm
25	SILT (ML), brown with black patches, some clay, soft.		25	12 12 14	Sample: W-D-25 HNU = 1.75 ppm
30	GRAVELLY SILT/SILTY GRAVEL(GM), brown with gray rocks, trace clay, moist to wet, rock stuck in sampler.		30	50/ 6	Rock stuck in sampler No response HNU

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PROJECT NAME ARROW RENTALS NO. 90C0321A

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW-COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
35	SILT (ML), brown with black patches, some clay, moderately stiff.		35	12 15 20	Sample: W-D-35 HNU = 2 ppm
40	SANDY SILT (SM), brown, homeogenous, coarse sand, dense, wet. Some sloughing occured from 40 to 34 feet, just above the sand pack, during drilling.		40	30 50/ 6	Sample :W-D-40 HNU = 1.5 ppm
45	CLAYEY SILT (CL), brown, medium plasticity, moderately soft, wet.		45	12 15 22	Sample: W-A-45 HNU = 150 ppm
50			50		
55			55		
60			60		Boring terminated at approximately 57-1/2 feet below grade.

FIELD LOG OF BORING NO. W-D SHEET 2 OF 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 90C0321A

BORING LOCATION End of M Street, Livermore, CA			ELEVATION AND DATUM
DRILLING AGENCY Kvilhaug	DRILLER Mike Furlow, Joel Vincent		DATE STARTED 7/10/90 → DATE FINISHED 7/10/90
DRILLING EQUIPMENT B 53 Mobile Drill			COMPLETION DEPTH 61 ft. / SAMPLER 2 in.
DRILLING METHOD Hollow Stem Auger	DRILL BIT		NO. OF SAMPLES DIST. / UNDIST. 8
SIZE AND TYPE OF CASING 2 "-diamter Schedule 40 PVC			WATER LEVEL FIRST 47 ft. / COMPL. 24 HRS. 43.08
TYPE OF PERFORATION 0.010 Slotted PVC	FROM 60 -1/3 TO 40 - 1/2 FT		LOGGED BY: Lois Gruenberg / CHECKED BY:
SIZE AND TYPE OF PACK Monterey Sand # 2/12	FROM 61 TO 37 FT		
TYPE OF SEAL NO. 1 Bentonite Pellets	FROM 30 TO 29 FT		
NO. 2 5 sack, 3/4" agg. - Grout / Quick Seal to set Christy box	FROM 29 TO 0 FT		

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW-COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
	Asphalt Concrete - 4 "				
	Cuttings - SILT (ML), gravels to 1/2 ", brown, loose.				
5	SILTY SAND (SM) , brown and gray, some gravels to 1/2 ", quartz gravels with black veins, fryable, loose.		5	10 14 18	Sample: W-E-5 HNU= 2 ppm
10	GRAVELLY SILT/ SILTY GRAVEL (GM), brown, some silt, fractured, very hard rocks.		10	20 30 40	Sample: W-E-10 HNU= 2.5 ppm
15	SILTY, SANDY GRAVEL mixture, brown with orange, gravels to 1/2 ", some clay, loose, damp to moist.		15	12 25 25	Sample: W-E-15 HNU= no response
20			20	15 20 28	Sample: W-E-20 HNU= no response
25			25	12 20 28	Sample: W-E-25 HNU= no response
30			30	28 50/ 5	Sample W-E-30 HNU = no response

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTAL NO. 90C0321A

DEPTH (feet)	LITHOLOGIC DESCRIPTION	Well Completion Diagram	DEPTH (feet)	SAMPLES BLOW-COUNTS	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
35	Grades to wet.		35	12 15 12	Sample: W-E-35 HNU < 1 ppm Little recovery
	Very soft drilling encountered. Sloughing occured at approximately 37 to 30 feet during well installation.				
40	CLAYEY SILT (ML-CL), brown, some medium sand, homogeneous, soft, moist.		40	2 3 5	Sample : W-E-40 HNU < 1 ppm
45	Grades to less sand, brown with faint black blebs.		45	5 8 8	Sample: W-E-45 HNU = no response
	More difficult drilling encountered.				
50	GRAVELS (GM), pebbles black/gray, saturated, some silt.		50	20 30 25	Sample not taken.
55			55		
60			60		Boring terminated at approximately 61 feet below grade.

FIELD LOG OF BORING NO. W-E SHEET 2 OF 2

Woodward-Clyde Consultants

Project: Arrow Rentals 90C0321A

Well Number and Location: Boring B-F at former Arrow Gas Pump	Elev. and Datum:
Drilling Agency: Arrow Rentals / Driller: Tony Sullins	Date Started: 3/11/91 Date Completed: 3/12/91
Drilling Equipment: Bobcat	Total Depth: 16 ft.
Drilling Method : flight auger / Drill bit: 8- inch	Sampler: Bulk, in 4inch brass liners
Size and Type of Casing: NA	Water Level: First / Compl. / 24 HRS.
Type of Perforation: NA — From: ft To: ft	No. of Samples: Dist. 2 / Undist.
Size and Type of Pack: NA — From: ft To: ft	
Seal: Bentonite Pellets NA — From: ft To: ft	Logged by: A. Ridley / Checked by:
Grout NA — From: ft To: ft	

Depth (feet)	LITHOLOGIC DESCRIPTION	LITHOLOGY	MONITORING WELL CONSTRUCTION	Sample	Blow Counts	REMARKS
	Concrete pavment- 4 inches thick					
	SILTY GRAVEL(GM) FILL					
1						
	CLAYEY GRAVEL (GC)					
2				P-1		P-1 collected on 1/22/91 from this location in brass liner, no gasoline odor
	-dark brown with sand, moist, with gravel to 1" diameter	GC				
3						
4						
5						
6						
7						
8						
9						
	Difficult drilling, larger gravel to 4" diameter					
10						
11						
	Increasing clay content, moist					
12						no gasoline odor
13						
14						
15		GC				
	Boring terminated at 16 ' in CLAYEY GRAVEL					
16				1,2		B-F-1 and 2 in brass liners, slight gasoline odor

FIELD LOG BORING NO. B-F page 1 of 1

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93G0273A

BORING LOCATION W-1S		ELEVATION AND DATUM	
DRILLING AGENCY GREGG DRILLING	DRILLER Chris St Pierre	DATE STARTED / DATE FINISHED 3/11/96 → 3/11/96	
DRILLING EQUIPMENT Mobile Drill		COMPLETION DEPTH	SAMPLER
DRILLING METHOD Hollow Stem Auger	DRILL BIT	NO. OF SAMPLES: DIST. 0	UNDIST. 0
SIZE AND TYPE OF CASING 6" diameter schedule 40 PVC		WATER ELEV.: FIRST	COMPL. / 24 HRS
TYPE OF PERFORATION 0.010 slotted PVC	FROM 45 TO 20 FT.	LOGGED BY Jerome Lebegue	CHECKED BY
SIZE AND TYPE OF PACK Monterey Sand #2/12	FROM 45 TO 17 FT.		
TYPE OF SEAL Bentonite Pellets	FROM 17 TO 15 FT.		

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Penetrometer Data	SAMPLES: Type No	SAMPLES: Recovery ft	SAMPLES: Penetro Blows/(Blows/6 in)	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
0	~~Asphalt Concrete 4 inches~~								
2	Cuttings - Gravel (GP)								
4									
6									
8									
10									
12									
14									
16									PID = 0.7 ppm
18									
20									PID = 182 ppm gasoline odor
22									
24									
26	Cuttings - Gravels with silt Silty gravelly sand (GM)								PID = 329 ppm gasoline odor
28									

FIELD LOG OF BORING NO. W-1S SHEET 1 of 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93C0273A

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Percussion Data	SAMPLES: Type No.	SAMPLES: Driven In	SAMPLES: Pocket Penet. (Blows/6 in.)	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
30	Silty gravelly sand (GM), moist								PID = 250 ppm gasoline odor
32									
34									
36									PID = 135 ppm gasoline odor
38									
40									PID = 77 ppm
42									
44									
46	Bottom of boring 45'								

FIELD LOG OF BORING NO. W-15 SHEET 2 of 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93C0273A

BORING LOCATION W-35		ELEVATION AND DATUM	
DRILLING AGENCY GREGG DRILLING	DRILLER Chris + Steve	DATE STARTED 3/12/96 → DATE FINISHED 3/12/96	
DRILLING EQUIPMENT Mobile Drill		COMPLETION DEPTH	SAMPLER
DRILLING METHOD Hollow Stem Auger	DRILL BIT	NO. OF SAMPLES DIST. 0	UNDIST. 0
SIZE AND TYPE OF CASING 4" diameter schedule 40 PVC		WATER ELEV. FIRST	COMPL. 24 HRS
TYPE OF PERFORATION 0.010 slotted PVC	FROM 45 TO 20 FT.	LOGGED BY Jerome Lebeque	CHECKED BY:
SIZE AND TYPE OF PACK Monterey sand #1 2/12	FROM 45 TO 18 FT.		
TYPE OF SEAL Bentonite pellets	FROM 18 TO 16 FT.		

DEPTH (feet)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No	SAMPLES: Recov ft	SAMPLES: Penetro Resist (Blows/6 in)	REMARKS (Drill Rate, Fluid loss, Odor etc.)
0	Asphalt concrete 4 inches								
2	Silty gravel (GC) brown to dark brown								
4									PID = 0 ppm
6									
8									
10	clayed gravel (GC)								PID = 0 ppm
12									
14									
16									PID = 0 ppm
18									
20									PID = 0 ppm
22									
24									
26	clayed gravel brown								PID = 0 ppm
28									

FIELD LOG OF BORING NO. W-35 SHEET 1 of 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93C0273A

DEPTH IN FEET	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No	SAMPLES: Recovery In	SAMPLES: Penetration Resistance (Blows/6 in.)	REMARKS (Drilling Rate, Field Tests, Odor, etc.)
30	Clayed gravel (GC), moist								PID = 0 ppm
32									
34									PID = 1.2 ppm
36									
38									PID = 1.7 ppm
40									
42									PID = 1.0 ppm
44									
46	Bottom of boring 45'								

FIELD LOG OF BORING NO. W-35 SHEET 2 of 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93C0273A

BORING LOCATION W-Bs		ELEVATION AND DATUM	
DRILLING AGENCY GREGG & DRILLING	DRILLER Chris & Pierre	DATE STARTED 3/12/96 → DATE FINISHED 3/12/96	
DRILLING EQUIPMENT Mobile Drill		COMPLETION DEPTH	SAMPLER
DRILLING METHOD Hollow Stem Auger	DRILL BIT	NO. OF SAMPLES DIST. 0	UNDIST. 0
SIZE AND TYPE OF CASING 6" diameter schedule 40 PVC		WATER ELEV. FIRST	COMPL. 24 HRS
TYPE OF PERFORATION 0.010 slotted PVC	FROM 45 TO 20 FT.	LOGGED BY Jerome Lebegue	CHECKED BY:
SIZE AND TYPE OF PACK Monterey Sand #2/12	FROM 45 TO 18 FT.		
TYPE OF SEAL Bentonite Pellets	FROM 18 TO 16 FT.		

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No.	SAMPLES: Recov. (ft)	SAMPLES: Penetr. Resist. (Blows/6 in.)	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
0	Asphalt concrete 4 inches								
2	Cuttings Silty gravels (GM) brown to dark brown								
4									PID = 2.0 ppm
6									
8									
10									PID = 2.5 ppm
12									
14									PID = 2.8 ppm
16	Gravelly sand (GM). brown with some silt, moist								
18									
20									PID = 3.5 ppm
22									
24									
26									PID = 3.3 ppm
28									

FIELD LOG OF BORING NO. W-B's SHEET 1 of 2

Woodward-Clyde Consultants

PROJECT NAME: ARROW RENTALS NO. 93C0273A

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Penetration Data	SAMPLES: Type No	SAMPLES: Recov ft	SAMPLES: Penetra Resist (Blows/6 in)	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
30									PID = 3.2 ppm
32									
34	Silt (ML), some clay, brown, moist								PID = 2.6 ppm
36									
38									
40									PID = 2.8 ppm
42									
44									PID = 4.7 ppm
46	Bottom of boring 45'								

FIELD LOG OF BORING NO. W-B5 SHEET 2 of 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93C0273A

BORING LOCATION W. ES		ELEVATION AND DATUM	
DRILLING AGENCY GREGG & DRILLING	DRILLER Kevin Joyner	DATE STARTED 3/13/96 DATE FINISHED 3/13/96	
DRILLING EQUIPMENT Mobile Drill		COMPLETION DEPTH	SAMPLER
DRILLING METHOD Hollow Stem Auger	DRILL BIT	NO. OF SAMPLES DIST. 0	UNDIST. 0
SIZE AND TYPE OF CASING 2" diameter schedule 40 PVC		WATER ELEV. FIRST	COMPL. 24 HRS
TYPE OF PERFORATION 0.010 slotted PVC	FROM 45 TO 20 FT.	LOGGED BY James Lebegue	CHECKED BY:
SIZE AND TYPE OF PACK Monterey sand #2/12	FROM 45 TO 18 FT.		
TYPE OF SEAL Bentonite Pellets	FROM 18 TO 16 FT.		

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Piezometer Data	SAMPLES: Type No.	SAMPLES: Recovery (ft)	SAMPLES: Penetr. Resist. (Blows/6 in.)	REMARKS (Drill Rate, Fluid Loss, Odor, etc.)
	Asphalt 1 inch								
2	silty gravel (GC). brown to dark brown								
4									
6									PID = 2.5 ppm
8									
10									PID = 3.3 ppm
12									
14									
16									PID = 2.9 ppm
18									
20									PID = 2.9 ppm
22									
24									
26	Silty to clayed gravel (GM/GC) brown								PID = 4.6 ppm
28									

FIELD LOG OF BORING NO. W-ES SHEET 1 of 2

Woodward-Clyde Consultants

PROJECT NAME ARROW RENTALS NO. 93C0273A

DEPTH (FEET)	DESCRIPTION	GRAPHIC LOG: Lithology	GRAPHIC LOG: Piezometer Installation	Water Content	Penetrometer Data	SAMPLES: Type No	SAMPLES: Recov ft	SAMPLES: Penetration Blows/6 in	REMARKS (Drill Rate, Fluid loss, Odor, etc.)
30	clayed sand (SC), brown, moist								PID = 2.4 ppm.
32									
34									
36									
38									
40									
42									
44									
46	Bottom of boring 45'								

FIELD LOG OF BORING NO. W-ES SHEET 2 of 2

Geological Technics Inc.

Borehole Log

Project Name SULLINS Borehole No. MW-4 Page 1 of 3

Project No. 1262.2 Date 10/2/06 Contractor

Area & County 187 NORTH L STREET, LIVERMORE

Field Geo/Eng J. ANGULO Drilling Method HSA

Borehole Dia. Tot. Depth Tot. Casing Depth Casing Dia. Screened Interval

Filter Pack Annular Seal Slot Size Grout Water Depth

Depth feet	Smpl. Intrvl	Sample No.	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks
								3" CONCRETE	
								CLAYEY SANDY GRAVEL - TO 2" DARK BROWN TO GREY LOOSE	MOIST 2'-4'
									DUP @ 5'
5			1300	2/8/12				(AA) DARK BROWN, MOIST, TO 2" (FILL?) NO ODOR	1
								↓ CLAYEY & MOIST	
10			1306	5/8/12				CLAYEY SAND GRAVEL - WET, BROWN TO GREY NO ODOR, TO 2"	0
								MORE CLAY THAN ABOVE	
15			1110	9/18/26		SEAL		CLAY-SILT - GRAVEL - MOIST - LT GREY SUB-R TO SUB-ANG GAS ODOR	415
20			1117	7/7/12				(AA) CLAY MORE PLASTIC GAS ODOR @21' MORE WEATHERED GREY, 45° CRACKS (<½")	454
25			1125	20/21/7				AS WET, SOME FE STAINING GAS ODOR	
									HOLD FOR GEO TECH

Notes: LAB 15' 1110 1912 30' 1135 1530 45' 1205 1618 60' 80'

Geological Technics Inc.

Borehole Log

Project Name SULLINS Borehole No. MW-4 Page 2 of 3

Project No. 1262.2 Date 10/2/06 Contractor

Area & County 187 NORTH L STREET, LIVERMORE

Field Geo/Eng J. ANGULO Drilling Method HSA

Borehole Dia. Tot. Depth Tot. Casing Depth Casing Dia. Screened Interval

Filter Pack Annular Seal Slot Size Grout Water Depth

Depth feet	Smpl. Intrvl	Sample No.	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks
30			1135	18/21/20				(AA) w/ 1" [illegible] COARSE SAND w LESS CLAY some cobbles to 1.5" HC ODOR	445
35			1145	13/21/28				(AA) C-S-GRAV [illegible] HC odor	257
18"			1155	5/6/18				SILTY CLAY — BROWN, MOIST, UNIFORM — ODOR SANDY CL- VF, WET	237
40 / 18"							40'S	[illegible] w/ [illegible]	
45			1205	20/13/7		45 HCAVE GRAVEL & SAND 48		CLAYEY SILT- [illegible], HC ODOR, [illegible] some sm. pebbles	459
50			1215	7/9/26		49.5 50.5		C-S-GRAVEL AS ABOVE [illegible]	273
			1220	5/9/50		52		SILTY CLAY BRN, MOIST, HC ODOR	469
			1330	7/7/7			SILTY	SANDY CLAY BRN, WET, HC ODOR, VF-FG SS	456
55			1337	7/9/14				SILTY CLAY BRN, GRAY STAINED [illegible]	75
			1340	6/7/11				(AA) BLACK 1/8" [illegible] HC ODOR STRONG MOTTLED GREY/BRN COLOR	79
57.5			1355	15/28/35				AA ODOR LESS G-S-CLAY COBBLES TO 1"	156 RAM CAR
60			1402	7/13/12				AA SILTY CLAY (GRAVEL RARE)	35

18" [illegible]

Notes:

Geological Technics Inc.

Borehole Log

Project Name: SULLINS · Borehole No.: MW-4 · Page 3 of 3

Project No.: 1262.2 · Date: 10/2/06 · Contractor:

Area & County: 187 NORTH L STREET, LIVERMORE

Field Geo/Eng: J. ANGULO · Drilling Method: HSA

Borehole Dia.: 8" · Tot. Depth: 82 · Tot. Casing Depth: 81.5 · Casing Dia.: CMT · Screened Interval:

Filter Pack: · Annular Seal: · Slot Size: · Grout: · Water Depth: ~34

Depth feet	Smpl. Intrvl	Sample No.	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks
60			1412	16/24/22				AA C-S-GRAVEL GREY GREEN, COBB TO 2"	466
62			1423	26/50-5"				~~COBBLE ... OF ...~~	
INC REC 64			1430	45/50		64		C-S-GRAVEL (AA) BRN ... CLAY 1.5" COBBS NO ODOR LESS CLAY MORE COARSE SAND FRACTION ...	260
65			1448	25/35/50-5		65.5 66.5		(AA)	HARD COBBS
			1455	35/50-6"				F-C SAND 1"-2" COBB TO 2" (AA)	
68			1505	45/50-6"		68		(AA)	41 183
70			1516	12/35/42				(AA) w 1" FE ORANGE STAINING VC LENS	72
			1525	29/50-5				AA MORE BROWN CLAY (30-40%) LESS SAND 1.5" COBBS	
			1530	9/9/20		73	CL	... SAND & VG (LESS ...) ... FAINT HC ODOR	8 ← 48
			1542	7/7/14				(AA) MORE GRAVEL	8 ← 50
75			1555	7/18/41		76		AA (LESS CLAY ... COBB)	5 52
SCREEN			1602	13/20/41				AA UNIFORM BROWN ... GRAVELLY SILTY CLAY NO ODOR	2 64
			1611	17/28/41		79.5		(AA COBBS TO 2")	1
80			1618	26/50/50		80 81.5		(AA)	1
82									
85									

20
29
30 — 65.5-66.5
68
74.5
75.5
76
80
86.5

49.5
50.5
65.5
66.5
74.5
75.5
5 (80 / 81.5)

Notes: BAGS ~~IIII~~ ~~IIII~~ II

BUCKETS ~~IIII~~ ~~IIII~~ IIII

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-4

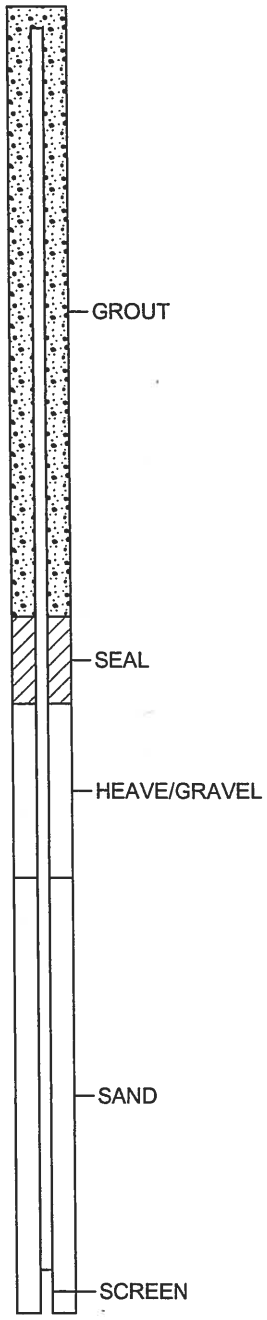
Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/2/06
Drilling Method : HSA
Driller : Cascade
Logged By : J. Angulo

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
0				3" Concrete			
				SANDY CLAYEY GRAVEL-pebbles to 2",dark brown to grey, moist 2-4', loose, no odor.		GP	
5		11:00	2 8 12	(as above- dry at 5', more clay than above)		GC	1
10		11:06	5 8 12	(as above but grey and wet)		GC	0
15		11:10	3 18 26	(as above but moist, lt.grey, with gasoline odor)		GC	415
20		11:17	7 7 12	(as above but w/more wet, plastic clay)		GC	454
				SANDY CLAYEY GRAVEL-uniform grey color,wet,pebbles <1/2",gas odor.		GP	
25		11:25	20 21 7	(as above with some orange Fe staining,wet)		GP	
30							

Well: MW-4
Elev.:



09-11-2014

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-4

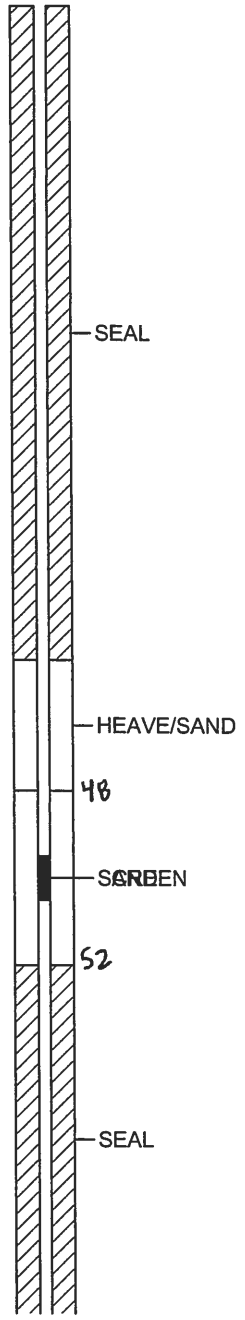
Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/2/06
Drilling Method : HSA
Driller : Cascade
Logged By : J. Angulo

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
30		11:35	18 20 21	(as above with 1" interbedded coarse sands, less clay, pebbles to 1.5", hydrocarbon odor)		GP	445
35		11:45	13 21 28	(as above)		GP	251
40		11:55	3 4 8	SILTY CLAY- brown, moist, HC odor.		CL	237
				SANDY CLAY- very fine grained, wet, brown, HC odor.		CL	
45		12:05	20 13 7	SANDY CLAYEY SILT- brown, moist, firm, some 5mm pebbles, HC odor.		ML	459
50		12:15	3 9 26	CLAYEY SANDY GRAVEL-grey, wet, HC odor.		GC	273
		12:20	5 9 50	SILTY CLAY- brown, moist, HC odor.		CL	469
		13:30	7 7 7	SILTY SANDY CLAY- v fine to fine grained, wet, brown, HC odor.		CL	456
55		13:37	7 9 14	SILTY CLAY- brown with grey stained nodules, black 1/8" nodules, HC odor.		CL	75
		13:40	6 7 12	(as above but more mottled brown/grey color)		CL	79
		13:55	15 28 35	(as above)		CL CL	156
60		14:02	7 13	GRAVELLY SANDY CLAY-mottled grey/brown, pebbles to 1", moist, HC odor.		CL	35

Well: MW-4
Elev.:



09-11-2014

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-4

Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/2/06
Drilling Method : HSA
Driller : Cascade
Logged By : J. Angulo

Well: MW-4
Elev.:

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
60		14:02	16			CL	35
			16			CL	
		14:12	24	(as above)		GC	466
			22				
		14:23	26	CLAYEY SANDY GRAVEL-grey-green, pebbles to 2", wet, HC odor.		GC	
			50-6"				
		14:30	45	No recovery- 2" pebble stuck in front of sampler.		GC	260
			49				
65			50	(as above- less clay more coarse sand grains)			
		14:48	25			GC	
			35	(as above)			
			50				
		14:55	35	SAND- fine to coarse, wet, HC odor.		SP	41
			50-6"			GC	
		15:05	45	CLAYEY SANDY GRAVEL-grey-green, pebbles to 2", wet, HC odor.		GC	183
			50-6"				
70		15:16	12	(as above)		GC	73
			35				
			42	(as above with 1" orange Fe stained v.coarse sand lens)			
		15:25	29			GC	
			50-5"	(as above but more brown clay,less sand, pebbles to 1.5")			
		15:30	9			SC	8
			19	CLAYEY SAND- v.coarse, uniform brown color, faint HC odor.			
			20				
		15:42	7			GC	8
75			7	CLAYEY SANDY GRAVEL-brown, wet, faint HC odor.			
			14				
		15:55	7			GC	5
			18	(as above but less clay, almost loose)			
			41				
		16:02	13			GC	2
			20	(as above)			
			41			CL	
			17	SANDY SILTY CLAY- uniform brown color, no odor.			
		16:11	28			CL	1
			42	(as above- pebbles to 2")			
80			28				
		16:18	50			CL	1
			50	(as above- some orange Fe staining).			
85							
90							

SEAL
SCREEN
SEAL
SAND
SCREEN
SEAL
SCREEN
HEAVE

09-11-2014

Geological Technics Inc.

Borehole Log

Project Name: SULLINS Borehole No.: MW-5 Page 1 of 3

Project No.: 1262.2 Date: 10-9-06 Contractor: Cascade Drilling, Rancho Cordova, 916-638-1169, # 142682

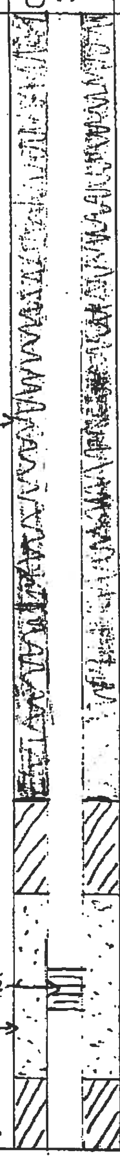
Area & County: 187 NORTH L STREET, LIVERMORE

Field (Geo)/Eng: ~~J. ANGULO~~ C. PRICE Drilling Method: HSA

Borehole Dia.: 8" Tot. Depth: 68 Tot. Casing Depth: 6' Casing Dia.: 1 5/8" Screened Interval: See diagram

Filter Pack: See diagram Annular Seal: See diagram Slot Size: (6) 1/2" drilled holes, Stainless screen Grout: 21.5 to Surf Water Depth: ____

Depth feet	Smpl. Intrvl	Sample No. MW5	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks OVM (ppm)
					Grout to surface			3' SC Gravel, dk brown, no odor, moist	
								5' Not enough recovered for sample	
								Clayey Sandy gravel, dk brown, powder, damp, some fines, sand f. - medium grain	
5			0912	15 17 20				11-11.5 CS Gravel, brown, no odor, damp, v. lg. clasts 1-3cm, [illegible], some grey discoloration [illegible]	10' - 0.0
								15-15.5 SC gravel, dk brown, [illegible] wet, no odor, clasts 0.5-2cm	15' - 0.0
10		d11	0915	7 9 10				16-16.5 Gravel, sand, light brown, v. coarse gr., some clasts >1cm	
								21 Silty sandy gravel, dk brown, [illegible] v. coarse [illegible] odor, [illegible] smaller clasts [illegible]	21' - 0.0
15		d16	0926	20 20 20				25-25.5 SC Gravel, grey, staining & slight odor, clasts 1-2cm avg., wet	25.5 - 4.7
								26-26.5 Sm silty sandy gravel, light brown, very sm. clasts < 1.5cm, no odor, dry	
20		d21.5	0937	7 18 26	21.5				
					T.S.				
					24				
25		d26	0948	9 15 21	#12 sand; screen				
30					T.S.				



Notes:

Geological Technics Inc.

Borehole Log

Project Name: SULLINS Borehole No.: MW-5 Page 2 of 3

Project No.: 1262.2 Date: 10-9-06 Contractor: Cascade

Area & County: 187 NORTH L STREET, LIVERMORE

Field (Geo)/Eng: ~~J. ANGULO~~ & P. Drilling Method: HSA

SEE PG. 1 of 3.

Borehole Dia.___ Tot. Depth___ Tot. Casing Depth___ Casing Dia.___ Screened Interval___

Filter Pack___ Annular Seal___ Slot Size___ Grout___ Water Depth___

Depth feet	Smpl. Intrvl	Sample No. MW-5	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks OVM (ppm)
30		d31	1000	17, 22, 34				30.5-31 Sandy gravel, grey, medium to v. coarse grain, most clasts [illegible] ~1.5 in, [illegible], slight odor	31 - 67.9
								31-37.25 SC gravel, grey, some odor, moist, more clay [illegible] sm. clasts	36 - 248.3
35		d36	1012	14, 26, 17				37.25-39.5 Clay - reddish brown, moderate plasticity, uniform appearance, stg odor	37 - 402.0
			1015	4, [illegible]				39.5-41 AA, some oxidation [illegible], [illegible] some fine grain sand stg odor	40 - 489
			1018	[illegible]				41-43.5 Clay - reddish brown, plastic, some grey mottling, stg odor	42 - 459
40		d40.5	1020	9, 10				43.5-44 Silty Clay - AA	44 - 462
			1028	7, 7, 14				44-45 Gravelly Clay - brown, some lg. clasts, odor, moist	45 - 372
		d43.5	1048	4, 4, 4				45-45.5 AA, grey	47.5 - 326
45		d45	1051	5, 5, 9				47-48.5 gravelly clay, light brown sm. clasts, some organic material (blk streaks) moist, light odor	50 - 308
				no recov				48.5-51.5 Sandy clay, greyish, wet, some odor, higher sand content	51 - 386
		d48	1058	7, 11, 14				51.5-52 silt greyish w/ oxidation, [illegible]	53 - 327
50			1107	5, 8, 15				52-54.5 Silty clay, brown w/ oxidation, [illegible] wet	55 - 67.4
			1114	10, 14, 16				54.5-55 Clayey gravel, light brown, wet	57 - 71.7
		d52.5	1121	10, 10, 10				55.5-56 - silt, oxidized, damp	59 - 109.3
			1127	4, 3, 3				56-56.5 - gravely clay, light brown, no odor, wet	
55		d55.5	1130	5, 9, 9				56.5-57.5 clay, some oxidation, lt brown, wet	
			1138	3, 3, 7				57.5-58.5 AA w/ some gravel,	
			1141	2, 3, 4				58.5-59 AA w.o. gravel	
60			1239	5, 5, 5				59-60 AA w/ some gravels	

no recovery

Notes:

Geological Technics Inc.

Borehole Log

Project Name SULLINS Borehole No. MW-5 Page 3 of 3

Project No. 1262.2 Date 10-9-06 Contractor Cascade

Area & County 187 NORTH L STREET, LIVERMORE

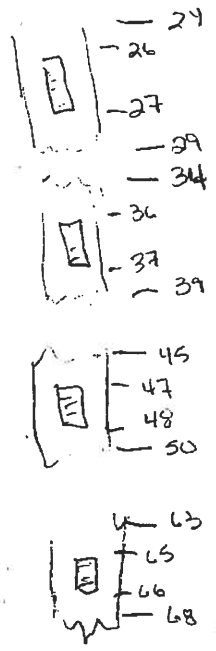
Field ~~Geo~~/Eng ~~J. ANGULO~~ L. P. Drilling Method HSA

SEE PG. 1 of 3

Borehole Dia.____ Tot. Depth____ Tot. Casing Depth____ Casing Dia.____ Screened Interval____

Filter Pack____ Annular Seal____ Slot Size____ Grout____ Water Depth____

Depth feet	Smpl. Intrvl	Sample No. Mus	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks JJM (ppm)
60		d61.5	1216	WS 2	Sinclair T30 1/4" time release bentonite chips			60.5-61 Gravely Clay, brown, wet more gravel than before, no odor	62 - 144
			1225	(7,9)2				61.5-62 SiM, brn w/ blk streaks, no odor	64 - 32.1
		d64.5	1258	12,20,36	screen interval			62-63 SC gravel, brown, wet, some large clasts, avg clasts 1.5-3.5cm	66 - 30.7
65		d66.5	1306	30,36, 50(3")	#12 sand			63-64 C S Gravel, AA w/ some clasts larger than 4cm	68 - 31.3
			1312	50(6")				64-65 C S Gravel, AA w/ clasts larger than tubes, avg >3cm	
								65-66 SAND, multi colored, med to coarse grain, wet	
								66-66.5 CSG, Brown, lg clasts	
								66.5-66.75 SAND, AA	
								66.75-68 CSG, AA	
70									
75									



Notes: Sinclair T30 1/4" time release bentonite chips
PMC Pacific Materials #2/12 sand

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-5

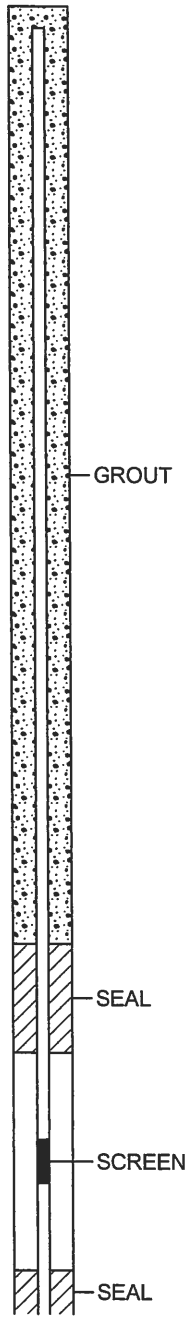
Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/9/06
Drilling Method : HSA
Driller : Cascade
Logged By : E. Price

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
0				3" Road base gravel			
				SANDY CLAYEY GRAVEL- dark brown, moist, no odor.		GC	
5		09:12	5 7 20				
10		09:18	7 9 18	CLAYEY SANDY GRAVEL- dark brown, moist, sands fine to coarse grained, no odor.		GC	0
				(as above - 1 - 3cm pebbles, some grey in clays)		GC	
15		09:26	20 20 20	SANDY CLAYEY GRAVEL- dark brown, some iron oxide stain, wet, 5 - 20 mm, no odor.		GC	0
				GRAVELLY SAND- lt brown, v. coarse, pebbles >4cm.		SW	
20		09:37	7 18 26	SILTY SANDY GRAVEL- dark brown, fine to v.coarse, wet, no odor.		GM	0
25		09:48	9 15 21	SANDY CLAYEY GRAVEL- grey, wet, pebbles avg. 1-2cm, staining and odor.		GC	4.7
				SILTY SANDY GRAVEL- lt brown, fine to v.coarse, dry, pebbles <1.5 cm, no odor.		GM	
30							

Well: MW-5
Elev.:



09-11-2014

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-5

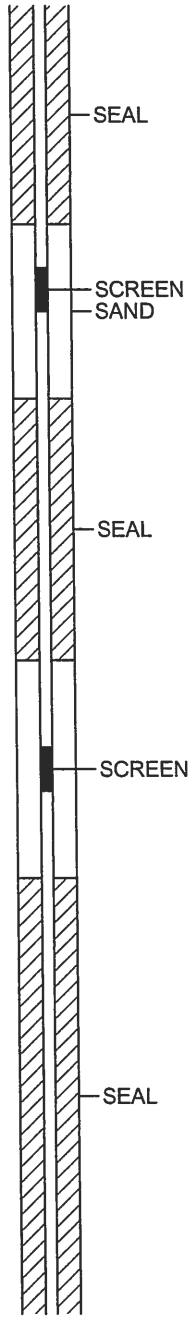
Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/9/06
Drilling Method : HSA
Driller : Cascade
Logged By : E. Price

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
30		10:00	17 22 34	SANDY GRAVEL-grey,med to v coarse, moist,wet, slight odor.		GW	67
35		10:12	14 26				248
			17 4	SANDY CLAYEY GRAVEL- grey, moist, odor.		GC	
		10:15	6				402
			8 7	CLAY- reddish brown, mod plasticity, uniform, strong odor.		CL	
		10:18	7 7				
40			7				
		10:26	9 10	(as above- some oxidation staining & fine grain sand)		CL	489
			7				
		10:29	7 14	CLAY- reddish brown, plasticity, grey mottling, strong odor.		CL	459
			4				
		10:48	4				462
			4			CL	
			5	SILTY CLAY- as above		CL	
		10:51	5				372
45			9	GRAVELLY CLAY- brown, moist, odor.		CL	
				(as above- but grey)			
			7				
		10:58	11 14	GRAVELLY CLAY- lt brown, organic material -black streaks, moist, odor.		CL	326
			5				
		11:07	8 15	SANDY CLAY-grey, wet, odor.		CL	308
50			10				
		11:14	14 16				386
			10			ML	
		11:21	10	SILT- grey w/oxidation, moist.			327
			10				
			4	SILTY CLAY- brown w/oxidation, wet.		CL	
		11:27	7 3				
			5			GC	
55		11:30	9	CLAYEY GRAVEL- lt brown, wet.		ML	67
			9				
			3	SILT- mottled grey-brown, oxidized, moist.		CL	
		11:38	3			CL	72
			7	GRAVELLY CLAY- lt brown, wet, no odor.			
			2			CL	
		11:41	2 4	CLAY- lt brown w/ oxidation, wet.			109
			5			CL	
		12:39	5	(as above - w/ some gravel)		CL	
60							

Well: MW-5
Elev.:



09-11-2014

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-5

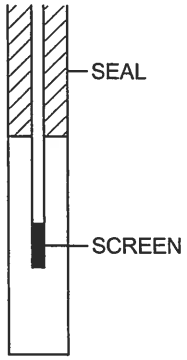
Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/9/06
Drilling Method : HSA
Driller : Cascade
Logged By : E. Price

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
60		12:39	5			CL	
			4			CL	
		12:46	5	GRAVELLY CLAY- brown,wet, no odor.			144
			7			ML	
			7	SILT- brown w/black streaks, no odor.		GC	
		12:51	9				
			12	SANDY CLAYEY GRAVEL- brown,wet,pebbles avg 1.5-3.5cm.		GC	
		12:58	12				32
			20				
65			36	(as above - with some pebbles >4cm)			
			22			SW	
		13:06	36	SAND-multi-colored, med to coarse, wet.			31
			50-3"			GC	
		13:12	50-6"	SANDY CLAYEY GRAVEL- brown, lg pebbles, 6" sand layer as above.			31
70							
75							
80							
85							
90							

Well: MW-5
Elev.:



09-11-2014

Geological Technics Inc.

Borehole Log

Project Name SULLINS Borehole No. MW-6 Page 1 of 3

Project No. 1262.2 Date 10/10/06 Contractor Cascade Drilling

Area & County 187 NORTH L STREET, LIVERMORE

Field Geo/Eng ~~J. ANGULO~~ E. Price Drilling Method HSA

Borehole Dia. 8" Tot. Depth 68 Tot. Casing Depth 66.2' Casing Dia. 1 5/8" Screened Interval See Diagram

Filter Pack [illegible] Annular Seal [illegible] Slot Size [illegible] Grout ______ Water Depth ______

Depth feet	Smpl. Intrvl	Sample No. MW-6	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks
5			0808	15 16 26				5-6 [illegible]	
10			[illegible]	5 30 12				[illegible] gravely [illegible]	
15		16	0819	7 17 21				[illegible]	
20			0826	[illegible]				[illegible]	
25		[illegible]	0835	[illegible]	24 T.S. 27				
30					29 30				

Notes:

Geological Technics Inc.

Borehole Log

Project Name SULLINS Borehole No. MW-6 Page 2 of 3

Project No. 12622 Date 10/10/06 Contractor CASCADE DRILLING

Area & County 187 NORTH L STREET, LIVERMORE

Field Geo/Eng ~~T. ANGUS~~ E. PRICE Drilling Method HSA

SEE PG. 1 of 3.

Borehole Dia.____ Tot. Depth____ Tot. Casing Depth____ Casing Dia.____ Screened Interval____

Filter Pack____ Annular Seal____ Slot Size____ Grout____ Water Depth____

Depth in feet	Smpl. Intrvl	Sample No.	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks
0					31				
					T.S.				
35					35				
					36				
					37				
					39				
45									
					T.S.				
					47				
					49				
50			1028	6,6,9	50				
					52				
55									
			1056	3,3,4	T.S.				
			1102	2,3,3					
60			1105	2,2,4					

Notes:

Geological Technics Inc.

Borehole Log

Project Name: SULLINS Borehole No.: MW-6 Page 3 of 3

Project No.: 1262.2 Date: 10/10/06 Contractor: Cascade Drilling

Area & County: 187 NORTH L STREET, LIVERMORE

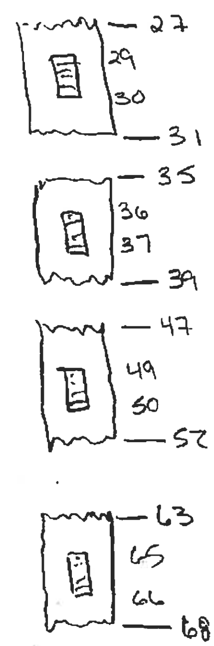
Field (Geo)/Eng: ~~J. Angulo~~ E. Price Drilling Method: HSA

SEE PG. 1 of 3

Borehole Dia. ___ Tot. Depth ___ Tot. Casing Depth ___ Casing Dia. ___ Screened Interval ___

Filter Pack ___ Annular Seal ___ Slot Size ___ Grout ___ Water Depth ___

Depth feet	Smpl. Intrvl	Sample No.	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks
60		d61.5	1113	5, 4, 26	T.S.			59.75 - 60.75 AA w/ [illegible]	[illegible]
(very little recovery)			[illegible]	26, [illegible]	63			60.75 - 62 Clayey sandy gravel, brown, lg clasts some > 2 cm, wet, no odor	62' - 1.1
(very little recovery)								62 - 63.5 Clayey sandy gravel, [illegible] [illegible], no odor, [illegible] coarse [illegible] sand, 0.2 cm to > 5 cm, [illegible], [illegible]; limited recovery	67' - 0.5
65 (No recovery)			1123	50(6)	65			63.5 - 65 AA, major [illegible] [illegible]	
			1133	27, 50(5)	66			66.5 - 67.5 Clayey gravelly sand, brown, wet, coarse to v. coarse grained, some clasts 0.2 - 0.8 cm, no odor	
		d67.5	1141	38, 45, 50(5)	68			67.5 - 68 SC Gravel, AA w/ larger clasts	
70									



Notes: 65 [illegible] forced to put split-spoon on end

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-6

Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/10/06
Drilling Method : HSA
Driller : Cascade
Logged By : E. Price

Well: MW-6
Elev.:

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
0				3" Concrete			
5		08:08	15 16 26	SILTY SANDY GRAVEL- lt brown, pebbles 0.5-1.5 cm.		GM	
10		08:15	15 30 12	SANDY CLAYEY GRAVEL- brown, no odor. SANDY GRAVEL- brown, v large pebbles, whitish appearance maybe calcite.		GC GW	0
15		08:19	7 17 21	GRAVELLY SILTY SAND- brown, few large pebbles, dry, no odor. SANDY CLAYEY GRAVEL-dark brown,pebbles 0.5 to 2 cm, oxidation, moist, no odor.		SW GC	0
20		08:26	9 18 22	(as above except with v large clasts as long as tube 6") CLAYEY SANDY GRAVEL- dark brown, smaller pebbles than above 0.2 - 1 cm w/more clay, moist, no odor.		GC GC	0.2
25		09:03	20 42 12	SANDY CLAYEY GRAVEL- as above with larger pebbles. (as above with pebbles avg >2 cm)		GC GC	0.1
30							

GROUT
SEAL
SCREEN

09-11-2014

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-6

Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/10/06
Drilling Method : HSA
Driller : Cascade
Logged By : E. Price

Well: MW-6
Elev.:

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
30			12	(as above with calcite crystals)		GC	
		09:14	26			GC	0.3
			18	SANDY CLAYEY GRAVEL- mottled brown-grey, some v large pebbles, moist, no odor.			
35			10	SANDY CLAYEY GRAVEL- grey w/oxidation, pebble size decreasing with depth, wet, no odor.		GC	
		09:34	20				34.4
			25				
			7				
		09:38	10				11
			12	CLAY- reddish-brown,mod plastic, increasing silt with depth.		CL	
		09:42	7				
			7				
			9				
40			7			CL	
		09:47	8	(as above with some pebbles)			11
			10			CL	
			7	SANDY CLAY- v fine, low plasticity, brown, moist, no odor.		CL	
		09:50	7				
			9				
			6	GRAVELLY SANDY CLAY- brown w/oxidation, small pebbles, friable.		SW	
		10:01	6				17
			7				
			9				
45		10:07	9	CLAYEY GRAVELLY SAND- grey, wet, fine grain, no odor.		SC	177
			9				
			7				
		10:07	7	CLAYEY SAND - as above but no pebbles.		CL	
			9				
			14	CLAY- lt brown, wet, slight odor.		CL	
		10:13	28				14
			32	(as above but mottled grey-brown)		CL	
			5			CL	
		10:17	10	(as above but increasing silt content)			2
50			15			CL	
			6	SILTY CLAY- mottled grey-borwn, moist, no odor.		CL	
		10:28	6				
			9				
			12	SANDY CLAY- mottled brown-grey, v fine grains.		CL	
		10:33	18				2
			30	(as above with less sand)			
			7				
		10:38	7	CLAY- lt brown, wet, 6" silty layer, no odor.		ML	0.8
			11				
55			10	SILT- lt brown, minor grey mottling, moist, some organic material, no odor.		CL	
		10:50	25			CL	
			50				
			3	GRAVELLY CLAY- lt brown, wet, no odor.		CL	
		10:56	3				
			4	CLAY- mottled brown-grey, no odor.		CL	
			9				
		11:02	8	GRAVELLY CLAY- few pebbles.		CL	0.3
			20				
		11:05	2	(as above - grey, with pebbles 2 - 6mm)			0.3
60			2			CL	

SEAL
SCREEN
SAND
SEAL
SCREEN
SEAL

09-11-2014

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-6

Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/10/06
Drilling Method : HSA
Driller : Cascade
Logged By : E. Price

Well: MW-6
Elev.:

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
60		11:05	6	(as above w/small pebbles)		CL	0.3
			13				
		11:13	14	CLAYEY SANDY GRAVEL- brown, pebbles>2 cm, wet,		GC	1
			26	no odor.			
			26				
		11:19	40			GC	
			50-4"	CLAYEY SANDY GRAVEL- lt brown, wet, no odor,			
		11:23	50-6"	med-v coarse grains, 0.2 to >5cm pebbles, bent tube & limited recovery.		GC	
65							
			27	(as above with slighty greater clay content)			
		11:33					
			50-5"	no recovery.			
			38			SW	
		11:41	45	CLAYEY GRAVELLY SAND- brown, wet, coarse to v			0.5
			50-5"	coarse grain, pebbles 0.2 - 0.8 cm, no odor.		SW	
				(as above but larger pebbles)			
70							
75							
80							
85							
90							

SEAL

SCREEN

09-11-2014

Geological Technics Inc.

Borehole Log

Project Name SULLINS Borehole No. MW-7 Page 1 of 3

Project No. 1262.2 Date 10/4/06 Contractor

Area & County 187 NORTH L STREET, LIVERMORE

Field Geo/Eng J. ANGULO Drilling Method HSA

Borehole Dia. 8" Tot. Depth 69.5 Tot. Casing Depth 66.5 Casing Dia. Screened Interval

Filter Pack Annular Seal Slot Size Grout Water Depth

Depth feet	Smpl. Intrvl	Sample No.	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks
					GROUT				
5	X		1400	7/7/11				S-C-GRAVEL - MOIST, [illegible]	O
					SLURRY				
10	X		1405	10/8/12				SC - GRAVEL - [illegible] SAND [illegible], BRN COBB TO 1.5" [illegible], SL MOIST NO ODOR	O
					14				
15	X		1412	7/19/24		[illegible]		AA MOIST, A 2" LT GRAY SILT LENS NO ODOR	O
20			1417	12/18/19	20			(AA) 2" BRN SANDY SILT LENS NO ODOR SOME WET CLAYS IN BETWEEN - GRAY-BROWN MOIST LAYERS (LEACHING FROM WASHOUT AREA?)	O
25	X		1423	7/11/30				(AA) LESS DARK COLOR, MORE UNIFORM BROWN COLOR TO CLAYS	✓
					29				
					30				

Notes:

52
49
68

Geological Technics Inc.

Borehole Log

Project Name: SULLINS Borehole No.: MW-1

Project No.: 1262.2 Date: 10/4/06 Contractor:

Area & County: 187 NORTH L STREET, LIVERMORE

Field Geo/Eng: J. ANGULO Drilling Method: HSA

Borehole Dia.: ___ Tot. Depth: ___ Tot. Casing Depth: ___ Casing Dia.: ___ Screened Interval: ___

Filter Pack: ___ Annular Seal: ___ Slot Size: ___ Grout: ___ Water Depth: ___

Depth feet	Time	Blow Count/6"	Description	Remarks (OVM)
30	1432	12/18/32	AA – GREY 1-2" SAND LENSES, HC ODOR MORE SAND, LESS CLAY 50%G, 45 S, <5 C ?	15
35	1450	12/12/18	AA – MORE CLAY HC ODOR 10/10/80 G S C	115
37	1506	6/7/9	BRN, PLASTIC CLAY HC ODOR	49
39	1503	7/6/8	AA SILT LENSES STRONG GAS ODOR GREY HC STAINED NODULES	521
40	1507	7/9/12	SILT BRN UNIFORM WET [illegible]	164
42	1510	MISS	AA MORE CLAY GAS ODOR	183
	1525	9/12/15	SILTY CLAY BRN, AC ODOR	105
45	1530	9/12/18	SANDY-G CLAY - GREY MOIST STRONG HC ODOR	554
46	1534	2/7/12	SANDY CLAY DARK BRN GRAVEL	418
47	1537	7/11/13	(AA) SOME SILT BRN LENSES	109
49	1542	7/9/20	SAND VF.F WET GREY HC ODOR	72
50	1545	12/11/20	NO RECOVERY	–
52	1600	10/17/14	SAND - VF BRN WET HC ODOR	40
53	1603	15/39/50/4"	C-S-GRAVEL GREY WET HC ODOR	12
55	1611	9/26/39	AA W ORANGE FE STAINING	10
56	1619	7/8/26	AA SAND VF BRN TO GREY WET ? FAINT HC ODOR SILTY CLAY - BRN	88
58	1630	7/9/20	C-S-G BRN	13
60				

Notes:

Geological Technics Inc.

Borehole Log

Project Name: SULLINS Borehole No.: MW-7 Page 3 of 3

Project No.: 1262.2 Date: 10/4/06 Contractor:

Area & County: 187 NORTH L STREET, LIVERMORE

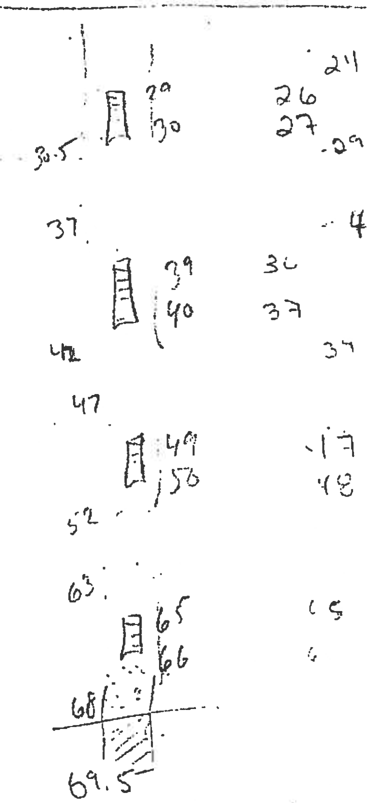
Field Geo/Eng: J. ANGULO Drilling Method: HSA

Borehole Dia.___ Tot. Depth___ Tot. Casing Depth___ Casing Dia.___ Screened Interval___

Filter Pack___ Annular Seal___ Slot Size___ Grout___ Water Depth___

Depth feet	Smpl. Intrvl	Sample No.	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks
60			1636	9/13/22				(AA) C-S-G less clay	6
62			1642	12/12/14				SAND - VC GRAIN WET, NO ODOR (6") S-C GRAVEL BRN AS ABOVE, NO ODOR	40
63									
64			1646	23/35/49				(AA) - VC SAND 4" LAYER ODOR?	5
65			1655	7/4/38				(AA) BUT GREY NO ODOR GREY LIKE SAND ABOVE	14
66									
67			1810	35/50-5"				(AA)	4
68			1720	34/50-6"				(AA)	3
69									
70									
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									

SLOUGH ON SAMPLE



Notes:

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-7

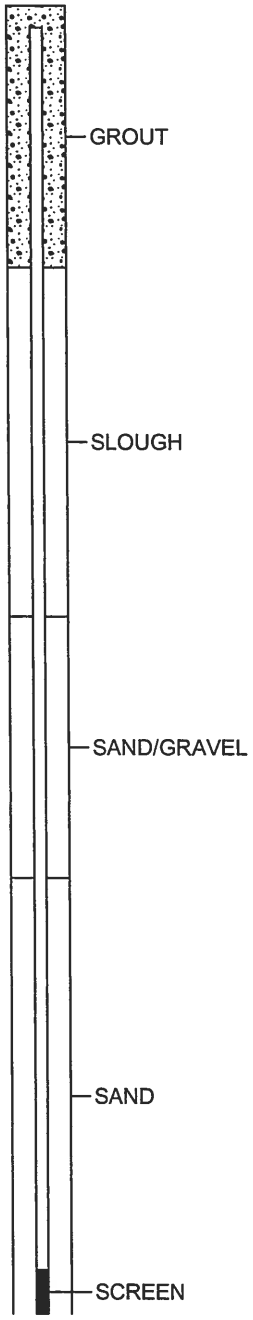
Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/4/06
Drilling Method : HSA
Driller : Cascade
Logged By : J. Angulo

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
0				3" Concrete			
				SANDY CLAYEY GRAVEL- dark brown, moist, no odor.		GC	
5		14:00	7 7 11	(as above)		GC	0
10		14:05	10 18 12	SANDY CLAYEY GRAVEL- brown,more sand than above, sl moist,pebbles to 1.5 ", no odor.		GC	0
15		14:12	7 19 24	(as above- moist, 1/2" lt grey silt lens,no odor)		GC	0
20		14:17	12 18 19	(as above- 2" brown sandy silt lens, some wet clay grey-brown lenses)		GC	0
25		14:23	7 14 30	(as above- less dark in color, more uniform brown clays)		GC	0
30							

Well: MW-7
Elev.:



09-11-2014

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-7

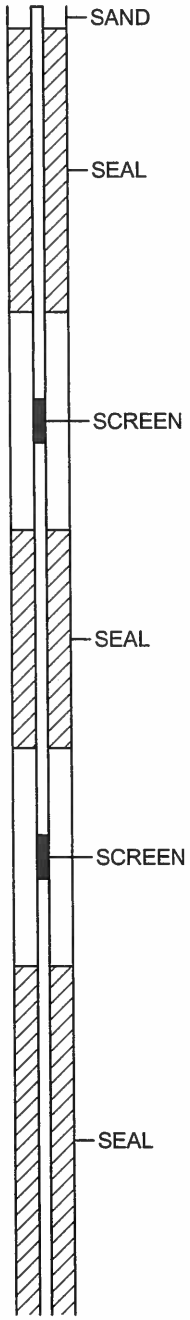
Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/4/06
Drilling Method : HSA
Driller : Cascade
Logged By : J. Angulo

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
30		14:32	12 28 32	(as above- grey 1-2" sand lenses, HC odor)		GC	15
35		14:50	12 12 18	GRAVELLY CLAY- as above but more clay than gravel, HC odor.		CL	115
		15:00	6 7 9	CLAY- brown, plastic, HC odor.		CL	49
		15:03	9 16 12	(as above- silt lenses, grey HC stained nodules, strong gasoline odor)		CL	521
40		15:07	7 9 12	SILT- brown, uniform, wet, HC odor.		ML	164
		15:10		CLAYEY SILT- brown, uniform, wet, gasoline odor.		ML	183
		15:25	9 12 15	SILTY CLAY- brown, gasoline odor.		CL	105
45		15:30	9 12 18	SANDY GRAVELLY CLAY- grey, strong HC odor,pebbles to 1".		CL	554
		15:34	2 7 12	(as above - brown to grey)		CL	418
		15:37	7 11 13	(as above - some grey silt lenses)		CL	109
		15:42	7 9 20	SAND- v.fine to fine, grey, wet, HC odor.		SP	72
50		15:45	12 17 20	No recovery.			
		16:00	10 17 14	CLAYEY SAND- v.fine, grey, wet, HC odor.		SC	40
		16:03	15 39 50-4"	CLAYEY SANDY GRAVEL-grey, wet, HC odor.		GC	12
55		16:11	9 26 39	(as above - some orange Fe staining)		GC	10
		16:19	7 18 26	(as above)		GC SP CL	88
		16:30	7 19 20	SAND- v.fine, brown to grey, wet, faint HC odor. SILTY CLAY- brown, faint HC odor.		GC	13
60				CLAYEY SANDY GRAVEL-brown, faint HC odor.		GC	

Well: MW-7
Elev.:



09-11-2014

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-7

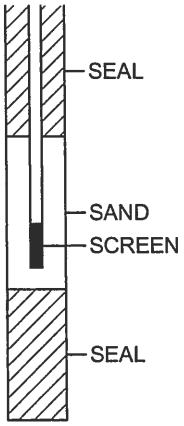
Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/4/06
Drilling Method : HSA
Driller : Cascade
Logged By : J. Angulo

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
60			9			GC	
		16:36	13	(as above- less clay)		GC	6
			23				
			12			SP	
		16:42	12	SAND-v.coarse, grey,wet, no odor.		GC	40
			14				
			23	SANDY CLAYEY GRAVEL- brown, HC odor.			
		16:46	35			GC	5
			44	(as above- v.coarse 4" sand layer, odor?)			
65			7				
		16:55	14	(as above but grey, no odor)		GC	14
			38				
			35				
		17:10	50-5"	(as above)		GC	4
			34				
		17:20	50-6"	(as above)		GC	3
70							
75							
80							
85							
90							

Well: MW-7
Elev.:



09-11-2014

Geological Technics Inc.

Borehole Log

Project Name: SULLINS Borehole No.: MW-8 Page 1 of 3

Project No.: 1262.2 Date: 10/5/06 Contractor: ______

Area & County: 187 NORTH L STREET, LIVERMORE

Field Geo/Eng: J. ANGULO Drilling Method: HSA

Borehole Dia. ______ Tot. Depth ______ Tot. Casing Depth ______ Casing Dia. ______ Screened Interval ______

Filter Pack ______ Annular Seal ______ Slot Size ______ Grout ______ Water Depth ______

Depth feet	Smpl. Intrvl	Sample No.	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks PROPANE TANK B6 +2
			1'					~3" CONCRETE FILL GRAVEL 10" C-S-G	
5	X		1250	9/10/25				C-S-G LT BRN, DRY, NO ODOR UP TO 1"	2
10	X		1300	50-6"				(AA) COBB TO 2" GREY MOIST	1
15	X		1305	11/18/50 5"				MORE CLAY IN CUTTINGS SLIGHTLY LESS GRAVEL (AA) SL MOIST, MORE CLAY NO ODOR	1
20			1315	15/12/17				(AA) MOIST, MORE CLAY 5Y/5Z CLGR SOME FE STAINING ORANGE	1
25			1325	11/19/24				S-GRAV-CLAY GREY, SL MOIST CLAYEY SAND - BRN, MOIST NO ODOR (4") (AA)	0
								(DRILLER'S SOIL HARDER THAN AT MW-4,7 LOCATIONS)	

Notes:

25 35 45 55 5.25

Geological Technics Inc.

Borehole Log

Project Name: SULLINS　　Borehole No.: MW-8　　

Project No.: 1262.2　　Date: 10/5/06　　Contractor:

Area & County: 187 NORTH L STREET, LIVERMORE

Field Geo/Eng: J. ANGULO　　Drilling Method: HSA

Borehole Dia.　　Tot. Depth　　Tot. Casing Depth　　Casing Dia.　　Screened Interval

Filter Pack　　Annular Seal　　Slot Size　　Grout　　Water Depth

Margin notes	Depth feet	Time	Blow Count/6"	Columnar Section	USCS Sym.	Description	Remarks
	30	1340	19/26/40		CS	GRAVEL GRAY, MOIST, HARD, TAN 1-2" [illegible] CORES "HOT" NO ODOR	1
[illegible] FELL	35	1356	7/9/14			AA [illegible] GREY FIRST GAS ODOR! 6" VF SAND LENS GREY MOIST	314
5 MIN BREAK	36–37	1400	6/6/12	37	S	CLAY – BRN TO GREY, HC ODOR WET TO MOIST, VF SAND	8
	38	1415	9/8/12			(AA)	–
	39–40	1420	5/9/12			(AA. VF SAND 1-2" LENSES)	17
[illegible] FELL	41	1430	11/13/19	42		SILTY CLAY – BRN TO GREY MOIST HC ODOR	2
"UPS"	42–43	1445	4/7/10			AA	446
						GRAV SAND - CLAY BRN TO GREY HC ODOR	
	44	1455	4/4/4			SILTY CLAY – BRN TO GREY HC ODOR	19
	45–46	1500	9/12/17			S-G-CLAY – [illegible], GRAY TO BRN HC ODOR V. HARD 2-3" LAYER	66
	47–48	1503	5/5/7			SILTY CLAY – BRN, [illegible] HC [illegible] WET	33
	49	1506	7/10/15			AA WET	7
	50–51	1510	7/12/10			AA	63
	52	1512	12/15/20	52		SAND – GREY-GRAVEL, VF-F [illegible] HC ODOR	275
	53	1520				HEAVE - NO RECOVERY - [illegible] GRAVELS	–
	54	1533	17/36/45	54		SAND F TO VC GREY WET ODOR	3
	55				GS	GRAVEL – GREY - DARK GREEN [illegible] ½" WET	
	56	1544	17/24/30			AA – SOME FE STAINED NODULES/GRAVELS [illegible] TO 2"	18
	57					AA – MORE SAND	
	58	1546	4/9/21		CL <10%	CLAY-SILT – MOTTLED BRN/GREY NO ODOR	11
	59	1550	10/15/26		SG	CLAY – MOTTLED [illegible]/GREY [illegible] ½"	11
MILLED OFF 6"		1600	7/7/11		SG	[illegible] – [illegible] [illegible] CLAY MORE SAND	4

Notes:

Geological Technics Inc.

Borehole Log

Project Name SULLINS Borehole No. MW-8 Page 3 of 3

Project No. 1262.2 Date 10/5/06 Contractor

Area & County 187 NORTH L STREET, LIVERMORE

Field Geo/Eng J. ANGULO Drilling Method HSA

Borehole Dia. 8" Tot. Depth 66.5 Tot. Casing Depth 66.5 Casing Dia. Screened Interval

Filter Pack Annular Seal Slot Size Grout Water Depth

Depth feet	Spl. Intrvl	Sample No.	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks
60									
61			1607	7/6/22				AA	
62								AA MORE SAND/SILT SANDY CLAY AND GRAVEL NO ODOR	7
63	X		1610	3/6/10		63			
64			1615	8/12/18				AA LESS SAND NO ODOR	7
65									
66			1623	17/29/42				S-C-GRAVEL NO ODOR NO ODOR	4
67									
68									
69									
70									
71									
72									
73									
74									
75									

20
20
30

37
40
42

49

51
52
54

63

65
66

Notes:

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-8

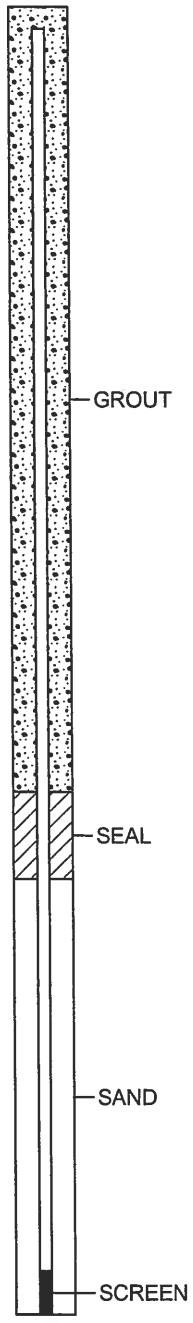
Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/5/06
Drilling Method : HSA
Driller : Cascade
Logged By : J. Angulo

Well: MW-8
Elev.:

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
0				2-3" Concrete over fill gravel			
5		12:50	9 20 25	CLAYEY SANDY GRAVEL- lt brown, dry, pebbles to 1", no odor.		GC	2
10		13:00	50-6"	(as above but grey with pebbles to 2")		GC	1
15		13:05	12 28 50-5"	(as above but sl moist, more clay)		GC	1
20		13:15	15 12 17	(as above much less sand-more clay, orange oxidation staining)		GC	1
25		13:25	11 19 24	SANDY GRAVELLY CLAY- grey, sl moist, 4" clayey sand layer @ 25', no odor.		CL	0
30							



09-11-2014

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-8

Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/5/06
Drilling Method : HSA
Driller : Cascade
Logged By : J. Angulo

Well: MW-8
Elev.:

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
30		13:40	19 26 40	CLAYEY SANDY GRAVEL- grey, moist, 1-2" pebbles, no odor.		GC	1
35		13:56	7 9 14	(as above - but grey, strong gas odor, 6" v fine sand layer)		GC	314
		14:00	6 6 12	SANDY CLAY- brown to grey, wet to moist, HC odor, v fine sand grains.		CL	8
		14:15	9 8 12	(as above)		CL	
40		14:20	5 5 12	(as above with v fine 1-2" sand lenses)		CL	17
		14:30	11 13 19	SILTY CLAY- brown to grey, moist, HC odor.		CL	2
		14:45	4 7 10	(as above)		CL CL	446
45		14:55	4 4 4	GRAVELLY SANDY CLAY- brown to grey, HC odor. SILTY CLAY- brown to grey, HC odor.		CL	19
		15:00	9 12 17	SANDY GRAVELLY CLAY- grey to brown, pebbles to 1/2", very hard 3" layer, HC odor.		CL	66
		15:03	5 5 9	SILTY CLAY- brown with some grey HC nodules, wet, HC odor.		CL	33
		15:06	7 10 15	(as above)		CL	7
50		15:10	7 10 10				63
		15:12	12 15 20	SAND- grey-green, v fine to fine, wet, strong HC odor.		SP	275
		15:20		Heave- no recovery but gravels?			
		15:33	17 36 45	SAND- fine to v coarse, grey, wet, HC odor.		SW GC	3
55		15:44	17 24 30	CLAYEY SANDY GRAVEL- grey to dark green, wet, pebbles to 1/2".		GC	18
		15:46	4 9 21	(as above with iron oxide stained nodules, pebbles to 2")		GC ML	11
		15:50	10 15 26	(as above but more sand)		CL	11
60		16:00	7	CLAYEY GRAVELLY SILT- mottled grey-brown, no odor.		CL	4

SEAL
SCREEN
SEAL
SCREEN
SEAL

09-11-2014

GROUND ZERO ANALYSIS, INC.

LOG OF BORING MW-8

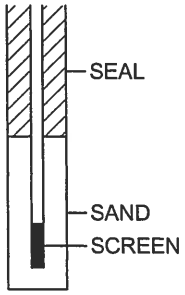
Sullins
187 North L Street
Livermore, CA

Project No.: 1262.2

Date : 10/5/06
Drilling Method : HSA
Driller : Cascade
Logged By : J. Angulo

Depth in Feet	Lab Sample	Time	Blow Count	DESCRIPTION	GRAPHIC	USCS	OVM (ppm)
60		16:00	7 4 7			CL	4
		16:07	16 22			CL	
			3	(as above but more sand/silt)			
		16:10	6 10	SANDY CLAY- mottled grey-brown, no odor.		CL	7
			6				
		16:15	12 18	(as above but less sand)		CL	7
65			17				
		16:23	28 42	SANDY CLAYEY GRAVEL-mottled grey-brown, some chocolate brown clay nodules, no odor.		GC	4
70							
75							
80							
85							
90							

Well: MW-8
Elev.:



09-11-2014

Geological Technics Inc.

Borehole Log

Project Name SULLINS. Borehole No. EW-1 Page 1 of 1

Project No. 1262.2 Date 10/3/06 Contractor CASCADE

Area & County 187 NORTH L STREET, LIVERMORE

Field Geo/Eng J. ANGULO Drilling Method HSA

Borehole Dia. 10" Tot. Depth 25.5 Tot. Casing Depth 25 Casing Dia. 4" Screened Interval 10-25

Filter #2/12 Pack 9.5-25 Annular Seal 7.5-9.5 Slot Size ____ Grout ____ Water Depth NA

~125'

Depth feet	Smpl. Intrvl	Sample No.	Time	Blow Count/6"	Well Details	Columnar Section	USCS Sym.	Description	Remarks
								FILL GRAVEL	
5									
						7.5			
						9.5			
10									
15									
20									
25					CAP now PLUG				

Notes:

GROUND ZERO ANALYSIS

INTERVAL/SAMPLE DESCRIPTION

PROJECT Sullins
WELL/BORING NO. MW-9
DATE/BY 1-27-2015
ANDREW DORN

LOG INTERVAL	SC 20 - 31.5'			CL 35-41.5 *		SC LENSE?	
SAMPLE INTERVAL	20-21.5'	25-26.5'	30-31.5'	35-36.5'	40-41.5'	41.5 SHOE	45-46.5'
BLOWCOUNTS	50/-6" -	50/-6" -	50/-6" -	5 - 8 - 8	4 - 6 - 9	- -	- -
% SAND	50	50	50	20	30-40	50	30-40
GR SIZE/RANGE	FN M (CRS)	FN M (CRS)	FN M (CRS)	(VFN) M CRS	(VFN) M CRS	FN (M) CRS	FN (M) CRS
ANGULARITY	(A) SA SR R	(A) SA SR R	(A) SA SR R	A SA SR R	A SA SR R	A (SA) SR R	(A) SA SR R
GRADING	W (P)	W (P)	W (P)	W P	W P	W P	(W) P
% GRAVEL	20	20	20	0	0	0	<10
GR SIZE/RANGE	FN (CRS)	FN (CRS)	FN (CRS)	FN CRS	FN CRS	FN CRS	FN CRS
ANGULARITY	(A SA) SR R	(A SA) SR R	(A SA) SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R
GRADING	W P	W P	W P	W P	W P	W P	W P
COBBLES	UP TO 2cM	UP TO 3cm	UP TO 2cM				
% FINES	30	30	30	80	60-70	50	50-60
DRY STRENGTH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH
DILATANCY	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R
TOUGHNESS	L M H	L M H	L M H	L M H	L M H	L M H	L M H
PLASTICITY	N L M H	N L M H	N L M H	(N) L M H	(N) L M H	(N) L M H	(N) L M H
CMPCTNSS/CNSSTNCY							
COLOR	BROWN/RED	BROWN/RED	BROWN/RED	REDISH BROWN	BROWN/GRAY	BROWN/GRAY	BROWN
ODOR	(N) SL M STRNG	(N) SL M STRNG	(N) SL M STRNG	N (SL) M STRNG	N SL (M) STRNG	N SL (M) STRNG	N (SL) M STRNG
ORGANICS	N Y	N Y	N Y	(N) Y	(N) Y	(N) Y	(N) Y
MOISTURE	(DRY) MST WET	(DRY) MST WET	(DRY) MST WET	(DRY) MST WET	DRY (MST) WET	DRY (MST) WET	DRY (MST) WET
HCL REACTION	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG
CEMENTATION	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG
~~STRUCTURE~~ TIME				0910	0915		0920
COMMENTS	INCOMPLETE RECOVERY SAND MATRIX	INCOMPLETE RECOVERY SAND MATRIX SIMILAR TO ABOVE W/ ↑ GRAIN SIZE & ANGULARITY	INCOMPLETE RECOVERY SAND MATRIX	CLAY MATRIX W/ SILT + SAND FRACTURED	CAPILLARY FRINGE GRAY SPOTTING ↑ SAND CONTENT & GRAIN SIZE W/ DEPTH		SIMILAR TO 40' W/ ↑ GRAIN SIZE GW IN BORING
SAMPLE ID				MW-9@35'	MW-9@40'		MW-9@45'
NAME	CLAYEY GRAVELLY SAND	→	→	SANDY CLAY	SANDY CLAY	CLAYEY SAND	SANDY CLAY
SYMBOL	SC	SC	SC	CL	CL	SC	CL
PID	0	0	0	45 ppm	980 ppm		130 ppm

scmptrm.dwg

GROUND ZERO ANALYSIS

INTERVAL/SAMPLE DESCRIPTION

PROJECT SULLINS
WELL/BORING NO. MW-9
DATE/BY 1-27-2015
ANDREW DORN.

LOG INTERVAL	SC 50-51.5	CL 55-56.5'	SC 60-66.5'				
SAMPLE INTERVAL	50-51.5	55-56.5'	60-61.5'	65-66.5'			
BLOWCOUNTS	50/-6" -	50/-6" -	10 - 10 - 11	50/-6" -	- -	- -	- -
% SAND	50	20	60	70			
GR SIZE/RANGE	FN M CRS	VFN M CRS	FN M CRS	FN M CRS	FN M CRS	FN M CRS	FN M CRS
ANGULARITY	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R
GRADING	W P	W P	W P	W P	W P	W P	W P
% GRAVEL	30	0	<5	10			
GR SIZE/RANGE	FN CRS	FN CRS	FN CRS	FN CRS	FN CRS	FN CRS	FN CRS
ANGULARITY	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R
GRADING	W P	W P	W P	W P	W P	W P	W P
COBBLES	UP TO 2cm		UP TO 1/2cm	UP TO 4cm			
% FINES	20	80	35	20			
DRY STRENGTH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH
DILATANCY	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R
TOUGHNESS	L M H	L M H	L M H	L M H	L M H	L M H	L M H
PLASTICITY	N L M H	N L M H	N L M H	N L M H	N L M H	N L M H	N L M H
CMPCTNSS/CNSSTNCY							
COLOR	GRAY	BROWN	REDISH BROWN	RED/BROWN			
ODOR	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG
ORGANICS	N Y	N Y	N Y	N Y	N Y	N Y	N Y
MOISTURE	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET
HCL REACTION	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG
CEMENTATION	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG
~~STRUCTURE~~ TIME				0945			
COMMENTS	INCOMPLETE RECOVERY NO SAMPLE	CLAY MATRIX W/ SILT & SAND VERY DRY W/ WET UNIT ABOVE @ 50'	SAND MATRIX W/ CLAY MOSTLY FINE SAND W/ SOME MED & COARSE	INCOMPLETE RECOVERY			
SAMPLE ID				MW-9@65'			
NAME	CLAYEY GRAVELLY SAND	SANDY CLAY	CLAYEY SAND	CLAYEY GRAVELLY SAND			
SYMBOL	SC	CL	SC	SC			

PID 84 ppm 0 ppm 19 ppm 37 ppm

scmpfrm.dwg

GROUND ZERO ANALYSIS

INTERVAL/SAMPLE DESCRIPTION

PROJECT: SULLINS
WELL/BORING NO.: MW-10
DATE/BY: 1-26-2015 ANDREW DORN

LOG INTERVAL	SC, SW/SP 45' - 56.5'			CL 60 - 66.5'			
SAMPLE INTERVAL	50-51.5'	55-56'	56-56.5'	60-61.5	65-66.5'		
BLOWCOUNTS	50/-6" -	28-50/6"-	- -	12-14-28	50/-6" -	- -	- -
% SAND	60	70	50	30-40	30-40		
GR SIZE/RANGE	VFN M CRS	FN M CRS	FN M CRS	FN M CRS	FN M CRS	FN M CRS	FN M CRS
ANGULARITY	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R
GRADING	W P	W P	W P	W P	W P	W P	W P
% GRAVEL	<10	20	20	30	30		
GR SIZE/RANGE	FN CRS	FN CRS	FN CRS	FN CRS	FN CRS	FN CRS	FN CRS
ANGULARITY	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R
GRADING	W P	W P	W P	W P	W P	W P	W P
COBBLES	UP TO 1cm	UP TO 1cm	UP TO 2cm	UP TO 2cm	UP TO 2cm		
% FINES	30	10	30	30-40	30-40		
DRY STRENGTH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH
DILATANCY	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R
TOUGHNESS	L M H	L M H	L M H	L M H	L M H	L M H	L M H
PLASTICITY	N L M H	N L M H	N L M H	N L M H	N L M H	N L M H	N L M H
CMPCTNSS/CNSSTNCY							
COLOR	BROWN	L. BROWN	L. BROWN	L. BROWN	L. BROWN		
ODOR	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG
ORGANICS	N Y	N Y	N Y	N Y	N Y	N Y	N Y
MOISTURE	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET
HCL REACTION	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG
CEMENTATION	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG
~~STRUCTURE~~ TIME	1455				1520		
COMMENTS	MOSTLY VF SAND AND SILT INCOMPLETE RECOVERY	SIMILAR TO 40-41' W/ ↓ CLAY, ↑ SILT INCOMPLETE RECOVERY	COARSE SAND DOMINATE	CLAY MATRIX	CLAY MATRIX		
SAMPLE ID	MW-10@50'				MW-10@65'		
NAME	CLAYEY SAND	GRAVELLY SAND	GRAVELLY CLAYEY SAND	GRAVELLY CLAY	GRAVELLY CLAY		
SYMBOL	SC	SW	SC/SP	CL	CL		
PID	17 ppm	0	0	0	0		

scmpfrm.dwg

GROUND ZERO ANALYSIS

INTERVAL/SAMPLE DESCRIPTION

PROJECT SULLINS
WELL/BORING NO. MW-10
DATE/BY 1-26-2015
ANDREW DORN

LOG INTERVAL	CL 20-31.5'			SC/SW 35-41'		CL 41-41.5'	
SAMPLE INTERVAL	20-21.5'	25-26.5'	30-31.5'	35-36.5'	40-41'	41-41.5'	45-46.5'
BLOWCOUNTS	50/-6" -	50/-6" -	50/-6" -	50/-6" -	35-50/6"-	- -	50/-6" -
% SAND	40	40	40	50	50	20	50
GR SIZE/RANGE	(FN) M CRS	(FN) M CRS	(FN) M CRS	FN M (CRS)	FN M (CRS)	(VFN) M CRS	FN M (CRS)
ANGULARITY	(A) SA SR R	(A) SA SR R	(A) SA SR R	(A) SA SR R	(A) SA SR R	A SA SR R	(A) SA SR R
GRADING	(W) P	(W) P	(W) P	(W) P	(W) P	W P	W (P)
% GRAVEL	10	10	10	20	20	0	20
GR SIZE/RANGE	(FN) CRS	(FN) CRS	(FN) CRS	(FN) CRS	(FN) CRS	FN CRS	(FN) CRS
ANGULARITY	(A) SA SR R	(A) SA SR R	(A) SA SR R	(A) SA SR R	(A) SA SR R	A SA SR R	(A) SA SR R
GRADING	W P	W P	W P	W P	W P	W P	W P
COBBLES	UP TO 1 CM	UP TO 1CM	UP TO 1CM	UP TO 1CM	UP TO 1CM		UP TO 2CM
% FINES	50	50	50	30	30	80	30
DRY STRENGTH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH
DILATANCY	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R
TOUGHNESS	(L) M H	(L) M H	(L) M H	L M H	L M H	L M H	L M H
PLASTICITY	(N) L M H	(N) L M H	(N) L M H	N L M H	N L M H	N (L) M H	N L M H
CMPCTNSS/CNSSTNCY							
COLOR	REDDISH BROWN	REDDISH BROWN	REDDISH BROWN	L. BROWN	L. BROWN	BROWN	L. BROWN
ODOR	(N) SL M STRNG	(N) SL M STRNG	(N) SL M STRNG	(N) SL M STRNG	(N) SL M STRNG	N (SL) M STRNG	(N) SL M STRNG
ORGANICS	N Y	N Y	N Y	N Y	N Y	N Y	N Y
MOISTURE	(DRY) MST WET	(DRY) MST WET	(DRY) MST WET	(DRY) MST WET	DRY (MST) WET	DRY (MST) WET	DRY MST (WET)
HCL REACTION	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG
CEMENTATION	(WEAK) M STRNG	(WEAK) M STRNG	(WEAK) M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG
~~STRUCTURE~~ TIME					1440		
COMMENTS	INCOMPLETE RECOVERY	INCOMPLETE RECOVERY	INCOMPLETE RECOVERY	COARSE SAND DOMINATE LENSES OF CLEAN COARSE SAND W/ F. GRAVEL	COARSE SAND DOMINATE →	CLAY MATRIX W/ SAND & SILT	COARSE SAND DOMINATE LENSES OF CLEAN COARSE SAND W/ F. GRAVEL
SAMPLE ID					MW-10@40'		
NAME	SANDY CLAY	SANDY CLAY	SANDY CLAY	GRAVELLY CLAYEY SAND	GRAVELLY CLAYEY SAND	SANDY CLAY	GRAVELLY CLAYEY SAND
SYMBOL	CL	CL	CL	SC/SW	SC/SW	CL	SC/SP
PID	0 ppm	0	0	0	0	0	scmpfrm.dwg 54 ppm

GROUND ZERO ANALYSIS

PROJECT SULLINS
WELL/BORING NO. EW-2
DATE/BY 1-26-2015
ANDREW DORN

INTERVAL/SAMPLE DESCRIPTION

LOG INTERVAL	PEA GRAVEL UST PIT ?	GM/GC 10 - 31.5'					*
SAMPLE INTERVAL	5-6.5'	10-11.5'	15-16.5'	20-21.5'	25-26.5'	30-31.5'	35-36.5'
BLOWCOUNTS	- -	50/-6" -	50/-6" -	50/-6" -	50/-6" -	50/-6" -	13 - 8 - 9
% SAND		40	40	40	40	40	20
GR SIZE/RANGE	FN M CRS	FN M CRS	FN M CRS	FN M CRS	FN M CRS	FN M CRS	VFN M CRS
ANGULARITY	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R
GRADING	W P	W P	W P	W P	W P	W P	W P
% GRAVEL		50	40	50	30	30	0
GR SIZE/RANGE	FN CRS	FN CRS	FN CRS	FN CRS	FN CRS	FN CRS	FN CRS
ANGULARITY	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R
GRADING	W P	W P	W P	W P	W P	W P	W P
COBBLES		UP TO 3CM	UP TO 3CM	UP TO 3CM	UP TO 4CM	> 4CM	
% FINES		10	20	10	30	30	80
DRY STRENGTH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH
DILATANCY	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R
TOUGHNESS	L M H	L M H	L M H	L M H	L M H	L M H	L M H
PLASTICITY	N L M H	N L M H	N L M H	N L M H	N L M H	N L M H	N L M H
CMPCTNSS/CNSSTNCY							
COLOR		BROWN/RED	BROWN/RED	BROWN/RED	BROWN/RED	BROWN/RED	BROWN
ODOR	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG	N SL M STRNG
ORGANICS	N Y	N Y	N Y	N Y	N Y	N Y	N Y
MOISTURE	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET	DRY MST WET
HCL REACTION	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG
CEMENTATION	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG
~~STRUCTURE~~ TIME				1010	1015		1025
COMMENTS	UST BACKFILL	UST BACKFILL SOME NATIVE MATERIAL	INCOMPLETE RECOVERY	INCOMPLETE RECOVERY	INCREASED CLAY CONTENT INCOMPLETE RECOVERY	INCOMPLETE RECOVERY	SOME ANGULAR GRAVEL - POSS. SLUFF CLAY MATRIX W/ SAND & SILT
SAMPLE ID				EW-2@20'	EW-2@25'		EW-2@35'
NAME		SANDY GRAVEL	SANDY GRAVEL	SANDY GRAVEL	CLAYEY GRAVEL	CLAYEY GRAVEL	SANDY CLAY
SYMBOL		GM	GM	GM	GC	GC	CL

PID 0 ppm 0 0 0 0 0

scmpfrm.dwg

1140 ppm

GROUND ZERO ANALYSIS

PROJECT SULLINS
WELL/BORING NO. EW-2
DATE/BY 1-26-2015
ANDREW DORN

INTERVAL/SAMPLE DESCRIPTION

LOG INTERVAL	CL 35-46.5' *		SP 50-51.5'	CL 55-61.5' *			
SAMPLE INTERVAL	40-41.5'	45-46.5'	50'-51.5'	55'-56.5'	60-61.5'		
BLOWCOUNTS	10 - 10 - 12	8 - 8 - 13	23 - 50/6" -	9 - 12 - 23	10 - 12 - 13	- -	- -
% SAND	20	30	70	20	30		
GR SIZE/RANGE	(VFN) M CRS	(VFN) M CRS	FN (M) CRS	(VFN) M CRS	(VFN) M CRS	FN M CRS	FN M CRS
ANGULARITY	A SA SR R	A SA SR R	A (SA) (SR) R	A SA SR R	A (SA) (SR) R	A SA SR R	A SA SR R
GRADING	W P	W P	W (P)	W P	W P	W P	W P
% GRAVEL	0	0	30	0	0		
GR SIZE/RANGE	FN CRS	FN CRS	(FN) CRS	FN CRS	FN CRS	FN CRS	FN CRS
ANGULARITY	A SA SR R	A SA SR R	(A) (SA) SR R	A SA SR R	A SA SR R	A SA SR R	A SA SR R
GRADING	W P	W P	(W) P	W P	W P	W P	W P
COBBLES			UP TO 1cm				
% FINES	80	70	0	80	70		
DRY STRENGTH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH	N L M H VH
DILATANCY	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R	N SLW R
TOUGHNESS	L M H	L M H	L M H	L M (H)	L M H	L M H	L M H
PLASTICITY	N (L) (M) H	N (L) M H	N L M H	N (L) (M) H	N (L) M H	N L M H	N L M H
CMPCTNSS/CNSSTNCY							
COLOR	BROWN/GRAY	BROWN/GRAY	GRAY	GRAY	REDDISH BROWN/GRAY		
ODOR	N SL (M) STRNG	N SL (M) STRNG	N SL (M) STRNG	N SL (M) STRNG	N (SL) M STRNG	N SL M STRNG	N SL M STRNG
ORGANICS	(N) Y	(N) Y	(N) Y	(N) Y	(N) Y	N Y	N Y
MOISTURE	DRY (MST) WET	DRY (MST) WET	DRY MST (WET)	DRY MST (WET)	DRY (MST) (WET)	DRY MST WET	DRY MST WET
HCL REACTION	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG	N WEAK STRNG
CEMENTATION	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG	WEAK M STRNG
STRUCTURE	1040	1045	1050	1055	1100		
COMMENTS	CLAY MATRIX SILT w/SAND	FRACTURED CLAY MATRIX SILT	WATER TABLE WATER BEARING INTERBEDDED C- GRAVELY SAND AND F. WELL GRADED SAND	CLAY MATRIX SILT w/ SAND	FRACTURED CLAY MATRIX WATER BEARING		
PID →	900 PPM	190 PPM	810 PPM	90 PPM	44 PPM		
SAMPLE ID	EW-2@40'	EW-2@45'	EW-2@50'	EW-2@55'	EW-2@60'		
NAME	SANDY CLAY	SANDY CLAY	GRAVELLY SAND	SANDY CLAY	SANDY CLAY		
SYMBOL	CL	CL	SP	CL	CL		

PIPE TD = 60' 4"
BOREHOLD TD = 60'
SCREEN 60' - 40'

SAND PACK 60' - 38'
BENTONITE 38' - 35'

SRI SUPREME #12 SAND

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