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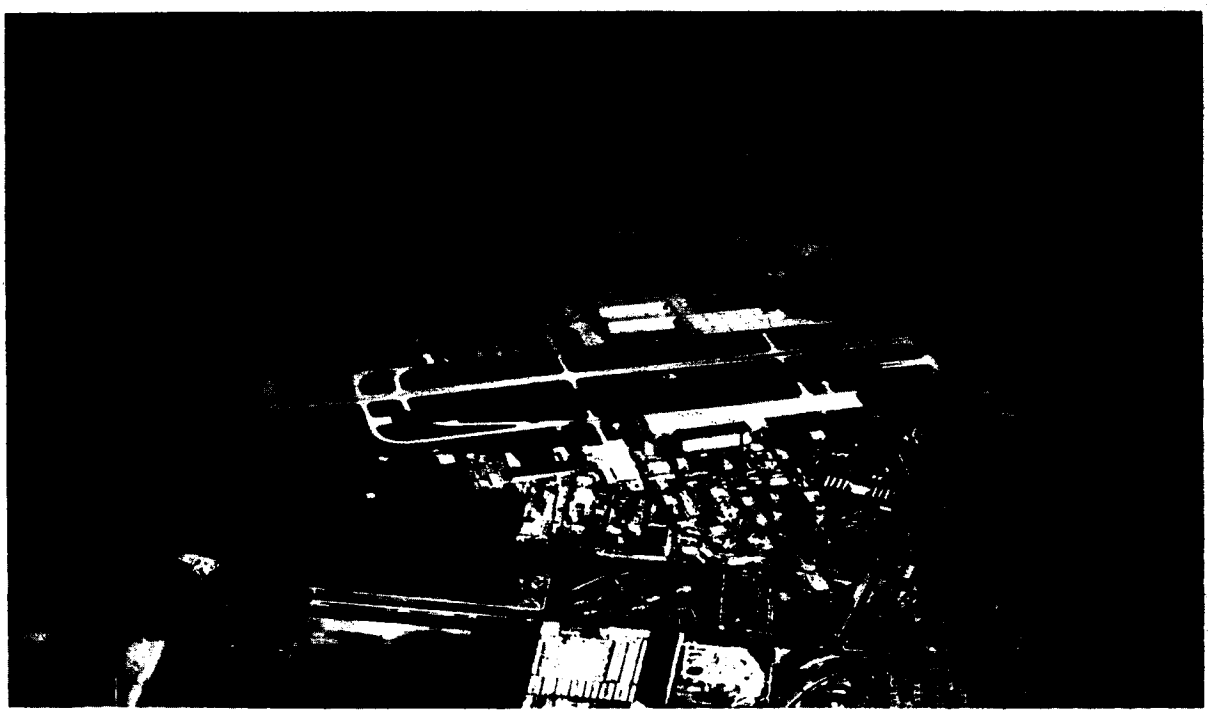
MOFFETT FIELD
SSIC NO. 5090.3

CONFIRMATION STUDY (VERIFICATION STEP)

MOFFETT FIELD NAVAL AIR STATION

VOLUME II



for

Department of the Navy
Western Division
Naval Facilities Engineering Command
P.O. Box 727
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by

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April 1986

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APPENDICES - FIELD INVESTIGATIONS

CONFIRMATION STUDY
(VERIFICATION STEP)

MOFFETT FIELD NAS

APRIL, 1986

N00296.000053
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CONFIRMATION STUDY (VERIFICATION STEP)

DATED 01 APRIL 1986

THIS RECORD CONTAINS MULTIPLE VOLUMES
WHICH HAVE BEEN ENTERED SEPARATELY

VOLUME I OF II IS FILED AS ADMINISTRATIVE
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APPENDIX A

FIELD DRILLING OPERATIONS

FIELD DRILLING OPERATIONS

The field drilling operations for the Phase 1 Verification and Characterization Study of Moffett Field NAS were carried out between July 17, 1985 and August 30, 1985. The objectives of the drilling and soil sampling portions of the overall investigation were the following:

1. To install and develop a total of 33 groundwater monitoring wells for groundwater sampling;

2. To drill shallow auger borings to obtain soil samples for chemical analyses;

3. To develop information on the subsurface soils and groundwater conditions at the various sites under investigation;

4. To perform geophysical logging within selected boreholes (nine new wells and three existing wells);

5. To obtain soil samples for classification purposes and chemical analyses; and

6. To record groundwater level measurements in all existing and new wells.

The location and distribution of the 33 wells and 27 auger borings within the ten selected sites is shown in Figures A-1 through A-6. Also shown on these figures are wells previously installed at some of the sites.

A tabulation of the total number of wells and auger borings drilled at the various sites is presented in Table A-1. All wells consisted of two-inch diameter stainless steel casing and screen. A summary of the depth, length of screen and screen interval for each well is presented in Table A-2. In Table A-3 the number of auger borings drilled at each site is tabulated together with their corresponding depths.

The field investigations were carried out under the general direction of Dr. Julio E. Valera, principal geotechnical engineer from Earth Sciences Associates, Inc. (ESA). Mr. Bradford Peterson, staff geologist/geophysicist from ESA supervised the day-to-day drilling operations and observed and logged all of the boreholes. Mr. Peterson also performed all of the geophysical logging at Moffett Field. Gregory Jones, field technician with ESA, assisted in the drilling, sampling and waste disposal operations. All boreholes were logged in accordance with the Unified Soil Classification System. Detailed logs of all borings are presented in Appendix B. Throughout the entire field operations, all drilling equipment was steam cleaned between borings. In addition, all sampling equipment was cleaned using a tri-sodium phosphate solution and then rinsed with clean water after each soil sample was taken.

All soil cuttings from the drilling operations were collected in 55 gallon drums at each of the sites and transported to a central staging area located at the northwest corner of Site 2. The cuttings were then placed in a large capacity dumpster for temporary storage until permanently disposed of at an appropriate location. Soil cuttings from Site 8, where possible PCB contamination might exist, were stored in sealed 55 gallon drums. After the field investigation and review of the results of the laboratory analyses of the soil samples were completed, it was decided to dispose of the materials at a non-hazardous waste site because of the low levels of contamination present in the soils. However, this did not prove possible and the materials were therefore disposed of at a Class I hazardous waste site.

The dumpster containing the soil cuttings was transported to the IT Benicia site for disposal. The 55 gallon drums from Site 8 were transported to South Bay Chemical for later disposal at the Casmalia Disposal Site.

All of the liquids produced during drilling of the 8 "B" wells and the 1 "C" well were disposed of on-site in the field behind the central staging area. Because of the clayey nature of the soils being drilled using the rotary-wash method it was necessary to constantly introduce "clean water" into the holes in order to prevent the drilling mud from becoming too thick. At each well location the liquid portion of the drilling mud was separated from the solids and pumped into 55 gallon drums once the mud became too thick to continue drilling. The liquid was then disposed

of in the open field area located north of Site 2. No water was required during the installation of the 24 shallow "A" wells or drilling of the 27 shallow auger borings.

All wells were developed using a dual-tube air-lift system. The system consisted of an inner and an outer pipe lowered into the hole to a depth several feet above the top of the well screen. Air pressure was then introduced through the inner pipe and regulated so that water was being ejected through the outer pipe and not through the casing itself. This insured that no air was being introduced through the well screen into the aquifer. This operation was continued until good water clarity was obtained. A sample of the water was taken for visual inspection. In many cases the well itself was not producing enough water during development so that it was necessary to add "clean water" to properly develop the well. Development of the wells took anywhere from one-half to several hours.

The drilling operations at Moffett field were carried out in two stages. The first stage consisted of drilling, sampling, installing and developing eight wells in the "B" aquifer and one well in the "C" aquifer. Geophysical logging of these wells, in addition to gamma logging of three existing "B" wells, was also performed during this stage of the investigation. The second stage consisted of drilling, sampling, installing and developing 24 wells in the "A" aquifer and drilling and sampling 27 shallow auger borings.

The initial stage of the field drilling operations began on Wednesday, July 17, 1985 and was completed on Tuesday, August 13, 1985. The J. N. Pitcher Drilling Company of East Palo Alto, California, performed the drilling using a Failing 1500 rotary-wash drill rig. The drill rig was operated by Ron Baker who was assisted by Wayne McKnight.

Table A-1

SUMMARY OF NUMBER OF WELLS, AUGER BORINGS AND SAMPLES FOR CHEMICAL ANALYSES FOR EACH SITE

Site #	Site Description	Wells "A"	Wells "B"	Wells "C"	Auger Borings	Samples for Chemical Analyses: Soil	Samples for Chemical Analyses: Water
1	Runway Landfill	4	-	-	6	11	4
2	Golf Course Landfill	3	-	-	3	9	3
3	Marridge Road Ditch	3	3	1	3	6	12
4	Former Industrial Waste-water Holding Ponds	2	1	-	-	4	7
5	Fuel Farm French Drains	3	-	-	3	9	3
6	Runway Aprons	1	1	-	-	4	3
1	Hangers 2 and 3	3	1	-	-	6	11
8	Waste Oil Transfer Area	1	-	-	6	7	1
9	Old Fuel Farm	2	-	-	6	14	2
10	Chase Park Area (Runway Area)	2	2	-	-	-	4
	TOTAL	24	8	1	27	70	50

Table A-2

DEPTH OF MONITORING WELLS AND
SCREEN LENGTH INTERVALS
FOR WELLS INSTALLED
AT MOFFETT FIELD NAS

Site No.	Well No.	Total Depth (ft)	Screen Length (ft)	Screen Interval (ft)	
1	W 1-1A	25	10	15.0 - 25.0	
	W 1-2A	25	10	15.0 - 25.0	
	W 1-3A	25	10	25.0 - 35.0	
	W 1-4A	15	5	10.0 - 15.0	
2	W 2-1A	25	10	10.0 - 20.0	
	W 2-2A	25	10	15.0 - 25.0	
	W 2-3A	25	10	10.0 - 20.0	
3	W 3-1A	25	10	10.0 - 20.0	
	W 3-2A	20	10	5.0 - 15.0	
	W 3-3A	20	10	8.0 - 18.0	
	W 3-1B	80	15	69.0 - 79.0	
	W 3-2B	80	15	65.0 - 80.0	
	W 3-3B	80	20	55.0 - 75.0	
	W 3-1C	225	25	200.0 - 225.0	(hole drilled to 250')
4, 6, 7	W 4-1A	25	10	10.0 - 20.0	
	W 4-2A	25	10	10.0 - 20.0	
	W 6-1A	25	10	15.5 - 25.5	
	W 7-1A	30	10	20.0 - 30.0	
	W 7-2A	30	10	20.0 - 30.0	
	W 7-3A	25	10	15.0 - 25.0	
	W 4-1B	50	15	35.0 - 50.0	(hole drilled to 200')
	W 6-1B	45	10	33.5 - 43.5	
	W 7-1B	80	10	63.0 - 73.0	
5	W 5-1A	30	10	20.8 - 30.8	
	W 5-2A	30	10	20.8 - 30.8	
	W 5-3A	30	10	20.8 - 30.8	
8	W 8-1A	30	10	20.0 - 30.0	
9	W 9-1A	30	10	20.0 - 30.0	
	W 9-2A	30	10	20.0 - 30.0	
10	W 10-1A	30	10	20.3 - 30.3	
	W 10-2A	30	10	20.3 - 30.3	
	W 10-1B	80	10	59.0 - 64.0	-
				69.0 - 74.0	
	W 10-2B	80	15	81.0 - 96.0	(hole drilled to 200')

Table A-3

DEPTH OF SHALLOW AUGER BORINGS
COMPLETED AT MOFFETT FIELD NAS

Site No.	Boring No.	Total Depth (ft)
1	A1-1	10.0
	A1-2	14.5
	A1-3	10.5
	A1-4	20.0
	A1-5	3.0*
2	A2-1	7.5
	A2-2	7.5
	A2-3	7.5
3	A3-1	5.0
	A3-2	5.0
	A3-3	5.0
5	A5-1	7.5
	A5-2	7.5
	A5-3	7.5
8	A8-1	2.0
	A8-2	2.0
	A8-3	2.0
	A8-4	2.0
	A8-5	2.0
	A8-6	2.0
9	A9-1	10.0
	A9-2	10.0
	A9-3	10.0
	A9-4	10.0
	A9-5	10.0
	A9-6	10.0

*Abandoned due to high methane levels.

All "B" and "C" wells were drilled to the depths shown on Table A-1 using a 5 7/8-inch tri-cone bit. Because of the clayey nature of the soils encountered, it was usually required to add "clean water" to the hole to keep the mud from becoming too thick. Soil samples were taken in the "B" and"C" well boreholes at the following depths for classification purposes:

- 5-foot intervals for depths $\leq$ 50 feet.
- 10-foot intervals for depths >50 feet and $\leq$ 150 feet.
- 20-foot intervals for depths >150 feet.

Sampling in each hole was performed by means of a 285-pound downhole slip-jar hammer arrangement which was lowered into the hole by means of a cable attached to a winch. A modified California Sampler containing three six-inch steel liners was attached to the end of the slip-jar hammer and driven a total of 18 inches into the ground. The blow counts required to drive the sampler each six-inch interval were measured and recorded on the boring logs. The amount of sample recovery was also noted on the log. The middle liner was capped, labeled and saved. All samples were transported to ESA's laboratory in Mountain View, California for storage.

A Mineral Logging System Model 3501 Electric Logger was used to perform the following logs in each of the boreholes:

- Spontaneous Potential
- Six-foot Lateral
- Long and Short Resistivity
- Detail Resistivity
- Gamma

Gamma logs were also performed in three existing wells; MW-12B, MW-17B and MW-20B. Each geophysical log was run just after completion of the borehole, but before installation of the well casing. Well W3-1C was the only exception to this procedure. Logging of this well was done in two steps in an attempt to better define the possible extent of the so-called "C" aquifer. The initial logging was done from a depth of 231 feet to the ground surface. The upper 90 feet of the hole were then sealed off with steel casing and grouted to avoid any possible cross-contamination of the deeper aquifers from the shallower ones. Drilling of the hole was then continued to a depth of 250 feet. Geophysical logging of the hole was then carried out from a depth of 250 feet to 90 feet.

The depth of each well, the length of screen and the screen interval were selected based on a careful examination of the geophysical logs together with the detailed lithologic logs of each borehole.

A summary of the wells in which geophysical logging was conducted is presented in Table A-4. The depths to which the logging was carried out is also given in this table. Copies of all original geophysical logs were sent to Mr. Thomas Berkins and Mr. Gil Torres of the Regional Water Quality Control Board. These are reproduced in the main text.

The second stage of the field drilling operation at the Moffett Field NAS began on Wednesday, August 14, 1985 and was completed on Friday, August 30, 1985. This second stage involved drilling, sampling, installing and developing a total of 24 wells within the "A" aquifer and drilling and sampling 27 auger borings at 10 separate sites (refer to Tables A-1, A-2 and A-3 for locations and depths). An Acker AD-2 drilling rig owned and operated by personnel of J. H. Klienfelder and Asociates of Stockton, California, was used to drill and sample all boreholes. The drill rig was operated by Douglas Shearer, who was assisted by a helper. A second helper was used to steam clean all the drilling equiment and assist in the grouting operations. All A-well boreholes were drilled using an eight-inch hollow-stem auger, whereas all shallow auger borings were drilled with a six-inch flight auger. Soil samples were taken by driving a 2-inch O.D. Modified Porter Sampler containing three 6-inch long stainless steel liners, a distance of 18 inches into the ground. A 140-pound Dritrich safety hammer with a 30-inch drop was used to drive the sampler.

A total of 70 soil examples taken during the Stage 2 investigation were carefully packaged, refrigerated and sent by courier service to J. M. M. Montgomery Engineers laboratory in Pasadena, California, for chemical analysis (refer to Table A-1 for distribution of soil samples within the various sites).

Due to obstructions encountered within the Runway Landfill Site (Site 1) at the locations of auger borings A1-2 and A1-3, sampling intervals were slightly modified. In borehole A1-2 an adequate sample could not be obtained at the planned depth of three feet. The hole was therefore drilled deeper and subsequently sampled at depths of 6 feet and 13 feet. At the location of boring A1-3, a sample could not be obtained due to obstructions in the fill until a depth of 9 feet was reached; the hole was terminated after this sample was taken since native soils were encountered. At the location of boring A1-5, dangerously high levels of methane gas were encountered at a depth of 3 feet, and the drilling was therefore terminated by the site safety officer. The hole was offset 20 feet to the west from the original location and again methane was encountered at a depth of 3 feet. Consequently, a decision was made to abandon this boring (refer to Figure A-2 for offset locations).

High levels of methane gas were also present at the location of boring W1-4A at a depth of approximately 20 feet. Drilling was immediately terminated by the site safety officer without removal of the hollow-stem augers from the hole. Reading made several days later also indicated high levels of methane gas. An attempt was therefore made to try and bleed-off the methane gas in this hole using dry ice; however, this did not produce any significant reduction in the gas levels over a two-day period. A new boring was started at a location 30 feet to the east of boring W1-4A at the base of the landfill. This hole was successfully completed and a well was installed to a depth of 15 feet.

Two wells (W5-1A and W5-2A) at site 5 were also relocated during the field investigation to bring them within 10 feet of existing underground fuel tanks. These borings were offset to satisfy monitoring well requirements set by the Santa Clara Valley Water District for underground fuel tanks.

One well at site 9 (W9-2A) was offset due to an underground fuel tank which was encountered while drilling at its original location. A suitable offset location

for this one well was established by Paul Prater of Public Works (refer to Figure A-5 for offset locations).

All other borings were completed in according with the agreed-upon work plan. The depth of the wells, location of well screen and length of screen were selected on the basis of the detailed lithologic logs developed during the drilling operations (refer to Table A-2 for depths and screen intervals). All A-wells were developed by J. H. Klienfelder and Associates using an air lift purging system until good water clarity was observed.

Table A-4

SUMMARY OF WELLS IN WHICH
GEOPHYSICAL LOGS WERE CONDUCTED

Site No.	Well No.	Depth (ft)
	W 3-1C	231.0
		250.0
3	W 3-1B	80.0
	W 3-2B	80.0
	W 3-3B	80.0
4	W 4-1B	200.0
6	W 6-1B	45.0
7	W 7-1B	80.0
10	W 10-1B	80.0
	W 10-2B	200.0
Existing Wells - Gamma Logs Only	MW-12B	42.9
	MW-17B	71.0
	MW-20B	67.7

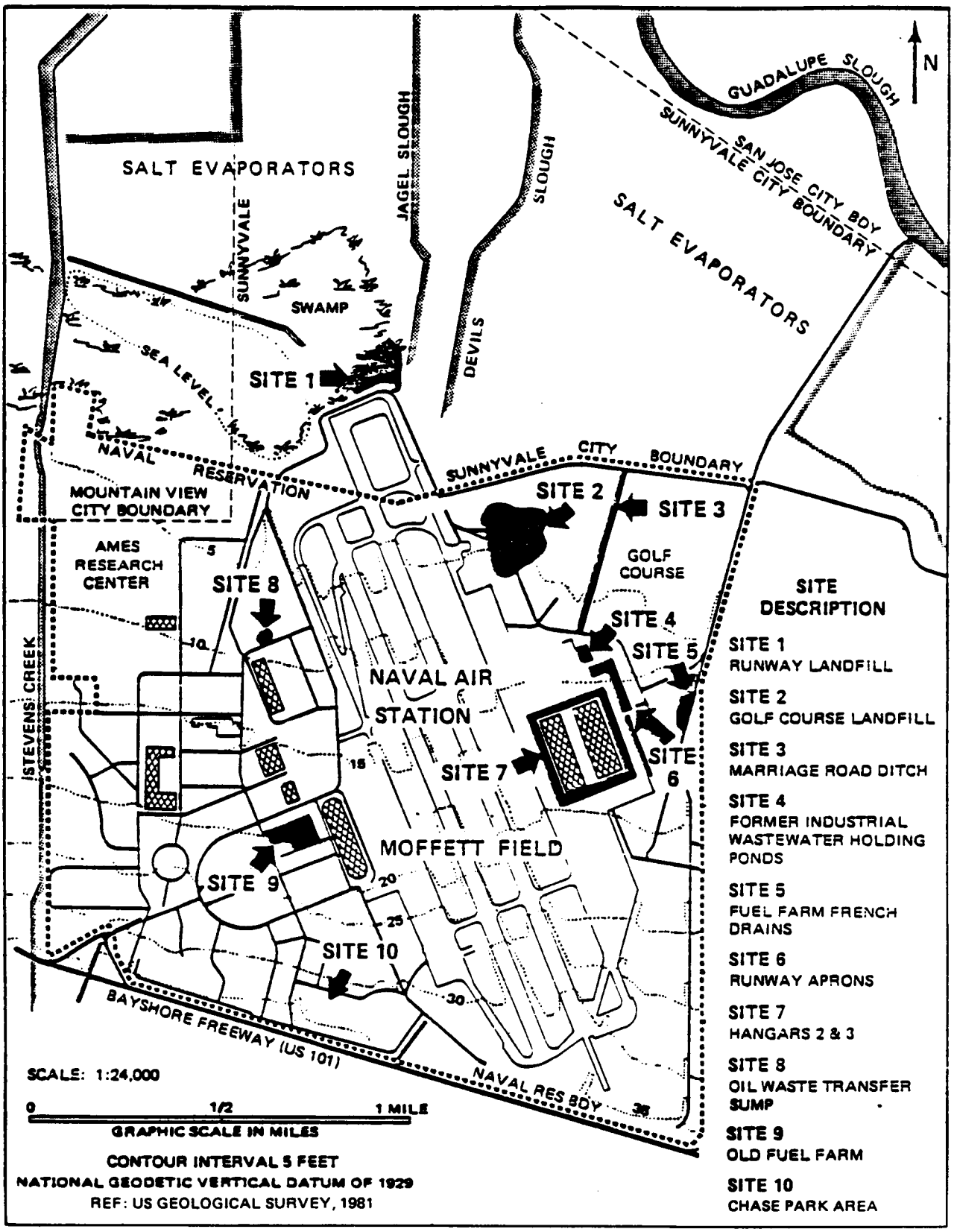

Figure A-1 Waste Disposal Sites - NAS Moffett Field

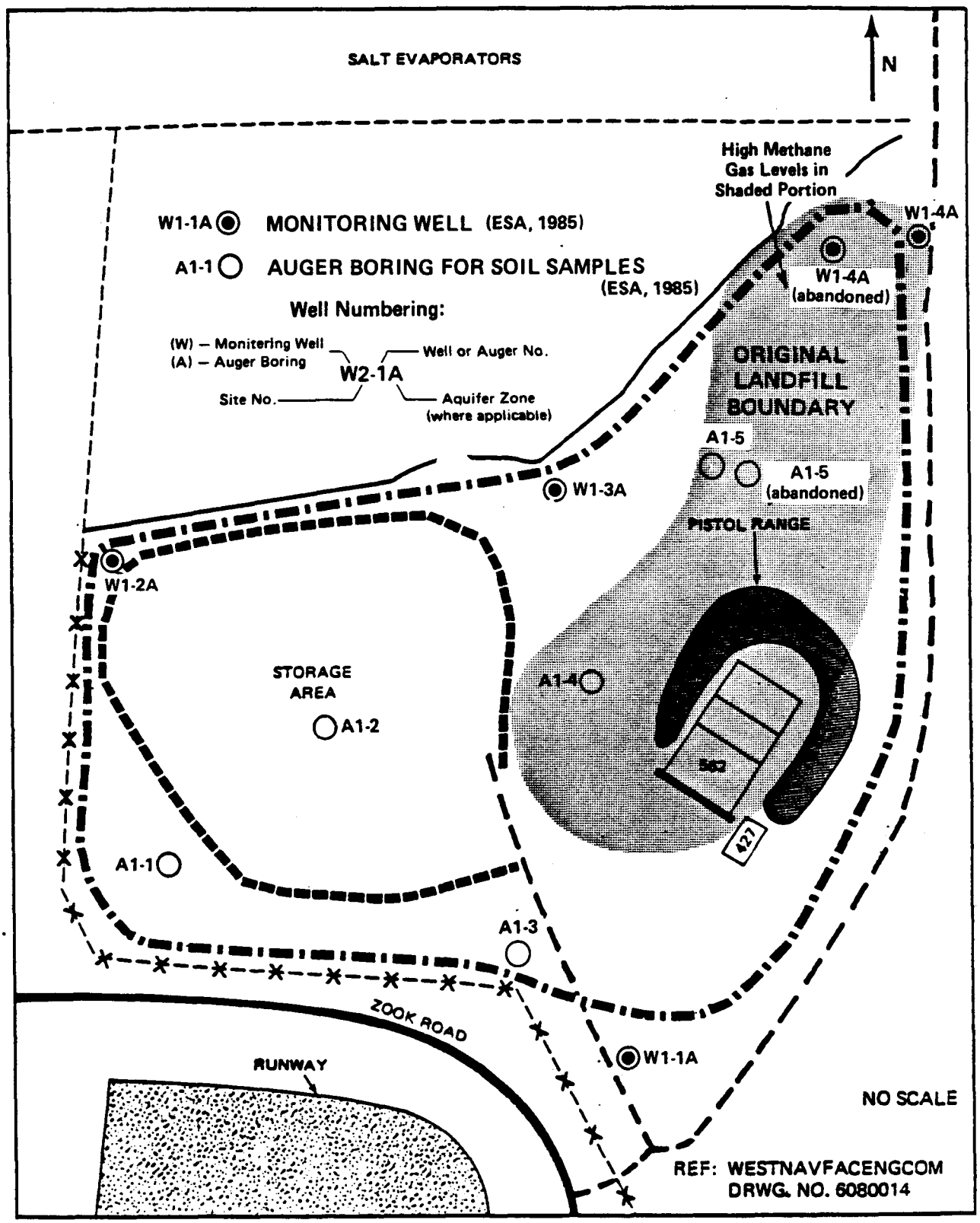

Figure A-2 Site No. 1 – Runway Landfill

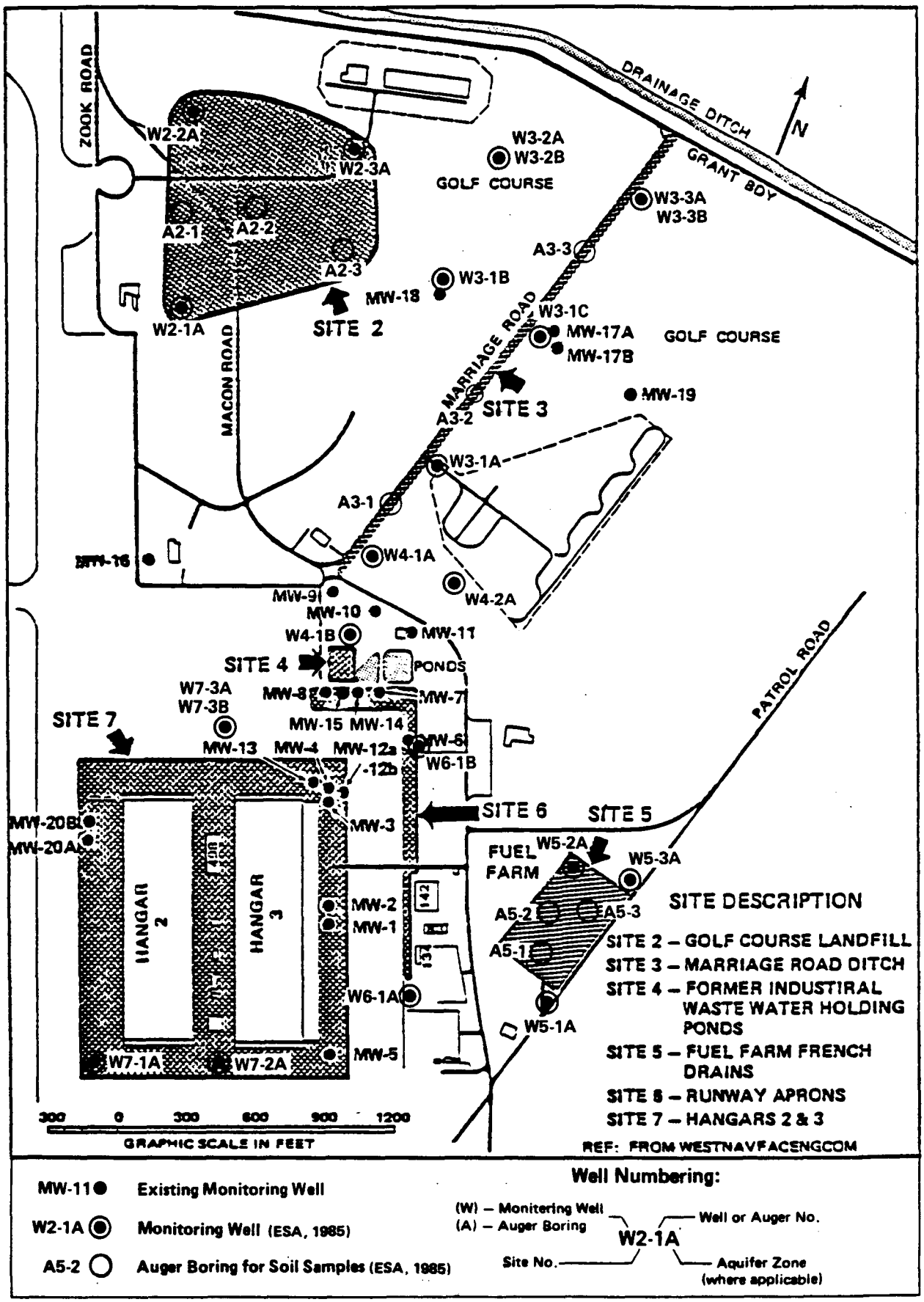

Figure A-3 Locations of Sites 2, 3, 4, 5, 6, 7
NAS Moffett Field

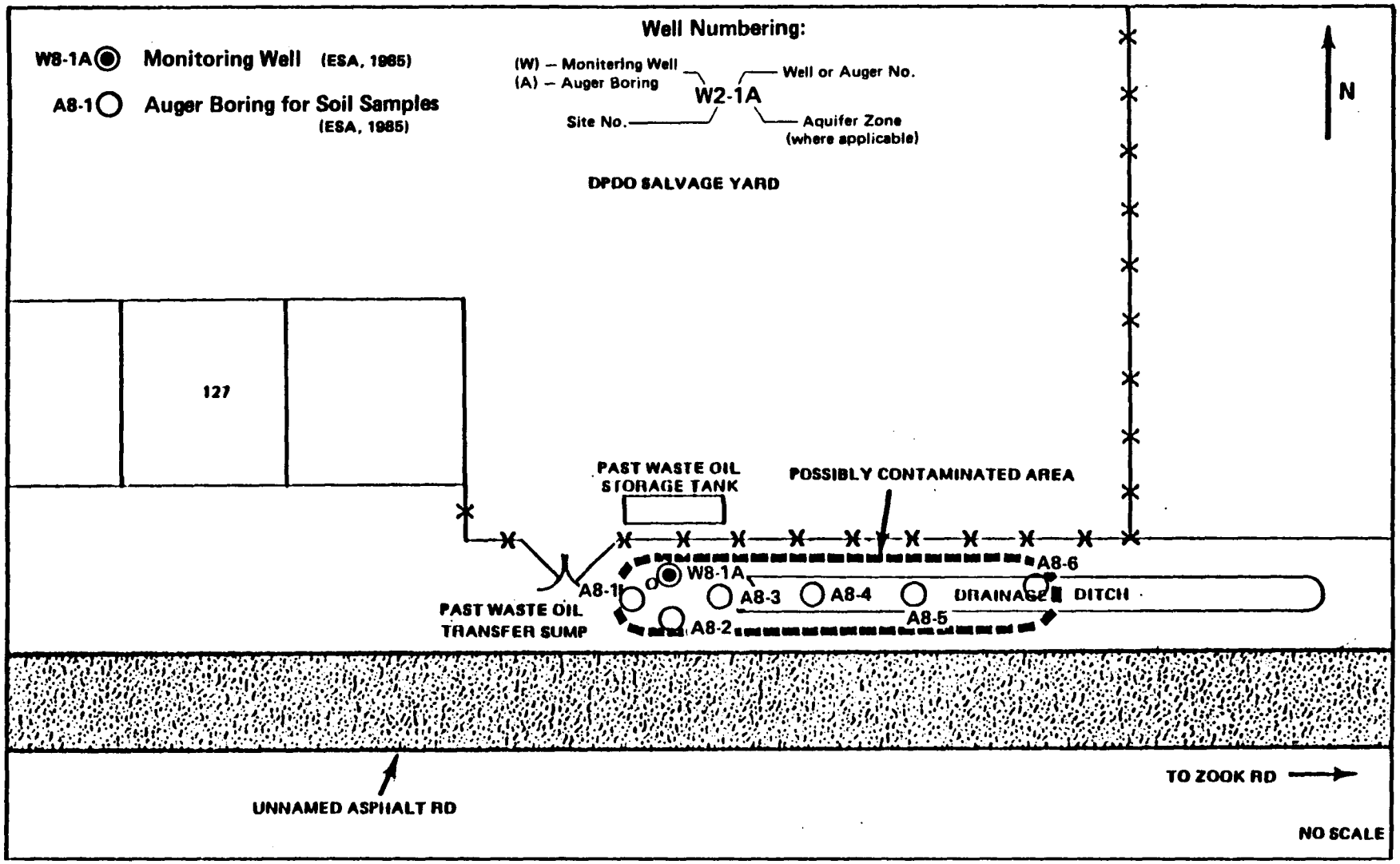

Figure A-4 Site No. 8 - Waste Oil Transfer Area
NAS Moffett Field

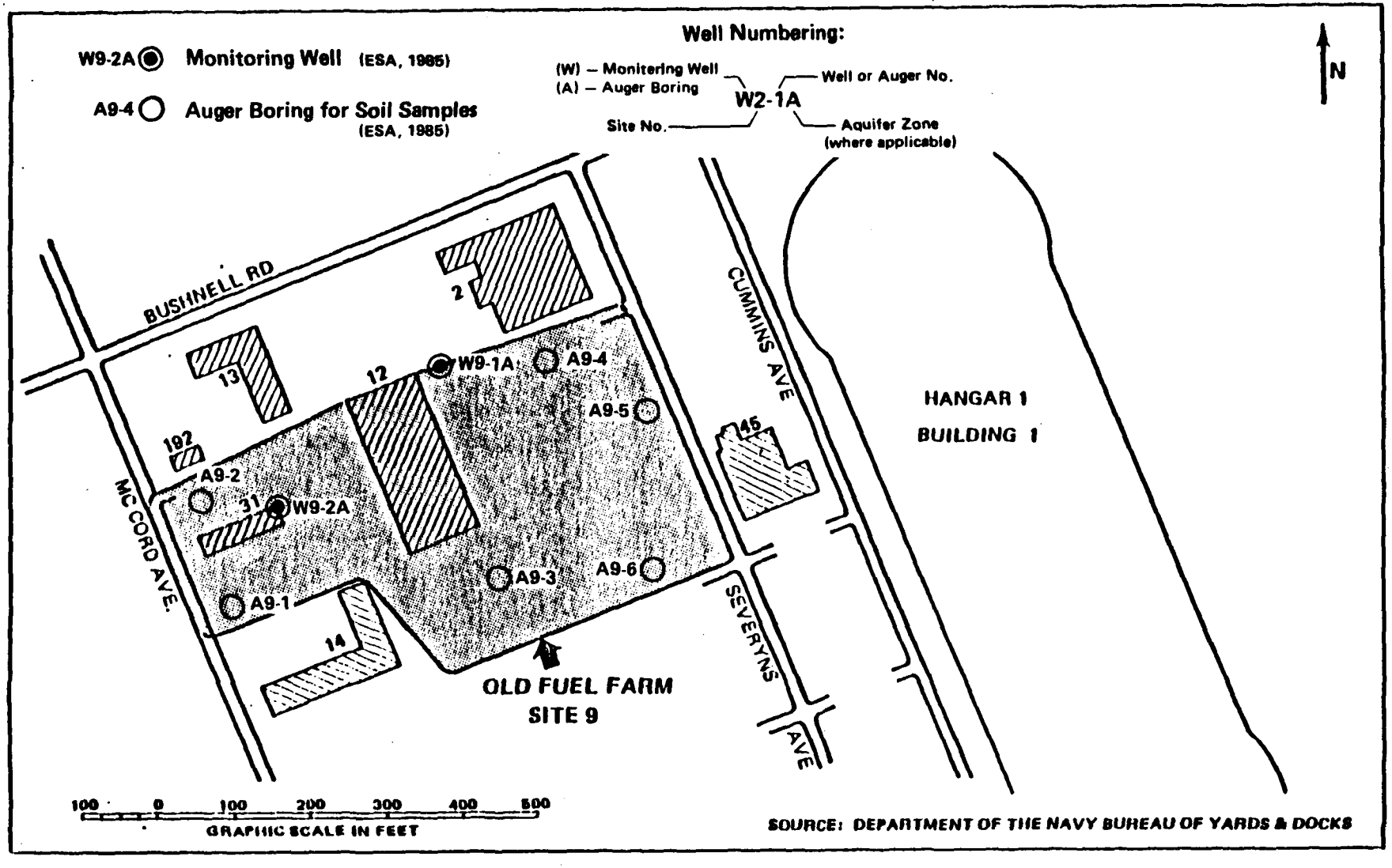

Figure A-5 Site No. 9 - Old Fuel Farm Site

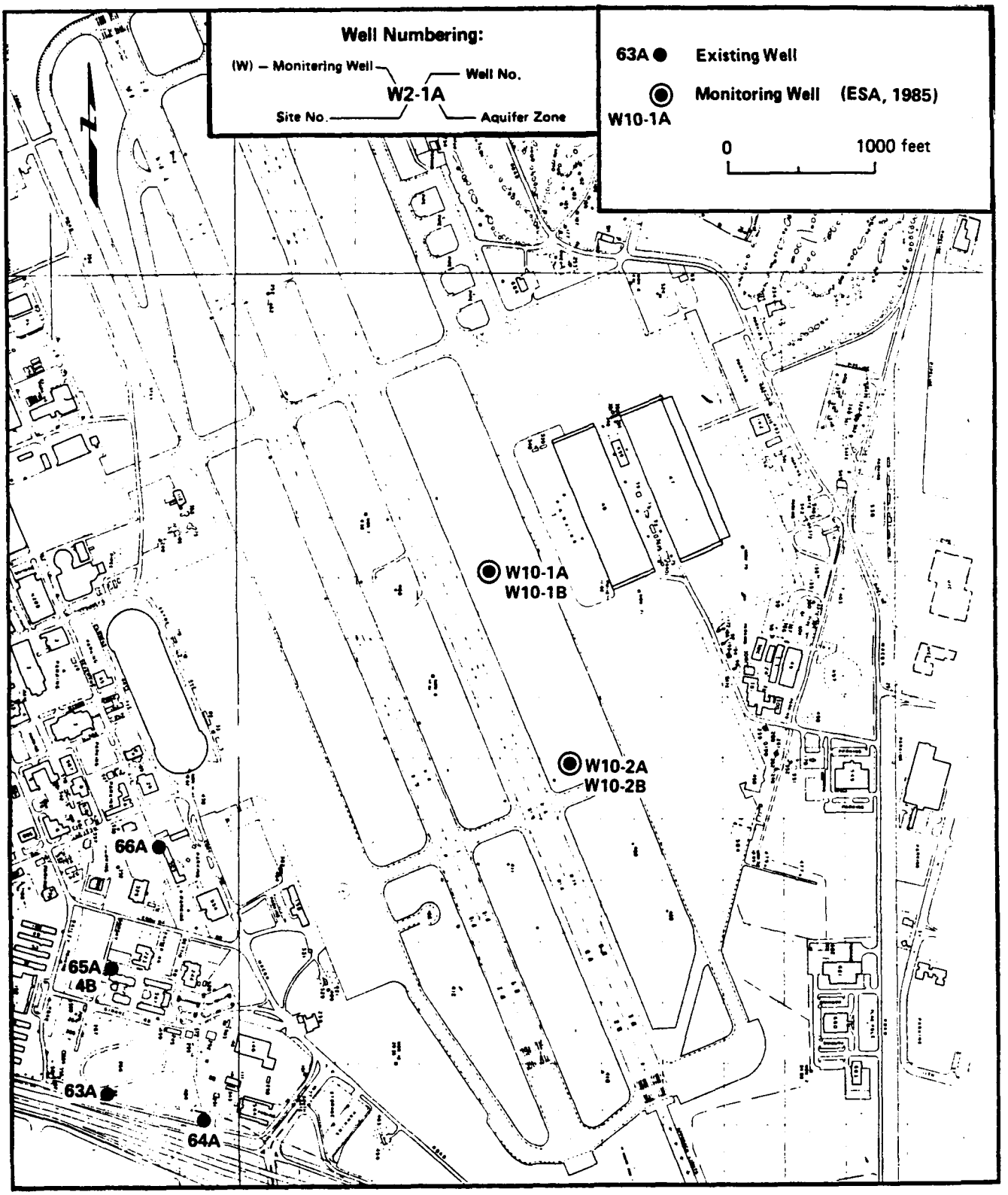

Figure A-6 Site No. 10 – Chase Park Area

APPENDIX B

BORING LOGS

B1 - LOGS OF "A" WELLS

B2 - LOGS OF "B" AND "C" WELLS

B3 - LOGS OF SHALLOW AUGER BORINGS

B4 - GAMMA RAY LOGS OF SELECT EXISTING WELLS

APPENDIX B1

LOGS OF "A" WELLS

Earth Sciences Associates
701 Welch Road, Palo Alto, California 94304
(415) 321-3071

Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/23/85 HOLE NO. W1-1A
LOCATION Site 1 (Runway Landfill) GROUND ELEV. 2.7' (Survey)
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 9.0 W.D / 6.0 A.F
TYPE OF RIG Acker AD-2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Gravelly Sands: dry hard. TOTAL DEPTH 25.7' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0	SP	0.0 - 2.0 GRAVELLY SAND; Fill; Olive Gray 5Y 3/2 ~10% non plastic fines; ~60% fine to coarse grained sand; ~30% fine to medium gravels; dense dry to damp.			AD			Set-up and started drilling at 1:00 P.M.
2.0	GC							
3.0		2.0 - 6.0 CLAYEY GRAVEL; Grayish Olive 10Y 4/2 ~40% low to medium plastic fines; ~10% fine to coarse grained sand; ~50% fine to medium gravels; medium dense; moist.	L-1	5 7 8	DR AD			Drove modified Porter Sampler at 3.0' Recovery = 1.1/1.5
4.0								
5.0								
6.0	OH	6.0 - 17.0 ORGANIC CLAY; Grayish Black N-2 ~95% medium to high plastic fines; < 5% fine grained sand; highly organic; soft to firm; moist to wet.						
7.0								
8.0								
9.0								
10.0								
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0	CL	17.0 - 25.0 SANDY CLAY; Light Olive Gray 5Y 5/2 ~80-90% medium plastic fines; ~10-20% fine to medium sand; mostly fine; traces of coarse sand; stiff-hard; wet.						
18.0								
19.0								
20.0								

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/23/85 HOLE NO. W1-1A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	17.0-25.0 SANDY CLAY; AS ABOVE (cont.)			AD			
21.0								
22.0								set well to 25.7'
23.0								set screen from 15.5' to 25.7'
24.0								
25.0		completed boring to 25.7'						

SHEET 2 OF 2

Earth Sciences Associates
701 Welch Road, Palo Alto, California 94304
(415) 321-3071

Soil and Bedrock Log

PROJECT Moffett Field 3110-C **DATE DRILLED** 8/23/85 **HOLE NO.** W1-2A
LOCATION site 1 (Runway Landfill) **GROUND ELEV.** 4.4' (Survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 19.5 WD AF
TYPE OF RIG Acker-AD2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS 2'-3' high grass **TOTAL DEPTH** 25.9' **NO. CORE BOXES** ____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0, 3.0, 4.0, 5.0	SP	0.0-5.5 GRAVELLY SAND; Fill; Olive Gray 5Y 3/2; < 10% non plastic fines; ~ 60% fine to coarse grained sand; subangular to subrounded; ~ 30% fine to coarse gravels; very dense; dry.			AD			Set-up and started drilling at 9:30 A.M.
6.0, 7.0, 8.0	GP	5.5-8.5 SANDY GRAVEL; Fill; Olive Gray 5Y 3/2; < 10% non plastic fines; ~ 10-20% Medium to coarse grained sand; subangular; ~ 60-70% fine to coarse gravels; dense - very dense, dry.						Drilling very hard at 5.5-8.5'.
9.0, 10.0, 11.0, 12.0, 13.0, 14.0	OH	8.5-15.0 ORGANIC CLAY; Swamp Deposit; Light Olive Gray 5Y5/2 to Olive Gray 5Y 3/2 ~ 80% medium to high plastic fines; < 5% fine grained sand; ~ 20% fibrous material (swamp grass) very soft; moist.	L-1	1 1 1	DR AD			Drove modified Porter sampler at 10.0' Recovery = 1.4/1.5
15.0, 16.0, 17.0, 18.0, 19.0, 20.0	CL	15.0-25.0 SANDY CLAY; Medium Dark Gray N-3 ~ 90% medium to high plastic fines; ~ 10% fine to coarse grained sand; mostly fine; subangular; stiff; moist to wet.						

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/23/85 HOLE NO. W1-2A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	15.0-25.0 SANDY CLAY; As Above (cont.)			AD			
21.0								
22.0								
23.0								set well to 25.9'
24.0								set screen from 15.7' to 25.9'
25.0		Completed boring to 25.9'						

SHEET 2 OF 2

Earth Sciences Associates
701 Welch Road, Palo Alto, California 94304
(415) 321-3071

Soil and Bedrock Log

PROJECT Moffett Field 3110-C DATE DRILLED 8/22/85 HOLE NO. W1-3A
LOCATION site 1 (Runway landfill) GROUND ELEV. 12.3' (Survey)
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER
TYPE OF RIG Acker-AD2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry; hard; expansive soils TOTAL DEPTH 36.2' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OH	0.0 SANDY CLAY; Topsoil; (Fill); Black N1 ~80-90% medium plastic fines; ~10-20% fine to coarse grained sand; subangular to subrounded; stiff; dry to damp.			AD			Set-up and started drilling at 1:00 P.M.
1.0								
2.0								
3.0								
4.0								
5.0								
6.0								
7.0	Trash Garbage	7.0 - 20.0 encountered garbage Tin cans; plastics; asphalt; concrete; etc.						
8.0								
9.0								
10.0								hole reeks of Garbage.
11.0		10.5 - 15.0 Cardboard; papers; etc.						
12.0								
13.0								
14.0								
15.0		15.0 Filter paper; wire; rags.						
16.0								
17.0								
18.0								
19.0								
20.0								

PROJECT Moffett Field DATE DRILLED 8/22/85 HOLE NO. W1-3A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	OH	20.0 - 30.0 SILTY CLAY Black N-1; ~ 90% medium to high plastic fines; < 10% fine - medium grained sand; fibrous; roots and rootlets; rags; plastics; stiff; moist.			AD			
21.0								
22.0								
23.0								
24.0								
25.0								25.0 encountered obstruction; rig is drilling very hard and slow; rig standing on bit.
26.0		25.0 - 26.5 encountered obstruction - piece of metal or concrete.						
27.0								
28.0								water runs out at surface at 28.0' Thick - highly plastic Black clay - saturated.
29.0								
30.0	CL	30.0 - 35.0 SANDY CLAY; Light Olive Gray 5Y 5/2 ~ 90% medium to high plastic fines; < 10% fine to coarse grained sand; subangular to subrounded; stiff; moist to wet.	L-1	4 5 8				
31.0								
32.0								set well to 36.2'
33.0								set screen from 26.0 - 36.2'
34.0								
35.0		completed boring to 36.2'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field **DATE DRILLED** 8/29/85 **HOLE NO.** W1-4A
LOCATION Site 1 (Runway Landfill) offset 30' East of original location **GROUND ELEV.** 2.1' (Survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** JBLP **DEPTH TO GROUND WATER** 6.0' WD 48 AB
TYPE OF RIG Acker AD 2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS 2' high grass - scattered concrete. **TOTAL DEPTH** 15.8' **NO. CORE BOXES** ____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	CL	0.0 - 3.0 SANDY CLAY; Dark Yellowish Brown 10YR 4/2 ~70-80% low plastic fines; ~20-30% fine to coarse grained sand; traces of fine gravel; firm; damp to moist.			AD			Set-up and started drilling at 2:00 PM. Redrilled hole at the base of the landfill due to high methane levels at original location.
1.0								
2.0								
3.0		3.0 - 7.0 SILTY CLAY; Dark Greenish Gray 5GY 4/1 ~90% low to medium plastic fines; <10% fine to very fine grained sand; very soft to soft; moist to wet.	L-1	2 1 2	DR AD			Drove modified Porter Sampler at 3.0' Recovery = .8/1.5
4.0								
5.0								
6.0								
7.0	OH	7.0 - 15.0 ORGANIC CLAY; Grayish Black N-2 >90% medium to high plastic fines; <5% fine to very fine sand; highly organic; sticky; soft; wet.						Organic vapor meter is registering high levels. Breathing zone is ~5 PPM
8.0								
9.0								
10.0								
11.0								
12.0								
13.0								
14.0								Set well to 15.8'
15.0								Set screen from 9.6 to 15.8'
16.0		Completed boring to 15.8'						

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field 3110-C **DATE DRILLED** 8/22/85 **HOLE NO.** W1-4A (abandoned)
LOCATION site 1 (Runway Landfill) **GROUND ELEV.** _____
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** Dry W.P. 180 A.
TYPE OF RIG Acker-AD2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS 3' high grass - Asphalt-Concrete **TOTAL DEPTH** 20.0' **NO. CORE BOXES** _____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OL	0.0-1.5 SANDY CLAY; Fill, Black N-1 - Grayish Brown 5YR 3/2; ~70-80% low to med. plastic fines; ~20-30% fine to coarse grained sand; subrounded; stiff; dry to damp.			AD			Set-up and started drilling at 11:00 A.M
1.0								
2.0	Garbage							
3.0		Scattered debris from 0.0 - 20.0 tin cans; rags, plastics, concrete, asphalt, etc.						could not obtain samples due to garbage encountered.
4.0								
5.0								
6.0								
7.0								
8.0								
9.0								hole smells like mold and rotten garbage.
10.0								
11.0								
12.0		12.0-14.0 Reinforced Concrete						
13.0								
14.0								
15.0		15.0 grades moist						Driller reports hole is very loose.
16.0								
17.0								
18.0								
19.0								Gas (Methane) registering at dangerous levels at ~20.0'
20.0		Had to abandon hole due to high methane levels						SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field 3110-C **DATE DRILLED** 8/21/85 **HOLE NO.** W2-1A
LOCATION site 2 (Golf Course Landfill) **GROUND ELEV.** 2.7' (survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 10.5 W AE
TYPE OF RIG Acker-AD2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS Dry-hard-expansive topsoil **TOTAL DEPTH** 25.0' **NO. CORE BOXES** ____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0, 3.0, 4.0	OH	0.0 - 4.0 SANDY CLAY; Topsoil; Black N-1 ~90% medium to high plastic fines; ~10% fine to medium grained sand; mostly fine; roots; dry.			AD			Set-up and started drilling at 2:00 P.M.
5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0	CL	4.0 - 11.0 SANDY CLAY Dark Yellowish Brown 10YR 4/2 ~70% low plastic fines; ~30% fine to coarse grained sand; subangular to subrounded; firm to stiff; damp to moist.						
10.0			L-1	6, 10, 16	DR			Drove modified Porter Sampler at 10.0' Recovery = 1.2/1.5
12.0, 13.0, 14.0	SC	11.0 - 14.0 CLAYEY SAND; Dark Yellowish Brown 10YR 4/2 ~40% non to low plastic fines; ~60% fine to medium grained sand; subrounded to rounded; dense; wet to saturated.			AD			
15.0, 16.0, 17.0, 18.0, 19.0, 20.0	CL	14.0 - 21.0 SANDY CLAY; Light Olive Brown 5Y 5/6 ~70-80% low plastic fines; ~20-30% fine to medium grained sand; subrounded; dense; wet.						

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/21/85 HOLE NO. W2-1A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	14.0-21.0 SANDY CLAY; As Above (cont.)			AD			
21.0		21.0-25.0 grades medium to highly plastic; < 10% fine to medium sand.						
22.0								
23.0		grades light Olive Gray 5Y 5/2						set well to 19' 7½"
24.0								set screen from 9'5" to 19' 7½"
25.0		completed boring to 25.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/15/85 HOLE NO. W2-2A
LOCATION Site 2 Golf Course Landfill GROUND ELEV. 0.6' (survey)
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 7.0' AB
TYPE OF RIG Acker-AD-2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS 2' high weeds - dry hard-topsoil TOTAL DEPTH 25'9" NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
0.0	OL	0.0 - 4.0 SANDY CLAY; Topsoil; Black N-1; ~70% low plastic fines; ~30% fine to medium grained sands; traces of coarse sand; sub-rounded to subangular; roots and rootlets; stiff; dry to damp.			AD			Set-up and started drilling at 1:30 P.M.
1.0								
2.0								
3.0								
4.0	CL	4.0 - 5.5 SANDY CLAY; Dark Yellowish Brown 10YR 4/2 ~60% low plastic fines; ~40% fine to coarse grained sand, firm, moist						
5.0				3	DR			Drove modified Porter Sampler at 5.0
6.0	SC	5.5 - 17.5 CLAYEY SAND; Pale Yellowish Brown 10YR 6/2 to Dark Yellowish Brown 10YR 4/2 ~30-40% low plastic fines; ~60-70% fine to coarse grained sand; subrounded to subangular; traces of fine gravel; dense; wet to saturated.	L-1	4				Recovery = 1.2/1.5
7.0				4	AD			
8.0								
9.0								
10.0								
11.0								
12.0								
13.0								
14.0								
15.0								Water runs out at surface ~14.5'
16.0								
17.0								
18.0	CL to CH	17.5 - 25.0 SANDY CLAY; Light Olive Gray 5Y 5/2 ~80% highly plastic fines; ~20% fine to very fine grained sand; traces of medium sand; sticky; firm to stiff; wet.						
19.0								
20.0								

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/15/85 HOLE NO. W2-2A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
21.0	CL to CH	17.5-25.0 SANDY CLAY: As Above			AD			
22.0								
23.0								set well to 25'9"
24.0								Set screen from 15'6" to 25'9"
25.0								
26.0		completed boring to 25.8'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field 3110-C **DATE DRILLED** 8/22/85 **HOLE NO.** W2-3A
LOCATION site 2 (Golf Course Landfill) **GROUND ELEV.** 0.2' (Survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 9.5' W; 5.4' A
TYPE OF RIG Acker-AD2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS 1' to 2' grass - Plowed field **TOTAL DEPTH** 25.0' **NO. CORE BOXES**

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OL to CL	0.0-2.0 SANDY CLAY Topsoil; Dark Yellowish Brown 10YR 4/2 ~80% low to medium plastic fines; ~20% fine to coarse grained sand; subrounded to subangular; slightly organic, traces of roots and rootlets; stiff; dry.			AD			Set-up and started drilling at 7:30 A.M.
1.0								
2.0	CL							
3.0		2.0-11.0 SANDY CLAY; grades to a Pale Yellowish Brown 10YR 6/2, slightly less coarse; ~20% fine to medium sands; traces of coarse sand.						
4.0								
5.0								
6.0								
7.0		7.0-11.0 grades Moderate Yellowish Brown 10YR 5/4						
8.0				3	DR			Drove modified Porter Sampler at 8.0'
9.0				6 8				Recovery = 1.5/1.5
10.0					AD			
11.0	SC	11.0-15.0 CLAYEY SAND; Moderate Yellowish Brown 10YR 5/4 ~40% low plastic fines ~60% fine to medium grained sand; subangular to subrounded; medium dense; saturated.						
12.0								Water runs out at surface at ~12.0'
13.0								
14.0								
15.0		15.0-25.0 SANDY CLAY; Moderate Yellowish Brown 10YR 5/4 ~80% medium plastic fines; ~20% fine to medium grained sand; subrounded; stiff; wet.						
16.0								
17.0								
18.0		18.0-19.0 lens of Clayey Sand						
19.0								
20.0								

PROJECT Moffett Field DATE DRILLED 8/22/85 HOLE NO. W2-3A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
21.0	CL to CH	15.0-25.0 SANDY CLAY; As Above (cont.)			AD			
22.0		21.5-25.0 grades to medium to high plasticity.						
23.0								Set well to 20.4'
24.0								Set screen from 10.1 to 20.4'
25.0		Completed boring to 25.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field **DATE DRILLED** 8/15/85 **HOLE NO.** W3-1A
LOCATION Site 3 Mavridge Road Ditch **GROUND ELEV.** 3.2' (survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 6.0 WS 5.5 AB
TYPE OF RIG Acker AD-2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS Hard dry Black Topsoil **TOTAL DEPTH** 25.0' **NO. CORE BOXES**

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0, 3.0	OL	0.0 - 3.5 SILTY CLAY; Topsoil; Black N-1 ~80-90% low plastic fines; ~10-20% fine to medium grained sand; roots and rootlets; stiff, dry.			AD			Set-up and started drilling at 9:20 A.M.
4.0, 5.0, 6.0	CL	3.5 - 7.0 SANDY CLAY; Light Olive Brown 5Y 5/2 ~70% low to medium plastic fines; ~30% fine to medium grained sand; mostly fine; subrounded to subangular; firm; moist.	L-1	4, 5, 4	DR, AD			Drove modified Porter Sampler at 5.0'. Recovery = .9/1.5
7.0, 8.0	SM	7.0 - 20.0 Interbedded silty sands and sandy clays						Water runs out at surface at ~6.0-7.0'
9.0	CL							
10.0, 11.0	SM							
12.0	SC	11.0 - 13.0 CLAYEY SAND. Moderate Yellowish Brown 10YR 5/4 ~40% low plastic fines; ~60% fine to medium grained sand; subrounded; dense; saturated.						
13.0, 14.0	CL	13.0 - 15.0 SANDY CLAY; As Above						
15.0, 16.0	SM							
17.0, 18.0, 19.0, 20.0	SC	17.0 - 20.0 CLAYEY SAND; As Above						Set-well to 20.75'. Set Screen from 10.75' to 20.75'

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/15/85 HOLE NO. W3-1A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	20.0-25.0 SANDY CLAY; As Above			AD			
21.0								
22.0								Set well to 19' 7"
23.0								Set screen from 10' to 19' 7"
24.0								
25.0		Completed boring to 25.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/14/85 HOLE NO. W3-3A
LOCATION Site 3 Golf Course GROUND ELEV. ~2.0 (survey)
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 4.5 ft 2.7 AB
TYPE OF RIG Acker HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS 2" Grass - mowed TOTAL DEPTH 20.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OL	0.0-3.8 SILTY CLAY; Topsoil; Black N-1 ~80% low plastic fines; ~20% fine to medium grained sand; subrounded to subangular; roots and rootlets; stiff; dry.			AD			Set-up and started drilling at 2:30 P.M.
1.0								
2.0	CL			6	DR			Drove modified Porter Sampler at 2.0'
3.0		2.0-3.8 SANDY CLAY Light Olive Gray 5Y 5/2 ~70% low to medium plastic fines ~30% fine to medium grained sand; subangular to subrounded; moist.	L-1	10				Recovery = .7/1.5
4.0	SW			12	AD			
5.0								
6.0		3.8-7.5 GRAVELLY SAND: Dark Yellowish Brown 10YR 4/2 ~10% non to low plastic fines; ~80% fine to coarse grained sand, subangular to subrounded; highly pervious; ~10% fine gravels; dense wet.						
7.0								
8.0	CL							
9.0		7.5-20.0 SILTY CLAY; Light Olive Gray to Light Olive Brown 5Y 5/2 to 5Y 5/6 ~80% medium to high plastic fines; ~20% fine grained sand; very stiff; Portions mottled; moist.						
10.0								
11.0								
12.0								
13.0								
14.0								
15.0								Set-well to 15'5" Well-Screen from 5'2" to 15'5"
16.0								
17.0								
18.0								3:15 P.M.
19.0								
20.0								SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/14/85 HOLE NO. W3-3A
LOCATION Site 3 Golf Course GROUND ELEV. -0.7' (survey)
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 13.5 [illegible] 4.5 A.B.
TYPE OF RIG Acker HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Short 1" Grass - (mowed) TOTAL DEPTH 20' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OL	0.0 - 4.5 SILTY CLAY; Topsoil; Black N-1 ~80% low plastic fines; ~20% fine to medium grained sand, subrounded to subangular; roots and rootlets; stiff; dry.			AD			Set-up and started drilling at 10:45 A.M. Driller, Doug Shearer
1.0								
2.0								
3.0								
4.0		4.5 - 9.0 · Grades light olive Gray 5Y 5/2 traces of coarse sand - < 10%; damp to moist.						
5.0	CL							
6.0								
7.0								
8.0								
9.0		9.0 - 20.0 Grades Siltier; Light Olive Gray 5Y 5/2 to Light Olive Brown 5Y 5/6; portions mottled; moist.						
10.0	CL			2	DR			Drove modified Porter Sampler at 10.0'
11.0		10.0 13.5 Interbedded silty sands and sandy clays	L-1	4				Recovery = 1.5/1.5
	SM			6	AD			
12.0	CL							
13.0	CL							Water runs out at surface.
14.0	CL							
15.0								
16.0								Set well to 18' 1" Screen from 8.0 - 18' 1"
17.0		17.0 - Grades Very stiff						
18.0								
19.0								
20.0								

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/16/85 HOLE NO. W4-1A
LOCATION Site 4 (Holding Ponds) GROUND ELEV. 4.6' (survey)
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 7.0' A.E
TYPE OF RIG Acker AD-3 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry - Hard expansive soils TOTAL DEPTH 25' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OH	0.0-4.5 SILTY CLAY; Topsoil; Black N-1; ~80-90% medium to high plastic fines; ~10-20% fine sand; expansive; roots and rootlets; stiff; dry.			AD			Set-up and started drilling at 7:30 A.M.
1.0								
2.0								
3.0				7	DR			Drove modified Porter Sampler at 3.0'
4.0			L-1	9				Recovery = 1.3/1.5
				10	AD			
5.0	CL	4.5-6.0 SANDY CLAY; Light Olive Gray 5Y 5/2 ~80% low to medium plastic fines; ~20% fine grained sand; portions mottled; stiff; damp.						
6.0				2	DR			Drove modified Porter Sampler at 6.0'
7.0			L-2	2				Recovery = 1.4/1.5
				2	AD			
8.0		6.0-25.0 SANDY CLAY; Moderate Yellowish Brown 10YR 5/4 ~70% low to medium plastic fines; ~30% fine to medium grained sand; mostly fine; subrounded; firm; moist.						
9.0								
10.0								
11.0		11.0-17.0 - Interbedded clayey Sands; moist to wet.						
	SC							
12.0	CL							
13.0	SC							
14.0	CL							
15.0								Water runs out at surface at ~14.0'
	SC							
16.0								
17.0	CL							
18.0								
19.0								
20.0								

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/16/85 HOLE NO. W4-1A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	SANDY CLAY (Cont.)			AD			
21.0		As Above						Driller reports - no drilling header at 21.0'
22.0								
23.0								Set well to 20' 5 1/2"
24.0								Set screen from 10' 5" to 20' 5 1/2"
25.0		Completed boring to 25.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field **DATE DRILLED** 8/16/85 **HOLE NO.** W4-2A
LOCATION site 4 (Holding ponds) **GROUND ELEV.** 4.6' (survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 7.2' A.B.
TYPE OF RIG Acker-AD-2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS 1" high grass - mowed - Driving Range **TOTAL DEPTH** 25.0' **NO. CORE BOXES** ____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0, 3.0, 4.0	OH	0.0 - 4.5 SILTY CLAY; Topsoil; Black N-1 ~80-90% medium to high plastic fines; ~10-20% fine to medium grained sand; mostly fine; sub-rounded to subangular; expansive; roots and rootlets; stiff; dry to damp.			AD			Set-up and started drilling at 10:40 A.M.
5.0, 6.0	CL	4.5 - 6.5 SANDY CLAY; Light Olive Gray 5Y 5/2 ~80% medium plastic fines; ~20% fine grained sand; portions mottled; stiff; dry to moist at tip.	L-1	6, 10, 9	DR, AD			Drove modified Porter Sampler at 4.0' Recovery = 1.2/1.5
7.0, 8.0, 9.0, 10.0, 11.0	CL	6.5 - 16.0 SANDY CLAY; Light Olive Gray 5Y 5/2 ~70% low to medium plastic fines; ~30% fine to medium sand; mostly fine; firm to stiff; moist to wet.						
12.0, 13.0, 14.0, 15.0, 16.0	SC, GC, SC	11.5 - 16.0 Interbedded Clayey Sands and Clayey Gravels						Water runs out at surface at ~ 13.0'
17.0, 18.0, 19.0, 20.0	CL	16.0 - 25.0 SANDY CLAY; Light Olive Gray 5Y 5/2 to Light Olive Brown 5Y 5/6 ~80% - 90% medium to high plastic fines; ~10% to 20% fine to medium grained sand; mostly fine; sticky; stiff; wet.						

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/16/85 HOLE NO. W4-2A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	16.0-25.0 SANDY CLAY; As Above (cont.)			AD			
21.0								Set well to 20' 3"
22.0								Set screen from 10' to 20' 3"
23.0								
24.0								
25.0		completed boring to 25.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field **DATE DRILLED** 8/16/85 **HOLE NO.** W5-1A
LOCATION Site 5 (Fuel Farm) **GROUND ELEV.** 10.3' (survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 10.0' w.s.
TYPE OF RIG Acker AD-2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS dry-hard expansive Topsoil **TOTAL DEPTH** 32'3" **NO. CORE BOXES**

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0, 3.0	OL	0.0 - 3.0 SILTY CLAY; Topsoil; Black N-1; ~ 90% medium to high plastic fines; ~ 10% fine to medium grained sand; roots and rootlets; stiff, dry - damp			AD			Set-up and started drilling at 1:15 P.M.
4.0, 5.0, 6.0, 7.0, 8.0, 9.0	CL	3.0 - 30.0 SANDY CLAY: Light Olive Brown 5Y 5/6 ~ 70-80% low to medium plastic fines; ~ 20-30% fine to medium sand; mostly fine; traces of coarse sand; sub-angular; firm to stiff; moist.						
10.0				6	DR			Drove modified Porter sampler at 10.0'
11.0			L-1	5 / 5				Recovery = 1.2/1.5
12.0, 13.0, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0	SC, SM, SC, CL, SC, CL	12.0 - 18.0 Interbedded clayey sands and silty sands.			AD			encountered water table at 11.0' while sampling - strong Petroliferous odors in cuttings from water table

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/16/85 HOLE NO. W5-1A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	3.0 - 30.0 SANDY CLAY; As Above (cont.)			AD			
21.0								
22.0								
23.0								
24.0		24.0 - 30.0 grades slightly coarser; ~10% medium to coarse grained sands						
25.0								
26.0								set well to 32' 3"
27.0								set screen from 22' to 32' 3"
28.0								
29.0								
30.0		Completed boring to 32' 3"						

SHEET 2 OF 2

Earth Sciences Associates
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Soil and Bedrock Log

PROJECT Moffett Field 3110-C DATE DRILLED 8/19/85 HOLE NO. WS-2A
LOCATION Site 5 (Fuel Farm) GROUND ELEV. 12.8' (survey)
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER
TYPE OF RIG Acker-AD2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry-hard expansive soils TOTAL DEPTH 31.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OH	0.0 - 5.5 SANDY CLAY; Topsoil; Black N-1 ~ 80 - 90% medium to high plastic fines; ~ 10-20% fine to medium grained sand; subangular; roots; stiff; dry - damp.			AD			Set-up and started drilling at 11:45 A.M
1.0								
2.0								
3.0								
4.0								
5.0								
6.0	CL	5.5 - 30.0 SANDY CLAY; Dark Yellowish Brown 10YR 4/2 ~ 80% low to medium plastic fines; ~ 20% fine to coarse grained sand; subangular to subrounded; stiff; damp to moist.						
7.0								
8.0								
9.0								
10.0		10.0 - 12.0 SILTY SANDY CLAY; Dark Yellowish Brown 10YR 4/2 to Olive Grey 5Y 3/2 - portions mottled; thin laminae of silt present; stiff; moist.	L-1	3 6 10	DR AD			Drove modified Porter sampler at 10.0' Recovery = 1.1/1.5
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								

PROJECT Moffett Field DATE DRILLED 8/19/85 HOLE NO. W5-2A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	5.5-30.0 SANDY CLAY; As Above (cont.)			AD			
21.0								
22.0								
23.0								
24.0								
25.0								Set well to 30' 8"
								Set screen from 20'5"
26.0								to 30' 8".
27.0								
28.0								
29.0								
30.0		Completed boring to 31.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field 3110-C **DATE DRILLED** 8/19/85 **HOLE NO.** W5-3A
LOCATION Site 5 (Fuel Farm) **GROUND ELEV.** 7.8' (survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 7.5' w.s.
TYPE OF RIG Acker-AD2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS Dry-hard-expansive soils **TOTAL DEPTH** 30'5" **NO. CORE BOXES** ____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0	OH	0.0 - 2.8 SILTY CLAY; Topsoil; Black N-1 ~80% medium plastic fines; ~20% fine to medium grained sand; subangular; expansive; roots; stiff; dry.			AD			Set-up and started drilling at 9:15 A.M.
3.0, 4.0, 5.0	CL	2.8 - 5.0 SANDY CLAY; Brownish Black 5YR 2/1 ~60-70% low to medium plastic fines; ~30-40% fine to medium grained sands; subangular to subrounded; firm to stiff; damp.						
6.0, 7.0, 8.0	CL	5.0 - 12.0 SILTY CLAY; Light Olive Brown 5Y 5/6 ~90% low to medium plastic fines; < 10% fine grained sand; trace of slightly cemented silt nodules; portions mottled; firm; moist to wet.						
8.0			L-1	3 4 5	DR			Drove modified Porter Sampler at 8.0' Recovery = 1.5/1.5
9.0, 10.0		9.0 - 11.0 - grades light olive gray 5Y 5/2			AD			
11.0, 12.0								
13.0, 14.0, 15.0		12.0 - 30.0 SANDY CLAY; Light Olive Brown 5Y 5/6 ~80% medium plastic fines; ~20% fine to medium grained sand; mostly fine; subangular to subrounded; stiff; wet.						Water runs out at surface ~15.0'
16.0, 17.0, 18.0, 19.0, 20.0								

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/19/85 HOLE NO. WS-3A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	20.0-30.0 SANDY CLAY; As Above (cont.)			AD			
21.0								
22.0								
23.0								
24.0								Set well to 30' 5"
25.0								set screen from 20' 2" to 30' 5"
26.0								
27.0								
28.0								
29.0								
30.0		Completed boring to 30' 5"						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field 3110-C DATE DRILLED 8/20/85 HOLE NO. W6-1A
LOCATION Site 6 (Runway Apron) GROUND ELEV. 9.8' (survey)
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 14.0' W.D. 6.6' A.B.
TYPE OF RIG Acker-AD2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry-hard-expansive topsoil. TOTAL DEPTH 26.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0	OH	0.0 - 3.0 SANDY CLAY; Topsoil; Black N-1; ~ 80-90% medium to high plastic fines; ~ 10-20% fine to medium sand; subangular; roots; expansive; stiff; dry-damp			AD			Set-up and started drilling at 7:30 A.M.
3.0, 4.0, 5.0, 6.0	CL	3.0 - 6.0 SANDY CLAY; Grades to Dark Yellowish Brown 10YR 4/2 ~ 60-70% low plastic fines; ~ 30-40% fine to coarse grained sand; subangular to subrounded; portions mottled; stiff; damp to moist.	L-1	5, 6, 9	DR, AD			Drove modified Porter sampler at 3.0' Recovery = 1.0/1.5
7.0			L-2	4, 6, 7	DR			Drove modified Porter Sampler at 6.0' Recovery = 1.5/1.5
8.0, 9.0, 10.0, 11.0, 12.0, 13.0, 14.0		6.0 - 25.0 SANDY CLAY; grades less coarse ~ 20% fine to coarse grained sand; mostly fine.			AD			
15.0	SC	14.0 - 19.0 - Interbedded lenses of saturated clayey sands.						Water runs out at surface at ~ 15.0'
16.0	CL							
17.0	SC							
18.0								
19.0	CL							
20.0								

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/20/85 HOLE NO. W6-1A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	6.0 - 25.0 SANDY CLAY; As Above (cont.)			AD			
21.0								
22.0								
23.0								set well to 25' 1/2"
24.0								set screen from 14'9" to 25'1/2"
25.0		Completed boring to 26.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field 3110-C **DATE DRILLED** 8/20/85 **HOLE NO.** W7-1A
LOCATION site 7 (Hangars 2 and 3) **GROUND ELEV.** 11.3' (survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 6.5 W.S. A.
TYPE OF RIG Acker-AD2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS Asphalt Pavement **TOTAL DEPTH** 31.0' **NO. CORE BOXES** ____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
		0.0 - 0.5 ASPHALT (Parking lot)			AD			Set-up and started drilling at 10:00 A.M.
1.0	GP	0.5 - 2.0 GRAVELLY SAND; Fill; Dark Yellowish Brown 10YR 4/2 <10% non plastic fines; ~70% fine to coarse grained sand; ~20% fine to medium gravel.						
2.0	OH	2.0 - 3.5 SANDY CLAY; Topsoil; Black N-1; ~70-80% medium plastic fines, ~20-30% fine to medium grained sand; stiff; damp.						
3.0				6	DR			Drove modified Porter Sampler at 3.0'
4.0	CL		L-1	8				Recovery = 1.2/1.5
				8				
5.0		3.5 - 5.5 SANDY CLAY; Light Olive Gray 5Y 5/2 ~60-70% low plastic fines; ~30-40% fine to coarse grained sand; subangular; Portions mottled; stiff; moist.			AD			
6.0	GP				DR			Drove modified Porter Sampler at 6.0'
		5.5 - 30.0 GRAVELLY SAND; Moderate Yellowish Brown 10YR 5/4 ~10% non to low plastic fines; ~70% fine to coarse grained sand, subangular to subrounded; ~20% fine gravels; medium dense to dense; wet to saturated.		4				
7.0			L-2	10				Recovery = 1.1/1.5
				5				
8.0					AD			
9.0								
10.0								
11.0								
12.0								
13.0								
14.0								
15.0								Water runs out at surface ~16.0'
16.0								
17.0	SM	17.0 - 20.0 Interbedded seams of silty sand						
18.0								
19.0	SM							
20.0								

PROJECT Moffett Field DATE DRILLED 8/20/85 HOLE NO. W7-1A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	GP	5.5-30.0 GRAVELLY SAND; As Above (cont)			AD			
21.0								
22.0								
23.0								
24.0								
25.0								
26.0								Set well to 30' 7"
	SC	26.0-30.0 - lenses of Interbedded clayey sand						Set screen from 20' 7" to 30' 7"
27.0	GP							
28.0								
29.0								
	SC							
30.0		Completed Boring to 31.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field 3110-C **DATE DRILLED** 8/28/85 **HOLE NO.** W7-2A
LOCATION Site 7 (Hangers 2 and 3) **GROUND ELEV.** 10.7' (Survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 6.0 WS
TYPE OF RIG Acker-AD2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30" 5.0 AF
SURFACE CONDITIONS Asphalt - Parking lot. **TOTAL DEPTH** 31.0' **NO. CORE BOXES**

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
		0.0 - 0.4 ASPHALT;			AD			Set-up and started drilling at 7:20 A.M.
1.0	GP	0.4 - 1.5 GRAVELLY SAND Fill - Dark Yellowish Brown 10YR 4/2 & 20% non to low plastic fines, ~50% fine to coarse grained sand, ~30% fine to coarse gravel; medium dense, dry - damp.						
2.0	OH	1.5 - 4.0 SANDY CLAY; Topsoil; Black N-1; ~80-90% medium plastic fines; ~10-20% fine to medium grained sand stiff; damp to moist.						
3.0				5	DR			Drove modified Porter Sampler at 3.0'
4.0	CL	4.0 - 30.0 SANDY CLAY; Light Olive Grey 5Y 5/2 ~60-70% low plastic fines; ~30-40% fine to coarse grained sand; subangular to subrounded; portions mottled; stiff; moist to wet.	L-1	8 10				Recovery = .9/1.5
5.0					AD			
6.0				3	DR			Drove modified Porter Sampler at 6.0'
7.0			L-2	5 8				Recovery = 1.3/1.5
8.0					AD			
9.0								
10.0								
11.0								
12.0								
13.0	SM	13.0 - 20.0 Interbedded seams of silty sand and Gravelly sand						
14.0								
15.0	CL							
16.0								
17.0	GP							
18.0	CL							
19.0	GP							
20.0	CL							

PROJECT Moffett Field DATE DRILLED 8/28/85 HOLE NO. W7-2A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
		20.0 - 30.0 SANDY CLAY; As Above (cont.)			AD			
21.0	CL							
22.0		22.0 - 26.0 Interbedded seams of clayey sand.						Water runs out at surface at ~ 22.0'
23.0	SC							
24.0	CL							
25.0	SC							
26.0	CL							
27.0								Set well to 31.0'
28.0								Set screen from 20.8' - 31.0'
29.0								
30.0		completed boring to 30.0' drilled hole out to 31.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field 3110-C **DATE DRILLED** 8/21/85 **HOLE NO.** W7-3A
LOCATION Site 7 (Hangers 2 and 3) **GROUND ELEV.** 10.3' (survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** ___
TYPE OF RIG Acker-AD2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS Asphalt - Parking lot 5" **TOTAL DEPTH** 26.0' **NO. CORE BOXES** ___

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
		0.0 - 0.5 ASPHALT (Parking lot)			AD			Set-up and started drilling at 7:30 A.M.
1.0	GP	0.5 - 1.5 GRAVELLY SAND (Fill) Dark Yellowish Brown 10YR 4/2 <10% non plastic fines; ~70% fine to coarse grained sand; ~20% fine med gravel.						
2.0	SC	1.5 - 5.5 CLAYEY SAND; Moderate Yellowish Brown 10YR 5/4 ~40% low plastic fines; ~60% fine to coarse grained sand, mostly fine, subangular to subrounded, dense; damp.						
3.0					DR			Drove modified Porter Sampler at 3.0'
				11				
4.0			L-1	15				Recovery = 1.1/1.5
				22				
5.0					AD			
	OL	5.5 - 7.0 SANDY CLAY; Black - N-1 90% low-medium plastic fines; ~10% fine to coarse sand, mostly fine; subangular to subrounded; stiff, damp to moist.						
6.0					DR			Drove modified Porter Sampler at 6.0'
				7				
7.0			L-2	11				Recovery = 1.0/1.5
	CL	7.0 - 25.0 SANDY CLAY; Dark Yellowish Brown 10YR 4/2 ~90% low to medium plastic fines; ~10% fine to coarse grained sand; subangular to subrounded; stiff; moist.		14				
8.0								
9.0								
10.0								
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/21/85 HOLE NO. W7-3A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	7.0-25.0 SANDY CLAY			AD			
21.0		As Above (cont)						
22.0		22.0-25.0 Interbedded lenses of clayey sand.						
	SC							
23.0								set well to 26.0'
	CL							set screen from 16.0'
24.0								to 26.0'
	SC							
25.0		completed boring to 26.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field **DATE DRILLED** 8/27/85 **HOLE NO.** W8-1A
LOCATION site 8 (Waste oil transfer area) **GROUND ELEV.** 7.4' (Survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 21.0 WD 12
TYPE OF RIG Acker AD-2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS Dry-hard-Sandy Gravels **TOTAL DEPTH** 30.0' **NO. CORE BOXES** ____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	CL	0.0-21.0 SANDY CLAY; Black N-1 ~80% low to medium plastic fines; ~20% fine to coarse grained sand; subangular to subrounded; traces of fine gravel; stiff, dry - damp.			AD			Set up and started drilling at 8:30 A.M.
1.0								
2.0								
3.0								
4.0		3.5-5.0 - grades Olive Gray 5Y 3/2 - moist						
5.0		5.0-13.0 - grades Light Olive Gray 5Y 5/2 - moist						
6.0					DR			Drove modified Porter sampler at 6.0'
				8				
7.0			L-1	10				Recovery = 1.2/1.5
				13				
8.0					AD			
9.0								
10.0								
11.0								
12.0								
13.0		13.0-21.0 SANDY CLAY; Moderate Yellowish Brown 10YR 5/4 ~80% low to medium plastic fines; ~20% fine to coarse grained sand; subangular to subrounded; medium dense to dense; moist.						
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/27/85 HOLE NO. WB-1A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	0.0-21.0 SANDY CLAY; (cont.) As Above			AD			
21.0	SM	21.0-26.0 SILTY SAND; Moderate Yellowish Brown 10YR 5/4 ~ 40% non to low plastic fines; ~ 60% fine to coarse grained sand; subrounded to subangular; medium dense to dense; wet to saturated.						Water rises out at surface between 20.0 and 21.0'
22.0								
23.0								
24.0								
25.0								
26.0	SC	26.0-30.0 CLAYEY SAND; Moderate Yellowish Brown 10YR 5/4 ~ 40% low to medium plastic fines; ~ 50% fine to coarse grained sand; subangular to subrounded; <10% fine to medium gravel; dense; wet to saturated.						
27.0								
28.0								Set well to 30.0'
29.0								Set screen from 19.8 to 30.0.
30.0		completed boring to 30.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field **DATE DRILLED** 8/29/85 **HOLE NO.** W9-1A
LOCATION Site 9 (Old Fuel Farm) **GROUND ELEV.** 15.7 (Survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 120' W.S. 8.4' A.B.
TYPE OF RIG Acker AD-2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS Asphalt .4' thick **TOTAL DEPTH** 30.0' **NO. CORE BOXES** ____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
		0.0 - 0.4 Asphalt			AD			Set-up and started drilling at 11:15 A.M.
1.0	SP	0.4 - 2.0 GRAVELLY SAND; (Fill) Moderate Yellowish Brown 10YR 5/4 < 10% nonplastic fines; ~ 50-60% fine to coarse grained sand; ~ 30-40% fine to coarse gravel; med-dense; dry.						
2.0	OL	2.0 - 4.0 SILTY CLAY; Topsoil; Black - N-1 ~ 90% low to medium plastic fines; ~ 10% fine to very fine grained sand; traces of medium sands; firm to stiff; damp.						
3.0								
4.0	CL	4.0 - 6.0 grades Pale Yellowish Brown 10YR 4/2; portions laminated.						
5.0								
6.0		6.0 - 14.0 SANDY CLAY; Pale Yellowish Brown 10YR 4/2 ~ 60% low to medium plastic fines; ~ 30% fine to coarse grained sand; subrounded to subangular; < 10% fine gravels; stiff, damp to moist						
7.0								
8.0								
9.0								
10.0		10.0 - grades Light Olive Gray 5Y 5/2						
11.0	SM	11.0 - 30.0 Interbedded seams of SILTY SAND						
12.0	CL			5	DR			Drove modified Porter sampler at 12.0'
13.0	SM		L-1	6				Recovery = 1.4/1.5
				6	AD			
14.0	CL	14.0 - 30.0 SILTY CLAY; Medium Gray N-5 ~ 90% low plastic fines; < 10% fine to medium grained sand, mostly fine; stiff; moist.						
15.0								
16.0	SM							
17.0	CL							
18.0								
19.0								
20.0								SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/29/85 HOLE NO. W9-1A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	14.0-30.0 SILTY CLAY; AS Above (cont)			AD			
21.0								
22.0		11.0-30.0 Interbedded seams of SILTY SAND						
	SM							
23.0								
	CL							
24.0								
	SM							
25.0								
	CL							
26.0								
27.0								
28.0								Set well to 30.0'
	SM							
29.0								Set screen from 19.8' to 30.0'
30.0		completed boring to 30.0'						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/28/85 HOLE NO. W9 - 2A (abandoned)
LOCATION site 9 (Old Fuel Farm) GROUND ELEV. 19.5' (Survey)
DRILLING CONTRACTOR Kleinfelder LOGGED BY BLP DEPTH TO GROUND WATER ___
TYPE OF RIG Acker AD-2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Asphalt 3"-4" thick TOTAL DEPTH 30.0' NO. CORE BOXES ___

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
		0.0 - 0.4 ASPHALT						Set-up and started drilling at 10:00 A.M.
		0.4 - GRAVELLY SAND (Fill) Moderate Yellowish Brown 10YR 5/4 ~20% non to low plastic fines; ~50% fine to coarse grained sand; ~30% fine to coarse gravels.						
1.0								
2.0		2.0 - grades Dark Yellowish Brown 10 YR 4/2 - grades less coarse; ~10% non plastic fines; ~70-80% fine to coarse grained sand; ~10-20% fine gravels; med-dense; damp to moist.						2.0 - Soil has strong petroliferous odor.
3.0								
4.0								
5.0								
6.0								
7.0								
8.0								
9.0		traces of medium to coarse gravels						
10.0								
11.0		abandoned hole due to storage tanks at 12.0' had to relocate hole. See other boring log.						
12.0								tryed pounding sampler at 12.0 - sampler bouncing when hammering.
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/28/85 HOLE NO. W9-2A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	12.0 - 30.0 SILTY CLAY; As Above (cont.)			AD			
21.0	SM	18.0 - 30.0 Interbedded seams of SILTY SAND						
22.0								
23.0	CL							
24.0	SM							
25.0								
26.0								
27.0								
28.0	SM							Set well to 31.0'
29.0								Set screen from 20.8 - 31.0
30.0	CL							
31.0		completed boring to 31.0'						
32.0								

SHEET 2 OF 2

Earth Sciences Associates
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(415) 321-3071

Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/29/85 HOLE NO. W9-2A
LOCATION Site 9 (Old Fuel Farm) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 13.0 W; 8.5 A
TYPE OF RIG Acker AD-2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Asphalt, 4" thick TOTAL DEPTH 31.0 NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
		0.0 - 0.4 Asphalt			AD			Set-up and started drilling at 7:15 A.M
1.0	GP	0.4 - 1.5 GRAVELLY SAND; (F.11) Moderate Yellowish Brown 10YR 5/4 ~10% non to low plastic fines; ~50% fine to coarse grained sand; ~40% fine to coarse gravel; med-dense; dry						
2.0	CL	1.5 - 3.0 SANDY CLAY; Moderate Brown 5YR 4/4 ~70-80% low plastic fines; ~20-30% fine to coarse grained sand; subrounded to subangular; firm to stiff; damp.						
3.0	CL	3.0 - 8.0 SILTY CLAY; Pale Yellowish Brown 10YR 6/2 ~90% low to medium plastic fines; ~10% fine to very fine grained sand; traces of medium to coarse sand; firm to stiff; damp.						
4.0								
5.0								
6.0								
7.0								
8.0		8.0 - 12.0 SANDY CLAY; Dark Gray N-3 ~80-90% low plastic fines; ~10-20% fine to medium grained sand; subrounded to subangular; traces of fine gravels; stiff, damp to moist.						
9.0								
10.0								
11.0								
12.0		12.0 - 30.0 SILTY CLAY; Light Olive Gray 5Y 5/2 to Light Olive Brown 5Y 5/6 ~90% low to medium plastic fines, ~10% fine to very fine grained sand; traces of medium grained sand; portions mottled; firm; moist to wet.						
13.0			L-1	5	DR			Drove modified Porter Sampler at 13.0'
14.0				4				Recovery = 1.5/1.5
				5				
15.0					AD			Water runs out at surface ~ 14 to 15'
16.0								
17.0								
18.0	SM	18.0 - 30.0 Interbedded seams of SILTY SAND						
19.0	CL							
20.0								

SHEET 1 OF 2

APPENDIX B1 – LOGS OF "A" WELLS

HOLE NO. W9-2A
TOTAL DEPTH 31.0
SHEET 2 OF 2

CONFIRMATION STUDY
(VERIFICATION STEP)

THE ABOVE IDENTIFIED SHEET IS NOT AVAILABLE.

EXTENSIVE RESEARCH WAS PERFORMED BY NAVFAC SOUTHWEST TO LOCATE THIS SHEET. THIS PAGE HAS BEEN INSERTED AS A PLACEHOLDER AND WILL BE REPLACED SHOULD THE MISSING ITEM BE LOCATED.

QUESTIONS MAY BE DIRECTED TO:

DIANE C. SILVA
RECORDS MANAGEMENT SPECIALIST
NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132

TELEPHONE: (619) 532-3676

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Soil and Bedrock Log

PROJECT Moffett Field 3110-C **DATE DRILLED** 8/21/85 **HOLE NO.** W10-1A
LOCATION Site 10 (Chase Park) **GROUND ELEV.** 9.7' (survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 5'
TYPE OF RIG Acker-AD2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS 1' to 2' high grass - portions plowed **TOTAL DEPTH** 30' 5" **NO. CORE BOXES**

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0, 3.0, 4.0	OH	0.0-4.0 SILTY CLAY; Topsoil; Dusky Yellowish Brown 10YR 2/2; ~90% medium to high plastic fines; ~10% fine grained sand; subangular; roots and rootlets; dry to damp.			AD			Set-up and started drilling at 10:15 A.M.
5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0	CL	4.0-12.5 SANDY CLAY; grades to a Light Olive Gray 5Y 5/2; ~80% medium to high plastic fines; ~20% fine grained sand; subangular; hard; damp to moist. 10.0- grades to a mottled light olive gray 5Y5/2 and Moderate Yellowish Brown 10YR 5/4 portions laminated.						Water runs out at surface at ~11.5'
13.0, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0	ML, SW, ML, SW, ML	12.5-20.0 SANDY SILT; Light olive Gray 5Y5/2 ~60% low plastic fines; ~40% fine grained sand; subrounded; traces of coarse sand; very dense; saturated. 16.0-20.0 Interbedded seams of Sand						

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/21/85 HOLE NO. W10-1A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	20.0-24.0 SILTY CLAY; Light Olive Grey 5Y 5/2 ~90% medium plastic fines ~10% fine to very fine grained sand; very stiff; moist to wet.			AD			
21.0								
22.0								
23.0								
24.0								Set well to 30' 4"
	CL	24.0-28.0 SANDY CLAY; Light Olive Grey 5Y 5/2 to Light Olive Brown 5Y 5/6 ~60% low to medium plastic fines; ~40% fine to medium grained sand; mostly fine; subrounded to subangular; stiff; wet.						
25.0								Set screen from 20' to 30' 4"
26.0								
27.0								
28.0	CL	28.0-30.0 SILTY CLAY; Light Olive Brown 5Y 5/6 ~70% low to medium plastic fines; ~30% fine to coarse sand; portions mottled; hard; moist.						
29.0								
30.0		completed boring to 30' 5"						

SHEET 2 OF 2

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Soil and Bedrock Log

PROJECT Moffett Field 3110-C **DATE DRILLED** 8/21/85 **HOLE NO.** W10-2A
LOCATION Site 10 (Chase Park) **GROUND ELEV.** 15.6' (Survey)
DRILLING CONTRACTOR Klienfelder **LOGGED BY** BLP **DEPTH TO GROUND WATER** 18: WD AB
TYPE OF RIG Acker-AD2 **HOLE DIAMETER** 8" **HAMMER WEIGHT AND FALL** 140 lb - 30"
SURFACE CONDITIONS 1'-2' high grass - portions plowed **TOTAL DEPTH** 31.0' **NO. CORE BOXES**

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0, 3.0, 4.0	OL	0.0-4.5 SANDY CLAY; Topsoil; Brownish Black 5YR 2/1 ~80% low to medium plastic fines; ~20% fine to coarse grained sand; mostly fine; subangular; roots and rootlets; dry-damp. 3.0 - grades to Light Olive Gray 5Y 5/2			AD			Set-up and started drilling at 11:30 A.M.
5.0, 6.0, 7.0, 8.0	SC	4.5-8.5 CLAYEY SAND; Light Olive Gray 5Y 5/2 to Light Olive Brown 5Y 5/6 ~40% low plastic fines; ~50% fine to coarse grained sand, subrounded to subangular; ~10% fine to medium gravels; medium dense; wet.						
9.0, 10.0, 11.0, 12.0, 13.0, 14.0	ML	8.0-15.0 CLAYEY SILT; Light Olive Gray 5Y 5/2 to Light Olive Brown 5Y 5/6 ~90% low plastic fines; ~10% fine to medium grained sand; mostly fine; subrounded to subangular; portions mottled; loose; wet.						
15.0, 16.0, 17.0	GP	15.0-18.0 GRAVELLY SAND; Dark Yellowish Brown 10YR 4/2 <20% non plastic fines; ~60% fine to coarse grained sand; subrounded to subangular; ~20% fine to medium gravels; very dense; wet.						
18.0, 19.0, 20.0	CL ML	18.0-26.0 SILTY CLAY; Grayish Olive 10Y 4/2 ~70% low plastic fines; ~20% fine grained sand; <10% fine to medium gravels; portions laminated; med-dense; damp to moist.						Water runs out at surface at ~ 19.0'

SHEET 1 OF 2

PROJECT Moffett Field DATE DRILLED 8/21/85 HOLE NO. W10-2A

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL ML	18.0-26.0 SILTY CLAY (cont) As Above			AD			
21.0								
22.0		22.0-25.0 grades more coarse and slightly more clayey						
23.0								
24.0								
25.0								
26.0	GC	26.0-30.0 CLAYEY GRAVEL; Light Olive Gray 5Y 5/2 to Light Olive Brown 5Y 5/6 ~30% low plastic fines, ~30% fine to coarse grained sand; subrounded to subangular; ~40% fine to medium gravel; very dense; wet to saturated.						Set well to 30' 9 1/2"
27.0								set screen from 20' to 30' 9 1/2"
28.0								
29.0								
30.0		completed boring to 31.0'						

SHEET 2 OF 2

APPENDIX B2

LOGS OF "B" AND "C" WELLS

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 7/25/85 HOLE NO. W3 - 1B
LOCATION Golf Course site 3 GROUND ELEV. 0.3 (survey)
DRILLING CONTRACTOR Pitcher LOGGED BY BLP DEPTH TO GROUND WATER
TYPE OF RIG Failing 1500 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 265-16 18"
SURFACE CONDITIONS swamp grass TOTAL DEPTH 79.5 NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OL	0.0-2.5 CLAYEY SILT; Topsoil. Black N1 ~80% non-low plastic fines; ~20% fine to coarse grained sand; subangular; roots and rootlets; dry.			AD			Set-up and started drilling at 9:00 A.M.
1.0			B-1					
2.0								Set-casing at 5.0' and set-up for Rotary drilling.
3.0	CL	2.5- SILTY CLAY; Olive Grey 5Y 3/2 ~70% low to medium plastic fines, ~30% fine to medium sands; portions mottled; firm; damp-moist.			RD			
4.0			B-2					
5.0			L-1	5	DR			Drove California Sampler at 5.0'
6.0		5.5 - Grades Light Olive Grey 5Y 5/2 to Moderate Yellowish Brown 10YR 5/4 ~80% medium plastic fines ~20% fine grained sand		9 / 10				Recovery = 1.2/1.5
7.0					RD			
8.0								
9.0								
10.0		grades very hard	L-2	12	DR			Drove California Sampler at 10.0'
11.0				28 / 40				Recovery = 1.4/1.5
12.0					RD			
13.0								
14.0								
15.0		SILTY CLAY Light Olive brown 5Y 5/6 95% low-medplastic fines 5% fine-coarse grained sand	L-3	15	DR			Drove California Sampler at 15.0'
16.0				32 / 46				Recovery = 1.4/1.5
17.0					RD			
18.0								
19.0								mud changes to slightly lighter color
20.0								

PROJECT Moffett Field DATE DRILLED 7/25/85 HOLE NO. W31F

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	25-27.5 SILTY CLAY (cont.)		20	DR			Drove California Sampler at
21.0		Light olive brown 5Y 5/6	L-4	60				20.0'
22.0		95% low-medium plastic fines			RD			Recovery = 1.0/1.0
23.0		5% fine-coarse grained sand mottled damp						>60 for .5 at 20.5
24.0								
25.0					DR			
				30				Drove California Sampler at
26.0			L-5	50				25.0'
27.0					RD			Recovery = 1.0/1.0
								>50 for .5 at 25.5
28.0	GP	27.5 GRAVELLY SAND						
29.0		75% fine silty sand						
		20% medium-coarse sand						
		5% fine gravel						
30.0					DR			
		Light olive gray 5Y 5/2		43				Drove California Sampler at
31.0		Lenses of sand & gravel	L-6	50				30.0'
		weak cementation						Recovery = 1.0/1.0
32.0		stiff moist			RD			>50 for .5 at 30.5'
		fine gravels seen in bailer sieve						
33.0	CL	33.0 SILTY CLAY						
34.0		95% low-medium plastic fines						
		5% fine-coarse sand						
35.0					DR			
		Light olive gray 5Y 5/2		38				Drove California Sampler at
36.0		stiff, moist	L-7	50				35.0'
								Recovery = 1.0
37.0					RD			>50 for .5 at 35.5
38.0								
39.0		38.5 Drilling rate increased						
40.0					DR			
		SILTY CLAY		15				Drove California Sampler at
41.0		95% low-med plastic fines	L-8	25				40.0'
		5% fine-coarse sand		30				Recovery = 1.5
42.0		Light olive gray 5Y 5/2			RD			
		stiff moist						Silty Sand in shoe of California Sampler ≈ 2" sand seam
43.0								
44.0								

SHEET 2 OF 4

PROJECT Moffett Field DATE DRILLED 7/25/85 HOLE NO. W3 E

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	SILTY CLAY (cont.)						
45.0		95% low-medium plastic fines			DR			Drove California Sampler at 45.0
		5% fine-medium grained sand		17				
46.0		very stiff; moist	L-9	37				Recovery = 1.0
				44				
47.0					RD			
	GM	SILTY GRAVEL						
48.0		47.0-50.0						
		based on drilling rate and						
49.0		rotary drill cuttings						
50.0					DR			
	SM	SILTY SAND		58				Drove California Sampler at 50.0
51.0		90% fine to coarse sand	L-10					Recovery = .5
		10% some fine gravel						>58 for .5 at 50.0
52.0		Light olive gray 5Y 5/2			RD			
		moist						
53.0								
54.0								
55.0	ML	grades to SILT at 54.5						
		based on rotary drill cuttings						
56.0								
57.0								
	CL	57.0 SILTY CLAY						
58.0		moderate olive brown						
		5Y 4/4						
59.0		95% low-medium plastic fines						
60.0		5% fine-coarse sand			DR			
		very stiff, moist		15				Drove California Sampler at 60.0
61.0			L-11	23				Recovery = 1.5
				38				
62.0					RD			
63.0								
64.0								
65.0								
66.0								
67.0								
68.0								

SHEET 3 OF 4

PROJECT Moffett Field DATE DRILLED 7/25/85 HOLE NO. W31B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	SILTY CLAY						
69.0		moderate olive brown						
		5Y 4/4 moist stiff						
70.0		95% low-medium plastic fines		31				Drove California Sampler at 70.0
		5% fine-coarse sand	L-12	50				
71.0	SM	70.8 SILTY SAND						Recovery : 1.0
		based on drilling rate						>50 for .5 at 70.5
72.0		and rotary drill cuttings						
73.0								
74.0								
75.0								
76.0								
77.0								
78.0								
	CL	SILTY CLAY		28				Drove California Sampler at 78.5
79.0		moderate olive brown	L-13	55				
		5Y 4/4 moist; stiff						Recovery = 1.0
		95% low-medium plastic fines						>55 at 79.5
		5% fine-coarse sand						
		Depth of boring = 79.5						
								set well to 79.0'
								set screen from 69.0'
								to 79.0'

SHEET 4 OF 4

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 7/23/85 HOLE NO. W3-2B
LOCATION Golf Course Site 3 GROUND ELEV. -2.2' (survey)
DRILLING CONTRACTOR Pitcher LOGGED BY BLP DEPTH TO GROUND WATER
TYPE OF RIG Failing 1500 HOLE DIAMETER 6 inch HAMMER WEIGHT AND FALL 285 lb - 18"
SURFACE CONDITIONS 3" high weeds - flat TOTAL DEPTH 80'5" NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0	OL	0.0-2.0 SILTY CLAY; topsoil; Brownish Black 5YR 2/1 ~80% low plastic fines; ~20% fine to coarse grained sand; roots and rootlets; dry to damp	B-1		AD			Set-up and started drilling at 10:00 A.M 7/23/85
2.0	CL	2.0-3.8 SANDY CLAY; Light Olive Gray 5Y 5/2 ~70% low to medium plastic fines; ~30% fine to medium grained sand; subangular to subrounded; moist.	B-2		RD			Set casing and set-up for Rotary at 3.0 Set additional casing to 9.0' to seal off heavy surface sand.
4.0	SW	3.8-7.5 GRAVELLY SAND; Dark Yellowish Brown 10YR 4/2 >10% non to low plastic fines; ~80% fine to coarse grained sand; subangular to subrounded; highly pervious; ~10% fine gravels; dense; wet.	L-1	5 10 25	DR RD			Drove California Sampler at 5.0' Recovery = 1.5/1.5
8.0	CL	7.5-23.0 SILTY CLAY; Light Olive Gray to Light Olive Brown (5Y 5/2) to (5Y 5/6) ~80% medium to high plastic fines; ~20% fine grained sand; very stiff; portions mottled; damp	L-2	7 12 29	DR RD			Drove California Sampler at 10.0 Recovery = 1.2/1.5
15.0			L-3	14 40 48	DR RD			Drove California Sampler at 15.0 Recovery = 1.4/1.5

SHEET 1 OF 4

PROJECT Moffett Field DATE DRILLED 7/23/85 HOLE NO. W3-2B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	7.5 - 23.0 SILTY CLAY;	L-4	30 >50	DR			Drove California Sampler at 20.0'
21.0								Recovery = .4/.7
22.0					RD			>50 for .2' at 20.5
23.0	SW	23.0-28.0 SAND; Dark Yellowish Brown 10 YR 4/2 ~10% non plastic fines; ~90% fine grained sand; subrounded to subangular; very dense; wet.						Drilling rate increases at 23.0'
24.0								
25.0	SM			20	DR			Drove California Sampler at 25.0
26.0	SW		L-5	33 39				Recovery = 1.2/1.5
27.0					RD			
28.0	CL	28.0 - 39.0 SILTY CLAY; Dark Yellowish Brown 10 YR 4/2 ~80% medium plastic fines; ~20% fine grained sand; portions mottled; hard; traces of roots; damp to moist.						
29.0								
30.0				39	DR			Drove California Sampler at 30.0'
31.0			L-6	>50				Recovery = .7/.8
32.0					RD			>50 for .3' at 30.5
33.0								
34.0								
35.0		35.0 - grades to a Light Olive Gray 5Y 5/2 to Moderate Yellow Brown 10 YR 5/4.		27	DR			Drove California Sampler at 35.0'
36.0			L-7	54				Recovery = .7/1.0
37.0					RD			>50 for .5' at 35.5
38.0								
39.0	SW	39.0 - 46.0 GRAVELLY SAND; Dark Yellowish Brn 10 YR 4/2 <10% non plastic fines; 70% fine to coarse grained sand, subrounded to subangular; ~20% fine to medium gravels; pervious; very dense; wet.						
40.0				15	DR			Drove California Sampler at 40.0'
41.0			L-8	30 50				Recovery = 1.4/1.5
42.0					RD			
43.0		42.5-43.0 silt seam						
44.0								

SHEET 2 OF 4

PROJECT Moffett Field DATE DRILLED 7/23/85 HOLE NO. W3-2B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	SW	39.0-46.0 GRAVELLY SAND; As Above (cont.)			RD			
45.0			L-9	>75	DR			Drove California Sampler at 45.0' Recovery = .5/1.5 >75 for .5' at 45.0'
46.0	ML	46.0 - CLAYEY SILT; Light Olive Grey 5Y5/2 ~80% low plastic fines; ~20% fine grained sand; portions mottled; slightly to moderately pervious; very dense; moist to wet.			RD			
47.0								
48.0								
49.0								
50.0			L-10	14	DR			Drove California Sampler at 50.0'
51.0	CL/ML	grading to silty clay		21				Recovery = 1.2/1.5
				38				
52.0					RD			
		? ?						1:00 P.M.
53.0	CL	SILTY CLAY Light olive gray to light olive brown (5Y5/2) to (5Y16) ~80% med. to high plastic fines ~20% fine grained sand stiff to very stiff; wet; mottled blue						
54.0								
55.0								
56.0								
57.0								
58.0								
59.0								
60.0				13	DR			Drove California Sampler at 60.0'
61.0		with some roots & fibers	L-11	36				Recovery = 1.5/1.5
				50				
62.0					RD			
63.0								
64.0								
65.0		grading to clayey silt						
66.0								
67.0	ML/CL	clayey silt/silty clay						
68.0								

SHEET 3 OF 4

PROJECT Moffett Field DATE DRILLED 7/23/85 HOLE NO. W3-2B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
					RD			
69.0		grading clayey silt interbedded with silty clay						
70.0			L-12	20	DR			Recovery = 0.75/1.0
71.0				55				>50 blows for 0.5'
72.0					RD			
73.0								
74.0								
75.0								
76.0								
77.0	CL	SILTY CLAY w/ some fine sand light olive gray to light olive brown (5Y5/2 to 5Y 1/6) ~80% med. to plastic clay ~20% fine sand very stiff; damp						drilling slower
78.0								
79.0								
80.0			L-13	41	DR			Recovery =
81.0				53				>50 blows for 0.5'
82.0		bottom of hole = 81'						
								set well to 80' 3"
								set screen from 65' to 80' 3"

SHEET 4 OF 4

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 7/23/85 HOLE NO. W3-3B
LOCATION Merridge Road Ditch Site-3 GROUND ELEV. -0.9' (survey)
DRILLING CONTRACTOR Pitcher LOGGED BY BLP DEPTH TO GROUND WATER 2.4 AB
TYPE OF RIG Failing 1500 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 285 lb
SURFACE CONDITIONS Short (1-2) grass (golf course) TOTAL DEPTH 86.5' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	CL	0.0 - 80.0 SILTY CLAY; Grayish Black N2 ~80% medium to high plastic fines; ~20% fine to medium sands; mostly fine; subangular to subrounded; stiff; scattered roots and rootlets; impervious; damp.			AD			Set-up rig and started drilling at 7:15 A.M. 7/23/85
1.0								
2.0			B-1					Set casing at 5.0' and set up for rotary drilling
3.0								
4.0		4.5 - Grades to a Medium Dark Gray N-4						
5.0			L-1	8	DR			Drove California Sampler at 5.0'
6.0		5.5 - Grades to a Light Olive Gray 5Y 5/2 to Moderate Yellowish Brown 10YR 5/4 ~60% medium plastic fines ~30% fine grained sand; subrounded; >10% medium grained sand; very stiff; damp to moist.		11				Recovery = 1.2/1.5
				15	RD			
7.0								
8.0								
9.0								
10.0			L-2	6	DR			Drove California Sampler at 10.0'
				17				Recovery = 1.2/1.5
11.0				27				
12.0					RD			
13.0								
14.0								
15.0		15.0 - Grades to a predominant Moderate Yellowish Brown 10YR 5/4, portions mottled with Olive gray 5Y 5/2	L-3	7	DR			Drove California Sampler at 15.0'
16.0				16				Recovery = 1.2/1.5
				31	RD			
17.0								
18.0								
19.0								
20.0								

SHEET 1 OF 4

PROJECT Moffett Field DATE DRILLED 7/23/85 HOLE NO. W3-3B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	0.0 - 80.0 SILTY CLAY; (cont)		34	DR			Drove California sampler at 20.0'
21.0		20.0 - grades hard	L-4	>50				Recovery = .7/.9
22.0					RD			>50 for .4' at 20.5'
23.0		22.0 - grades slightly siltier thin laminae of silt present; traces of roots and rootlets;						Drilling rate slightly increases at 22'
24.0								
25.0					DR			Drove California sampler at 25.0'
			L-5	12				
26.0				34				Recovery = 1.0/1.4
				>50				>50 for .4' at 26.0
27.0					RD			
28.0								
29.0								
30.0					DR			Drove California sampler at 30.0'
				39				
31.0			L-6	>50				Recovery = .7/.8
32.0					RD			>50 for .3' at 30.5
33.0								9:15 A.M. - 7/23/85
34.0								
35.0					DR			Drove California sampler at 35.0'
				21				
36.0			L-7	>50				Recovery = .7/.9
37.0					RD			>50 for .4' at 35.5
38.0								
39.0								
40.0					DR			Drove California sampler at 40.0'
				20				
41.0	SM	41.0 - 43.5 Interbedded silty sands present; very fine grained.	L-8	>50				Recovery = .9/1.0
42.0	CL				RD			>50 for .5' at 40.5
43.0	SM							
44.0	CL							

SHEET 2 OF 4

PROJECT Moffett Field DATE DRILLED 7/23/85 HOLE NO. W3-3B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	0.0 SILTY CLAY;			RD			
45.0		45.0 Grades to a Medium Bluish Gray 5B 5/1 medium plasticity; hard; impervious; moist.	L-9	34 / >50	DR			Drove California sampler at 45.0' Recovery = .7/.9 >50 for .4' at 45.5'
46.0								
47.0					RD			
48.0								
49.0								
50.0			L-10	29 / >50	DR			Drove California sampler at 50.0' Recovery = .9/1.0 >50 for .5' at 50.5
51.0								
52.0					RD			
53.0								
54.0								
55.0								* Drilling rate increased at 55.0'
56.0	SM	56.0-80.0 Interbedded silty sands present;						
57.0	CL							
58.0	SM							
	CL							
59.0	SM							
60.0	CL			25	DR			Drove California sampler at 60.0' Recovery = .8/.9 >50 for .4' at 60.5
61.0	SM		L-11	>50				
62.0	CL				RD			
63.0								
64.0	SM							
65.0								
	CL							
66.0	SM							
67.0								
68.0	CL							

SHEET 3 OF 4

PROJECT Moffett Field DATE DRILLED 7/23/85 HOLE NO. W3-3B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	0.0 - 80.0 SILTY CLAY; (cont.)			RD			11:00 A.M. - 7/23/85
69.0								
	SM	69.0-71.0 Interbedded silty sands						
70.0					DR			Drove California sampler at 70.0'
			L-12	17				
71.0				25				Recovery = 1.5/1.5
				30				
72.0					RD			
73.0								
74.0								
75.0								encountered change of materials at 76.0'
76.0	SM	76.0-79.0 Interbedded silty sands present			DR			Drove California sampler at 76.0'
			L-13	20				
77.0				25				Recovery = 1.5/1.5
				30				
78.0	CL				RD			
79.0	SM							
	CL							
80.0								11:37 A.M.
81.0								
82.0								
83.0								
84.0								
85.0					DR			Drove California sampler at 85.0
				15				
86.0			L-14	18				Recovery = 1.4/1.5
				37				
		Terminated hole at 86.5'						Set well to 79' 7½"
								Set screen from 59'6" to 79' 7½"

SHEET 4 OF 4

Earth Sciences Associates
701 Welch Road, Palo Alto, California 94304
(415) 321-3071

Soil and Bedrock Log

PROJECT Moffett Field **DATE DRILLED** 7/25/85 **HOLE NO.** W4-16
LOCATION Site 4 Former Industrial Waste Water Holding Ponds **GROUND ELEV.** 5.34' (Survey)
DRILLING CONTRACTOR Pitcher **LOGGED BY** GAJ **DEPTH TO GROUND WATER** ___
TYPE OF RIG Failing 1500 **HOLE DIAMETER** 6" **HAMMER WEIGHT AND FALL** 265 Lb. 18"
SURFACE CONDITIONS Grass Field **TOTAL DEPTH** 201.3 **NO. CORE BOXES** ___

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
0	OL	0.0-4.0 CLAYEY SILT Topsoil Black N1 80% non-low plastic fines 20% fine-coarse grained sand			AD			12:00 PM Set up and began drilling Casing set 5.0'
2.0								
3.0								
4.0	CL	SILTY CLAY Olive Gray 5Y 3/2 70% low to medium plastic fines 30% fine-medium sand Firm; damp						Drove California Sampler at 5.0 Recovery = 5
5.0				16	DR			
6.0			L-1	30				
				31				
7.0					RD			
8.0								
9.0								
10.0		SILTY CLAY Light olive brown 5Y 5/6 80% low to medium plastic fines 20% fine grained sand very hard			DR			Drove California Sampler at 10.0 Recovery = 1.0
				16				
11.0			L-2	28				
				36				
12.0					RD			12.5 Increased drilling rate
13.0								
14.0								
15.0		SILTY CLAY Light olive brown 5Y 5/6 80% low to medium plastic fines 20% fine grained sand very stiff; damp			DR			Drove California Sampler at 15.0 Recovery = 1.3
				8				
16.0			L-3	12				
				17				
17.0					RD			
18.0								
19.0								
20.0								

PROJECT Moffett Field DATE DRILLED 7/25/85 HOLE NO. W41B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	SILTY CLAY (cont.)		21	DR			Drove California Sampler at 20.0
21.0		Light olive brown 5Y 5/6	L-4	50				Recovery: .9
22.0		80% low to medium plastic fines			RD			> 50 for .4 at 20.4
		20% fine grained sand						
		very stiff, damp						
23.0								
24.0								
25.0					DR			
				27				Drove California Sampler at 25.0
26.0			L-5	50				Recovery: 1.0
27.0					RD			> 50 for .4 at 25.5
28.0								
29.0		AS Above						
30.0		Slight color change			DR			
		Light olive Gray 5Y 5/2		18				Drove California Sampler at 30.0
31.0		hard	L-6	32				Recovery 1.2
				38				
32.0	CL	Sandy Clay			RD			31.5 Driller reports hitting sand and gravel in clay rotary drilling cuttings grades to fine sand
	SM	Sand GC						
33.0		90% fine-coarse Sand						
		10% fine gravel						
34.0		Light olive gray 5Y 5/2						
		very dense						
35.0					DR			
				20				Drove California Sampler at 35.0
36.0			L-7	32				Recovery 1.3
				41				
37.0		changing to med - co. sand			RD			
38.0		85% Sand						
		15% fine gravel						
39.0	CL	Clay Seam						39.0 Clay seam reported by Driller
40.0					DR			
	SM	Sand		69				Drove California Sampler at 40.0
41.0		90% med. - coarse Sand	L-8		RD			Recovery .6
		10% < gravel						> 50 at 40.5
42.0		olive grey 5Y 3/2						
	CL	SILTY CLAY						
43.0		Light olive gray 5Y 5/2						
		90% low-med plastic fines						
44.0		<10% fine grained sands						

SHEET 2 OF 9

PROJECT Moffett Field DATE DRILLED 7/25/85 HOLE NO. W4'E

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	45.0-45.0 SILTY CLAY (cont.)						
45.0		As above			DR			
		Light olive gray 5Y 5/2		25				
46.0		90% low to medium plasticity fines	L-9	50				Drove California Sampler
		10% fine grained sand			RD			45.0
47.0								Recovery 1.0
48.0								
49.0								
50.0					DR			
				21				Drove California Sampler
51.0			L-10	56				50.0
								Recovery 1.0
52.0					RD			756 for .6 at 53.0
53.0								Started drilling at 7:00 AM 7/26/85
54.0								
55.0								
56.0								
57.0								
58.0								
59.0								
60.0					DR			
				33				Drove California Sampler at
61.0			L-11	750				60.0
								Recovery 2
62.0					RD			750 for .4 at 60.5
63.0								
64.0								
65.0								
66.0								
67.0								
69.0								

SHEET 3 OF 3

PROJECT Moffett Field DATE DRILLED 7/26/85 HOLE NO. W4-1B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
69.0	CL ML	69.0 - 80.5 CLAYEY SILT; Light Olive Gray 5Y 5/2 to Light Olive Brown 5Y 5/6 ~ 80% low plastic fines; ~ 20% very fine grained sand; portions mottled, very dense; wet.			RD			Drilling rate increases at 69.0'
70.0			L-12	15	DR			Drove California Sampler at 70.0'
71.0				24				Recovery = 1.5/1.5
				35	RD			
72.0								
73.0								
74.0								
75.0								
76.0								
77.0								
78.0								
79.0								
80.0				25	DR			Drove California Sampler at 80.0'
81.0	CL	80.5 - SILTY CLAY; Light Olive Gray 5Y 5/2; portions mottled with Light Olive brown 5Y 5/6; ~ 90% low to medium plastic fines; < 10% fine grained sand, very hard, moist	L-13	>50	RD			Recovery = .9/1.0
82.0								>50 for .5' at 80.5
83.0								
84.0								
85.0								
86.0								
87.0								
88.0								
89.0								
90.0	SM	90.0-91.5 grades siltier traces of sand			DR			Drove California Sampler at 90.0'
91.0	CL ML		L-14	20				Recovery = 1.2/1.5
				36				
				45				
92.0					RD			

SHEET 4 OF 9

PROJECT Moffett Field DATE DRILLED 7/26/85 HOLE NO. W4-1B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	SILTY CLAY; As Above (cont.)			RD			
93.0								
94.0								9:00 A.M.
95.0								
96.0								
97.0								
98.0								
99.0								
100.0					DR			Drove California Sampler at 100.0'
				21				
101.0	SM	101.0 - 102.0 - lens of silty sand	L-15	>50				Recovery = .7/.9
102.0	CL				RD			>50 for .4' at 30.5
103.0								
104.0								
105.0								
106.0								
107.0								
108.0								
109.0								
110.0					DR			Drove California Sampler at 110.0'
				21				
111.0			L-16	>50				Recovery = 1.0
112.0					RD			>50 for .4' at 110.5
113.0								
114.0								
115.0								
116.0								

SHEET 5 OF 9

PROJECT Moffett Field DATE DRILLED 7/26/85 HOLE NO. W4-1B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	SILTY CLAY: Olive Gray 5Y 3/2 ≈90% low/medium plastic fines <10% fine grained sand very hard moist			RD			
117.0								
118.0								
119.0								
120.0					DR			Drove California Sampler at 120.0
121.0	SM	VERY THIN SEAMS of fine Sand 121. – 121.5	L17	21, 37, 50				Recovery = 1.5 >50 for .3 at 121.0
122.0								
123.0								
124.0								
125.0								
126.0								
127.0								
128.0								
129.0								
130.0					DR			Drove California Sampler at 130.0
131.0			L18	22, 50				Recovery = 1.0 >50 for .4 at 131.0
132.0					RD			
133.0								
134.0								
135.0								
136.0								
137.0								
138.0								
139.0		SILTY CLAY						
140.0								

SHEET 6 OF 9

PROJECT Moffett Field DATE DRILLED 7-26-85 HOLE NO. W4 1B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
141.0	CL	SILTY CLAY LT. Olive Gray 5Y 5/2 90% - 95% med plastic fines traces of fine sand very hard dense dry	L19	43 50	DR RD			Drove California Sampler at 140.0 Recovery = 0.6 >50 for .3 at 40.5
142.0								
143.0								
144.0								
145.0								
146.0								
147.0	CL ML	at 147 SILT Moderate olive brown 5 Y 4/4 loose sandy silt ≈ 70% very fine silt low plastic ≈ 30% very fine sand	L20	39 50	DR RD			Drove California Sampler at 150.0 Recovery = .7 >50 for .3 at 50.5
148.0								
149.0								
150.0								
151.0								
152.0								
153.0								
154.0	CL	at 154 SILTY CLAY Grayish olive 10 Y 4/2 90-95% low-med plastic fines 5% fine sand						
155.0								
156.0								
157.0								
158.0								
159.0								
160.0								
161.0								
162.0								
163.0								
164.0								

SHEET 7 OF 9

PROJECT Mattole [illegible] DATE DRILLED 7-26-85 HOLE NO. W41B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
165.0	CL	SILTY CLAY Grayish olive 10Y 4/2 90-95% low-medium plastic fines 5% fine sand very hard dry			RD			
166.0								
167.0								
168.0								
169.0								
170.0					DR			Drove California Sampler at 170.0 Recovery = .7 750 at 170.5 for .3
		170.5 Sandy Clay Greenish Black 5 GY 2/1 65% low-medium plastic fines 25% fine-coarse sands 10% fine gravel moist	L-21	41 50				
171.0					RD			
172.0								
173.0								
174.0								
175.0								
176.0	GM	176.0 SILTY GRAVEL based on drilling rate and rotary drill cuttings						176. [illegible] gravel and coarse [illegible]
177.0								
178.0								
179.0								
180.0	CL	179.5 SILTY CLAY Grayish olive 10Y 4/2 95% low-medium plastic fines 5% fine sand						
181.0								
182.0								
183.0								
184.0								
185.0		184.5 SILTY CLAY Moderate olive brown 5Y 4/4 95% low-medium plastic fines 5% fine sand						slight color change based on [illegible] drill cuttings
186.0								
187.0								
188.0								

SHEET 8 OF 9

PROJECT Moffett DATE DRILLED 7/26/85 HOLE NO. W41B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
189.0								
190.0		190.0 Sandy Clay		59				Drove California Sampler at 190.0
191.0		Moderate olive brown 5Y 4/4	L-22					Recovery = .6
192.0		80% low-medium plastic fines 20% fine-medium grained sand						>59 for .6
193.0								192.0 Hit Sandy gravely layers
194.0		sandy gravely layers between 192.0 - 194.0						194.0 Sandy Clay
195.0								
196.0								
197.0								
198.0								
199.0								
200.0				39				Drove California Sampler at 200.0
		Depth of boring = 201.3	L-23	50				Recovery = .6 >50 for .3 [illegible]
								Set well to 50.0'
								Set screen from 35.0' to 50.0'

SHEET 9 OF 9

Earth Sciences Associates
701 Welch Road, Palo Alto, California 94304
(415) 321-3071

Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 7/29/85 HOLE NO. W6-1B
LOCATION Runway Aprons Site 6 GROUND ELEV. 5.5' (survey)
DRILLING CONTRACTOR _____ LOGGED BY G.A.T. DEPTH TO GROUND WATER ____
TYPE OF RIG Failing 1500 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 265 lb. 18"
SURFACE CONDITIONS Grass Field TOTAL DEPTH 46.4 NO. CORE BOXES ____

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OL	CLAYEY SILT			AD			10:00 AM. Set up and started drilling
1.0		Topsoil Black						Set casing at 5.0'
		~80% non-low plastic fines	B-1					
2.0		~20% fine-coarse grained sand						Set up for rotary drilling
		very dry						
3.0								
4.0	CL	SILTY CLAY						color change at 3.5
		Light olive brown 5Y 5/6						
5.0		~70% low-medium plastic fines			DR			
		30% fine-coarse grained sand portions molted		8				Drove California Sampler at 5.0
6.0		firm damp grades to	L-1	12				Recovery = 1.0
				18				
7.0	SM	SILTY SAND			RD			6.5 Shoe of California Sampler had silty sand and gravel
		Light olive brown 5Y 5/6						
8.0		85% non-low plastic fines to coarse silty sand						
9.0		15% fine gravel						
10.0		crumbles; damp			DR			
				25				Drove California Sampler at 10.0
11.0			L-2	33				Recovery = 1.0
				20				
12.0					RD			
13.0	CL	SANDY CLAY						Change to Sandy Clay at 13.0
14.0		Light olive brown 5Y 5/6						
		85% low-medium plastic fines						
15.0		15% fine-coarse grained sand			DR			
				7				Drove California Sampler at 15.0
16.0			L-3	11				Recovery = 1.3
				16				
17.0					RD			
	SM	SILTY SAND						Sand and gravel layer at 17.0 to 19.0
18.0		and gravel						
19.0								
	CL	SILTY CLAY						
20.0								

SHEET 1 OF 3

PROJECT Moffett Field DATE DRILLED 7/29/85 HOLE NO. W61B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
21.0	CL	**SILTY CLAY** Light olive brown 5Y 5/6 ~85% low-medium plastic fines ~15% fine-coarse sand stiff; moist	L-4	12 21 29	DR RD			Drove California Sampler at 20.0 Recovery = 1.3
22.0								
23.0								
24.0								
25.0	SM	**SILTY SAND** 85% fine-coarse Sand and gravel GP 15% non-low plastic fines moist; dense	L-5	25 50	DR RD			Drove California Sampler at 25.0 Recovery = 1.0 >50 for .6 at 25.5 change to sandy clay at 27.5
26.0								
27.0								
28.0	CL	27.5 **SANDY CLAY** 80% low-medium plastic fines 20% fine-coarse sand and fine gravel moist						
29.0								
30.0			L-6	19 21 25	DR RD			Drove California Sampler at 30.0 Recovery = .9 Hit gravel at 32.0
31.0								
32.0	SM	32.0 **SILTY SAND** Light olive gray 5Y 5/2 90% fine-coarse sand 10% fine gravel						
33.0								
34.0								
35.0			L-7	47 50	DR RD			Drove California Sampler at 35.0 Recovery = .5 >50 for .3 at 35.5 clay at 36.5
36.0								
37.0	CL	36.5 **SANDY CLAY** based on drilling rate and rotary drill cuttings						
38.0								
39.0		39.0 **SILTY SAND** Olive gray 5Y 3/2 90% fine-coarse sand 10% fine gravel						change at 39.0
40.0			L-8	67	DR			Drove California Sampler at 40.0 Recovery = .4
41.0	CL	41.0 **SILTY CLAY** based on drilling rate and rotary drill cuttings			RD			change at 41.0 into clay
42.0								
43.0								
44.0								

SHEET 2 OF 3

PROJECT Moffett Field DATE DRILLED 7/29/85 HOLE NO. W61B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	SILTY CLAY						
45.0		Light Olive gray 5Y 5/2			DR			Drove California Sampler at 45.0
		90% low-medium plastic fines		25				
		10% fine grained sand		45				
46.0		mottled; damp		50				>50 for .4 at 46.0
		very stiff						Recovery = 1.0
		End of boring depth = 46.4						set well to 43' 5 1/2"
								set screen from 33' 5" to 43' 5 1/2"

SHEET 3 OF 3

Earth Sciences Associates
701 Welch Road, Palo Alto, California 94304
(415) 321-3071

Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 7-30-85 HOLE NO. W7-3B
LOCATION Site 7 hangars 2 & 3 GROUND ELEV. 10.3' (survey)
DRILLING CONTRACTOR Pitcher LOGGED BY G.A.J DEPTH TO GROUND WATER
TYPE OF RIG Failing 1500 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 165 lb 18"
SURFACE CONDITIONS TOTAL DEPTH 80.8 NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	SC	0.0-0.4 Black Asphalt			AD			
1.0	OL	Clayey Sand Light olive brown 5Y 5/6 ~70% non-low plastic fines ~20% fine-coarse grained sand 10% fine-medium gravel	B-1					
2.0	SM							
3.0		1.0 Black Silty Clay NI ~90% low-med plastic fines ~10% fine-medium sand stiff; moist grades to	B-2					
4.0								
5.0		2.0 Silty Sand Light olive brown 5Y 5/6 ~70% low plastic fines ~20% fine-coarse grained sand 10% fine-medium gravel	L-1	7 14 23	DR RD			Drove California Sampler at 5.0 Recovery = .5
6.0	OL							
7.0	SM	3.0 grades to Sands						
8.0		6.0 Black Silty Clay NI 90% low-medium plastic fines 10% medium-coarse sand stiff; moist						
9.0		7.0 changes to a lighter color						
10.0	CL	8.0 drilling rate increased strata became sandy	L-2	5 9 18	DR RD			Drove California Sampler at 10.0 Recovery = 1.0
11.0								
12.0		10.0 Silty Clay Light olive brown 5Y 5/6 90% low-medium plastic fines 10% fine-coarse sand firm; moist						
13.0								
14.0								
15.0			L-3	12 32 38	DR RD			Drove California Sampler at 15.0 Recovery = 1.0
16.0								
17.0								
18.0								
19.0								
20.0								

SHEET 1 OF 4

PROJECT Moffett Field DATE DRILLED 7-30-85 HOLE NO. W7-3B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE		MODE	REMARKS
21.0	CL	SILTY CLAY (cont.) Light olive brown 5Y 5/6 ~90% low-medium plastic fines ~10% fine-medium sand firm; moist Thin sand seam at 21.0 <1" in thickness	L-4	22 30 31	DR RD	Drove California Sampler at 20.0 Recovery = 1.0
25.0			L-5	11 14 14	DR RD	Drove California Sampler at 25.0 Recovery = 1.0
28.5	CL	SILTY CLAY Grayish olive 10Y 4/2 85% low-medium plastic fines 15% fine-coarse grained sand coarse sand & fine gravel in shoe of California sampler firm; moist lighter color change at 32.0	L-6	12 20 23	DR RD	Drove California Sampler at 30.0 Recovery = 1.3
35.0			L-7	19 35 50	DR RD	Drove California Sampler at 35.0 Recovery = 1.1
37.5	SM	SILTY SAND and fine gravel				
39.0	CL	SILTY CLAY Light olive brown 5Y 5/6 90% low-medium plastic fines 10% fine grained sand stiff; moist	L-8	18 24 45	DR RD	Drove California Sampler at 40.0 Recovery 1.5

SHEET 2 OF 4

PROJECT Moffett Field DATE DRILLED 7-30-85 HOLE NO. W 7-3B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE		MODE	REMARKS
	CL	**SILTY CLAY** (cont.)				
45.0		Light olive brown 5Y 5/6 95% low - medium plastic fines 5% fine - medium sand very stiff; moist		46	DR	Drove California Sampler at 45.0
46.0			L-9	50		Recovery .6 >50 for .2 at 45.5
47.0					RD	
48.0						
49.0						
50.0		**SILTY CLAY**		24	DR	Drove California Sampler at 50.0
51.0		Light olive 10Y 5/4 95% low - medium plastic fines 5% fine - medium sands very stiff; moist	L-10	55		Recovery = 1.0 >50 at 50.5 for .6
52.0					RD	Increased drilling rate at 52.0 - 52.5
53.0						
54.0		color change in shoe of sampler				
55.0						
56.0						
57.0						
58.0						
59.0						
60.0		**SILTY CLAY**		46	DR	Drove California Sampler at 60.0
61.0		Moderate olive brown 5Y 4/4 95% low - medium plastic fines 5% fine - medium grained sands stiff; moist	L-11	50		Recovery = .8 >50 for .2 at 60.5
62.0					RD	
63.0						Hit seams of coarse sand and gravel at 62.0 - 68.0
64.0		Sand and gravel seams from 62.0 - 68.0				
65.0						
66.0						
67.0						
68.0						

SHEET 3 OF 4

PROJECT Moffett Field DATE DRILLED 7-30-85 HOLE NO. W7-3B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	MODE	REMARKS
	CL	**SILTY CLAY (cont)**			
69.0		Moderate olive brown 5Y 4/4			
70.0		90% low-medium plastic fines	48		Drove California Sampler at 70.0
		10% fine-medium sands	L-12 50		Recovery = .5
71.0		stiff; moist			> 50 at 70.5 for .2
72.0					
73.0					
74.0					
75.0					
76.0					
77.0					
78.0					
79.0					
80.0		**SILTY CLAY**	32		Drove California Sampler at 80.0
		Light olive brown 5Y 5/6	L-13 50		Recovery = .5
		90% low-medium plastic fines			> 50 at 80.5 for .3
		10% fine-medium sands			Increased drilling rate at 79.0 to 80.0
		firm; moist			
		Bottom of hole = 80.8			
					Hole was flushed to 80.0 using RD and 6" bit
					set well to 73'
					set screen from 63' to 73'

SHEET 4 OF 4

Earth Sciences Associates
701 Welch Road, Palo Alto, California 94304
(415) 321-3071

Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/9/85 HOLE NO. W10 - 1B
LOCATION Runway Apron Site 10 GROUND ELEV. 9.8' (survey)
DRILLING CONTRACTOR Fitchner LOGGED BY ELP DEPTH TO GROUND WATER
TYPE OF RIG Failing 1500 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 285 lb - 15"
SURFACE CONDITIONS Plowed Field. TOTAL DEPTH 81.3' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0, 3.0, 4.0	OH	0.0 - 4.0 SILTY CLAY; Topsoil; Dusky Yellowish Brown 10 YR 2/2; ~90% medium to high plastic fines; ~10% fine grained sand; subangular; roots and rootlets; dry to damp.	B-1		AD, RD			Set-up and started drilling at 9:00 A.M. Set casing at 4.0'. Set-up for rotary drilling - ~9:30 A.M.
5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0	CL	4.0-12.5 SILTY CLAY; grades to a Light Olive Gray 5Y 5/2; ~80% medium to high plastic fines; ~20% fine grained sand; subangular; portions laminated; hard, damp to moist. grades to a mottled Light Olive Gray 5Y 5/2 and Moderate Yellowish Brown 10 YR 5/4 - SILTY CLAY portions laminated;	L-1, L-2	15, 32, 45; 12, 21, 29	DR, RD			Drove California Sampler at 5.0' Recovery = .4/1.5; Drove California Sampler at 10.0' Recovery = .9/1.5
13.0, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0	ML, SW, SW	12.5-20.0 SANDY SILT; Light Olive Gray 5Y 5/2 ~60% low plastic fines; ~40% fine grained sand; subrounded; traces of coarse sand; very dense, saturated. 16.0 - 20.0 - interbedded seams of sand	L-3	17, 26, 45	DR, RD			Drove California Sampler at 15.0' Recovery = 1.0/1.5 10:00 A.M.

SHEET 1 OF 4

PROJECT Moffett Field DATE DRILLED 8/9/85 HOLE NO. W10-1B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
21.0, 22.0, 23.0	CL ML	20.0-23.5 SILTY CLAY; Light olive Gray 5Y 5/2 ~90% medium plastic fines; ~10% fine to very fine grained sand; very stiff; moist to wet.	L-4	7, 15, 23	DR, RD			Drove California Sampler at 20.0' Recovery = 1.0/1.5
24.0, 25.0, 26.0, 27.0	CL	23.5-27.5 SANDY CLAY; Light Olive Gray 5Y 5/2 to Light Olive Brown 5Y 5/6 ~60% low to medium plastic fines; ~40% fine to medium grained sand; mostly fine, subrounded to subangular; stiff; wet.	L-5	9, 10, 9	DR, RD			Drove California Sampler at 25.0' Recovery = 1.5/1.5
28.0, 29.0, 30.0, 31.0, 32.0, 33.0, 34.0	CL	27.5-50.5 SILTY CLAY; Light olive Brown 5Y 5/6 to Light olive Gray 5Y 5/2 ~70% low to medium plastic fines; ~30% fine to coarse sand; subrounded to subangular; portions mottled; hard; damp to moist	L-6	17, 56	DR, RD			Drove California Sampler at 30.0' Recovery = .7/1.0 56 blows for .5' at 30.5
35.0, 36.0, 37.0, 38.0, 39.0		SILTY CLAY	L-7	6, 9, 22	DR, RD			Drove California Sampler at 35.0' Recovery = 1.5/1.5
40.0, 41.0, 42.0, 43.0, 44.0		SILTY CLAY	L-8	23, 50	DR, RD			Drove California Sampler at 40.0' Recovery = .8/1.0 50 blows for .5' at 40.5'

SHEET 2 OF 4

PROJECT Moffett Field DATE DRILLED 8/9/85 HOLE NO. W10-1B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	27.5 - 50.5 SILTY CLAY; As Above (cont.)			RD			
45.0				13	DR			Drove California sampler at 45.0'
		45.0 - Interbedded seams of CLAYEY SAND.	L-9	18				
46.0				27				Recovery = 1.5/1.5
47.0					RD			
48.0								
49.0								
50.0		50.5-81.5 SILTY CLAY; Light Olive Grey 5Y 5/2 ~ 80-90% low to medium plastic fines; ~ 10 to 20% very fine grained sand; portions laminated; hard; damp to moist.		22	DR			Drove California Sampler at 50.0'
51.0			L-10	>50				Recovery = .7/.9
52.0					RD			>50 for .4' at 50.5
								10:30 A.M.
53.0								
54.0								
55.0								
56.0								
57.0								
58.0								
59.0								
60.0				13	DR			Drove California Sampler at 60.0'
61.0	SM	60.5-65.0 Interbedded seams of Silty Sand	L-11	30				
				50	RD			Recovery = 1.0/1.5
62.0	CL							
63.0	SM							
64.0	CL							
65.0	SM							
	CL							
66.0								
67.0								
68.0								

SHEET 3 OF 4

PROJECT Moffett Field DATE DRILLED 8/9/85 HOLE NO. W10-1B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	50.5-81.5 SILTY CLAY; As Above (cont.)			RD			
69.0								
70.0	SM	70.0-75.0 - Interbedded seams of sandy clays and silty sands			DR			Drove California sampler at 70.0'
71.0	CL - SM		L-12	22 50				Recovery = .7/10
72.0	CL				RD			
73.0	SM							
74.0								
75.0	CL -							
76.0								
77.0								
78.0								
79.0								
80.0		SILTY CLAY;			DR			Drove California sampler at 80.0'
81.0			L-13	21 40 50				Recovery = 1.3/1.3
82.0		completed boring to 81.3'						>50 for .3' at 81.0'
								Set well to 73' 6"
								Set screen from 59' to 64' then from 69' to 73' 6"

SHEET 4 OF 4

Earth Sciences Associates
701 Welch Road, Palo Alto, California 94304
(415) 321-3071

Soil and Bedrock Log

PROJECT Moffett Field (3110-C) DATE DRILLED 8/7/85 HOLE NO. W10 - 2B
LOCATION Runway Apron site 10 GROUND ELEV. 15.7' (survey)
DRILLING CONTRACTOR Pitcher LOGGED BY JBLP DEPTH TO GROUND WATER
TYPE OF RIG Failing 1500 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 285 lb - 18"
SURFACE CONDITIONS Plowed Field TOTAL DEPTH 200.3' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0, 3.0, 4.0	OL	0.0 - 4.5 CLAYEY SILT; Topsoil; Brownish Black 5YR 2/1 to Black N-1; ~80% low to medium plastic fines; ~20% fine to coarse sand; mostly fine; sub angular; roots and rootlets; damp. grades to Light Olive Gray 5Y 5/2	B-1		AD, RD			set-up and started drilling at 9:00 A.M. set-up for rotary drilling and set casing at 4.0'
5.0, 6.0, 7.0, 8.0	SC	4.5 - 8.5 CLAYEY SAND; Light Olive Gray 5Y 5/2 to Light Olive Brown 5Y 5/6. ~40% low plastic fines; ~50% fine to coarse grained sand; subrounded to subangular; ~10% fine to medium gravels; medium dense; wet.	L-1	6, 12, 16	DR, RD			Drove California Sampler at 5.0' Recovery = 1.2/1.5
9.0, 10.0, 11.0, 12.0, 13.0, 14.0	ML	8.5 - 14.5 CLAYEY SILT; Light Olive Gray 5Y5/2 to Light Olive Brown 5Y 5/6 ~90% low plastic fines; ~10% fine to medium sand; mostly fine; subrounded to subangular; portions mottled; loose; wet.	L-2	3, 4, 5	DR, RD			Drilling rate picks up at 8.5' Drove California Sampler at 10.0 Recovery = 1.0/1.5
15.0, 16.0, 17.0	GP	14.5 - 18.0 GRAVELLY SAND; Dark Yellowish Brown 10YR 4/2 < 20% non plastic fines; ~60% fine to coarse grained sand; subrounded to subangular; ~20% fine to medium gravels; very dense; wet.	L-3	33, >50	DR, RD			Drove California Sampler at 15.0' Recovery = .6/.7 >50 for .2' at 15.5
18.0, 19.0, 20.0	CL-ML	18.0 - 27.0 CLAYEY SILT; Grayish Olive 10Y 4/2 ~70% low plastic fines; ~20% fine grained sand; <10 fine to medium gravels; portions laminated; medium dense; damp.						

SHEET 1 OF 9

PROJECT Moffett Field DATE DRILLED 8/7/85 HOLE NO. W10-2B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
21.0	CL ML	18.0-27.0 CLAYEY SILT; As Above (cont.)	L-4	5 10 15	DR RD			Drove California Sampler at 20.0' Recovery = 1.4/1.5
22.0								
23.0		23.0-25.0 grades more coarse and slightly more clayey						
24.0								
25.0			L-5	9 26 37	DR RD			Drove California Sampler at 25.0' Recovery = 1.5/1.5
26.0								
27.0	GC	27.0-32.5 CLAYEY GRAVEL; Light Olive Grey 5Y 5/2 to Light Olive Brown 5Y 5/6 ~30% low plastic fines; ~30% fine to coarse grained sand; subrounded to subangular; ~40% fine to medium gravel; very dense; wet.						
28.0								
29.0								
30.0			L-6	31 59	DR RD			Drove California Sampler at 30.0' Recovery = .9/1.0 >50 for .5' at 30.5
31.0								
32.0	CL	32.5-90.0 SILTY CLAY; Light Olive Brown 5Y 5/6 ~70-80% low to medium plastic fines; ~20% fine to medium grained sands; mostly fine; < 10% coarse sand and fine gravel; portions mottled; very stiff; damp-moist.						
33.0								
34.0								
35.0			L-7	10 12 18	DR RD			Drove California Sampler at 35.0' Recovery = 1.4/1.5
36.0								
37.0								
38.0								
39.0								
40.0			L-8	10 18 31	DR RD			Drove California Sampler at 40.0' Recovery = 1.4/1.5
41.0								
42.0								
43.0								
44.0								

PROJECT Moffett Field DATE DRILLED 8/7/85 HOLE NO. W10 - 2B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	32.5 - 90.0 SILTY CLAY; As Above (cont.)			RD			
45.0					DR			
			L-9	10				
46.0				15				Drove California Sampler at 45.0'
				22				
47.0					RD			Recovery = 1.2/1.5
48.0								
49.0								
50.0		SILTY CLAY Light Olive Gray 5Y 5/2 to Light Olive Brown 5Y 5/6			DR			Drove California Sampler at 50.0'
			L-10	8				
51.0				18				Recovery = 1.5/1.5
				21				
52.0					RD			
53.0								
54.0								
55.0								
56.0								
57.0								
58.0								
59.0								
60.0		SILTY CLAY As Above			DR			Drove California Sampler at 60.0'
			L-11	14				
61.0				28				Recovery = 1.4/1.5
				37				
62.0					RD			
63.0								
64.0								
65.0								
66.0								
67.0								
68.0								

PROJECT Moffett Field DATE DRILLED 8/7/85 HOLE NO. W10-2B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	32.5 - 90.0 SILTY CLAY; As Above (Cont.)			RD			
69.0								
70.0		SILTY CLAY			DR			Drove California Sampler at 70.0'
				20				
71.0			L-12	40				Recovery = 1.2/1.5
				55				
72.0					RD			750 for .5' at 71.0
73.0								
74.0								
75.0								
76.0								
77.0								
78.0								
79.0								
80.0		80.0-SILTY CLAY; some slightly cemented nodules of clay.			DR			Drove California Sampler at 80.0'
				18				
81.0			L-13	37				Recovery = 1.4/1.5
				43				
82.0					RD			
83.0								
84.0								
85.0								
86.0		Some Interbedded seams of sand between 86.0-90.0'						
87.0								
88.0								
89.0								
90.0	SM	90.0- SILTY SAND; Light Olive Gray 5Y 5/2 to Grayish Olive 10Y 4/2 ~ 40-50% non-low plastic fines; ~50% fine grained sand; <10% Coarse sand and fine gravel;		63	DR			Drove California Sampler at 90.0'
91.0			L-14					Recovery = .5/.5
92.0					RD			

SHEET 4 OF 9

PROJECT Moffett Field DATE DRILLED 8/7/85 HOLE NO. W10-2B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
		90.0 - 104.0 SILTY SAND (cont) Light olive Gray 5Y 5/2 to Grayish Olive 10Y 4/2 ~40-50% non to low plastic fines; ~50% fine grained sand; subrounded to rounded; <10% coarse sand and fine gravel; portions are laminated; very dense; saturated.			RD			63 blows for .5' at 90.0
93.0								
94.0								
95.0								
96.0	CL	96.0-104.0 Interbedded seams of Silty Clay.						
97.0								
98.0	SM							
99.0								
100.0	CL		L-15	19 29 >50	DR RD			Drove California Sampler at 100.0' Recovery = 1.1/1.5 >50 for .5' at 101.0'
101.0	SM							
102.0	CL SM							
103.0								
104.0	CL	104.0 - 189.0 SILTY CLAY; Medium Bluish Gray 5B 5/1 to Light olive Brown 5Y 5/6 ~90% low to medium plastic fines; ~10% very fine sand; portions mottled; very dense; damp.						
105.0								
106.0								
107.0								
108.0								
109.0								
110.0	SM	110.0 - 120.0 Interbedded silty sands	L-16	21 61	DR RD			Drove California Sampler at 110.0' Recovery = 1.0/1.0 61 blows for .5' at 111.0'
111.0	CL SM							
112.0	CL							
113.0								
114.0								
115.0								
116.0								

PROJECT Moffett Field DATE DRILLED 8/7/85 HOLE NO. W10 - 2B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	104.0-189.0 SILTY CLAY; As Above (cont.)			RD			
117.0	SM	110.0-120.0 Interbedded silty Sands						
118.0								
	CL							
119.0	SM							
120.0	CL	SILTY CLAY			DR			Drove California Sampler at 120.0'
				17				
				>50				
121.0			L-17					Recovery = .8/1.0
122.0					RD			>50 for .5' at 120.5
123.0								
124.0								
125.0								
126.0								
127.0								
128.0								
129.0								
130.0		SILTY CLAY			DR			Drove California Sampler at 130.0'
				63				
131.0			L-18					Recovery = .3/.5
132.0					RD			63 blows for .5' at 130.0'
	SM	132.0-134.0 Interbedded silty Sands						
133.0								Drilling rate increases at ~133.0'.
134.0	CL							
135.0								Drilling rate is inconsistent from 135.0
136.0								to 140.0'
137.0								
138.0								
139.0								
140.0								

SHEET 6 OF 9

PROJECT Moffett Field DATE DRILLED 8/7/85 HOLE NO. W10-2B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
141.0	CL	104.0-189.0 SILTY CLAY; As Above (cont.)	L-19	21 >50	DR			Drove California Sampler at 140.0' Recovery = .7/.8
142.0					RD			>50 for .3' at 140.5
143.0		143.0-144.0 - lens of Silty Sand						
144.0	SM							
145.0	CL							
146.0								
147.0								
148.0								
149.0								
150.0		SILTY CLAY	L-20	45 >50	DR			Drove California Sampler at 150.0' Recovery = .6/.8
151.0								
152.0					RD			>50 for .3' at 150.0'
153.0								
154.0								
155.0								
156.0								
157.0								
158.0								
159.0								
160.0								
161.0								
162.0								
163.0								
164.0								

PROJECT Moffett Field DATE DRILLED 8/7/85 HOLE NO. W10-2B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	104.0-189.0 SILTY CLAY; As Above (cont.)			RD			
165.0								
166.0	SM	165.5-167.0 lens of Silty Sand						
167.0	CL							
168.0								
169.0								
170.0		SILTY CLAY;		54	DR			Drove California Sampler at 170.0'
171.0			L-21					Recovery = .4/.5
172.0					RD			54 blows for .5' at 170.0'
173.0								
174.0								
175.0								
176.0								
177.0								
178.0								
179.0								
180.0								
181.0								
182.0	SM	182.0-183.0 lens of Silty Sand.						
183.0	CL							
184.0								Drilling rate increased at ~184.0'
185.0								
186.0								
187.0								
188.0								

SHEET 8 OF 9

PROJECT Moffett Field DATE DRILLED 8/7/85 HOLE NO. W10-2B

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	104.0-189.0 SILTY CLAY; (cont)			RD			
189.0	SM	189.0-200.0 SILTY SAND; Light Olive Gray 5Y 5/2 to Grayish Olive 10Y 4/2 ~40 to 60% non to low plastic fines; ~50% fine grained sand; sub-rounded to rounded; <10% coarse sand and fine gravel; very dense; saturated.						
190.0				53	DR			Drove California Sampler at 190.0
191.0	CL		L-22					Recovery = .4/.5
192.0	SM				RD			53 blows for .5' at 190.0'
193.0								
194.0		190.5-200.0 - Interbedded seams of silty clay.						
195.0	CL							
196.0	SM							
197.0								
198.0								
199.0								
200.0	CL		L-23	80	DR			Drove California Sampler at 200.0'
201.0		Completed boring to 200.3' 10:00 A.M.						Recovery = .2/.3
202.0								80 blows for .3' at 200.0'
								Set well to 93' 2"
								Set screen from 78' to 93' 2"

SHEET 9 OF 9

Earth Sciences Associates
701 Welch Road, Palo Alto, California 94304
(415) 321-3071

Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 7/17/85 HOLE NO. W3-16
LOCATION Merridge Road Ditch Site-3 GROUND ELEV. -0.2' (survey)
DRILLING CONTRACTOR Pitcher LOGGED BY BLP DEPTH TO GROUND WATER
TYPE OF RIG Failing 1500 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 285 lb - 18"
SURFACE CONDITIONS Grass Field - Grass. 1' to 2' high TOTAL DEPTH 250.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OL	0.0 - 4.0 CLAYEY SILT; Grayish Black N2 ~70% low to medium plastic fines; ~20% fine grained sand; ~10% medium grained sand; roots and rootlets common; moderate to slightly pervious; very dense; dry.			AD			Set-up and started drilling at 10:30 A.M. Driller - Ron Baker. Helper - Wayne McKnight
1.0					DR			
			B-1	10				
2.0				22				Drove modified California sampler at 1.0' - Recovery = 1.2/1.5
				39				
3.0					AD			Set a 5 foot section of 6" casing to 4.0' Set-up for wash drilling. 1.0' stick-up
4.0	CL	4.0 - 40.0 SILTY CLAY; Light Olive Gray 5Y 5/2 to Moderate Yellowish Brown 10 YR 5/4; ~70% medium to high plastic fines; ~20% fine grained sand; subrounded; ~10% medium grained sand; subrounded to subangular; moderately to slightly pervious; stiff; damp.			RD			
5.0					DR			Drove modified California Sampler at 5.0'
				5				
6.0			L-1	9				Recovery = 1.0/1.5
				12				
7.0					RD			
8.0								
9.0	GW	9.0-9.5 lens of gravel						
	SP	9.5-11.0 lens of clean sand						
10.0					DR			Drove modified California Sampler at 10.0
				12				
11.0	CL			17				Recovery = 1.2/1.5
		as above portions mottled	L-2	12				
12.0					RD			
13.0								
14.0								
15.0					DR			Drove modified California Sampler at 15.0
				7				
				16				
16.0			L-3	24				Recovery = 1.3/1.5
					RD			
17.0		grades very stiff						rig chatters slightly at 17.0'
18.0								
19.0								
20.0								

SHEET 1 OF 11

PROJECT Moffett Field DATE DRILLED 7/17/85 HOLE NO. W3-16

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL (cont.)	4.0-40.0 SILTY CLAY (cont.)	L-4	39	DR			Drove modified California Sampler at 20.0
21.0		grades to a predominate moderate yellowish brown 10YR 5/4		>50				Recovery = .6/.7
22.0					RD			>50 blows for 1" at 20.5
23.0		grades slightly coarser ~30% fine to medium grained sands; subrounded to subangular.						
24.0		grades hard impervious						
25.0				38	DR			Drove modified California Sampler at 25.0
26.0			L-5	44				
				>50				Recovery = 1.0/1.3
27.0					RD			>50 for 4" at 26.0'
28.0								
29.0								
30.0			L-6	45	DR			Drove modified California sampler at 30.0'
31.0				>50				Recovery = .6/.6
32.0					RD			>50 for 1" at 30.5
33.0								
34.0								
35.0			L-7	47	DR			Drove modified California sampler at 35.0'
36.0				>50				Recovery = .8/.8
37.0					RD			>50 for .3' at 35.5
38.0								
39.0								
40.0	SM	40.0-48.0 SILTY SAND;	L-8	21	DR			Drove modified California Sampler at 40.0
41.0		Olive Gray 5Y 3/2 ~20% low plastic fines; ~80% fine to coarse grained sand; subangular to subrounded; moderately to highly pervious; very dense; wet.		24				
				29				Recovery = 1.3/1.5
42.0					RD			
43.0								
44.0								

PROJECT Moffett Field DATE DRILLED 7/17/85 HOLE NO. W3-1C

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	SM	40.0-48.0 SILTY SAND; (cont.) As Above			RD			
45.0					DR			Drove modified California Sampler at 45.0
				15				
46.0			L-9	28				Recovery = 1.3/1.5
				47				
47.0					RD			
48.0	CL	48.0 - 59.0 SILTY CLAY; Light Olive Grey 5Y 5/2 ~80% medium to high plastic fines; ~20% fine grained sand; portions mottled; hard; moist.						
49.0								
50.0					DR			Drove modified California Sampler at 50.0
			L-10	34				
51.0				>50				Recovery = .8/.8
52.0					RD			>50 for .3' at 50.5.
53.0								
54.0								
55.0								
56.0								
57.0								
58.0								
59.0	SM	59.0 - 75.0 SILTY SAND; Light Olive Grey 5Y 5/2 to Moderate yellowish brown 10YR 5/4 ~20% non-low plastic fines; ~80% fine grained sand; subrounded; very dense; saturated.						
60.0					DR			Drove modified California Sampler at 60.0
				13				
61.0			L-11	23				Recovery = 1.4/1.5
				41				
62.0					RD			
63.0								
64.0								
65.0								
66.0								
67.0								
68.0								

PROJECT Moffett Field DATE DRILLED 7/17/85 HOLE NO. W3-1C

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	SM	59.0 - 75.0 SILTY SAND, (cont) As Above			RD			
69.0								
70.0			L-12	34	DR			Drove modified California Sampler at 70.0'
71.0				>50				Recovery = .7/.8
					RD			>50 for .3' at 70.5
72.0								
73.0								
74.0								* Sealed off upper aquifers to 85' with grout to avoid contaminating lower C-aquifers
75.0	CL	75.0 - 116.0 SILTY CLAY; Light Olive Gray 5Y 5/2 to a Medium Gray N-5 ~70% low to medium plastic fines; ~30% fine grained sand; subrounded; portions mottled; moderately pervious; hard; wet.						
76.0								
77.0								
78.0								
79.0								
80.0				13	DR			Drove modified California Sampler at 80.0'
81.0			L-13	23				Recovery = 1.0/1.3
				>50	RD			>50 for .3' at 81.0
82.0								
83.0								
84.0								
85.0								
86.0		grades more clayey ~90% low to medium fines; <10% fine grained sand; slightly pervious to impervious						
87.0								
88.0								
89.0								
90.0			L-14	37	DR			Drove modified California Sampler at 90.0'
91.0				>50				Recovery = .7/1.8
								>50 at 90.5 for .3'
92.0					RD			

PROJECT Moffett Field DATE DRILLED 7/17/85 HOLE NO. W3-1C

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	SILTY CLAY; (cont.) As Above			RD			
93.0								
94.0								
95.0								
96.0								
97.0								
98.0								
99.0								
100.0			L-15	34	DR			Drove California sampler at 100.0'
101.0				>50				Recovery = .8/.9
102.0					RD			>50 for .4' at 100.5'
103.0								7:00 A.M. - 7/18/85 arrived on site started drilling at 8:00 A.M.
104.0								
105.0								
106.0		Portions mottled Fe-Ox stains						
107.0								
108.0								
109.0								
110.0				39	DR			Drove California sampler at 110.0'
111.0			L-16	>50				Recovery = .9/.9
112.0					RD			>50 for .4' at 110.5
113.0								
114.0								
115.0								
116.0								

SHEET 5 OF 11

PROJECT Moffett Field DATE DRILLED 7/18/85 HOLE NO. W3-1C

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	SM	116.0 – 125.0 SILTY SAND; Medium Gray N5 to Moderate Brown 5YR 4/4 ~20-30% non to low plastic fines; ~70-80% fine grained sand; subrounded; portions mottled; moderately pervious; Very dense; Saturated.			RD			
117.0								
118.0								
119.0								
120.0		121.0-122.0 Interbedded silts and clays	L-17	19	DR			Drove California Sampler at 120.0'
121.0				45				Recovery = 1.2/1.3
				>50				
122.0					RD			>50 for .3' at 121.0
123.0								
124.0								
125.0	CL	125.0 – SILTY CLAY; Medium Gray N5 to Light Olive Gray 5Y 5/2. ~80% low to medium plastic fines ~10-15% fine grained sand; ~5-10% shells, slightly pervious to impervious; hard; damp to moist.						rig and drilling rate starts to slow down Rig drills hard at 125.0'
126.0								
127.0								
128.0								
129.0								
130.0			L-18	>50	DR			Drove California Sampler at 130.0'
131.0								Recovery = .4/.5
132.0					RD			>50 for .5' at 130.0'
133.0								
134.0								
135.0								
136.0								
137.0		136.5-140.0 - Interbedded seams and lenses of silty sand						
138.0								
139.0								
140.0								

PROJECT Moffett Field DATE DRILLED 7/18/85 HOLE NO. W3 - 1C

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	125.0- SILTY CLAY; As Above (Cont.)	L-19	>50	DR			Drove California sampler at 140.0'
141.0								Recovery = .5/.5
142.0					RD			>50 for .5' at 140.0'
143.0								
144.0								
145.0								
146.0								
147.0								
148.0								
149.0								
150.0		150.0 - 164.0 SILTY CLAY; As Above grades to a Medium Dark Gray N 4	L-20	38	DR			Drove California sampler at 150.0
151.0				>50				Recovery = .7/.8
152.0					RD			>50 for .3' at 150.5'
153.0								
154.0								
155.0								
156.0								
157.0								
158.0								
159.0								
160.0								
161.0								
162.0								
163.0								
164.0								

PROJECT Moffett Field DATE DRILLED 7/18/85 HOLE NO. W3-1C

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	SC	164.0-169.0 CLAYEY SAND; Medium Grey N5 ~30-40% low to medium plastic fines; ~40-50% fine to coarse grained sand; subangular to subrounded; ~10% shells; traces of fine gravel; wet.			RD			retrieved wash sample of materials.
165.0								
166.0			B-2					
167.0								
168.0								
169.0	CL	169.0-250.0 SILTY CLAY; Light Grey N7 to Medium Light Grey N6 ~80% low to medium plastic fines; ~10% very fine grained sand; <10% medium to coarse grained sand; subangular; impervious; hard; damp.						
170.0			L-21	45	DR			Drove California Sampler at 170.0'
171.0				>50				Recovery = .7/.8
172.0					RD			>50 for .3' at 170.5
173.0								
174.0								
175.0								
176.0								
177.0								
178.0								
179.0								
180.0								
181.0								
182.0								
183.0								
184.0								
185.0								
186.0								
187.0								
188.0								

PROJECT Moffett Field DATE DRILLED 7/18/85 HOLE NO. W3-1C

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	169.0 SILTY CLAY; As Above (cont.)			RD			
189.0								
190.0		190.0-191.5 - portions contain decomposed roots and vegetation.		43	DR			Drove California sampler at 190.0'
191.0			L-22	>50				Recovery = .61.7
					RD			
192.0								>50 for .2' at 190.5
193.0								
194.0		194.0-250.0 lenses and seams of Interbedded Clayey Sands.						
195.0								
196.0								
197.0								
198.0								
199.0								
200.0								
201.0								
202.0								Drills easier at 202.0'
203.0								
204.0								
205.0								
206.0								
207.0								
208.0								
209.0								Drove California Sampler at 210.0'
210.0				41	DR			Recovery = .71.8
		SILTY CLAY; traces of Clayey Sand.	L-23	>50				>50 for .3' at 210.5'
211.0								
212.0					RD			

SHEET 9 OF 11

PROJECT Moffett Field DATE DRILLED 7/18/85 HOLE NO. W3-1C

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
	CL	169.0- SILTY CLAY; As Above. (cont.)			RD			
213.0								
214.0								
215.0								
216.0								
217.0								
218.0								
219.0								
220.0								
221.0								
222.0								
223.0								
224.0								
225.0								
226.0								
227.0								
228.0								Rig drills harder at 228.0'
229.0								
230.0		SILTY CLAY; As Above	L-24	>60	DR			Drove California Sampler at 230.0'
231.0								Recovery = .5/.5
232.0					RD			>60 for .5' at 230.0'
233.0								
234.0								
235.0								

SHEET 10 OF 11

PROJECT Moffett Field DATE DRILLED 8/3/85 HOLE NO. W3-16

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	RUN NO.	CORE REC. %	REMARKS
		169.0-250.0 SILTY CLAY; As Above (Cont.)			RD			
237.0								
238.0								
239.0								
240.0								Drilling rate picks up ~ 240' to 243.0
241.0								
242.0								
243.0								
244.0								
245.0								Hit minor obstruction at 246.0 - Rock bit chattering
246.0								
247.0								
248.0								
249.0								
250.0		SILTY CLAY; As Above	L-25	47 >50	DR			Drove California sampler at 250'
								Recovery = .6/.8
								>50 for .3' at 250.5
								Set well to 225.0'
								Set screen from 200' to 225'

SHEET 11 OF 11

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/30/85 HOLE NO. W3-1Ca
LOCATION Site 3 (Mayridge Road Ditch) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry Hard - Expansive soils TOTAL DEPTH 5.5' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0, 3.0, 4.0	OH	0.0-4.5 SANDY CLAY; Topsoil; Black N-1 ~90% medium plastic fines; ~10% fine to medium grained sand; mostly fine; expansive; firm; dry.			AD			set-up and started drilling at 4:00 P.M. Redrilled hole to obtain a sample for chemical analysis. Sample was taken just above the A-aquifer.
5.0, 6.0	CL	4.5-6.0 SANDY CLAY; Light olive Brown 5Y5/6 ~80% low plastic fines; ~20% fine to medium grained sand; subrounded; firm; moist to wet.		4, 5, 4	DR			Drove modified Porter sampler at 4.0' Recovery = 1.2/1.5

SHEET 1 OF 1

APPENDIX B3

LOGS OF SHALLOW AUGER BORINGS

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/30/85 HOLE NO. A1-1
LOCATION site 1 (Runway Landfill) GROUND ELEV. 3½± '
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry W.D. 9.0 A.P.
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS 1' to 2' high pickle weed. TOTAL DEPTH 10.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0, 2.0	OL	0.0 - 3.5 SILTY CLAY; Topsoil; Olive Grey 5Y 3/2 ~90% medium plastic fines; <10% fine to medium grained sand; portions mottled; firm; damp to moist.			AD			set-up and started drilling at 1:00 P.M.
3.0				1, 3, 3	DR			Drove modified Porter sampler at 3.0'
4.0, 5.0	OH	3.5 - 10.0 ORGANIC CLAY; swamp deposit; Medium Dark Grey N-4 ~90% medium to high plastic fines; <5% fine grained sand; ~5-10% fibrous materials (roots); soft to very soft; moist to wet.	L-1		AD			Recovery = .7/1.5
6.0				1, 1, 1	DR			Drove modified Porter sampler at 6.0'
7.0	Pt		L-2					Recovery = 1.4/1.5
8.0	OH				AD			
9.0	Pt							
10.0	OH	completed boring to 10.0'						

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/26/85 HOLE NO. A1-2
LOCATION Site-1 (Runway Landfill) GROUND ELEV. 4±'
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 10 WD. 5.8 A.B.
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS 1' high grass - dry hard soils TOTAL DEPTH 14.5 NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0	GC Fill	0.0-2.0 CLAYEY GRAVEL: Grayish Olive 10Y 4/2 Fill: ~40% low to medium plastic fines; ~10% fine to coarse grained sand; ~50% fine to medium gravels; medium dense to dense; dry to damp.			AD			Set-up and started drilling at 9:20 A.M.
2.0	Fill debris	2.0-3.0 - debris coming up from hole; cans; cardboard; plastics, etc.						* could not obtain samples in fill materials
3.0								tryed sampling at 3.0' sampler was bouncing so if it was rubber or rotten wood - had to move the hole 3 times and still could not get a sample at 3.0'
4.0		3.0-6.0 Wooden obstruction - wood is coming up from hole.						
5.0								could not obtain sample until 6.0'
6.0	OH Fill debris	6.0-10.0 ORGANIC CLAY; Black N-1 ~80% medium to high plastic fines; <10% fine grained sand; ~10% fibrous material; traces of wood; some fill present to ~9.0'.	L-1	4 2 3	DR AD			Drove modified Porter sampler at 6.0' Recovery = .5/1.5
7.0								
8.0								
9.0	native							
10.0	SC	10.0-14.5 CLAYEY SAND: Medium Bluish Gray 5B 5/1 ~30% low plastic fines; ~50% fine to coarse grained sand; subrounded to subangular; ~20% fine to medium gravels; dense; moist to wet.						
11.0								
12.0								
13.0			L-2	6 12 20	DR			Drove modified Porter sampler at 13.0' Recovery = 1.4/1.5
14.0								
15.0		Terminated boring at 14.5'						

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/30/85 HOLE NO. A1-3
LOCATION Site 1 (Runway Landfill) GROUND ELEV. 7'±
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS SANDY GRAVELS (Fill) TOTAL DEPTH 10.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	SP	0.0-0.6 GRAVELLY SANDS; Fill; Moderate Brown 5YR 4/4 <10% non plastic fines; ~70% fine to coarse grained sand; ~20% fine to medium gravels; medium dense; dry.			AD			Set-up and started drilling at 1:30 P.M.
1.0	Garbage							
2.0								hole smells of garbage
3.0		0.6-9.0 GARBAGE; Plastics; tin cans; wire; wood;						Could not sample at 3.0' due to obstructions encountered while drilling in fill. Porter sampler would bounce - could not penetrate.
4.0								
5.0								
6.0								could not sample at 6.0' - still in garbage. Drilled into native soils before sampling.
7.0								
8.0								
9.0	CL	9.0-10.5 SANDY CLAY Light Olive Gray 5Y 5/2 to Light Olive Brown 5Y 5/6; ~80% low to medium plastic fines; ~20% fine to coarse grained sand; Portions mottled; firm		3	DR			organic vapor meter goes off - registering ~50 PPM - downhole
10.0			L-1	3				
				4				
		Completed boring to 10.5'						

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/26/85 HOLE NO. A1-4
LOCATION site-1 (Runway Landfill) GROUND ELEV. 17±'
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 18.5 WD 17.0 AB
TYPE OF RIG Acker-AD-2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS 1' to 2' high grass - Dry-hard soil TOTAL DEPTH 20.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0	GC Fill	0.0 - 5.0 CLAYEY GRAVEL; Fill; Black - N-1 ~ 30% low plastic fines; ~ 20% fine to coarse grained sand; ~ 50% fine to medium gravel; medium dense to loose; dry.			AD			Set-up and started drilling at 12:45 P.M.
2.0								
3.0			L-1	16	DR			Drove modified Porter sampler at 3.0'
4.0				6				Recovery = .2/1.5
				3	AD			
5.0	CL Fill debris	5.0 - 9.0 GRAVELLY CLAY; Fill; Black N-1 ~ 60% low plastic fines; ~ 10% fine to coarse grained sand; ~ 30% fine to medium gravels, traces of cardboard; cans; wood debris; firm; damp to moist.						
6.0				16	DR			Drove modified Porter sampler at 6.0'
7.0				6				Recovery = 0.0/1.5
				5	AD			
8.0								
9.0	OH Fill debris	9.0 - 19.0 ORGANIC CLAY; Fill; Black - N-1 ~ 70% medium to high plastic fines; < 10% fine to medium grained sand; ~ 20% wood debris; traces of paper and plastic; soft to firm; moist.	L-2	3	DR			Drove modified Porter sampler at 9.0'
10.0				4				Recovery = 1.0/1.5
				5	AD			
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0	CL native	19.0 - 20.0 SANDY CLAY; Light Olive Gray 5Y 5/2 ~ 90% medium to high plastic fines, <10% fine to coarse sand; subangular to subrounded; stiff. Wet.						Terminated hole at 20.0' because of high methane levels.
20.0								

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/30/85 HOLE NO. A1-5
LOCATION Site 1 Runway Landfill GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker-AD-2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Gravelly Sand at surface TOTAL DEPTH 3.0 NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0	GP Fill	0.0-3.0 GRAVELLY SAND; Moderate Brown 5YR 4/4 Fill; < 10% non plastic fines; ~60% fine to coarse grained sand; subrounded to sub-angular; ~30% fine to coarse gravel; medium dense; dry.			AD			Set-up and started drilling at 1:00 P.M.
2.0								
3.0								
4.0		Hole terminated at 3.0' due to high methane levels.						Had to abandon hole at 3.0' due to high Methane levels
5.0								
6.0								Moved hole over 20.0' to the west and levels were still to high to continue drilling in the area
7.0								
8.0								
9.0								
10.0								
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/30/85 HOLE NO. A1-5 (abandoned)
LOCATION site-1 (Runway Landfill) - offset 20' west due to methane gas GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker-AD2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Gravelly Sand at surface TOTAL DEPTH 3.0 NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0 2.0 3.0	GP Fill	0.0-3.0 GRAVELLY SAND: Moderate Brown 6YR 4/4 Fill; <10% non-plastic fines; ~60% fine to coarse grained sand; subrounded to subangular; ~30% fine to coarse gravel; medium-dense; dry.			AD			terminated and abandoned hole at 3.0' due to high levels of methane gas.
		Boring abandoned at 3.0' due to high levels of methane gas.						

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/30/85 HOLE NO. A2-1
LOCATION Site 2 (Golf Course Landfill) GROUND ELEV. 1½±'
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 7.5 WS dry Air
TYPE OF RIG Acker-AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS 6" high grass - Gravelly Sands TOTAL DEPTH 7.5' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0	SP	0.0-4.5 GRAVELLY SANDS; Fill; Dusky Brown 5YR 2/2 <20% non to low plastic fines; ~50% fine to coarse grained sand; subrounded to sub-angular; ~30% fine to medium gravels; medium dense; dry.			AD			Set-up and started drilling at 3:00 P.M.
2.0								
3.0				7	DR			Drove modified Porter sampler at 3.0'
4.0			L-1	8				Recovery = .7/1.5
				17				
5.0	OL	4.5-6.5 SANDY CLAY; Dusky Brown 5YR 2/2 (topsoil) ~80% low plastic fines; ~20% fine to coarse grained sand; portions mottled; firm to stiff; dry.			AD			
6.0				7	DR			Drove modified Porter sampler at 6.0'
7.0	CL	6.5-7.5 - grades Light Olive Gray 5Y 5/2 - moist - wet.	L-2	8				Recovery = 1.3/1.5
				10				
8.0		completed boring to 7.5'			AD			Hit water table at 7.5 while sampling - dry - after boring.
9.0								
10.0								
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/30/85 HOLE NO. A2-2
LOCATION Site 2 (Golf Course Landfill) GROUND ELEV. 1½±'
DRILLING CONTRACTOR Klienfelder LOGGED BY JBLP DEPTH TO GROUND WATER 6.5 W.S. 6.3 A.B.
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry-hard expansive soil TOTAL DEPTH 7.5' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0 2.0	OL to OH	0.0 - 3.5 SANDY CLAY; Topsoil; Black N-1 - Dusky Brown 5YR 2/2 ~80% medium plastic fines; ~20% fine to coarse grained sand; subrounded to subangular; Portions mottled, very stiff; dry,			AD			Set-up and started drilling at 2:30 P.M.
3.0 4.0 5.0	CL	3.5-6.5 grades Light Olive Gray 5Y 5/2 ~60-70% low plastic fines, ~30-40% fine to medium grained sands; firm; moist.	L-1	9 13 17	DR AD			Drove modified Porter Sampler at 3.0' Recovery = .8/1.5 Hit water at 6.5 while sampling
6.0 7.0		6.5-7.5 GRAVELLY SANDS; Light Olive Brown 5Y 5/6 <20% non plastic fines; ~50% fine to coarse grained sand; ~30% fine - medium gravels; loose; wet.	L-2	1 2 6	DR			Drove modified Porter Sampler at 6.0' Recovery = 1.4/1.5
8.0		Completed boring to 7.5'						

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/30/85 HOLE NO. A2-3
LOCATION Site 2 (Golf Course Landfill) GROUND ELEV. 1'±
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 6.0 W.S. 5.8 A.B.
TYPE OF RIG Acker-AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry-hard-expansive soils TOTAL DEPTH 7.5' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0	OH	0.0 - 4.0 SANDY CLAY; Topsoil; Black N-1 ~90% medium to high plastic fines; ~10% fine-medium grained sand; mostly fine; expansive; roots and rootlets; stiff; dry.			AD			Set-up and started drilling at 3:30 P.M.
2.0								
3.0			L-1	7	DR			Drove modified Porter Sampler at 3.0'
4.0	CL	4.0 - 6.0 SANDY CLAY; Light Olive Gray 5Y 5/2 ~70-80% low plastic fines; ~20-30% fine to medium grained sand; subrounded; firm; damp to moist.		9				Recovery = .8/1.5
5.0				10	AD			Hit water while sampling at 6.0'
6.0	SC	6.0 - 7.5 CLAYEY SAND; color - as above; ~40% non-low plastic fines; ~60% fine to medium grained sand; subrounded; loose wet - saturated.	L-2	2	DR			Drove modified Porter sampler at 6.0'
7.0				1				Recovery = 1.3/1.5
8.0		completed boring to 7.5'		3	AD			
9.0								
10.0								
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/19/85 HOLE NO. A5-1
LOCATION Site 5 (Fuel Farm) GROUND ELEV. 10±'
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER DRY
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry-hard-expansive topsoil TOTAL DEPTH 7.5 NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OH	0.0 - 3.0 SANDY CLAY; Topsoil; Black N-1; ~ 90% medium to high plastic fines; ~ 10% fine to medium grained sand; subangular roots; expansive; stiff; dry-damp.			AD			Set-up and started drilling at 3:00 P.M.
1.0								
2.0								
3.0	CL	3.0 - 7.5 SILTY SANDY CLAY; Dark Yellowish Brown 10YR 4/2 ~ 80-90% low to medium plastic fines; ~ 10-20% fine grained sand; traces of medium to coarse sand; portions laminated; stiff; damp to moist.	L-1	5	DR			Drove modified Porter sampler at 3.0' Recovery = 1.4/1.5
4.0				6				
				8	AD			
5.0								
6.0					DR			Drove modified Porter sampler at 6.0' Recovery = 1.2/1.5
				6				
7.0			L-2	8				
				11				
		completed boring to 7.5'						
8.0								

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/19/85 HOLE NO. AS-2
LOCATION Site 5 (Fuel Farm) GROUND ELEV. 9½±'
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry-hard-expansive topsoil TOTAL DEPTH 7.5' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OH	0.0 - 4.5 SANDY CLAY; Topsoil; Black N-1; to Grayish Brown 5YR 3/2 ~80-90% medium to high plastic fines; ~10-20% fine grained sand; traces of roots; expansive; stiff; dry-damp.			AD			Set up and started drilling at 3:30 P.M.
1.0								
2.0								
3.0					DR			Drove modified Porter Sampler at 3.0'
			L-1	4				Recovery = 1.3/1.5
4.0				8				
				12				
	CL	4.5-7.5 SILTY SANDY CLAY; Moderate Yellowish Brown 10YR 5/4 ~80-90% low to medium plastic fines; ~10-20% fine to medium grained sand; subrounded; traces of coarse sand; portions mottled; stiff; damp to moist.			AD			
5.0								
6.0					DR			Drove modified Porter Sampler at 6.0'
			L-2	6				Recovery = 1.2/1.5
				8				
7.0				10				
		Completed boring to 7.5'						
8.0								

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/19/85 HOLE NO. A5-3
LOCATION site 5 (Fuel Farm) GROUND ELEV. 9±'
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER Dry
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb 30"
SURFACE CONDITIONS Dry-hard expansive topsoil TOTAL DEPTH 7.5' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OH	0.0 - 5.0 SANDY CLAY; Topsoil; Black - N-1; ~90% medium - high plastic fines; ~10% fine to medium grained sand; subangular; expansive; stiff; Dry.			AD			Set-up and started drilling at 2:00 P.M.
1.0								
2.0								
3.0					DR			Drove modified Porter sampler at 3.0'
			L-1	7				Recovery = .5/1.5
4.0				9				Strong Petroliferous oders at 3.0'
				9				
					AD			
5.0	CL	5.0 - 7.5 SANDY CLAY; Dark Greenish Gray 5G 4/1 ~60-70% low plastic fines; ~30-40% fine to medium grained sand; subrounded to rounded; stiff; moist - wet.						
6.0					DR			Drove modified Porter sampler at 6.0
			L-2	5				Recovery = 1.2/1.5
				5				
7.0				6				Strong oders again at 6.0'
		completed boring to 7.5'						
8.0								

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/27/85 HOLE NO. [illegible]
LOCATION Site B (Waste oil transfer area) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry - Hard - Sandy Gravels TOTAL DEPTH 2.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	GL Fill	0.0-2.0 CLAYEY GRAVEL; Black N-1 to Dark Gray N-3 ~30% low plastic fines, ~20% fine to coarse grained sand; ~50% fine to coarse gravel; medium dense; dry to damp	L-1	16 / 6 / 8	AD — DR			Drove modified Porter sampler at .5' Recovery = 1.0/1.5 soil has a Petroliferous odor.
1.0								
2.0		completed boring to 2.0'						

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/27/85 HOLE NO. AE-2
LOCATION Site 8 (Waste oil Transfer area) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry - Hard - Sandy Gravels TOTAL DEPTH 2.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	GC Fill	0.0-2.0 CLAYEY GRAVEL Black N-1 to Dark Grey N-3 ~30% low plastic fines; ~20% fine to coarse grained sand; ~50% fine to coarse gravel, dense; dry to damp	L-1	6 / 12 / 18	AD — DR			Drove modified Porter Sampler at .5' Recovery = 1.0/1.5 Soil has a petroliferous odor.
1.0								
2.0		Completed boring to 2.0'						

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/27/85 HOLE NO. A8-3
LOCATION Site 8 (Waste oil transfer area) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry - Hard - Sandy Gravels TOTAL DEPTH 2.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	GP Fill	0.0-2.0 GRAVELLY SAND; Dark Gray N-3 to Med Dark Gray N-4 < 20% low plastic fines; ~50% fine to coarse grained sand; ~30% fine to medium gravels;	L-1	15 / 13 / 6	AD / DR			Drove modified Porter Sampler at .5' Recovery = .8/1.5 Soil has a petroliferous odor.
1.0								
2.0		completed boring to 2.0'						

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/27/85 HOLE NO. A8-4
LOCATION Site 8 (waste oil transfer area) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry-hard Sandy Gravels TOTAL DEPTH 2.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OL to OH	0.0-2.0 SILTY CLAY; Black N-1; (probable topsoil) ~ 80-90% low to medium plastic fines; ~ 10 to 20% fine to medium grained sand, mostly fine; traces of gravel near surface; stiff; damp to moist.	L-1	3 4 8	AD — DR			Drove modified Porter sampler at .5'. Recovery = 1.0/1.5. soil has petroliferous odors.
1.0								
2.0		Completed boring to 2.0'						

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/27/85 HOLE NO. A8-5
LOCATION site 8 (waste oil transfer area) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry Hard - Sandy Gravels TOTAL DEPTH 2.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OL to OH	0.0-2.0 SILTY CLAY; Black N-1; (probable topsoil) ~90% low to medium plastic fines; <10% fine to coarse grained sand; traces of fine to medium gravels at surface; roots and rootlets; firm to stiff; dry to damp.	L-1	3 4 6	AD — DR			Drove modified Porter sampler at .5' Recovery = .5/1.5 Soil has a petroliferous odor.
1.0								
2.0		completed boring to 2.0'						

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/27/85 HOLE NO. A8-6
LOCATION Site B (waste oil transfer area) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Dry - Hard - Sandy Gravels TOTAL DEPTH 2.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
	OL to OH	0.0-2.0 SILTY CLAY; Black N-1; (probable topsoil) ~90% low to medium plastic fines; <10% fine to coarse grained sand; traces of fine to medium gravels; roots and rootlets; stiff; dry to damp.	L-1	6 8 12	AD DR			Drove modified Porter sampler at .5' Recovery = 1.0/1.5 Soil has petroleum odors.
1.0								
2.0		completed boring to 2.0'						

SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/28/85 HOLE NO. A9-1
LOCATION Site 9 (Old Fuel Farm) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Failing-AD-2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Asphalt - .4' thick TOTAL DEPTH 10.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
		0.0 - 0.4 Asphalt			AD			Set-up and started drilling at 2:30PM.
1.0	GP	0.4-1.5 GRAVELLY SAND; Fill; Moderate Yellowish Brown 10YR 5/4 < 20% non-low plastic fines; ~ 50% fine to coarse grained sand; ~ 30% fine to coarse gravel; dense; damp.						
2.0	OH	1.5 - 3.5 SANDY CLAY; Topsoil; Black - N-1 ~ 90% medium plastic fines; ~ 10% fine to medium grained sands; stiff; damp to moist.						
3.0					DR			Drove modified Porter Sampler at 3.0'
			L-1	6 8 12				Recovery = .8/1.5
4.0	CL							
5.0		3.5 - 10.0 SANDY CLAY; Light Olive Gray 5Y 5/2 ~ 80% low to medium plastic fines; ~ 20% fine to medium grained sand; mostly fine; traces of coarse sand; stiff; damp to moist.			AD			
6.0					DR			Drove modified Porter Sampler at 6.0'
			L-2	5 8 9				Recovery = .8/1.5
7.0								
8.0					AD			
9.0								
10.0		completed boring to 10.0'						
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/29/85 HOLE NO. A9-2
LOCATION Site 9 (Old Fuel Farm) GROUND ELEV.
DRILLING CONTRACTOR Kleinfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG B-Kay-AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Asphalt .4' thick TOTAL DEPTH 10.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
		0.0 - 0.4 Asphalt			AD			Set-up and started drilling at 10:00 A.M.
1.0	SP	0.4 - 2.0 GRAVELLY SAND; Pale Yellowish Brown 10YR 6/2 (Fill) <10% non-low plastic fines; ~50% fine to coarse grained sand; ~40% fine to coarse gravel; med-dense; dry.						
2.0	OL							
3.0		2.0-4.0 SILTY CLAY; Black - N-1; Topsoil ~90% low to medium plastic fines; <10% fine to medium grained sands; mostly fine; stiff, damp.		7	DR			Drove modified Porter Sampler at 3.0'
			L-1	9				Recovery = .8/1.5
4.0	CL			12	AD			
5.0		4.0-6.0 - Grades Pale Yellowish Brown 10YR 6/2 - portions mottled with Black - N-1; portions laminated; stiff; damp.						
6.0				3	DR			Drove modified Porter sampler at 6.0'
7.0		6.0 - 10.0 SANDY CLAY; Light Olive Gray 5Y 5/2 to Grayish Olive 10Y 4/2 ~50-60% low plastic fines; ~30-40% fine to coarse grained sand; subrounded to subangular; <10% fine to medium gravels stiff; damp to moist	L-2	6				Recovery = .8/1.5
				8	AD			
8.0								
9.0								
10.0		completed boring to 10.0'						
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/28/85 HOLE NO. A9-3
LOCATION Site 9 (Old Fuel Farm) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG B-Key-AD-2 HOLE DIAMETER 8" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Asphalt .4' thick TOTAL DEPTH 10.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
1.0	GP	0.0 - 0.4 Asphalt 0.4 - 2.0 GRAVELLY SAND; Fill; Moderate Yellowish Brown 10YR 5/4 < 20% low plastic fines; ~ 50% fine to coarse grained sand; ~ 30% fine to coarse gravel; medium dense; dry.			AD			Set-up and started drilling at 3:30 P.M.
2.0	OH	2.0 - 3.5 SANDY CLAY; Topsoil; Black N-1 ~ 90% medium plastic fines; ~ 10% fine to medium grained sand; stiff; damp.						
3.0	CL			4	DR			Drove modified Porter Sampler at 3.0'
4.0				7				Recovery = .8/1.5
				8				
5.0		3.5 - 6.0 SILTY CLAY; Pale Yellowish Brown 10YR 6/2 ~ 90% low to medium plastic fines; < 10% fine to medium grained sand; mostly fine; portions laminated; stiff; damp to moist.			AD			
6.0				4	DR			Drove modified Porter Sampler at 6.0'
7.0		6.0 - 10.0 SANDY CLAY; Light Olive Gray 5Y 5/2 ~ 80 - 90% low plastic fines; ~ 10 - 20% fine to medium grained sands; traces of coarse sand; stiff; damp to moist.		6				
				7				Recovery = 1.0/1.5
8.0					AD			
9.0								
10.0		completed boring to 10.0'						
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								SHEET 1 OF 1

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Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/30/85 HOLE NO. A9-4
LOCATION Site 9 (Old Fuel Farm) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 9.0 WD 8.5 AZ
TYPE OF RIG B-Key-AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Asphalt .4' thick TOTAL DEPTH 10.0 NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
		0.0 - 0.4 Asphalt			AD			Set-up and started drilling at 7:30 A.M.
1.0	CL	0.4 - 5.5 SILTY CLAY Pale Yellowish Brown 10YR 6/2 ~90% low to medium plastic fines;						
2.0		<10% fine to very fine grained sand; portions laminated; very stiff; damp.						
3.0					DR			Drove modified Porter sampler at 3.0'
			L-1	11 15 19				Recovery = .8/1.5
4.0								
5.0					AD			
		5.5 - 10.0 SANDY CLAY; Light Olive Gray 5Y 5/2						
6.0		~70-80% low plastic fines			DR			Drove modified Porter sampler at 6.0'
7.0		~20-30% fine to coarse grained sand; mostly fine; subrounded;	L-2	5 4 6				Recovery = .8/1.5
8.0		firm to stiff; moist to wet			AD			
9.0								Hit water at 9.0' while drilling.
10.0		completed boring to 10.0'						
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								SHEET 1 OF 1

Earth Sciences Associates
701 Welch Road, Palo Alto, California 94304
(415) 321-3071

Soil and Bedrock Log

PROJECT Moffett Field DATE DRILLED 8/30/85 HOLE NO. A9-5
LOCATION Site 9 (Old Fuel Farm) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER dry
TYPE OF RIG Acker-AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Asphalt .4' thick TOTAL DEPTH 10.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
		0.0-0.4 Asphalt			AD			Set-up and started drilling at 8:30 A.M.
1.0	GP	0.4-3.0 SANDY GRAVEL; (Fill) <10% non plastic fines; ~30% fine to coarse grained sand; ~50% fine to coarse gravels; ~10% 3"-4" cobbles.						
2.0								
3.0	CL	3.0-5.0 SILTY CLAY; Pale Yellowish Brown 10YR 6/2 ~90% low to medium plastic fines; <10% fine to very fine grained sand, traces of coarse sand; stiff-very stiff; damp.	L-1	8 13 16	DR			Drove modified Porter Sampler at 3.0' Recovery = .8/1.5
4.0								
5.0					AD			
6.0		5.0-10.0 SANDY CLAY; Medium Bluish Gray 5B 5/1 ~80% low plastic fines; ~20% fine to coarse grained sand; subrounded to subangular; portions mottled; soft to firm; damp to moist.			DR			Drove modified Porter Sampler at 6.0'
7.0			L-2	2 3 4				Recovery = 1.2/1.5
8.0					AD			Soil has a slight Petroliferous odor at 6.0'
9.0								
10.0		completed boring to 10.0'						
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								SHEET 1 OF 1

Earth Sciences Associates
701 Welch Road, Palo Alto, California 94304
(415) 321-3071

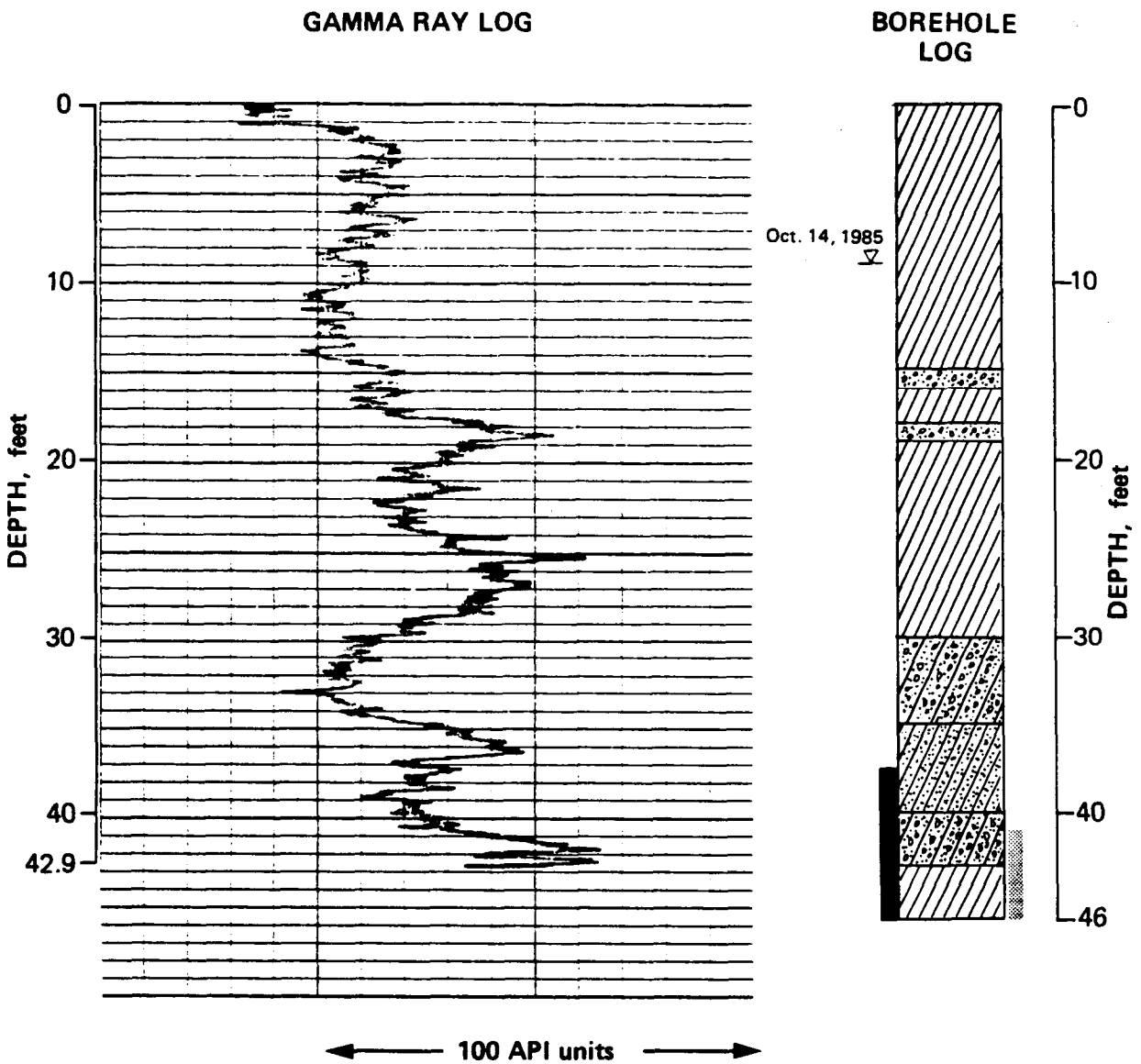
Soil and Bedrock Log

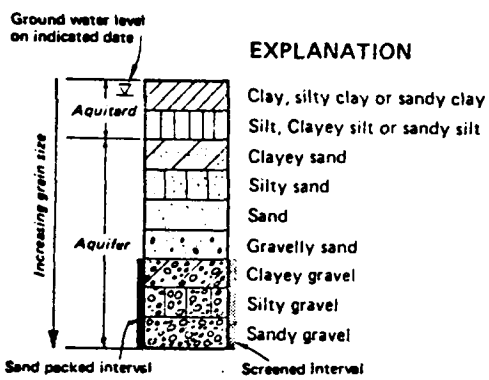
PROJECT Moffett Field DATE DRILLED 8/30/85 HOLE NO. A9-6
LOCATION Site-9 (Old Fuel Farm) GROUND ELEV.
DRILLING CONTRACTOR Klienfelder LOGGED BY BLP DEPTH TO GROUND WATER 9.8 WD 9.5 AE
TYPE OF RIG Failing AD-2 HOLE DIAMETER 6" HAMMER WEIGHT AND FALL 140 lb - 30"
SURFACE CONDITIONS Asphalt .4' thick TOTAL DEPTH 10.0' NO. CORE BOXES

DEPTH	CLASS.	FIELD DESCRIPTION	SAMPLE	SPT (6")	DRILL MODE	PIEZO.	CORE REC. %	REMARKS
		0.0 - 0.4' Asphalt			AD			Set-up and started drilling at 9:10 A.M.
1.0	SP	0.4 - 1.5 GRAVELLY SAND; (Fill) Light Olive Gray 5Y 6/1 <10% non to low plastic fines; ~60% fine to coarse grained sand; ~30% fine to medium gravels; dense; dry.						
2.0	CL							
3.0		1.5 - 3.0 SILTY CLAY; Topsoil; Black - N-1 ~90% low to medium plastic fines; <10% fine to very fine grained sand, traces of medium to coarse sand; portions laminated; stiff-very stiff, damp.	L-1	7 9 12	DR			Drove modified Porter sampler at 3.0' Recovery = .7/1.5
5.0					AD			
6.0		3.0 - 6.0 SILTY CLAY; Pale Yellowish Brown 10YR 6/2 As Above - grades firm.			DR			Drove modified Porter sampler at 6.0'
7.0		6.0 - 10.0 SANDY CLAY; Light Olive Gray 5Y 5/2 ~70% low plastic fines; ~30% fine to coarse grained sand; subrounded to subangular; portions mottled; firm to stiff; moist to wet.	L-2	3 5 3	AD			Recovery = 1.2/1.5
9.0								Hit water at 9.8' while drilling.
10.0		completed boring to 10.0'						
11.0								
12.0								
13.0								
14.0								
15.0								
16.0								
17.0								
18.0								
19.0								
20.0								SHEET 1 OF 1

APPENDIX B4

GAMMA RAY LOGS OF SELECT EXISTING WELLS





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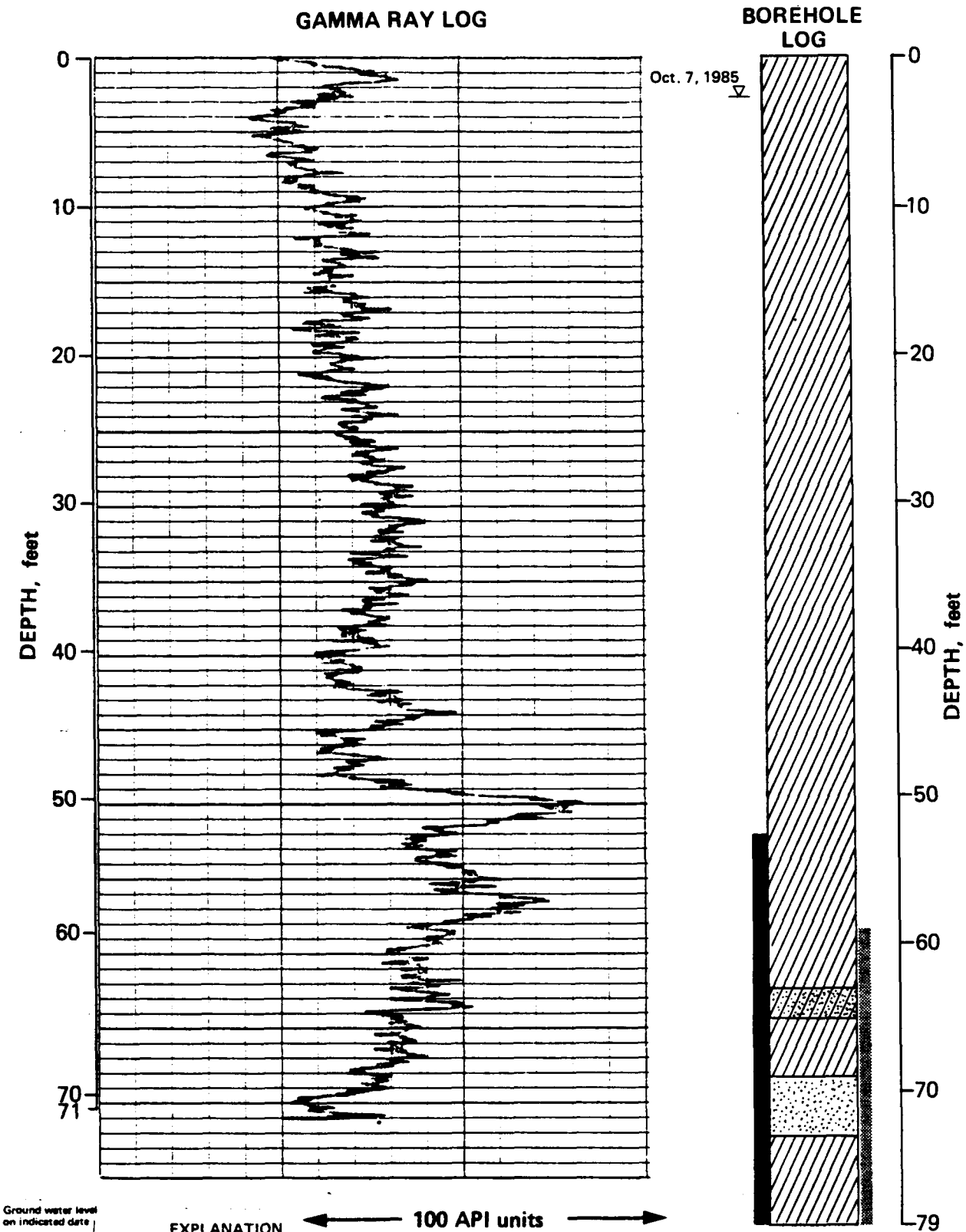
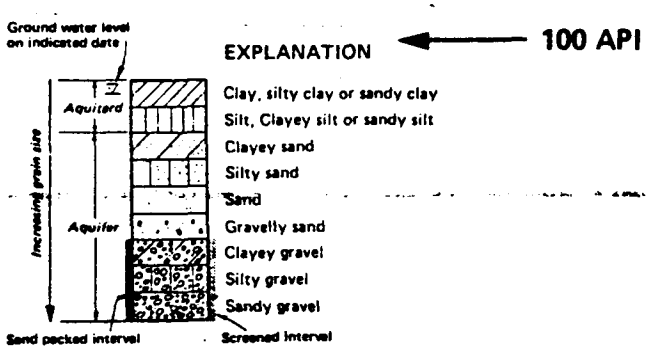
Palo Alto, California

CONFIRMATION STUDY (VERIFICATION STEP)
MOFFETT FIELD NAS
GAMMA RAY LOG OF CASED WELL MW-12B

Checked by _____ Date _____	Project No.	Figure No.
Approved by _____ Date _____	3110D	B-1

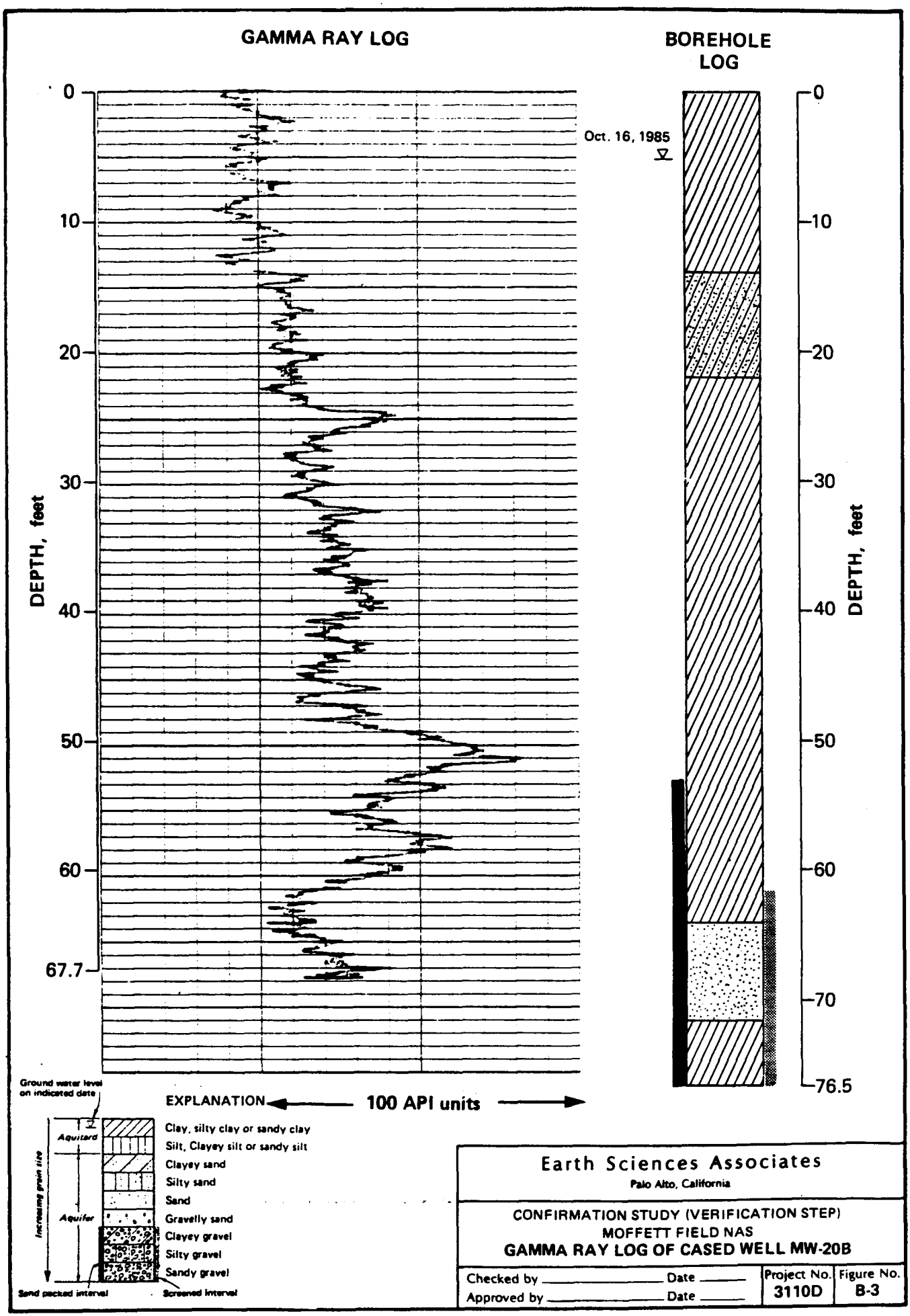




Earth Sciences Associates
Palo Alto, California

CONFIRMATION STUDY (VERIFICATION STEP)
MOFFETT FIELD NAS
GAMMA RAY LOG OF CASED WELL MW-17B

Checked by _____ Date _____	Project No.	Figure No.
Approved by _____ Date _____	3110D	B-2



Earth Sciences Associates
Palo Alto, California

CONFIRMATION STUDY (VERIFICATION STEP)
MOFFETT FIELD NAS
GAMMA RAY LOG OF CASED WELL MW-20B

Checked by _____ Date _____
Approved by _____ Date _____

Project No. 3110D | Figure No. B-3

APPENDIX C

CONSTRUCTION DIAGRAMS OF MONITORING WELLS

C1 - "A" WELLS

C2 - "B" AND "C" WELLS

APPENDIX C1

CONSTRUCTION DIAGRAMS OF "A" MONITORING WELLS

3110-C

MOFFETT FIELD

WI-1A

8/23/85 2:20 P.M.

10 SOLID CASING

5 WELL SCREEN

MATERIALS USED

? BAGS OF SAND

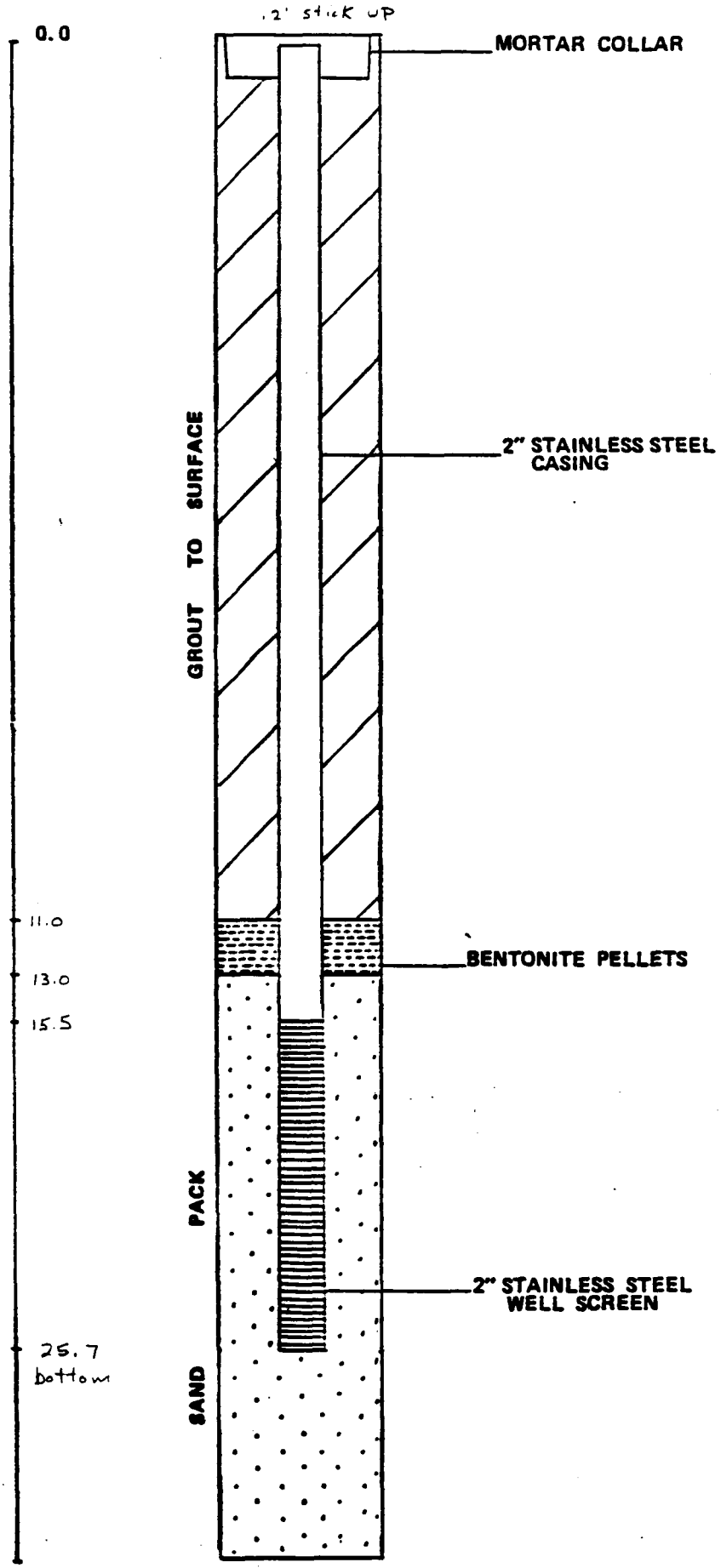
3/4 BUCKETS OF BENTONITE PELLETS

2 LB BENTONITE

2 BAGS OF CEMENT

WATER LEVEL

6.0 A.B.



3110-C

MOFFETT FIELD

W1-2A

8/23/85 10:45 A.M.

.2' stick up (all measurements referenced from ground surface (0.0))

SOLID CASING

WELL SCREEN

MATERIALS USED

3 BAGS OF SAND

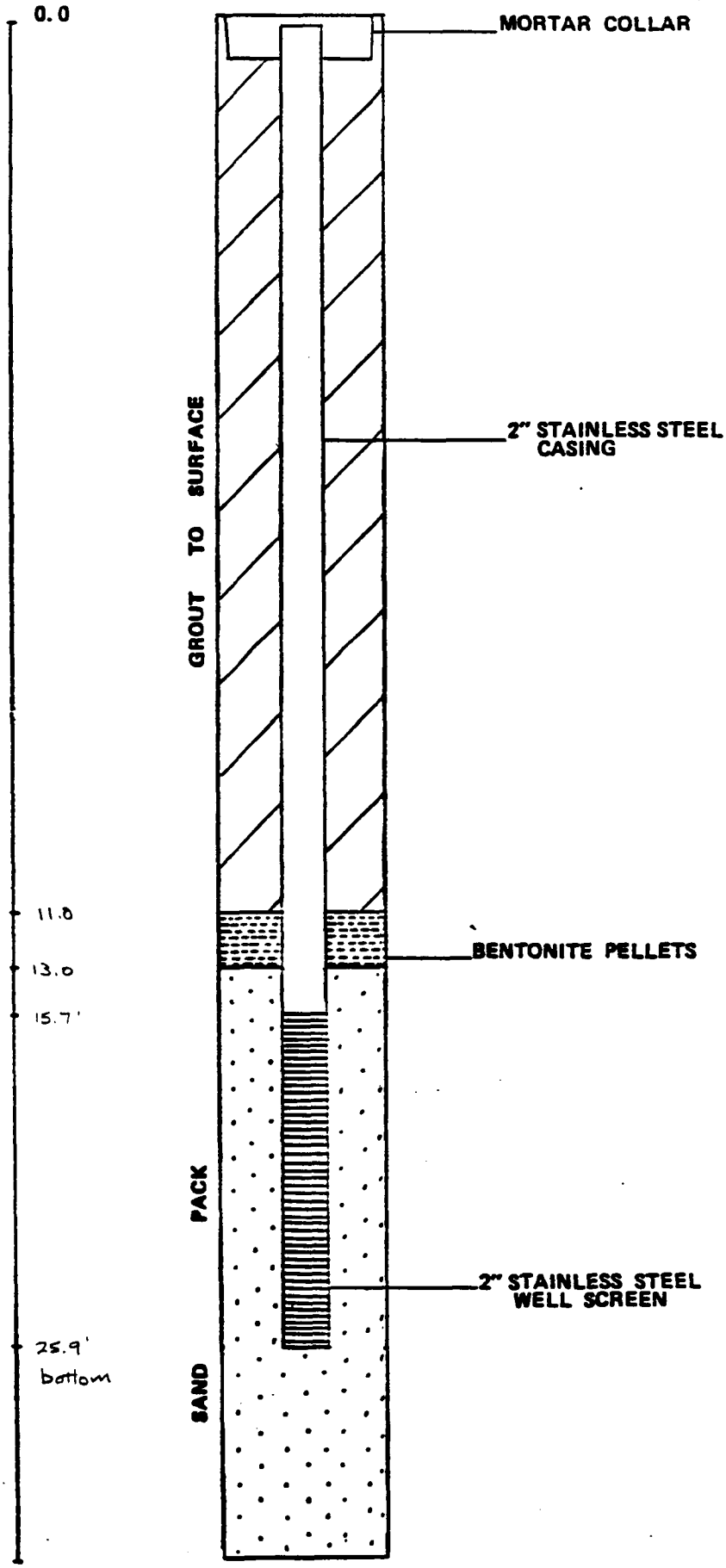
4 BUCKETS OF BENTONITE PELLETS

1 LB BENTONITE

2 BAGS OF CEMENT

WATER LEVEL

7.4' A.B.



W1-3A
8/22/85 3:30 P.M.

3110-C
MOFFETT FIELD

10 SOLID CASING

5 WELL SCREEN

5

MATERIALS USED

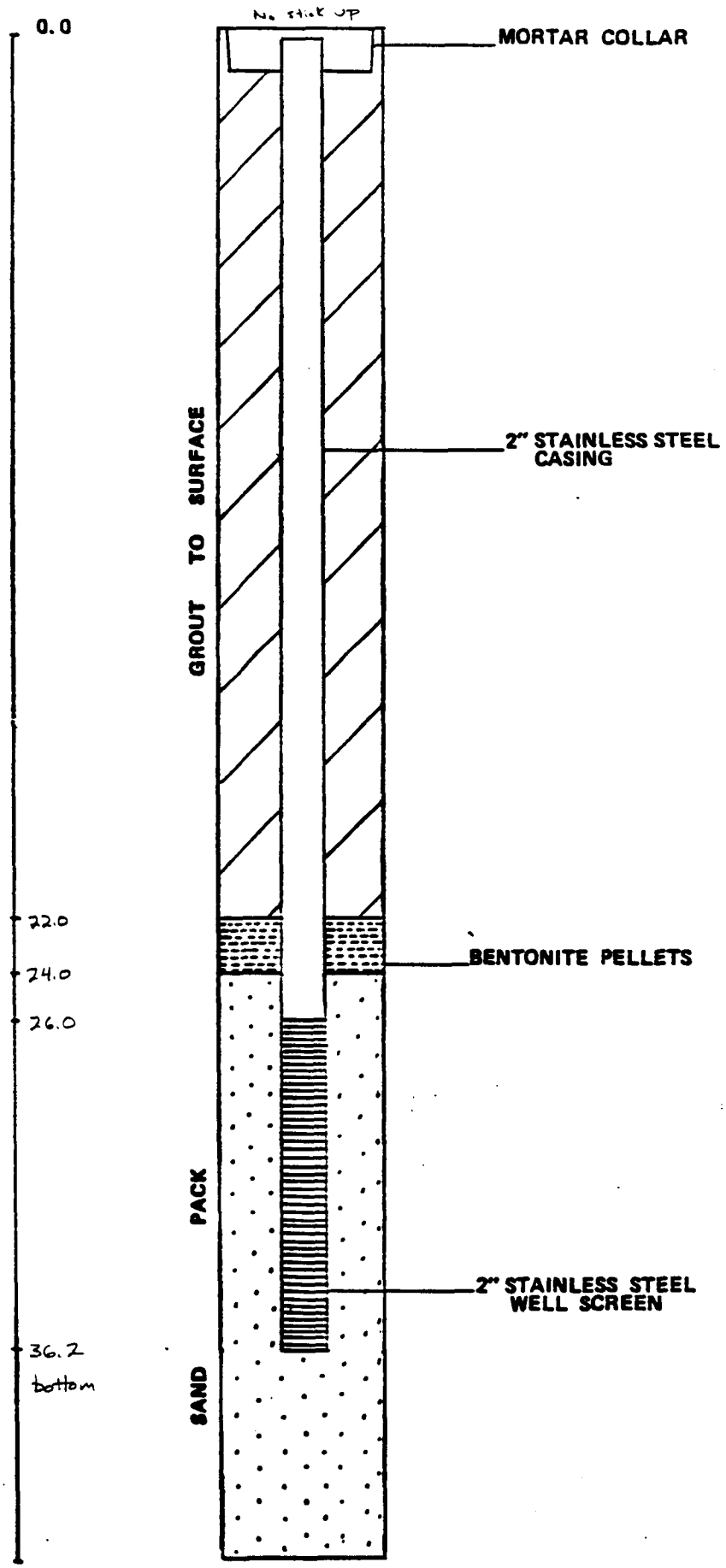
BAGS OF SAND

3½ BUCKETS OF BENTONITE PELLETS

LB BENTONITE

4.5 BAGS OF CEMENT

WATER LEVEL
23.5' A.B.
20.0 12 hrs.



W1-4A

8/29/85 3:15 P.M.

MOFFETT FIELD

5'
5' SOLID CASING

5' WELL SCREEN

MATERIALS USED

2.5 BAGS OF SAND

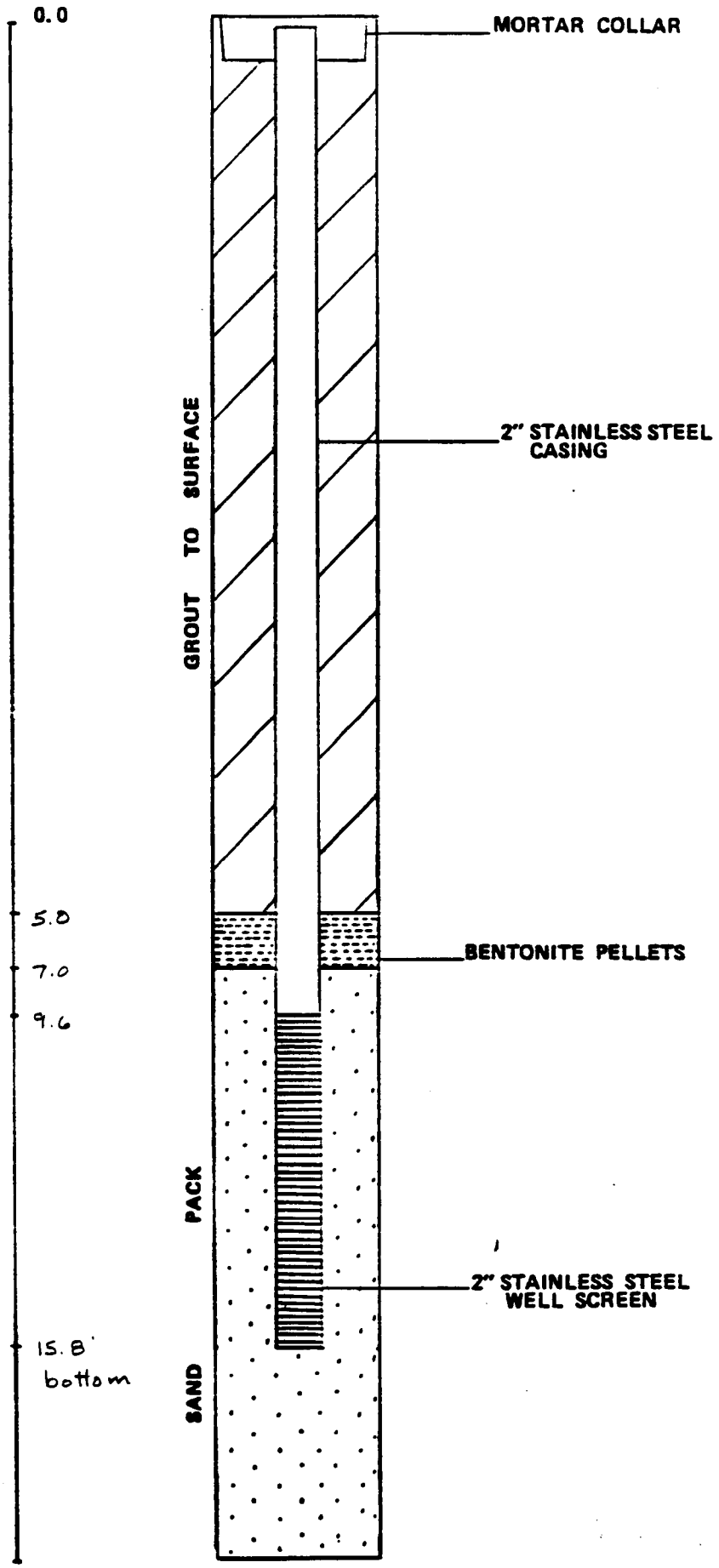
3/4 BUCKETS OF BENTONITE PELLETS

8 LB BENTONITE

1½ BAGS OF CEMENT

WATER LEVEL

4.8 A.B.



8/21/85

W2-1A

3110-C
MOFFETT FIELD

10 SOLID CASING

5 WELL SCREEN
5

MATERIALS USED

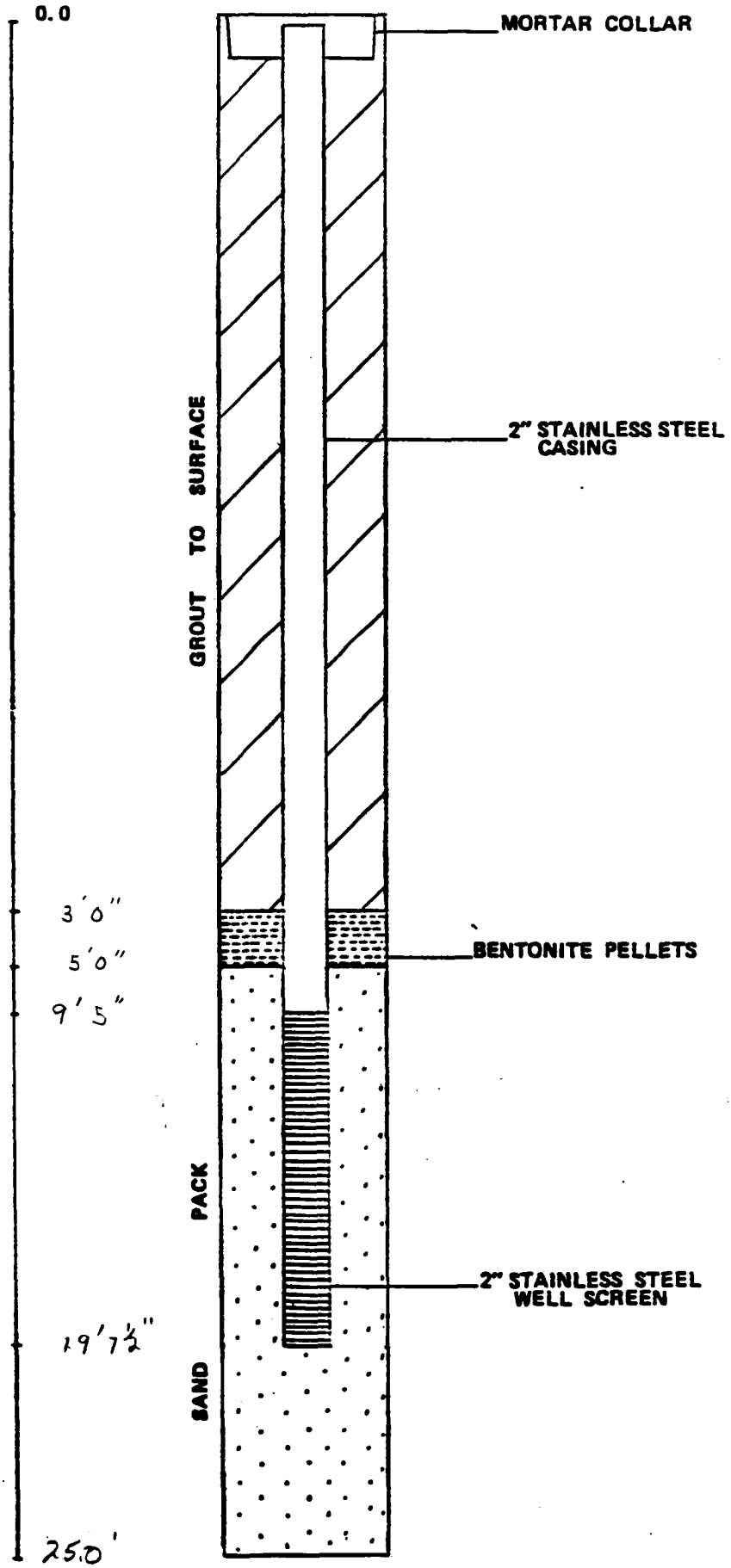
3½ BAGS OF SAND

3/4 BUCKETS OF BENTONITE PELLETS

8 LB BENTONITE

2 BAGS OF CEMENT

WATER LEVEL
6'4"



8/15/85 3:00 PM

W2-2A

3110-C

MOFFETT FIELD

5
10 SOLID CASING

10 WELL SCREEN

MATERIALS USED

4 BAGS OF SAND

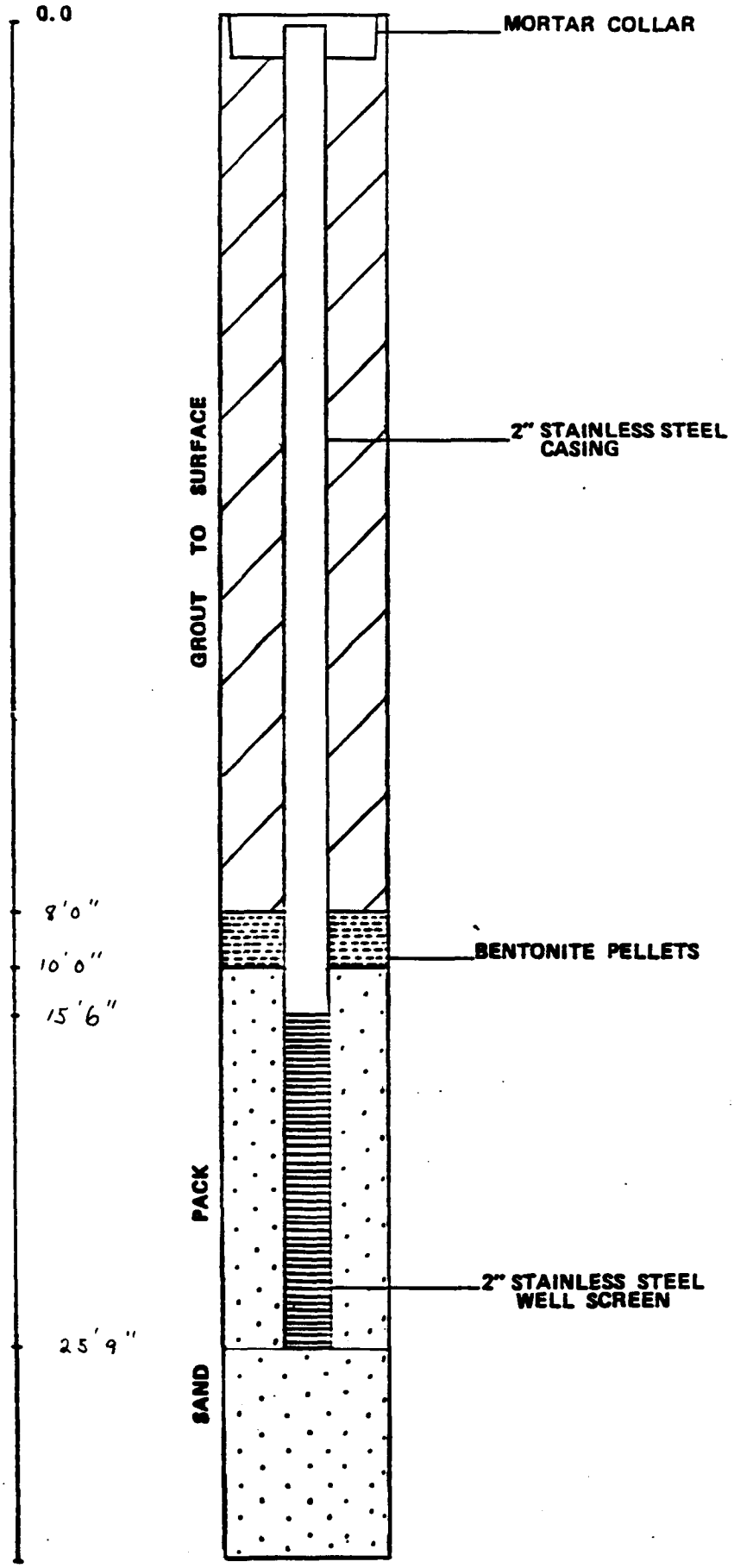
1 BUCKETS OF BENTONITE PELLETS

8 LB BENTONITE

1½ BAGS OF CEMENT

WATER LEVEL

7' 0"



8/22/85
9:10 AM

W2-3A

3110-C
MOFFETT FIELD

.1' stick-up of well casing from ground surface

0.0

10 SOLID CASING

5 WELL SCREEN
5

MATERIALS USED

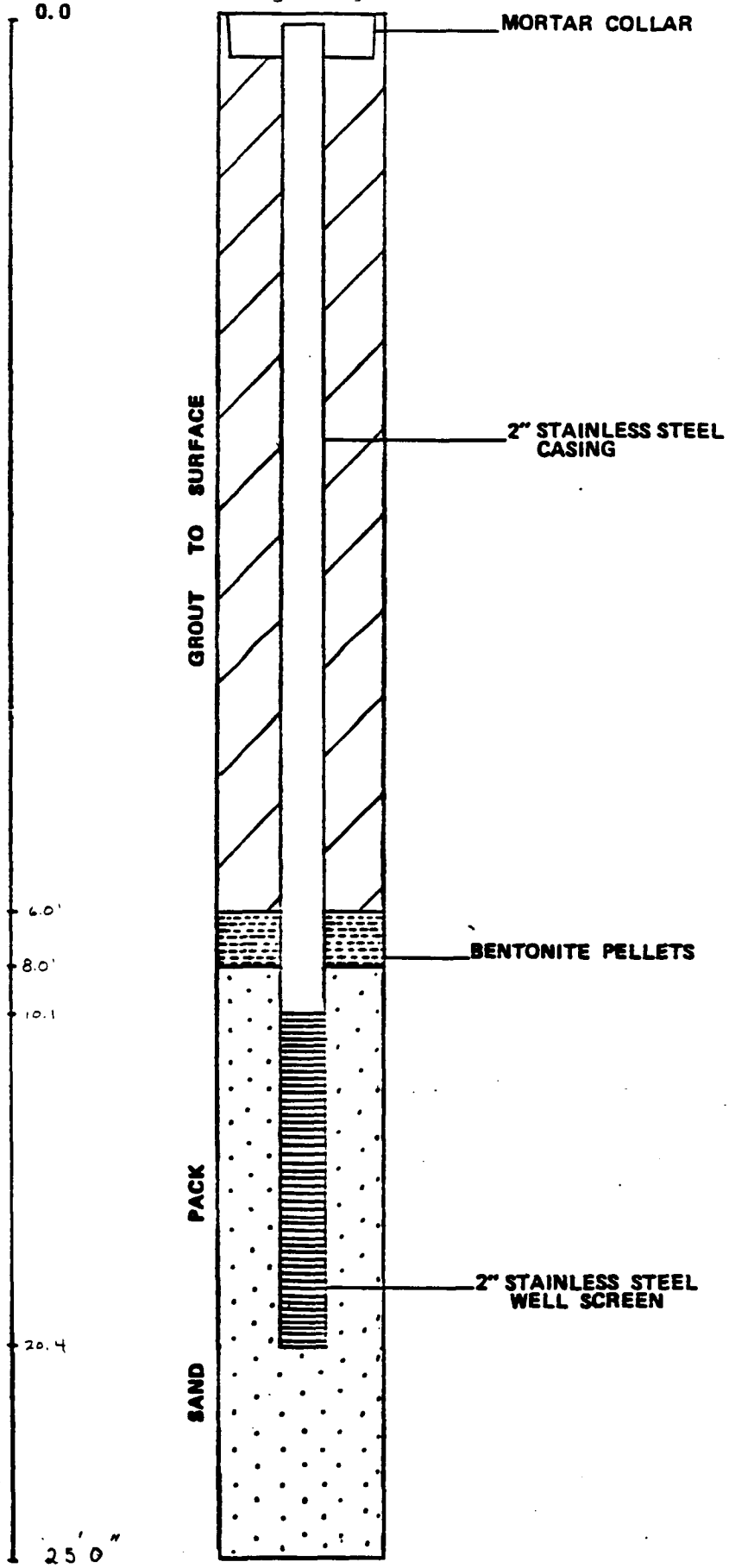
? 5 BAGS OF SAND

3/4 BUCKETS OF BENTONITE PELLETS

LB BENTONITE

1.5 BAGS OF CEMENT

WATER LEVEL
8.5' - while Sampling
5.4' - After Boring



8/14/85

W3-1A SITE 3

3110-C

MOFFETT FIELD

10 SOLID CASING

10 WELL SCREEN

MATERIALS USED

6 1/2 BAGS OF SAND

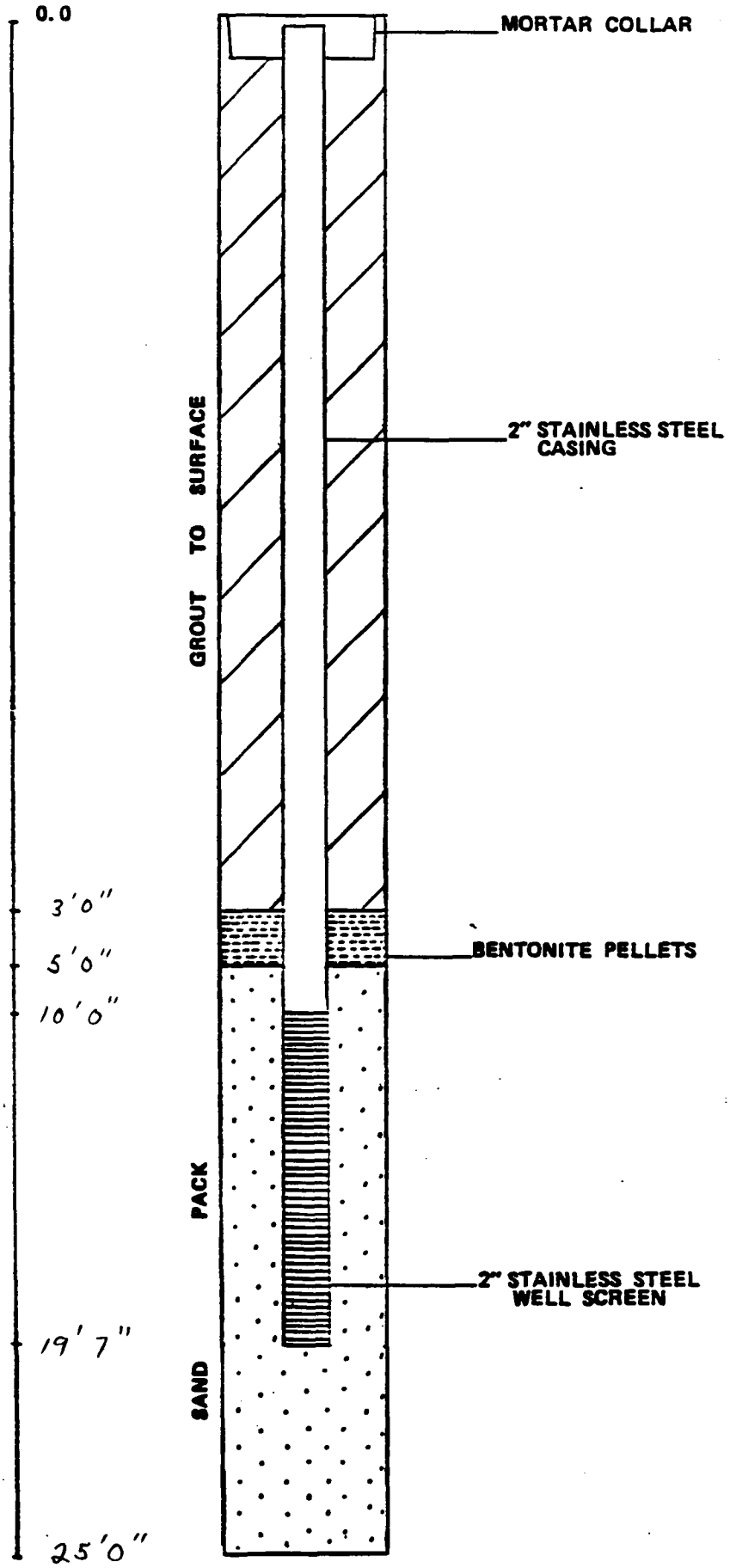
3/4 BUCKETS OF BENTONITE PELLETS

6 LB BENTONITE

1 3/4 BAGS OF CEMENT

WATER LEVEL

5' 5"



W32A

3:18 P.M.

Drilled to 20'
Hollow stem augers makes 8" hole

MOFFETT FIELD

5' SOLID CASING

10' WELL SCREEN

MATERIALS USED

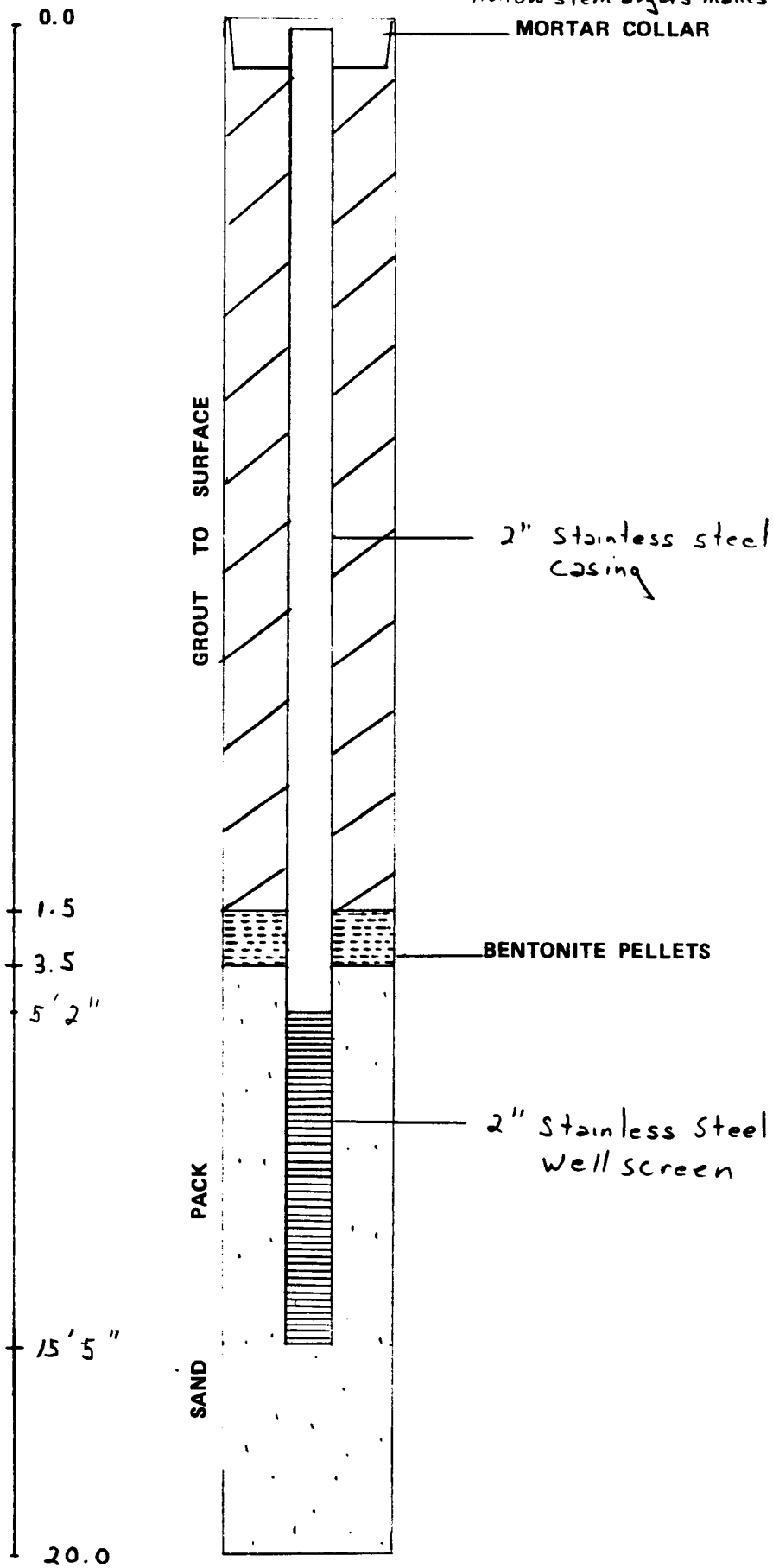
5.5 BAGS OF SAND

3/4 BUCKETS OF BENTONITE PELLETS

5 LB BENTONITE

1½ BAGS OF CEMENT

Water Level
2' 7"



W3-3A SITE 3

3110-C

MOFFETT FIELD

10 SOLID CASING

10 WELL SCREEN

MATERIALS USED

4 BAGS OF SAND

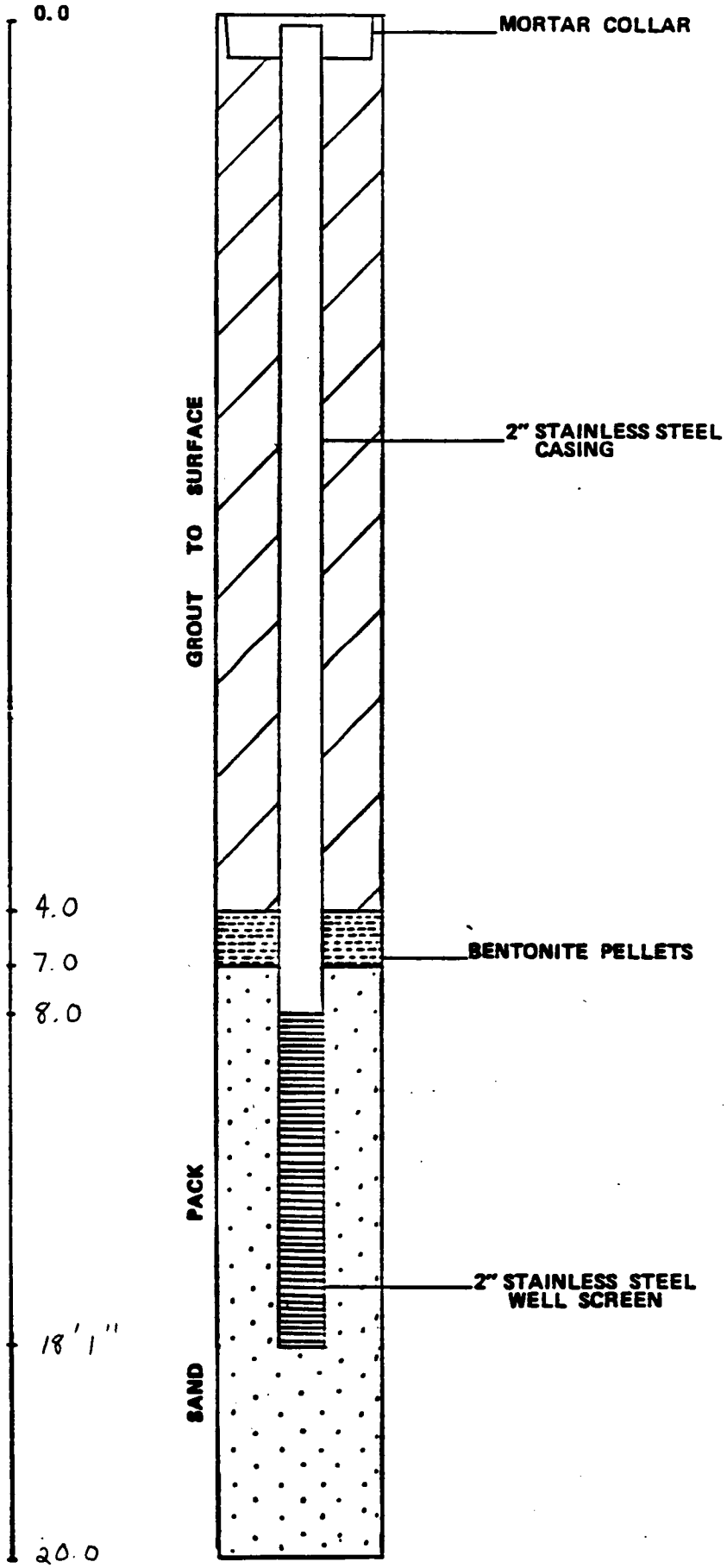
1 BUCKETS OF BENTONITE PELLETS

5 LB BENTONITE

1 1/3 BAGS OF CEMENT

WATER LEVEL

4' 4"



W4-1A SITE 4

3110-C

MOFFETT FIELD

10 SOLID CASING

10 WELL SCREEN

MATERIALS USED

5 BAGS OF SAND

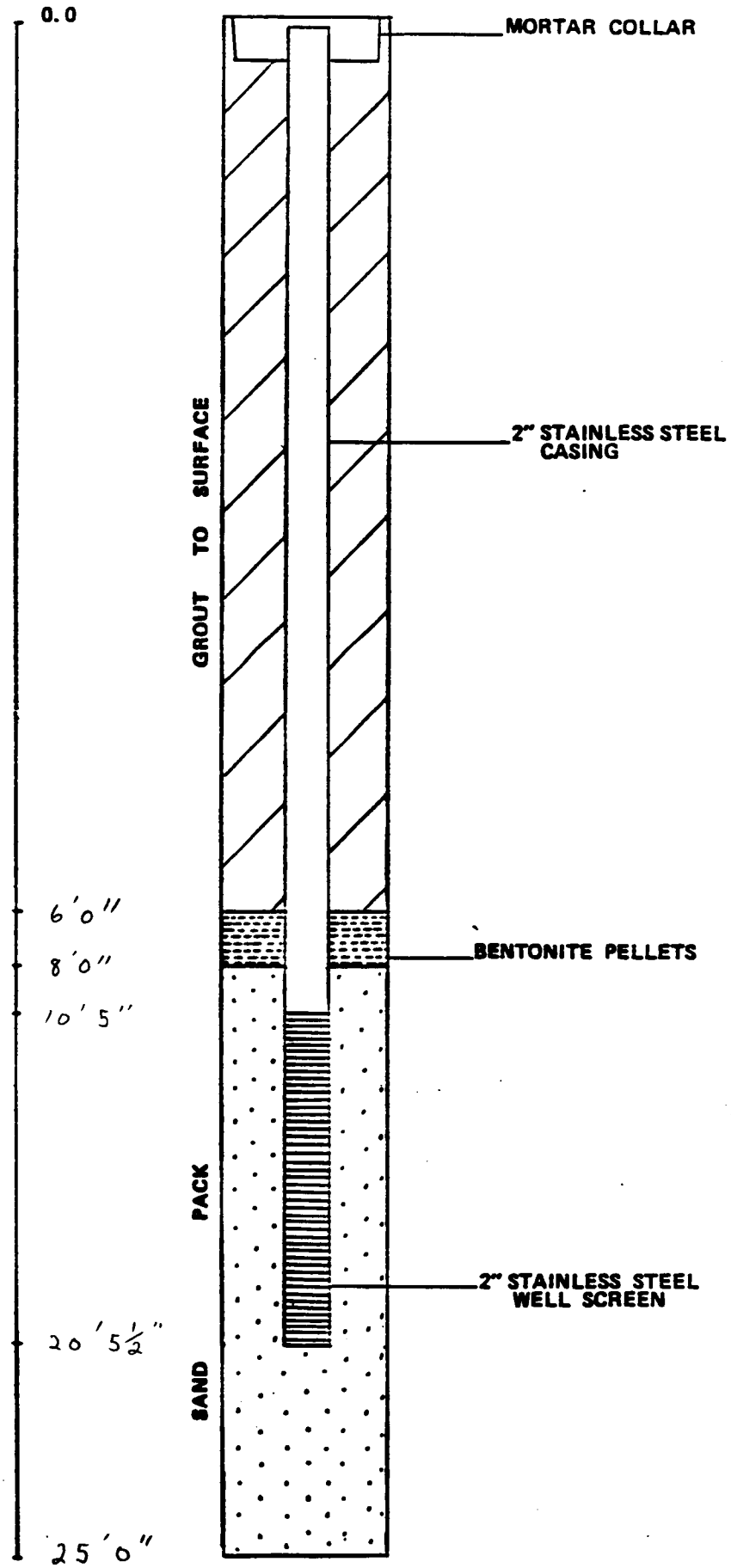
3/4 BUCKETS OF BENTONITE PELLETS

6 LB BENTONITE

2 BAGS OF CEMENT

WATER LEVEL

6'0"



8/16/85

W 4-2A

Top of casing is 3" below surf

3110-C

MOFFETT FIELD

10 SOLID CASING

10 WELL SCREEN

MATERIALS USED

5 BAGS OF SAND

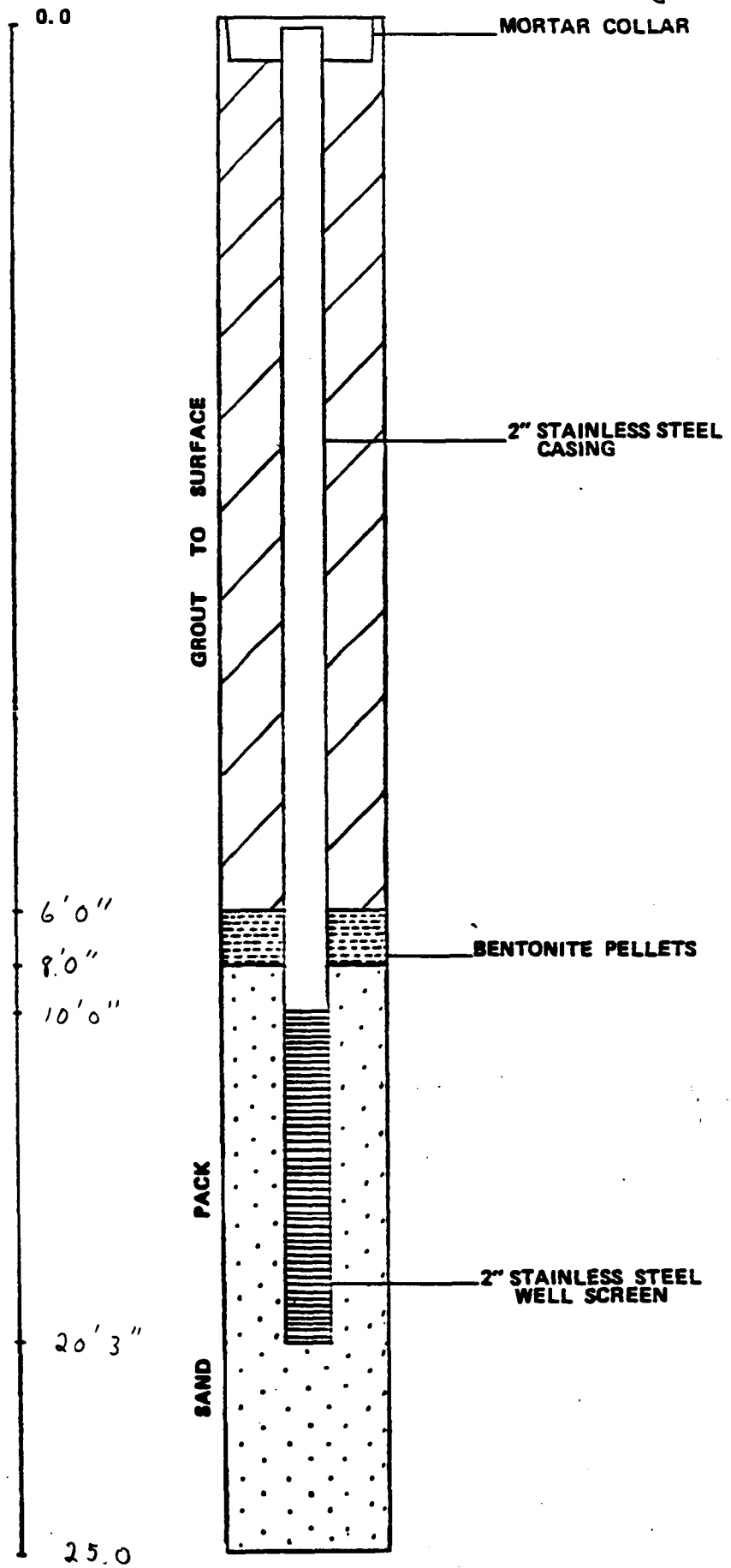
3/4 BUCKETS OF BENTONITE PELLETS

6 LB BENTONITE

2 BAGS OF CEMENT

WATER LEVEL

8' 1"



8/16/85

W5-1A SITE 5

3110-C

MOFFETT FIELD

5
5
10 SOLID CASING

10 WELL SCREEN

MATERIALS USED

3½ BAGS OF SAND

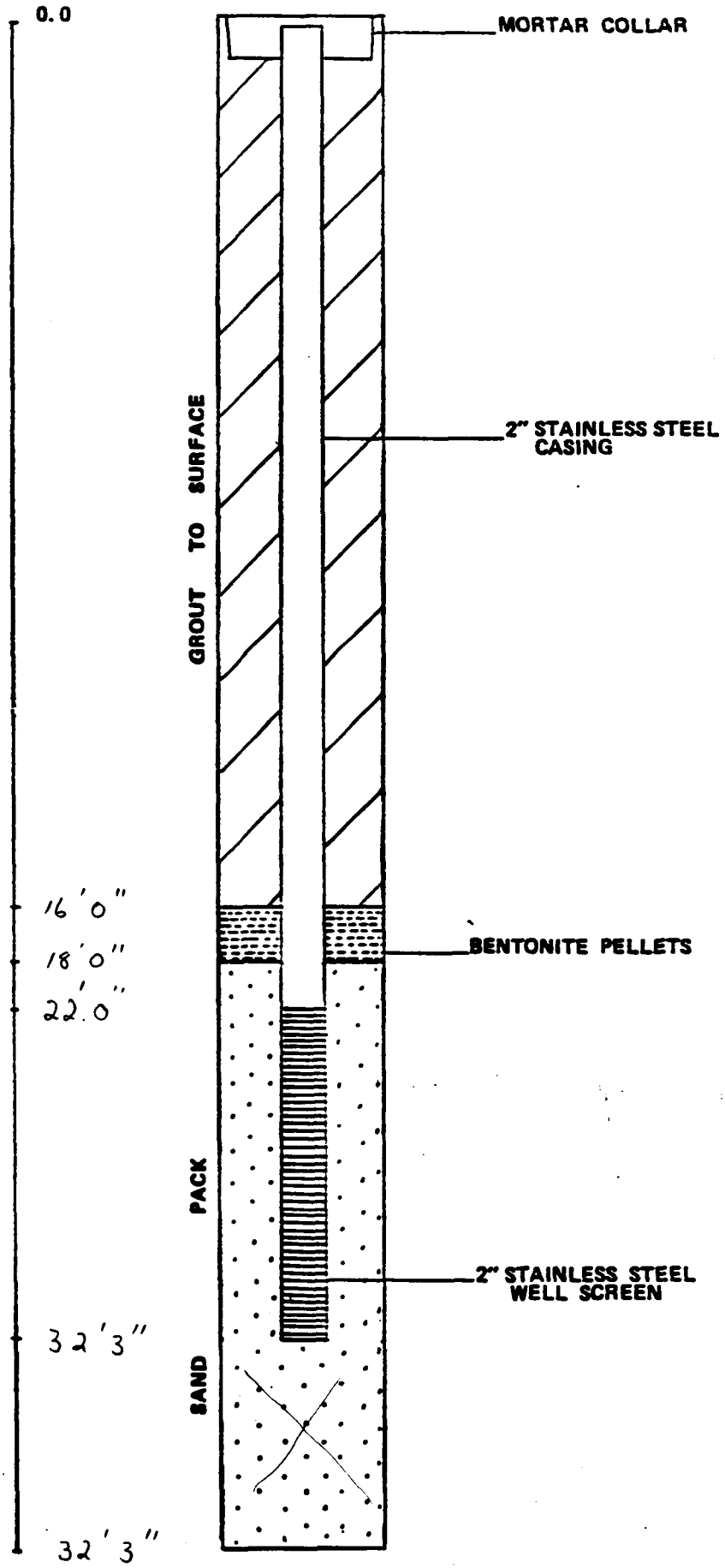
1 BUCKETS OF BENTONITE PELLETS

7 LB BENTONITE

2½ BAGS OF CEMENT

WATER LEVEL

7'6"



8/19/85

W5-2A SITE 5

3110-C

MOFFETT FIELD

10 SOLID CASING

10 WELL SCREEN

MATERIALS USED

5 BAGS OF SAND

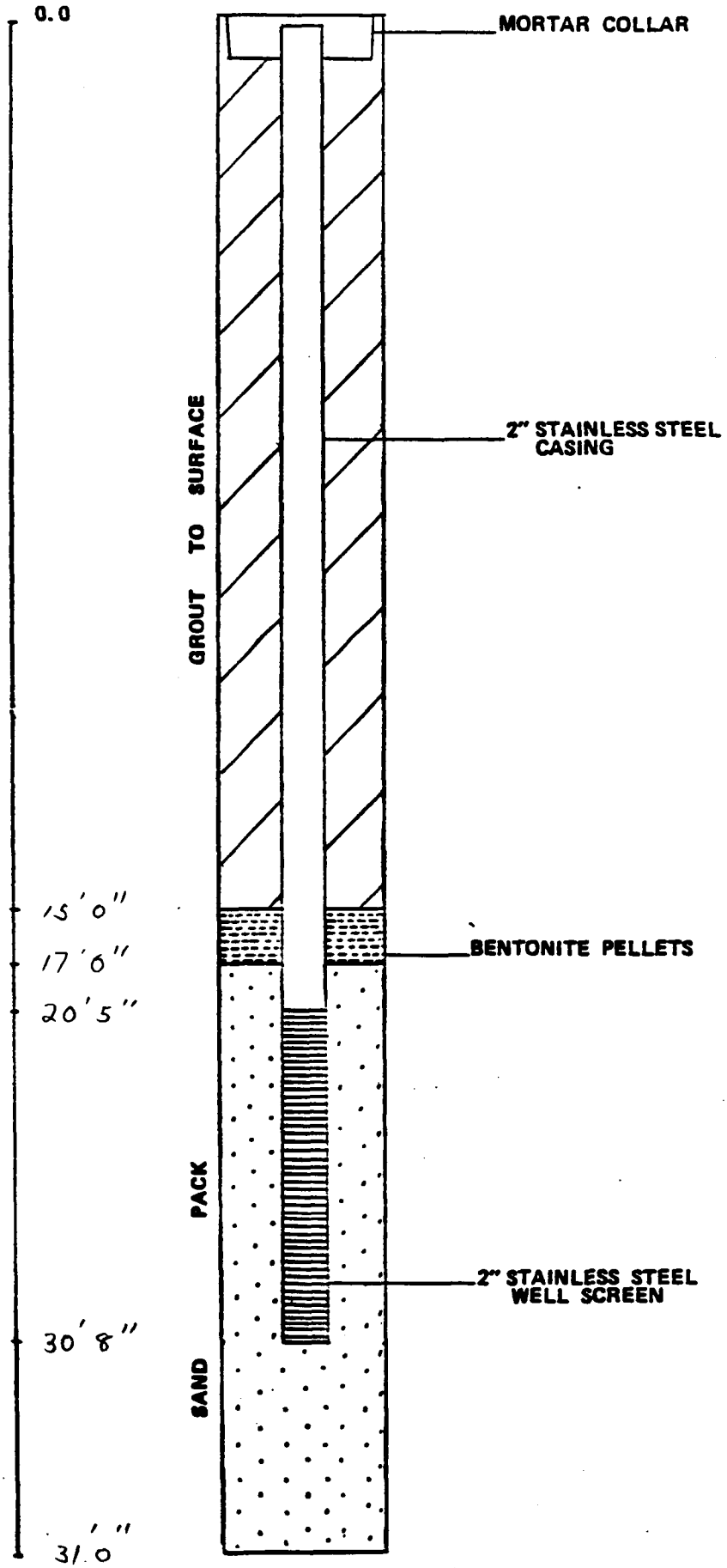
1 BUCKETS OF BENTONITE PELLETS

12 LB BENTONITE

3 BAGS OF CEMENT

WATER LEVEL

11' 4"



8/19/85

W5 - 3A SITE 5

8" auger hole

3110-C

MOFFETT FIELD

10

10 SOLID CASING

10 WELL SCREEN

MATERIALS USED

5 BAGS OF SAND

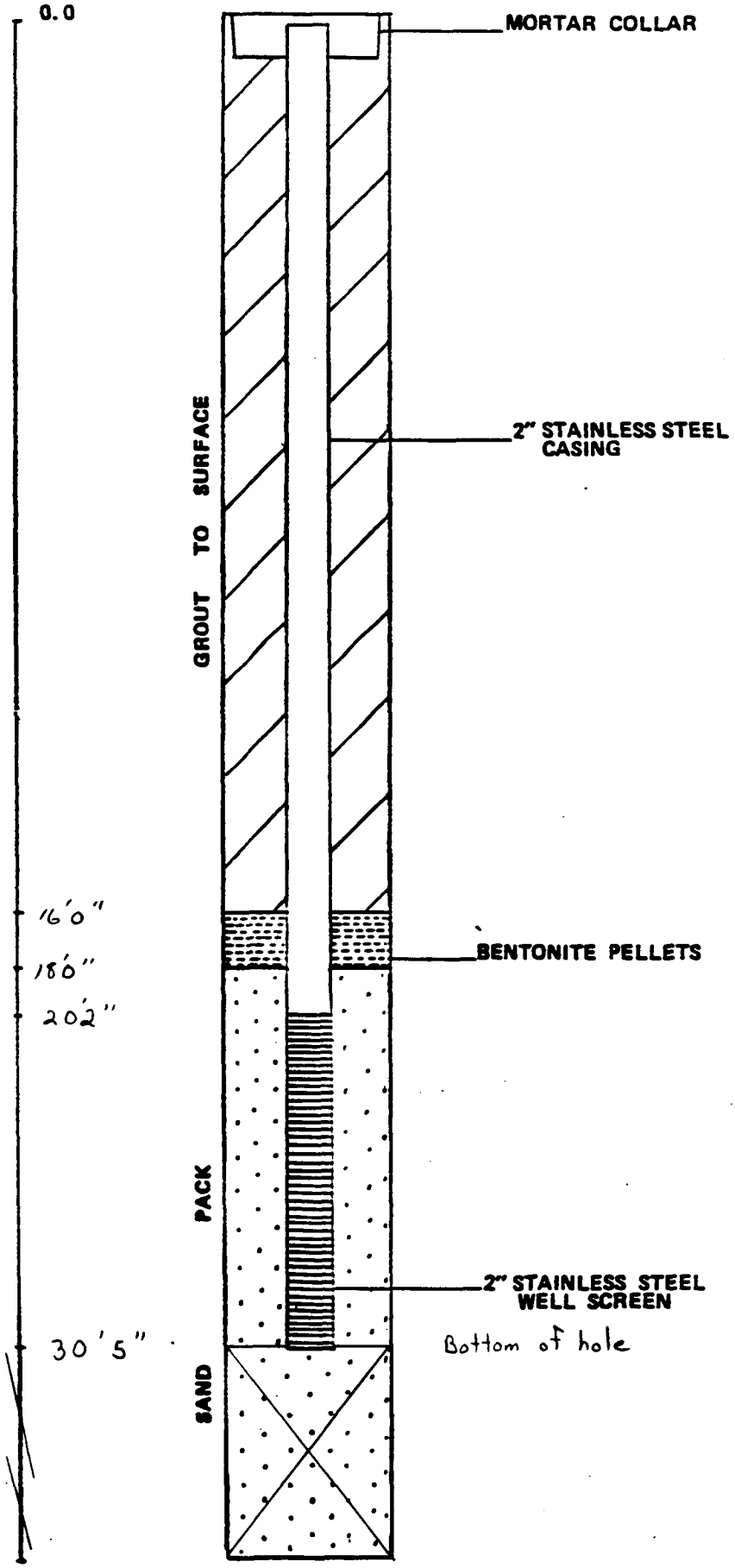
1 BUCKETS OF BENTONITE PELLETS

8 LB BENTONITE

2 3/4 BAGS OF CEMENT

WATER LEVEL

6' 8"



8/20/85

W6-1A SITE 6

3110-C

MOFFETT FIELD

5
10 SOLID CASING

10 WELL SCREEN

MATERIALS USED

3½ BAGS OF SAND

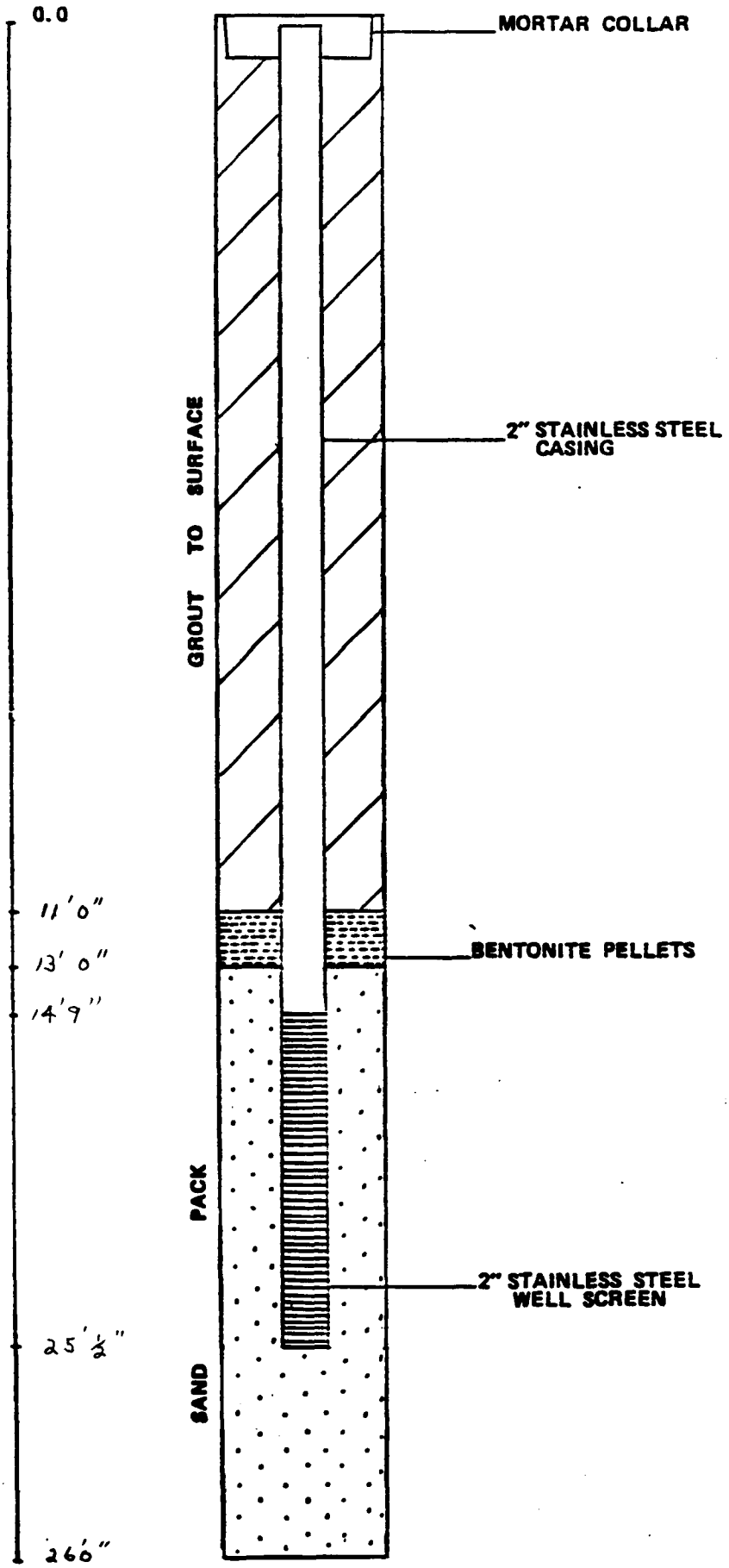
¾ BUCKETS OF BENTONITE PELLETS

8 LB BENTONITE

1⅔ BAGS OF CEMENT

WATER LEVEL

6' 8"



8/20/85

W7-1A

3110-C

MOFFETT FIELD

10
10 SOLID CASING

5 WELL SCREEN
5

MATERIALS USED

4 BAGS OF SAND

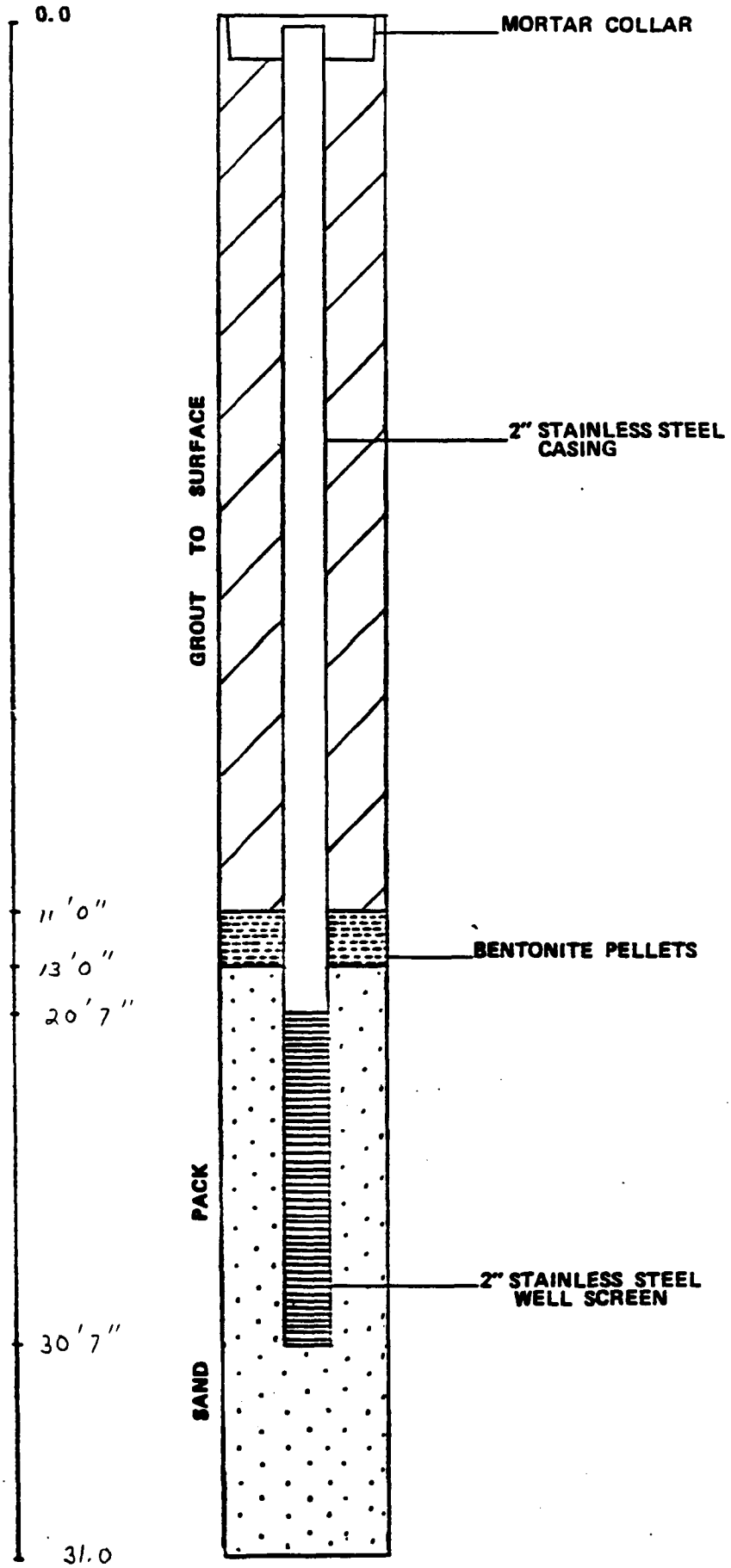
3/4 BUCKETS OF BENTONITE PELLETS

8 1/2 LB BENTONITE

2 1/3 BAGS OF CEMENT

WATER LEVEL

5' 4"



W7 - 2A

8/28/85 7:30 A.M.

MOFFETT FIELD

0' SOLID CASING 10'

5' WELL SCREEN

MATERIALS USED

3 BAGS OF SAND

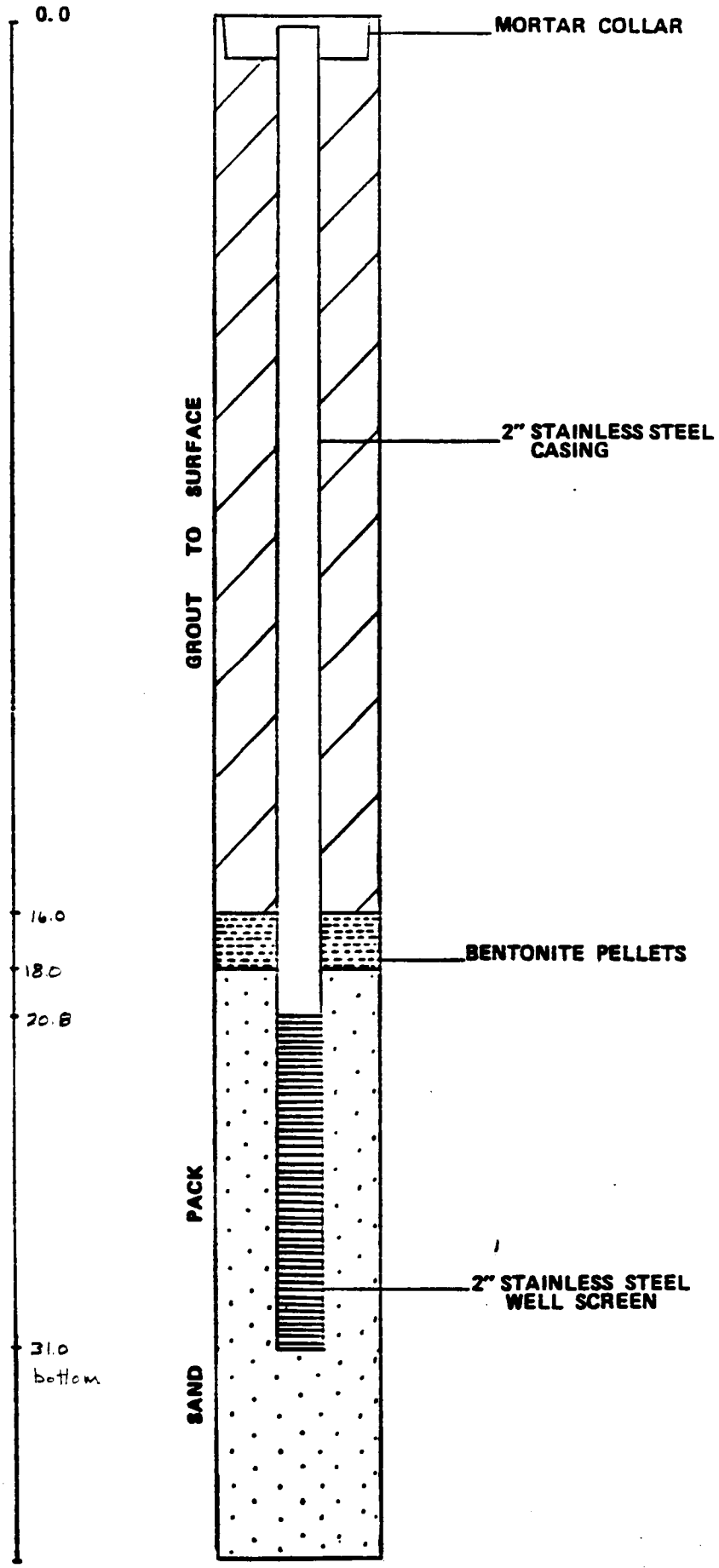
3/4 BUCKETS OF BENTONITE PELLETS

8.5 LB BENTONITE

1 2/3 BAGS OF CEMENT

WATER LEVEL

6.0 A.B.



8/21/85

W7-3A

3110-C

MOFFETT FIELD

5
10 SOLID CASING

5 WELL SCREEN
5

MATERIALS USED

3 BAGS OF SAND

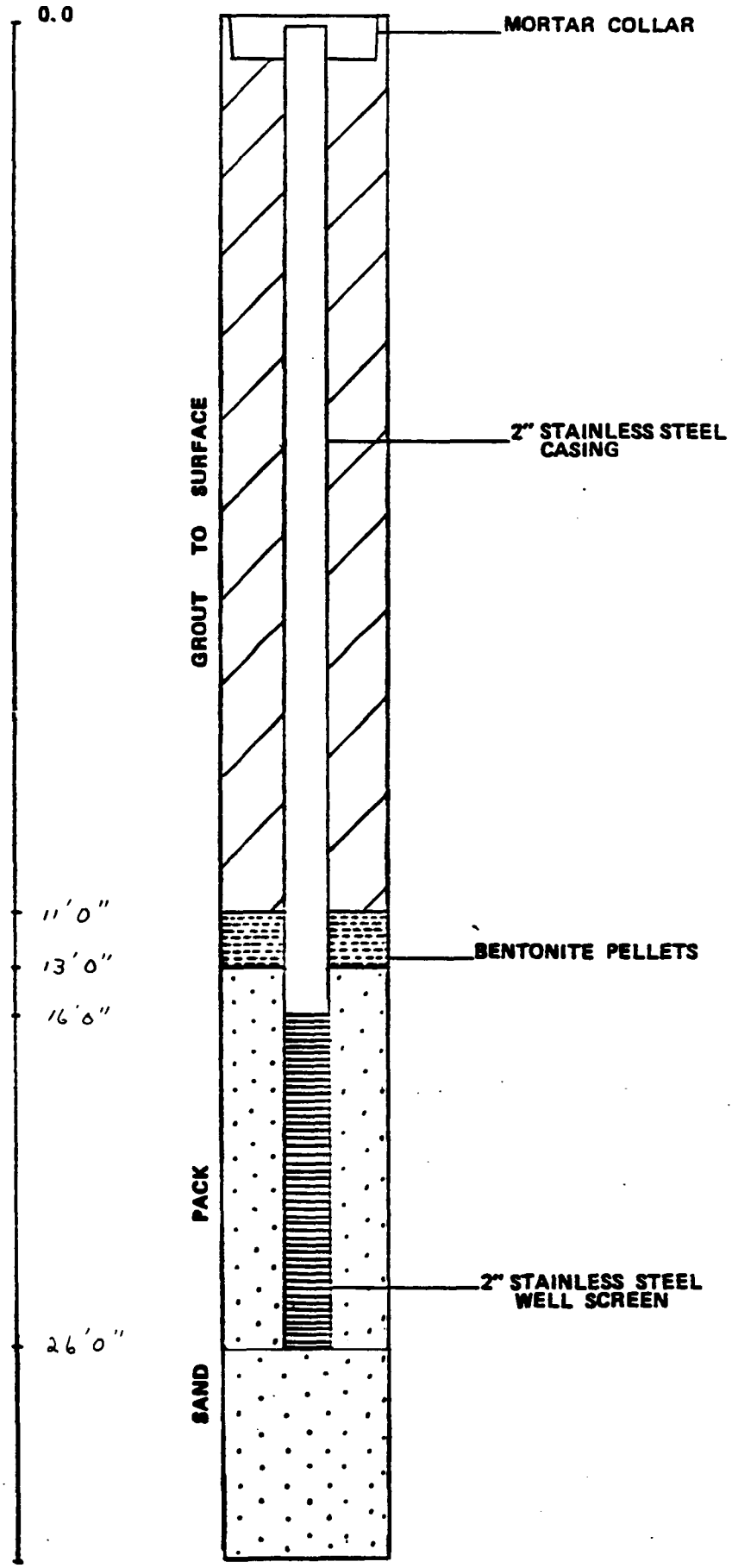
1 BUCKETS OF BENTONITE PELLETS

8 LB BENTONITE

2 1/3 BAGS OF CEMENT

WATER LEVEL

8' 8"



WB-1A
8/27/85 10:30 A.M.

MOFFETT FIELD

5' SOLID CASING

3'

5' WELL SCREEN

MATERIALS USED

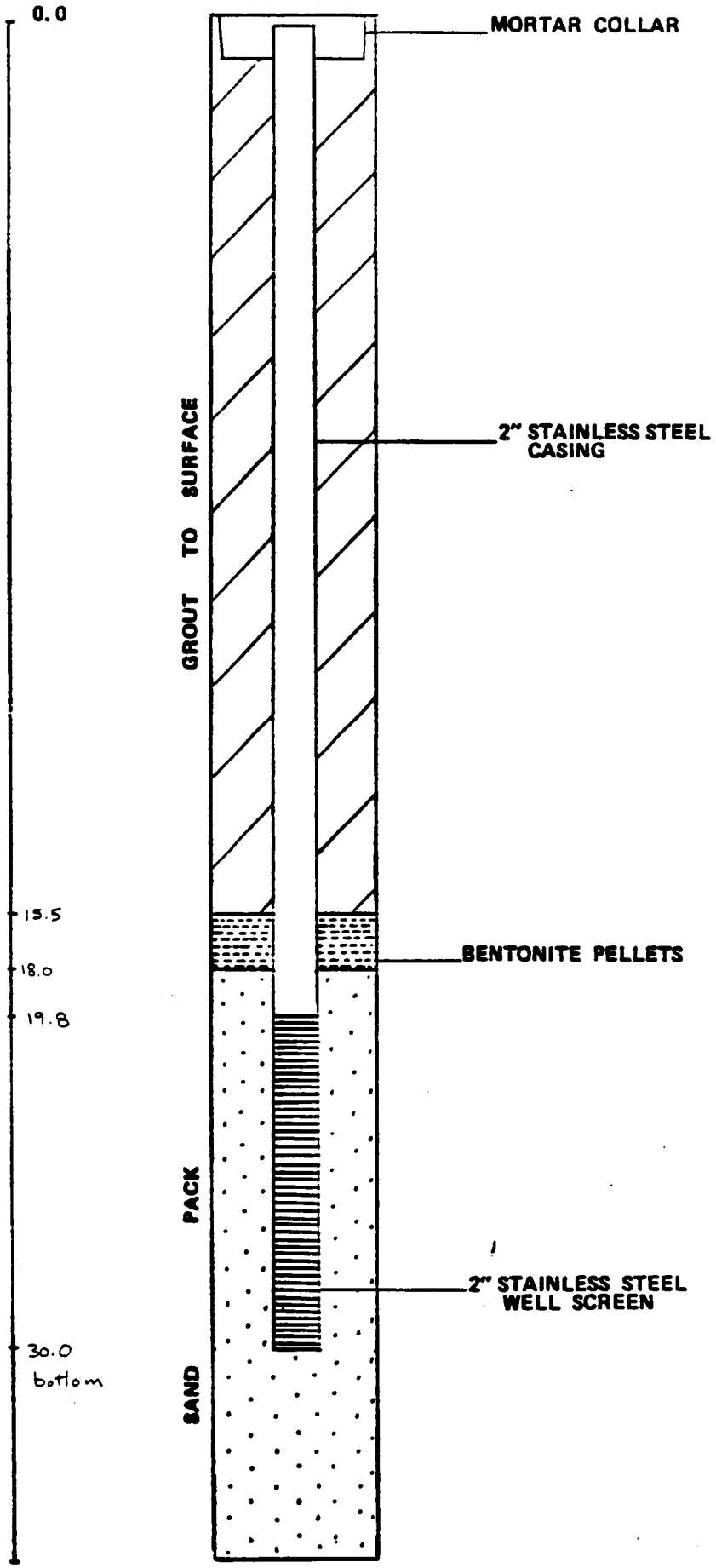
3 BAGS OF SAND

1 BUCKETS OF BENTONITE PELLETS

16 LB BENTONITE

2 1/3 BAGS OF CEMENT

WATER LEVEL
9.2 A.B.



W9 - 1A
8/29/85 11:30 A.M.

MOFFETT FIELD

SOLID CASING

WELL SCREEN

MATERIALS USED

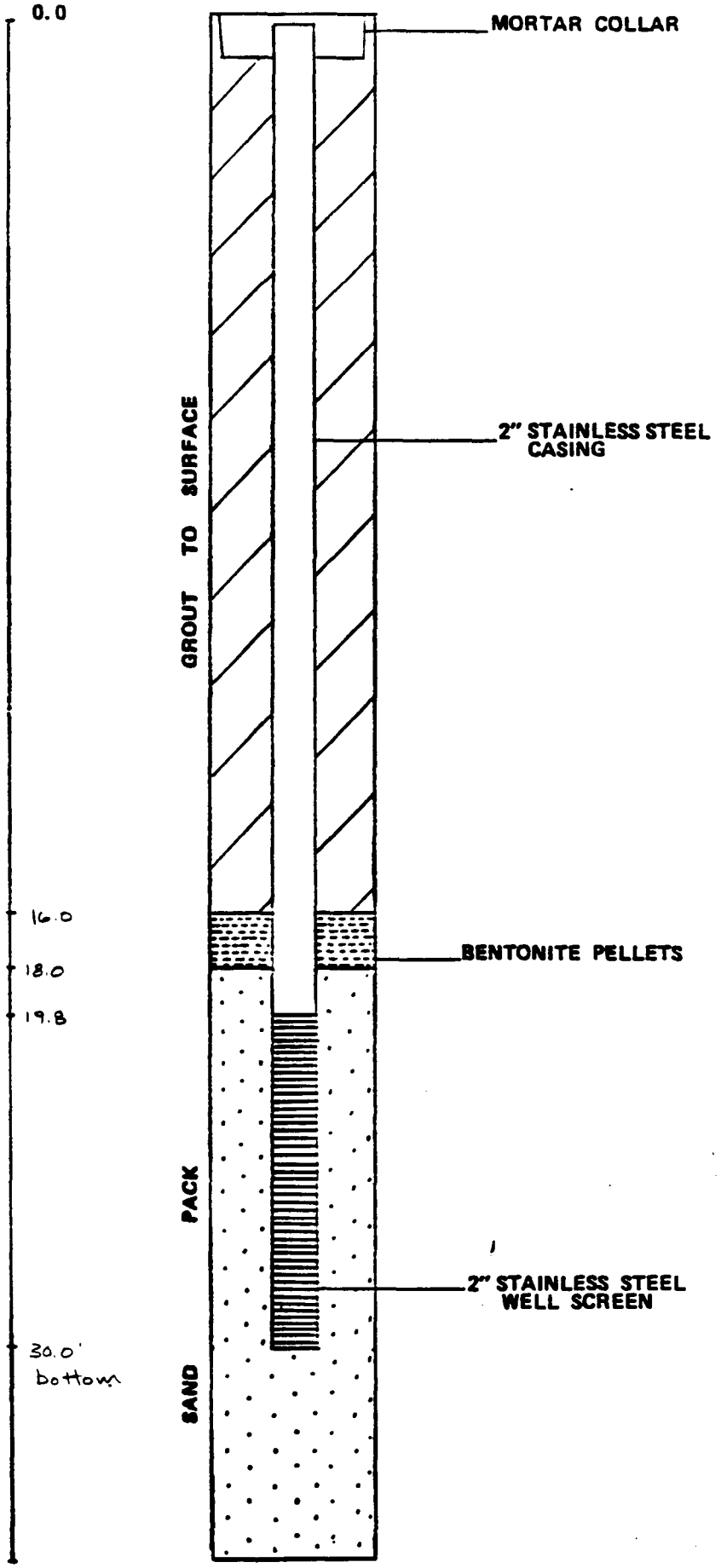
4 BAGS OF SAND

3/4 BUCKETS OF BENTONITE PELLETS

12 LB BENTONITE

2 BAGS OF CEMENT

WATER LEVEL
8.4' A.B



W4-2A
8/29/84 10:00 A.M.

MOFFETT FIELD

5'
SOLID CASING
5'

5'
WELL SCREEN

MATERIALS USED

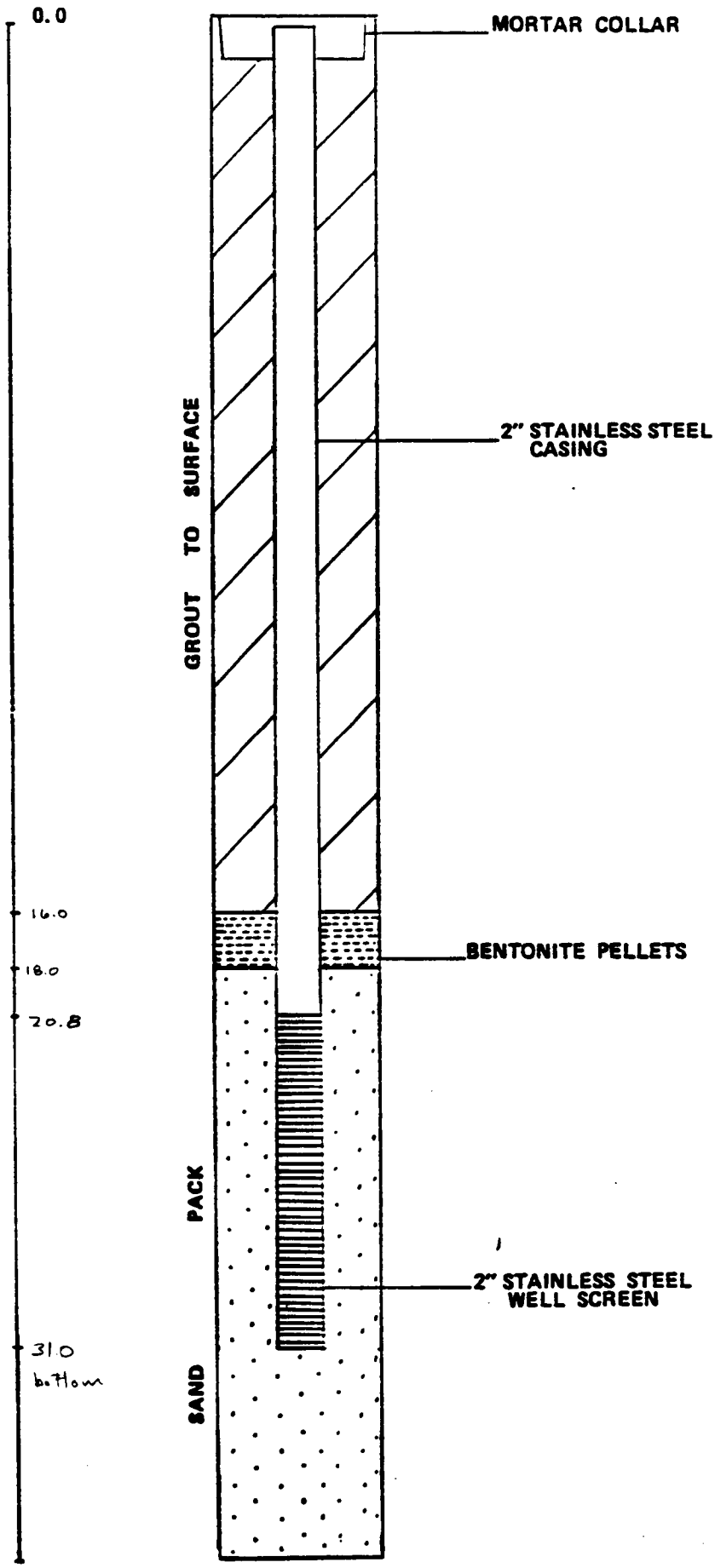
3 BAGS OF SAND

3/4's BUCKETS OF BENTONITE PELLETS

12 LB BENTONITE

2 1/3 BAGS OF CEMENT

WATER LEVEL
8.5 A.B.



8/21/85 10:55AM

W10-1A SITE 10

3110-C

MOFFETT FIELD

3" stickup from surface

10

10 SOLID CASING

5 WELL SCREEN

5

MATERIALS USED

3 BAGS OF SAND

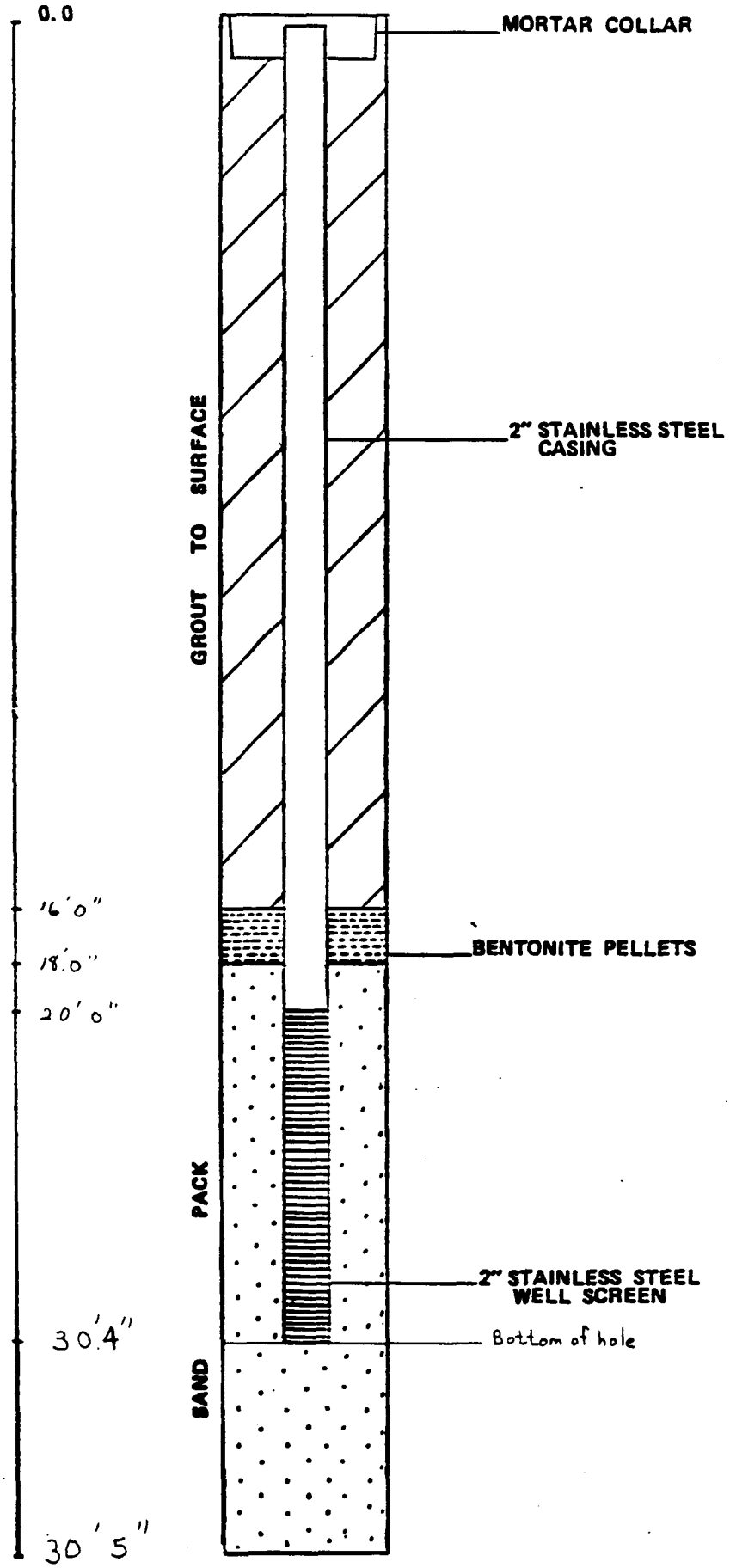
3/4 BUCKETS OF BENTONITE PELLETS

12 LB BENTONITE

2 BAGS OF CEMENT

WATER LEVEL

6' 6"



8/21/85 12:30 P

W10-2A SITE 10

3110-C

MOFFETT FIELD

10

10 SOLID CASING

5 WELL SCREEN

5

MATERIALS USED

3½ BAGS OF SAND

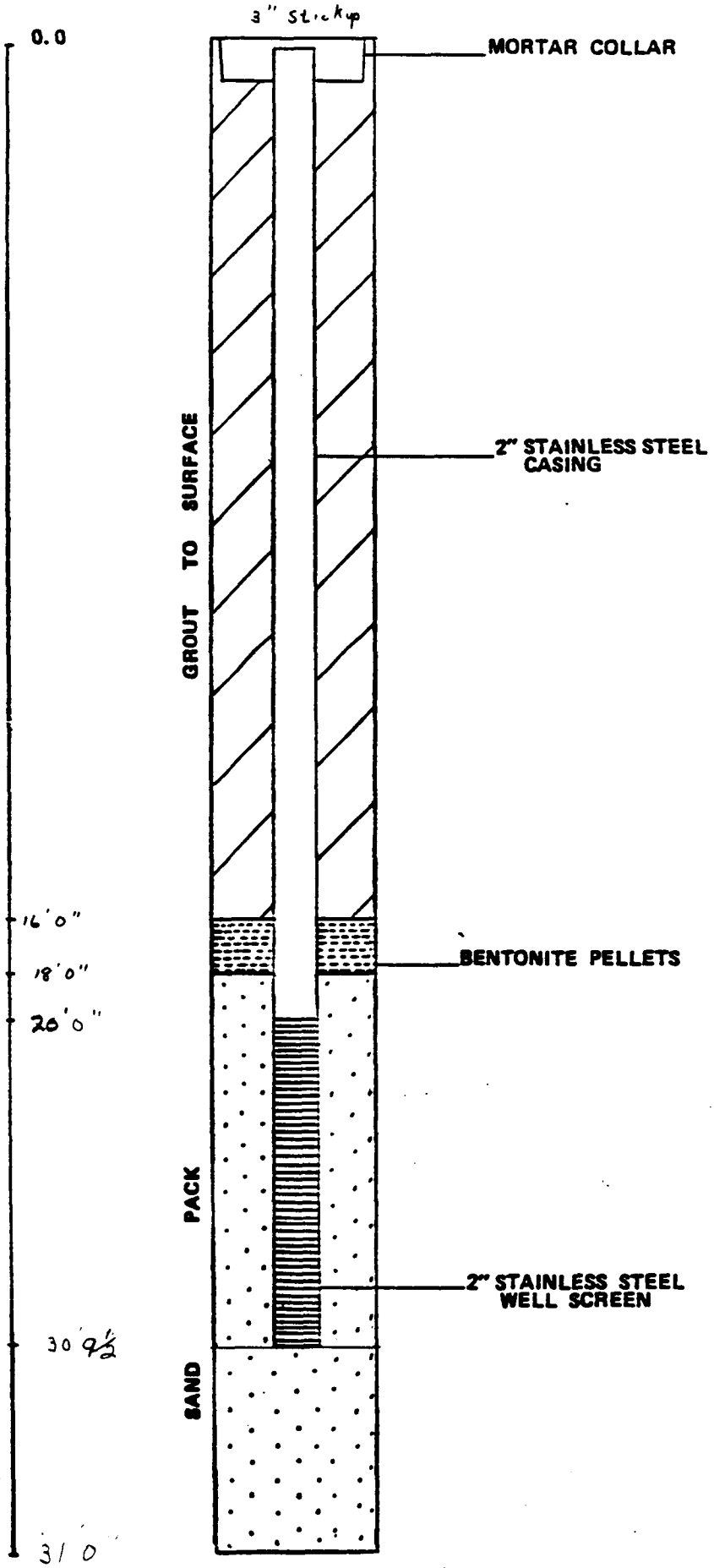
3/4 BUCKETS OF BENTONITE PELLETS

12 LB BENTONITE

2 BAGS OF CEMENT

WATER LEVEL

5' 3½"



APPENDIX C2

CONSTRUCTION DIAGRAMS OF "B" AND "C" MONITORING WELLS

8/1/85

W3-1B SITE 3

3110-C

MOFFETT FIELD

20
20
20
10 SOLID CASING

10 WELL SCREEN

MATERIALS USED

2 2/3 BAGS OF SAND

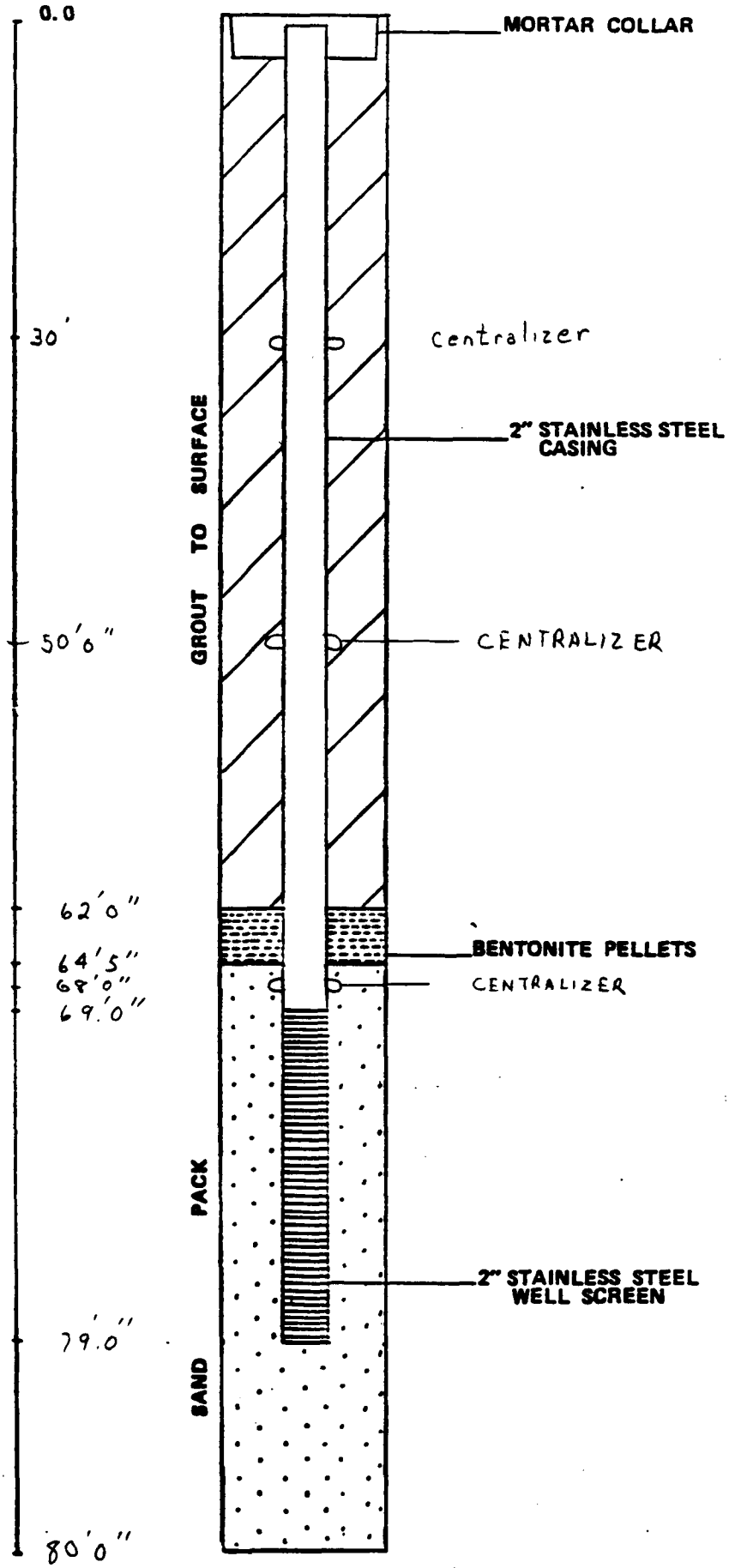
3/4 BUCKETS OF BENTONITE PELLETS

10 LB BENTONITE

8 BAGS OF CEMENT

WATER LEVEL

2' 8"



8/6/85

W3-2B SITE 3

3110-C

MOFFETT FIELD

20
20
20
5 SOLID CASING

5 WELL SCREEN
10

MATERIALS USED

3 BAGS OF SAND

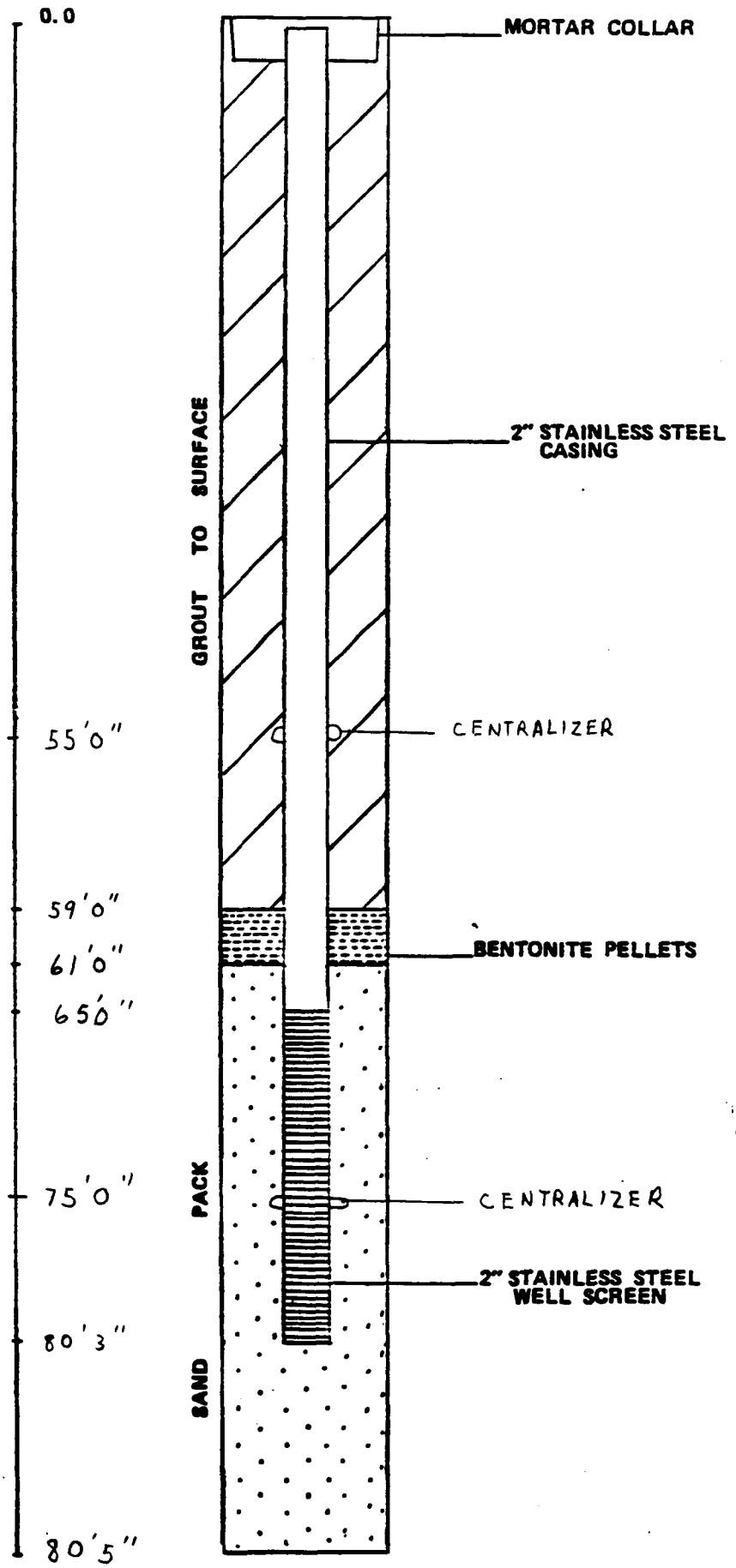
1/2 BUCKETS OF BENTONITE PELLETS

6 LB BENTONITE

4 BAGS OF CEMENT

WATER LEVEL

1' 0"



8/2/85

W 3-3B SITE 3

MOFFETT FIELD

20
20 SOLID CASING
20

10 WELL SCREEN
10

MATERIALS USED

5 BAGS OF SAND

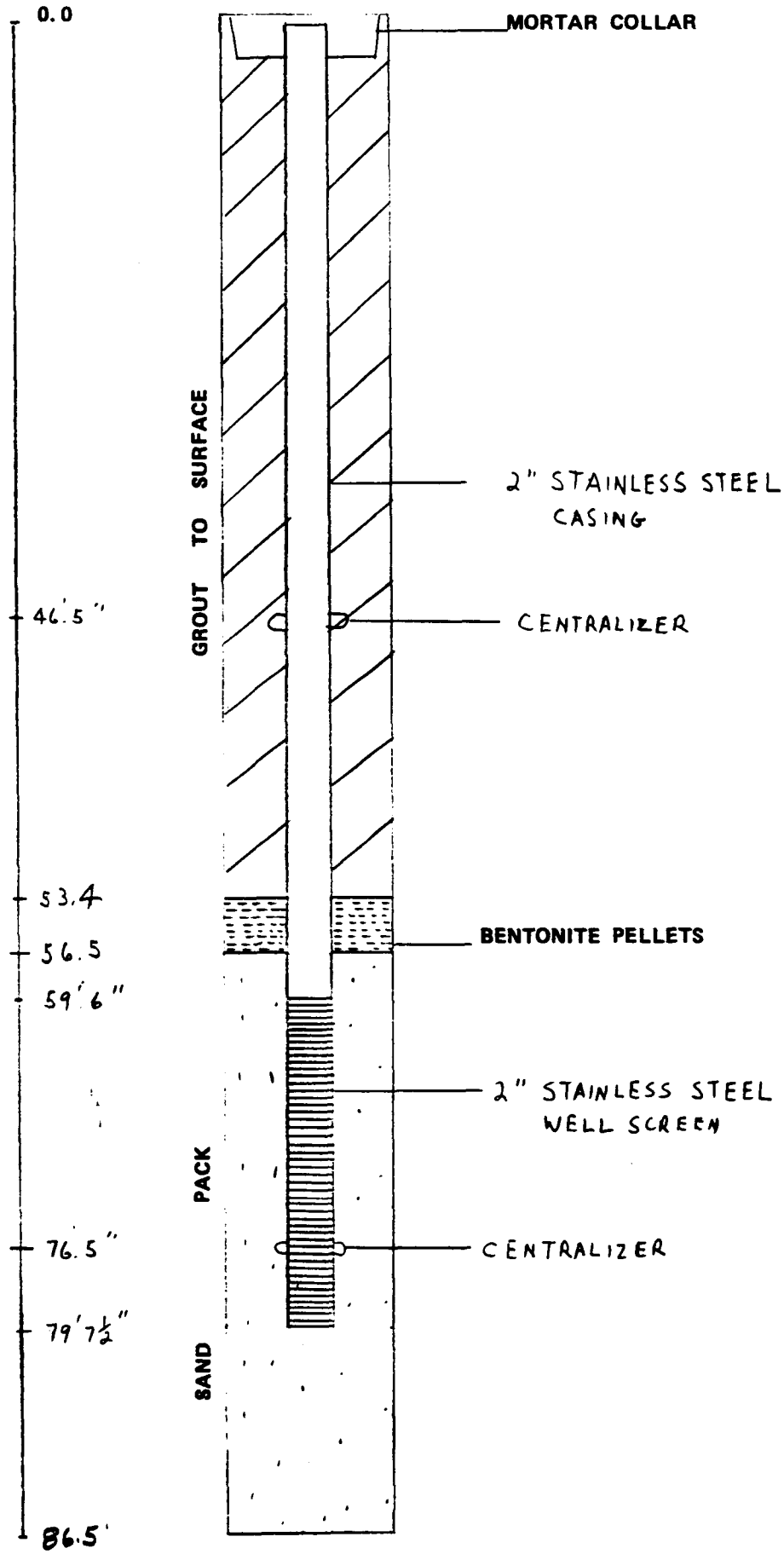
3/4 BUCKETS OF BENTONITE PELLETS

1/5 ~~LB~~ BENTONITE .50 Lb bag

7 BAGS OF CEMENT

Water Level

2' 4 1/2



W41B SITE 4 8/2/85

MOFFETT FIELD

10
20 SOLID CASING
5

10 WELL SCREEN
5

MATERIALS USED

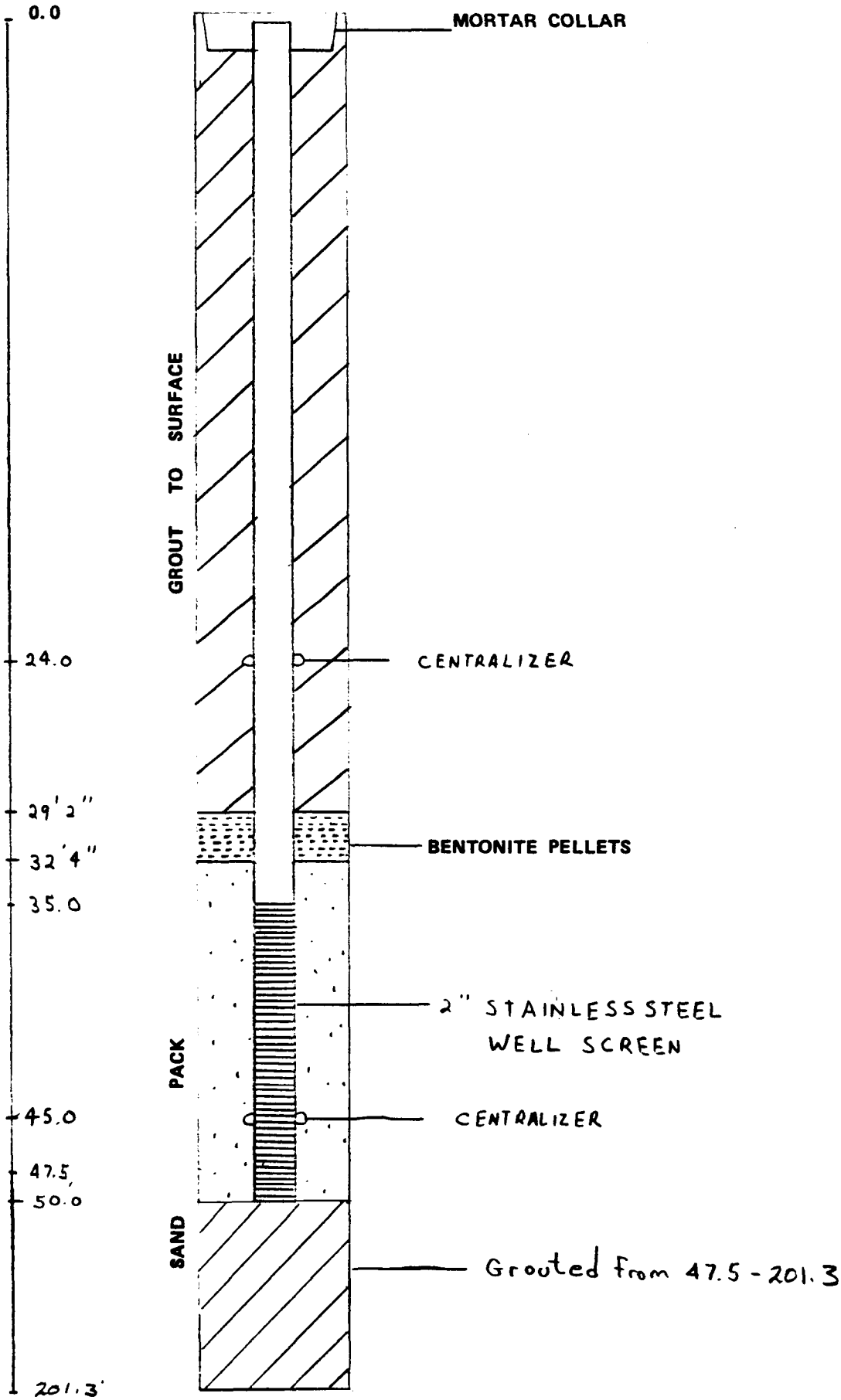
3.5 BAGS OF SAND

3/4 BUCKETS OF BENTONITE PELLETS

6 LB BENTONITE

5 BAGS OF CEMENT

Water Level
6' 6"



8/9/85

W6-1B SITE 6

3110-C

MOFFETT FIELD

20
5
10 SOLID CASING

10 WELL SCREEN

MATERIALS USED

4 BAGS OF SAND

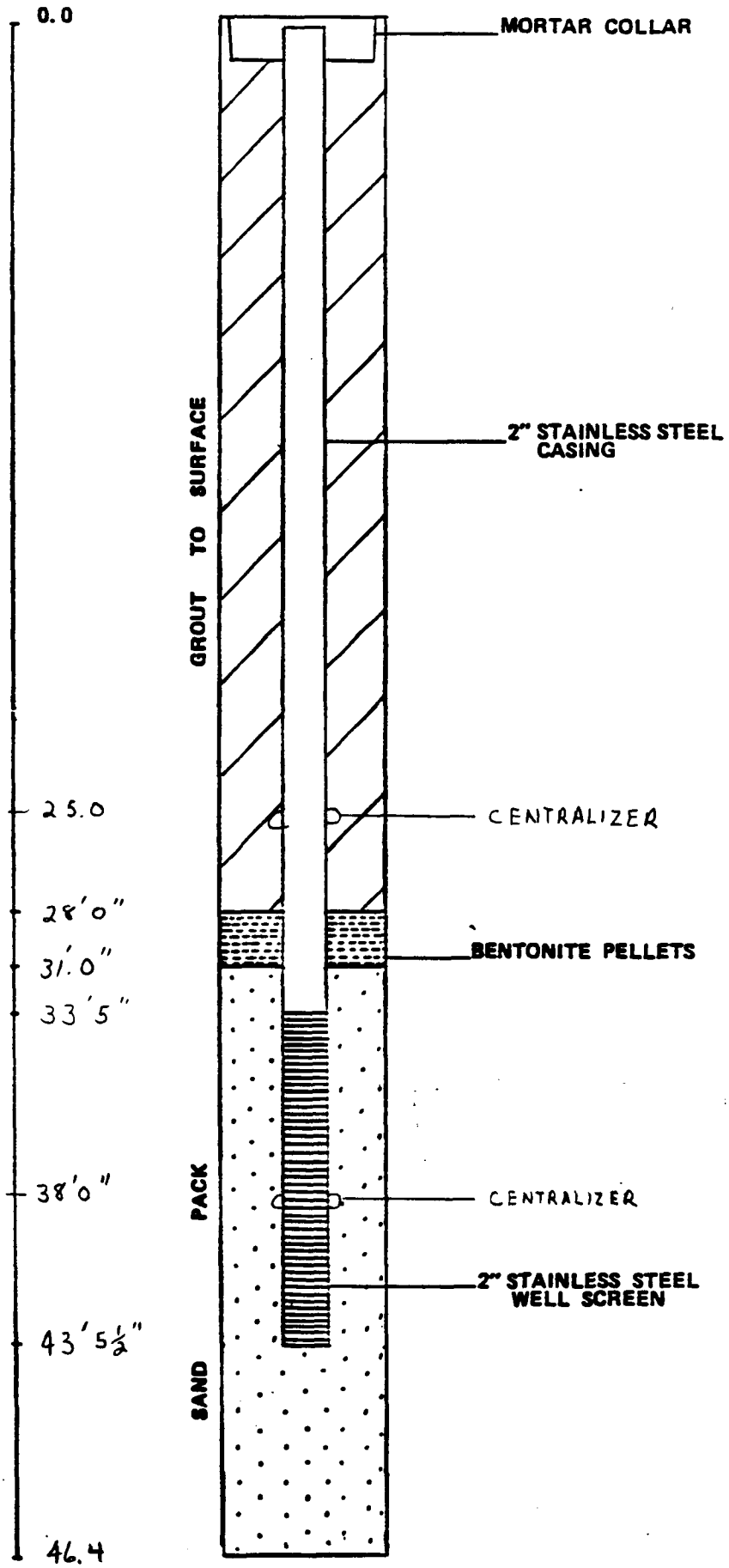
1 1/3 BUCKETS OF BENTONITE PELLETS

6 LB BENTONITE

4 BAGS OF CEMENT

WATER LEVEL

5' 6"

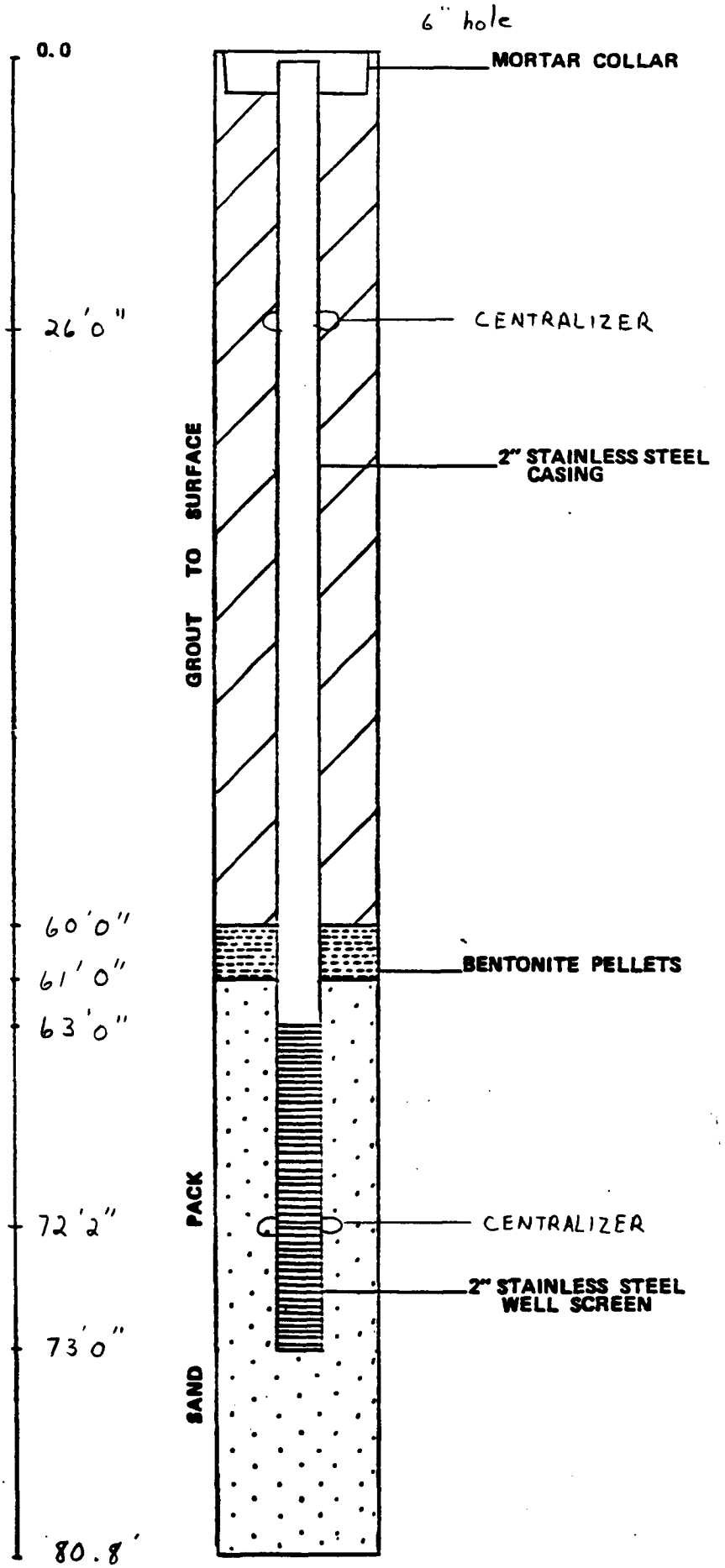


1/31/85

W7-3B SITE 7

3110-C

MOFFETT FIELD



5
20
20
20 SOLID CASING

10 WELL SCREEN

MATERIALS USED

3 BAGS OF SAND

1 BUCKETS OF BENTONITE PELLETS

½ LB BENTONITE

8 BAGS OF CEMENT

WATER LEVEL

8' 3½"

8/9/85

W10-1B

MOFFETT FIELD

10
10
20
10
5 SOLID CASING

5 WELL SCREEN
5

MATERIALS USED

5 BAGS OF SAND

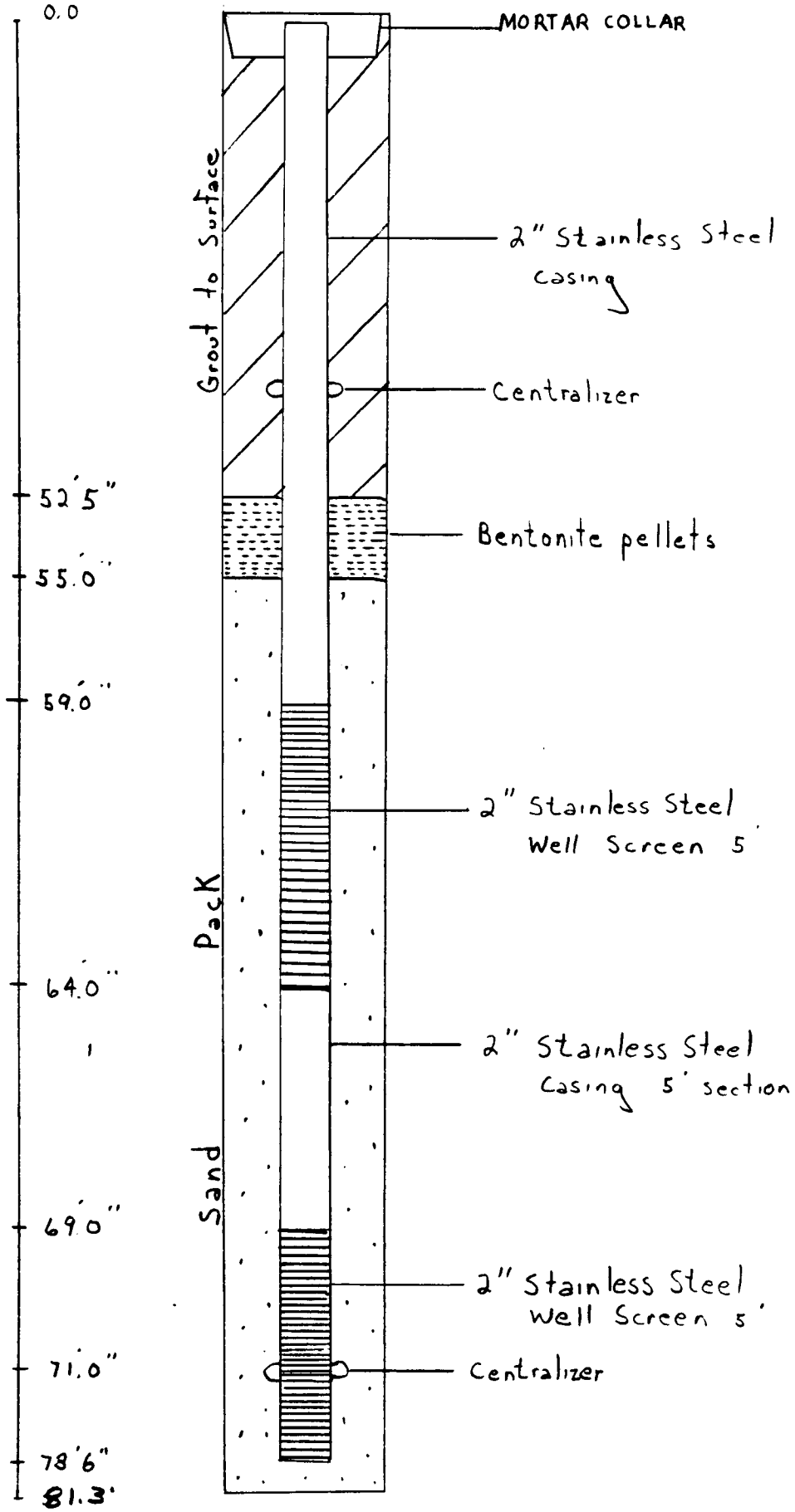
1/2 BUCKETS OF BENTONITE PELLETS

10 LB BENTONITE

6 BAGS OF CEMENT

Water Level

5' 5 1/2"



8/7/85

W102B SITE 10

3110-C

MOFFETT FIELD

0
10
10
10
10
10
10 SOLID CASING
10

5 WELL SCREEN
10

MATERIALS USED

3 BAGS OF SAND

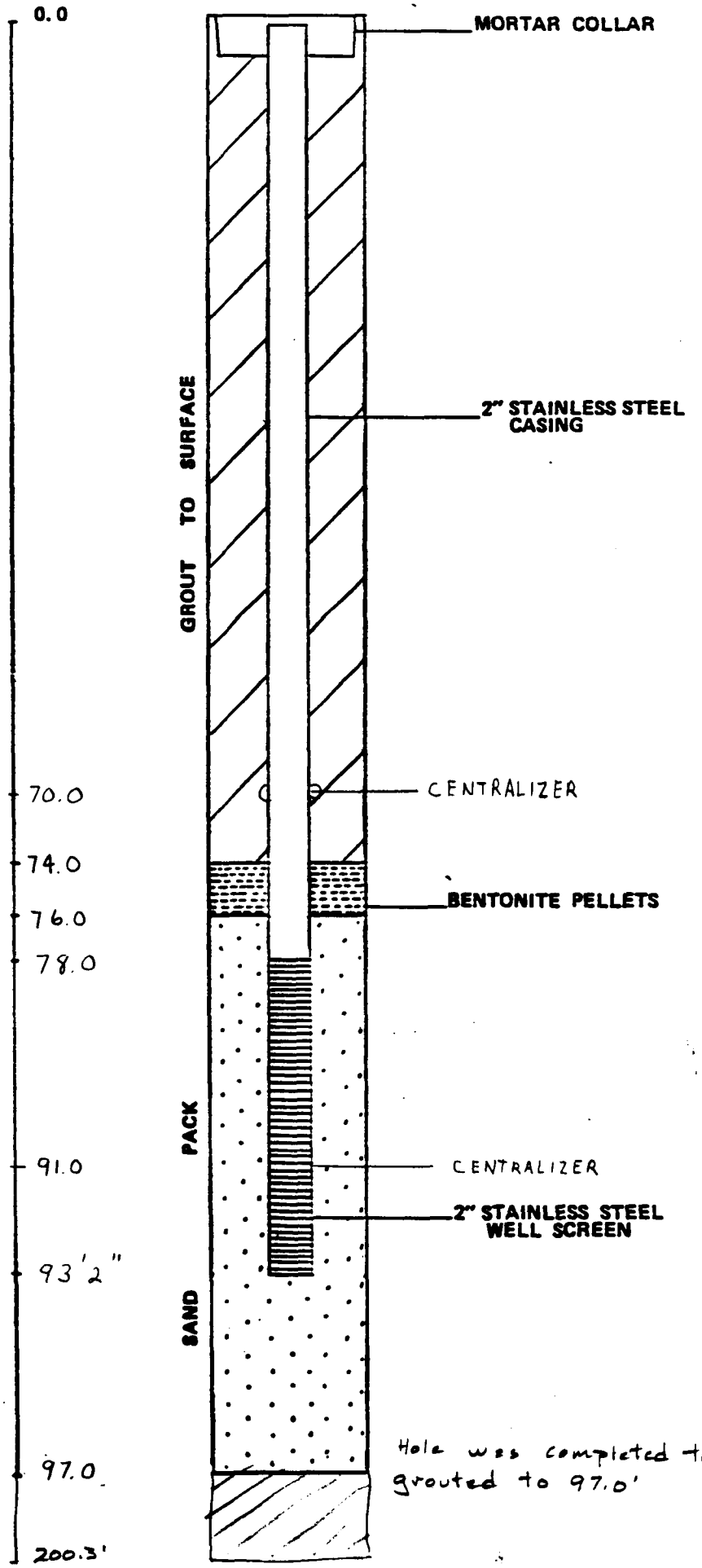
½ BUCKETS OF BENTONITE PELLETS

8 LB BENTONITE

6 BAGS OF CEMENT

WATER LEVEL

5' 0"



Hole was completed to 200.3' then grouted to 97.0'

8/5/85
W31C SITE 3
6" Casing set to 91'0"

MOFFETT FIELD

20
20
20
20
20
20 SOLID CASING
20
20
20
20

10 WELL SCREEN
10
5

MATERIALS USED

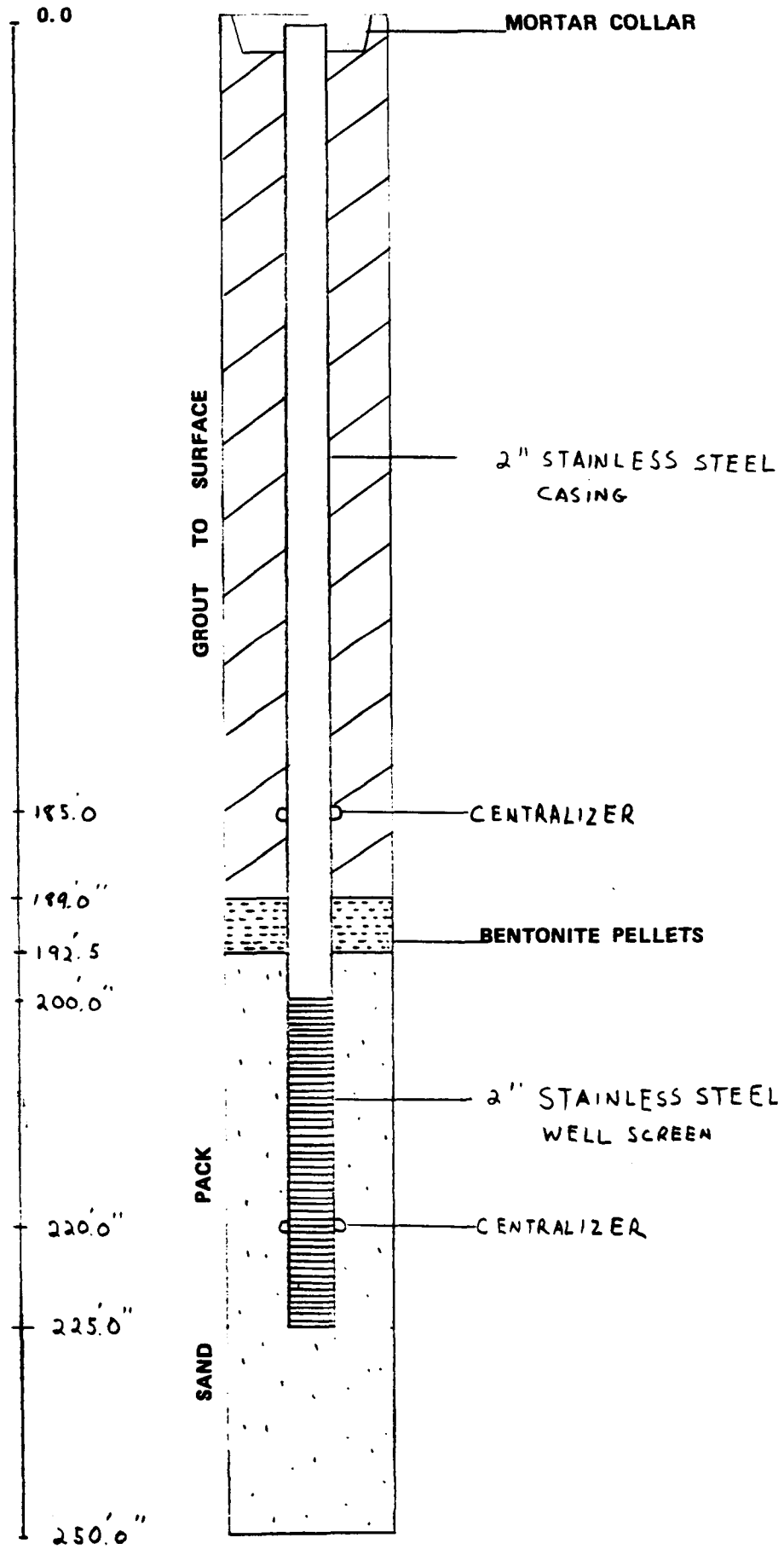
10 BAGS OF SAND

1/2 BUCKETS OF BENTONITE PELLETS

24 LB BENTONITE

16 BAGS OF CEMENT

Water Level
0' 0"
at top of casing



APPENDIX D

EXAMINATION OF AERIAL PHOTOGRAPHS AND PERFORMANCE OF MAGNETOMETER SURVEY AT GOLF COURSE LANDFILL SITE

SITE NO. 2

EXAMINATION OF AERIAL PHOTOGRAPHS AND PERFORMANCE OF MAGNETOMETER SURVEY AT GOLF COURSE LANDFILL SITE SITE NO. 2

The Golf Course Landfill Site, Site No. 2, was in operation from the 1940's to the 1960's. During this period between 75,000 to 150,000 gallons of toluene, methyl ethyl ketone, paint and TCE were dumped at this site.

The exact boundaries of the Golf Course Landfill Site shown in Figure A-3 are not well defined. Thus, two separate studies were carried out in an attempt to better define the lateral extent of the site. The studies consisted of the following:

1. Inspection of stereo pairs of aerial photographs taken of Moffett Field during the period of 1947 thru 1981.

2. Performance of a magnetometer survey at Site No. 2.

These two studies are described below.

INSPECTION OF AERIAL PHOTOGRAPHS

Various sets of aerial photographs taken of Moffett Field during the period of 1947 to 1977 were borrowed from Mr. Stephen Eikenberry of the U.S. Navy at Port Hueneme. A listing of the photographs loaned to ESA by Mr. Eikenberry is provided below:

Year	Month	Number of Photographs	Type
1947	November	2	black and white
1950	April	10	black and white
1956	June	8	black and white
1960	June	2	black and white
1963	September	8	black and white
1967	July	2	color
1977	March	3	black and white
1980	April	3	black and white
1981	May	2	black and white

A careful examination of these stereo photographs was made by Mr. Phil Frame and Dr. Timothy Hall of ESA. Although it could be noted that extensive backfilling operations had taken place at various times in the general area of the golf course, no clear distinction of the Site No. 2 landfill was visible from the photographs. Thus, the exact boundaries of Site No. 2 could not be established on the basis of the aerial photographs.

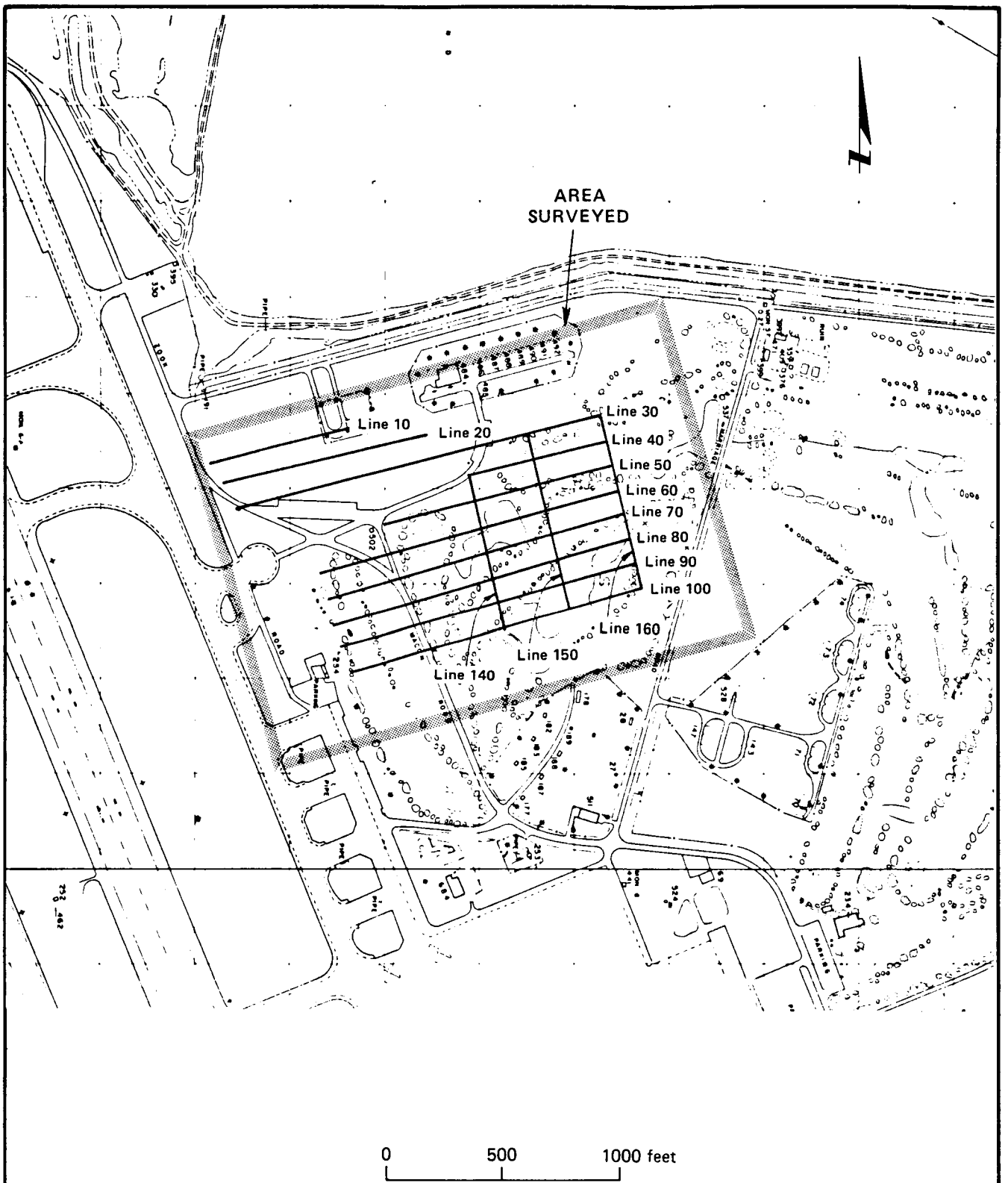
MAGNETOMETER SURVEY

The objective of the magnetometer survey conducted in the general area of Site No. 2 was to try to locate ferromagnetic materials which might have been buried within the golf course landfill dump site, and which might serve as an indicator of the lateral extent of the dump site.

The magnetometer survey was conducted over a period of three days (7/16/85 thru 7/18/85) by Mr. Kurt Nihei of ESA at the assumed location of Site No. 2 which includes the munitions and golf course areas. During the period of the survey the NOAA Space Environment Service in Boulder, Colorado forecasted low sunspot and low magnetic storm activity.

The magnetic field was measured using a proton precision magnetometer with a staff length of 8 feet (EG&G Geometrics G 856). Magnetic field readings were taken at 20 foot intervals along thirteen lines (surveyed using a compass). Ten lines trending N60E were spaced 100 feet apart, and three lines trending N30W were spaced 300 feet apart (see Figure D-1).

Statistical evaluation of the data, and profiles of magnetic readings for each of the thirteen lines were carried out using MAGPAC software and an IBM PC computer. A summary of the data is presented in Table D-1. Interpretation of the data was made without knowledge of the subsurface man-made features or the types of materials which exist at Site No. 2.



Earth Sciences Associates
Palo Alto, California

CONFIRMATION STUDY (VERIFICATION STEP)
MOFFETT FIELD NAS
LOCATION OF MAGNETIC SURVEY LINES

Checked by _____	Date _____	Project No.	Figure No.
Approved by _____	Date _____	3110D	D-1

Table D-1

SUMMARY OF MAGNETIC SURVEY DATA

Line No.	No. of Samples	Magnetic Readings Minimum	Maximum	Average
10	22	50,382.5	51,822.6	50,812.7
20	42	50,336.2	51,563.9	50,655.4
30	78	49,629.6	51,028.4	50,549.8
40	32	50,473.5	50,691.3	50,568.6
50	52	50,045.9	50,997.4	50,554.1
60	67	50,442.2	51,164.1	50,572.8
70	71	50,296.9	50,745.4	50,553.4
80	68	50,228.9	50,683.0	50,545.6
90	70	50,293.9	50,699.8	50,538.6
100	74	49,922.4	51,093.7	50,553.9
140	33	50,557.7	50,612.3	50,566.3
150	40	50,478.3	50,682.1	50,565.6
160	39	50,537.5	50,554.9	50,550.2
ALL	ALL	49,629.6	51,822.6	50,583.6

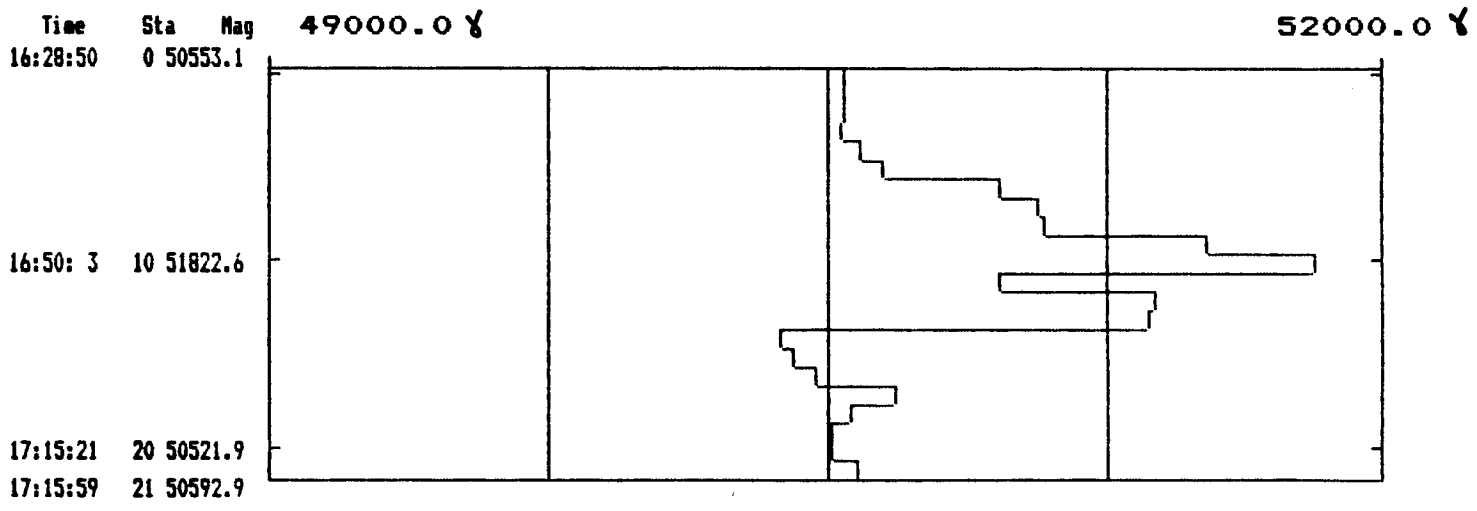
Profiles for each of the thirteen lines surveyed are plotted on the attached figures. Because of the nature of the surveyed area (previously a dump site) it is assumed that the magnetic anomalies shown on these profiles are due to man-made features. Possible features capable of producing anomalies of the magnitude detected include pipelines, well casing, well heads, steel drums and various other iron or steel objects.

By measuring the anomaly half-width at its half-height, the depth to the source can be determined for a particular model (e.g. dipole, monopole, line of poles, etc..). Furthermore, by using the magnitude of the anomaly, the mass of the source can also be determined for an assumed ferromagnetic material.

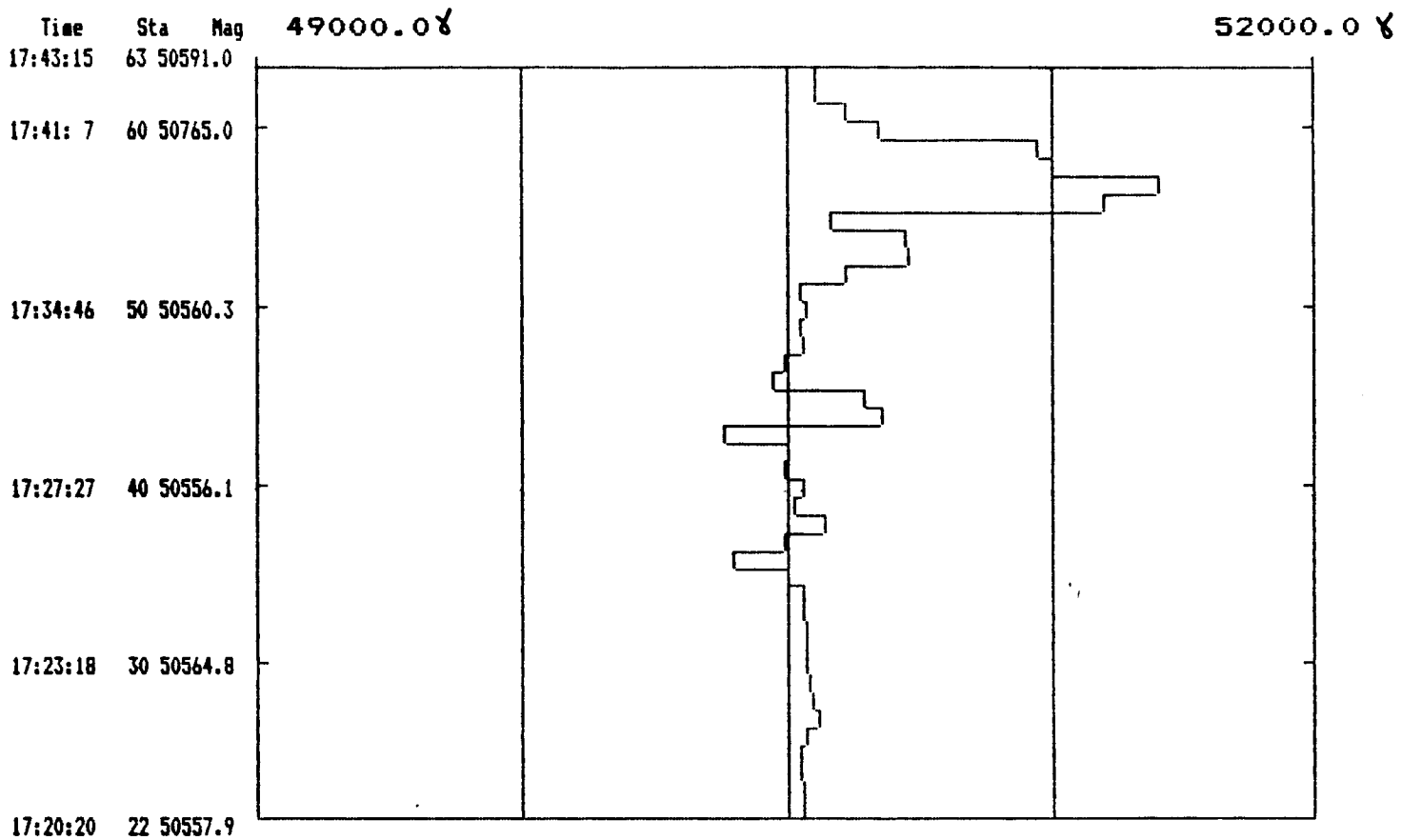
Profiles of the thirteen lines surveyed exhibit anomalies of both monopole and dipole shape, with magnitudes ranging from 50 gammas to 1300 gammas (1 gamma = 10E-5 Gauss). The most prominent anomaly is situated on lines 10, 20, and 30. This anomaly is most likely a large ferromagnetic body (e.g. 6" to 12" pipeline) at a depth no greater than 8 feet.

The lesser anomalies on the remaining 10 lines (10 gammas to 680 gammas) have narrow half-widths suggesting sources at shallow depths. Such anomalies could be produced by anything from a kilogram of iron to a 55 gallon steel drum.

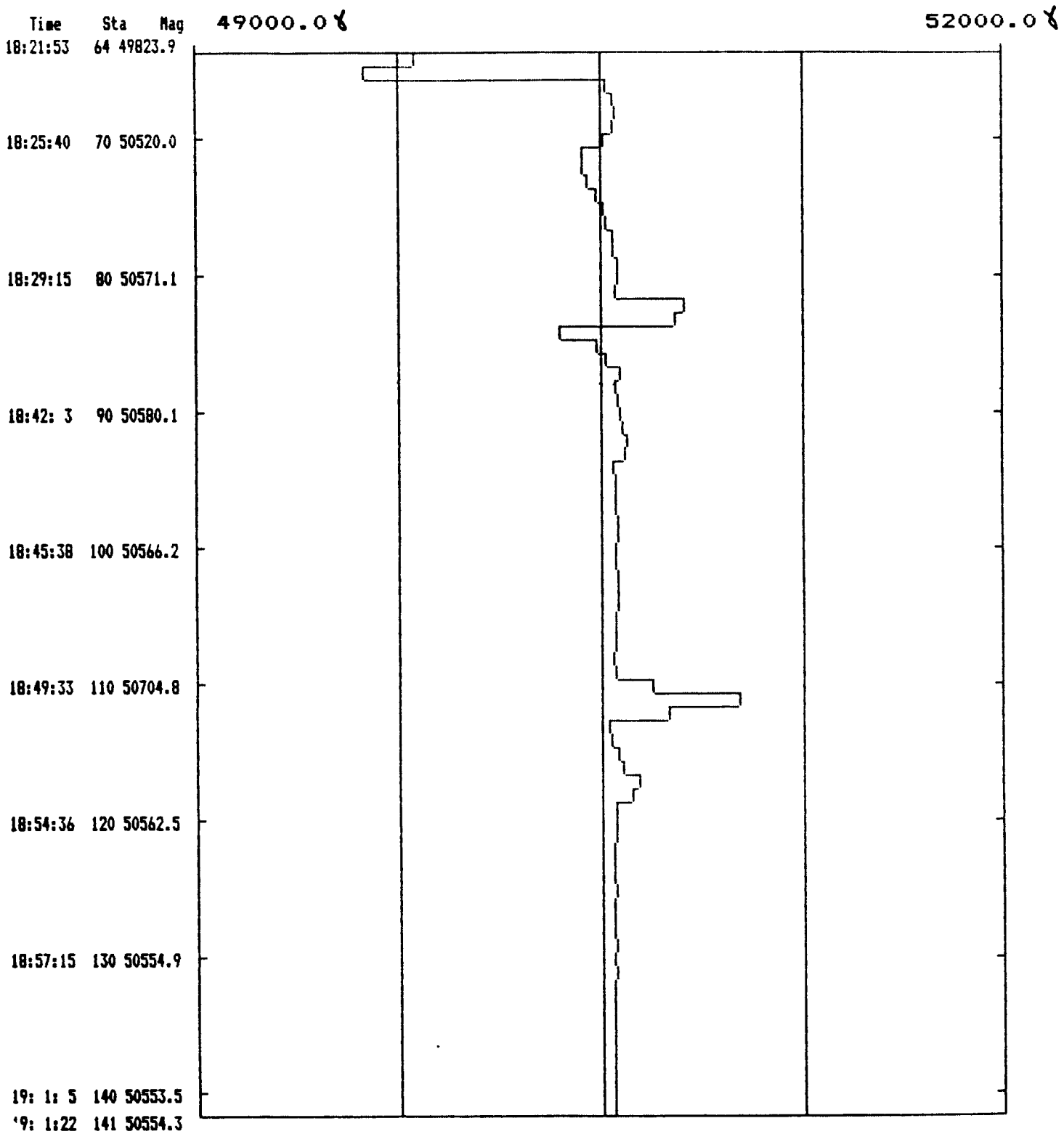
Based on the results of the magnetic survey there does not appear to be significant quantities of buried metallic materials present within the golf course landfill dump site. Thus, the information obtained from this survey did not provide any additional data from which the boundaries of Site No. 2 could be determined.



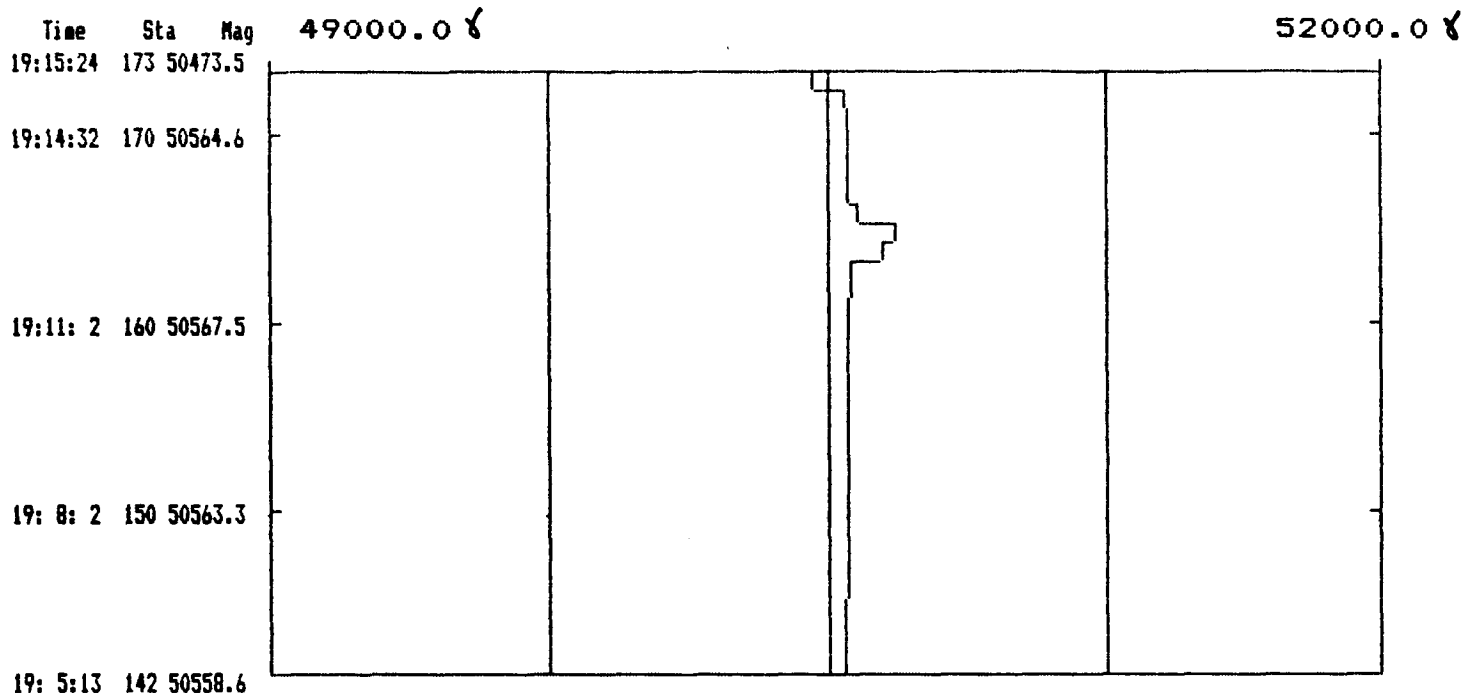
Profile - Line Number - 10



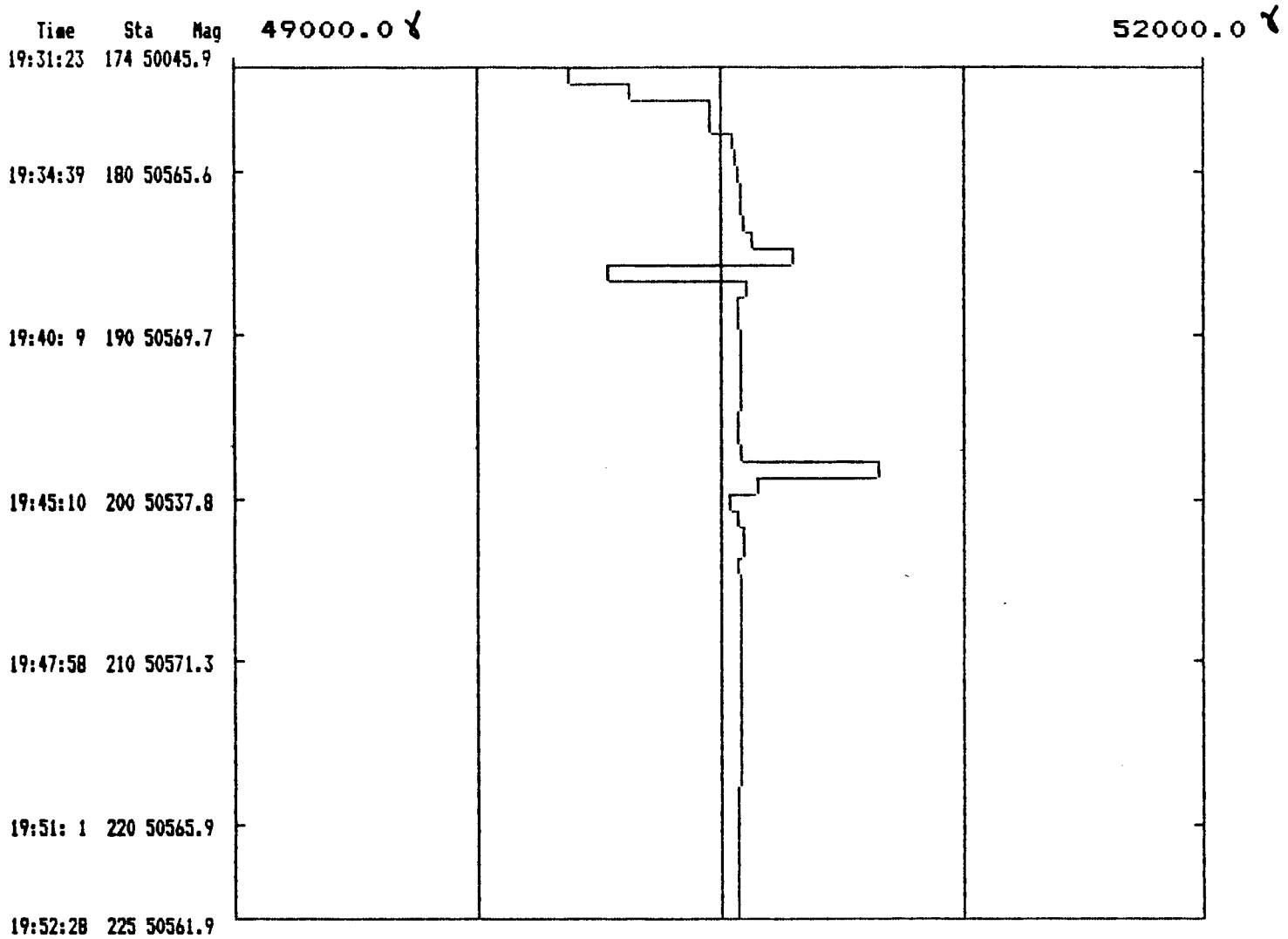
Profile - Line Number - 20



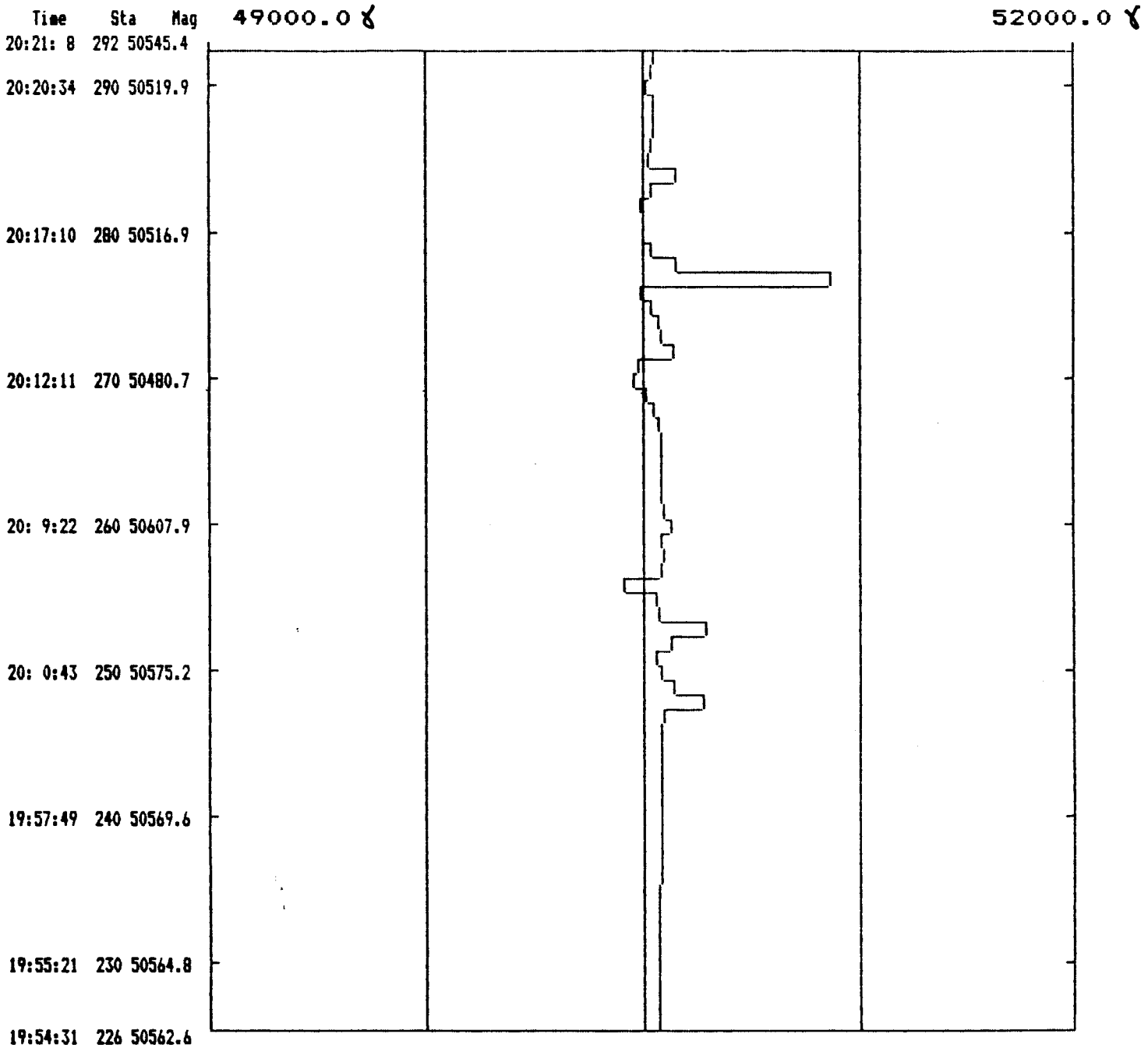
Profile - Line Number - 30



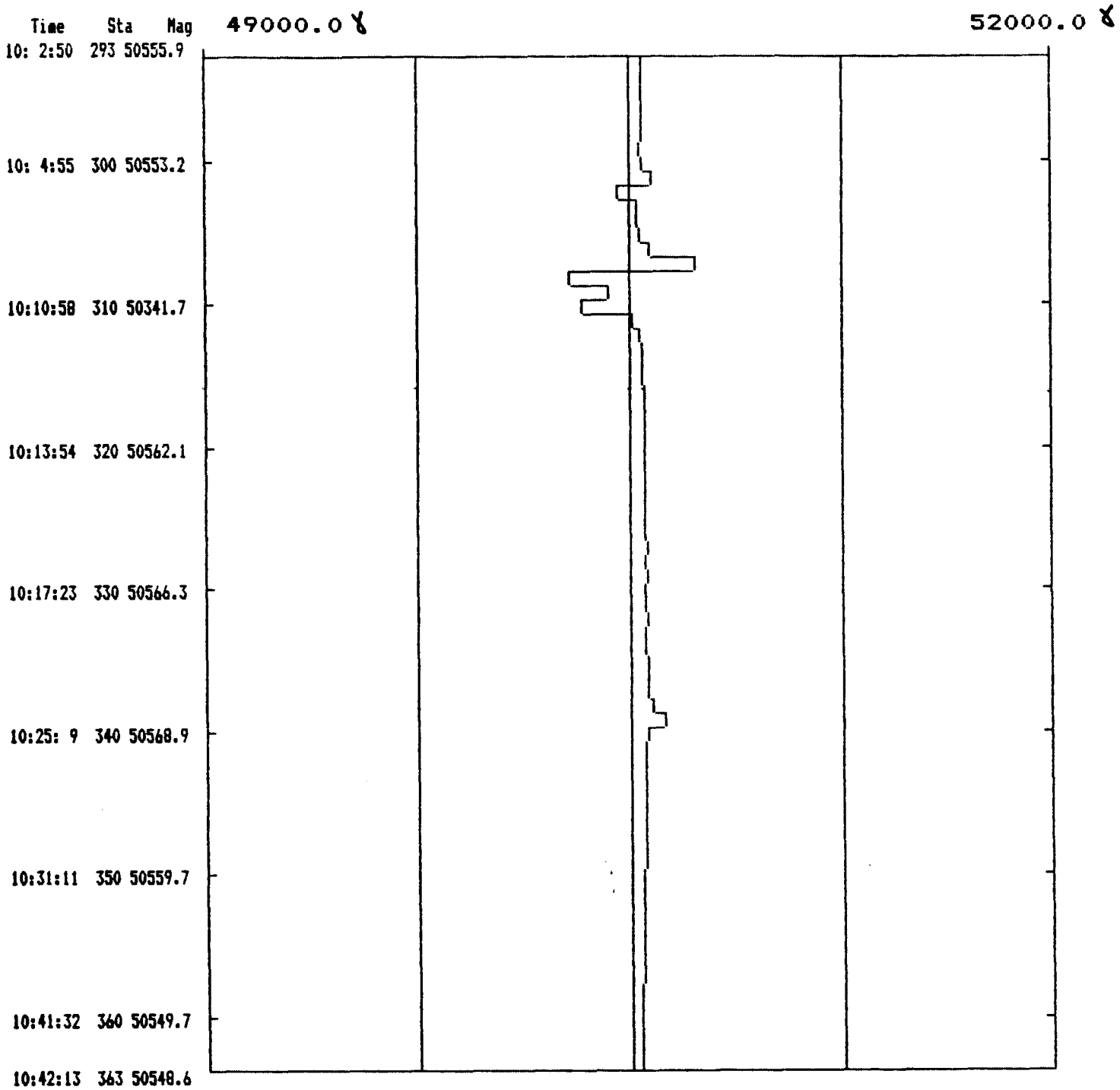
Profile - Line Number - 40



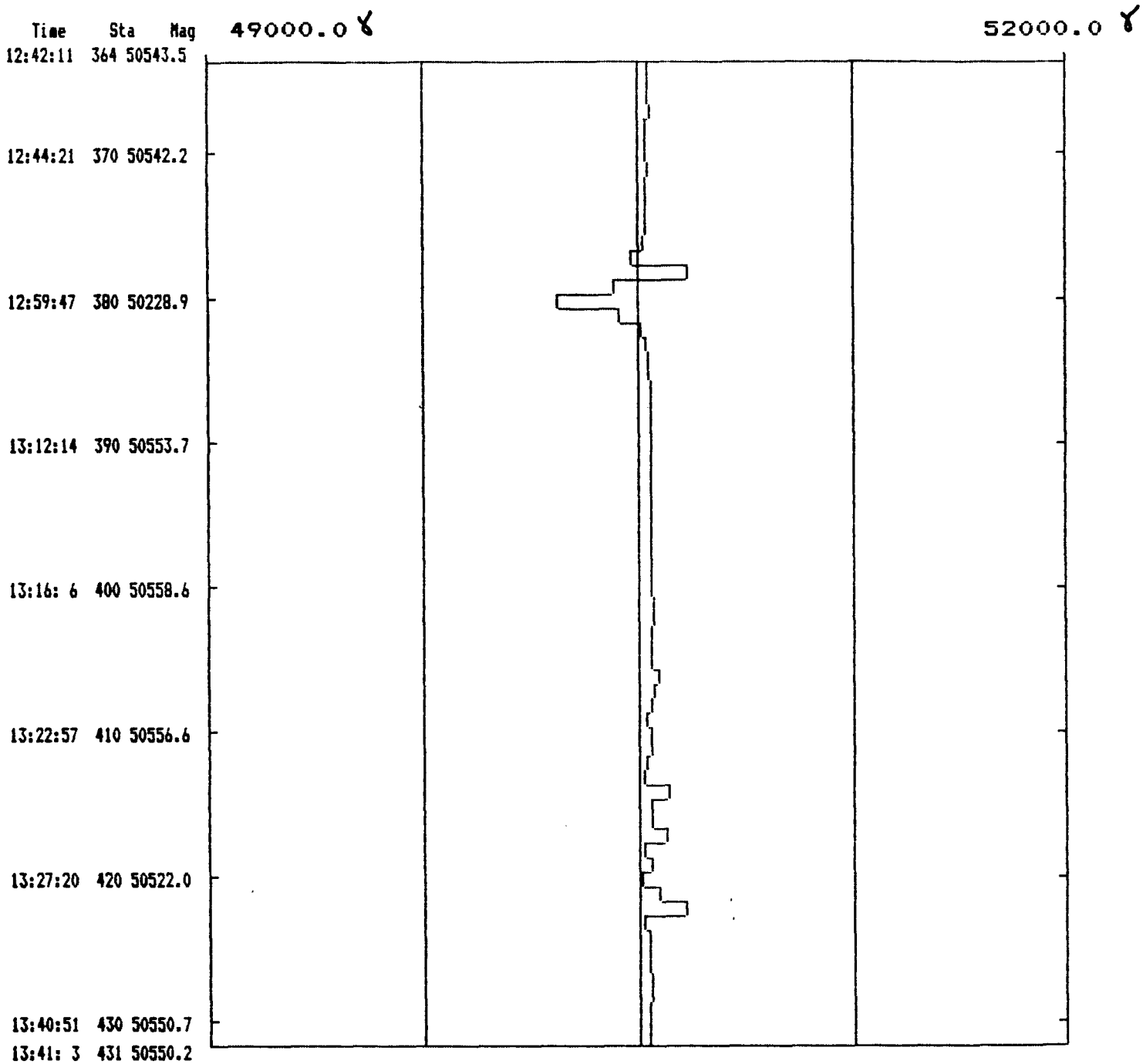
Profile - Line Number - 50



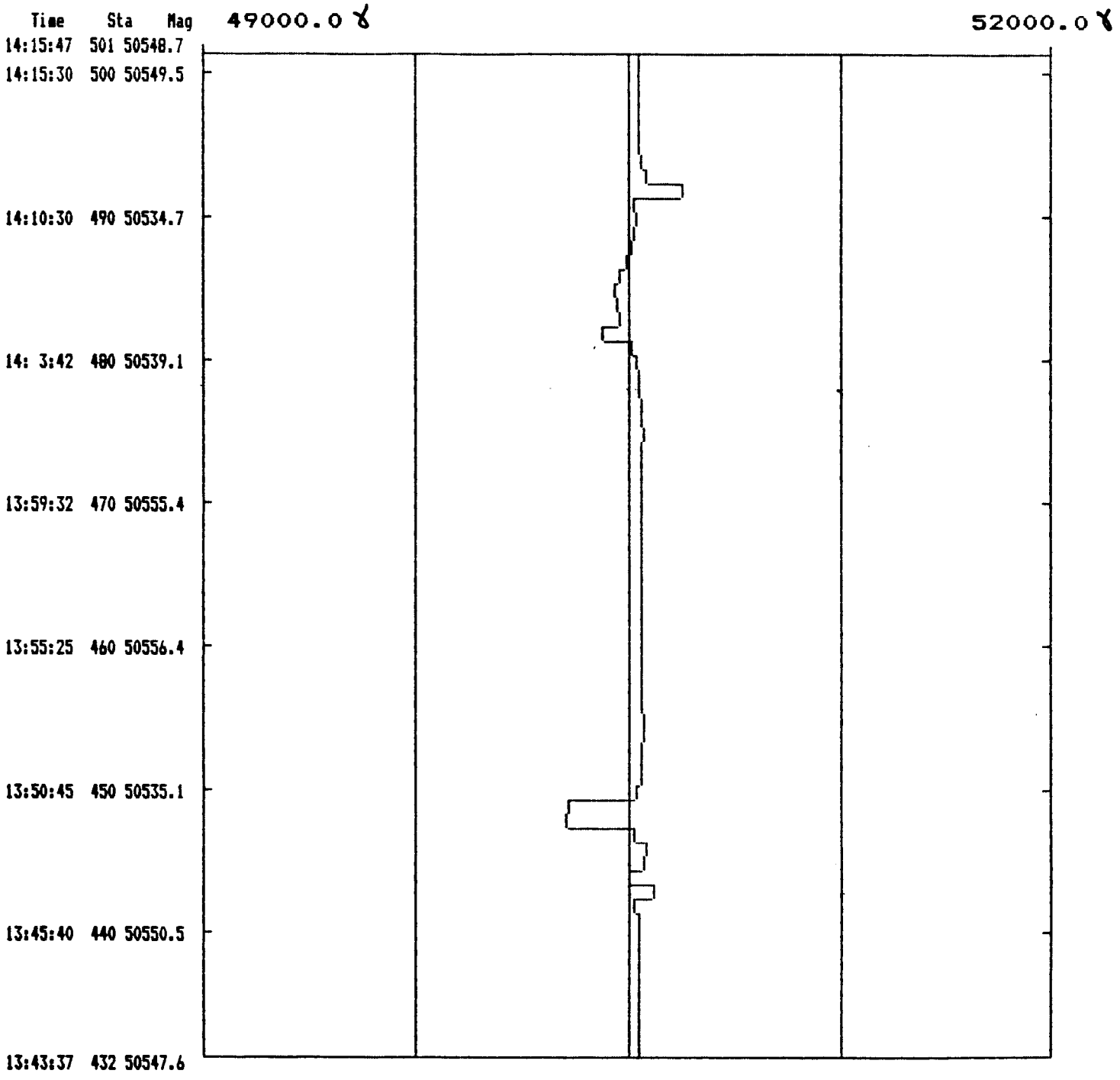
Profile - Line Number - 60



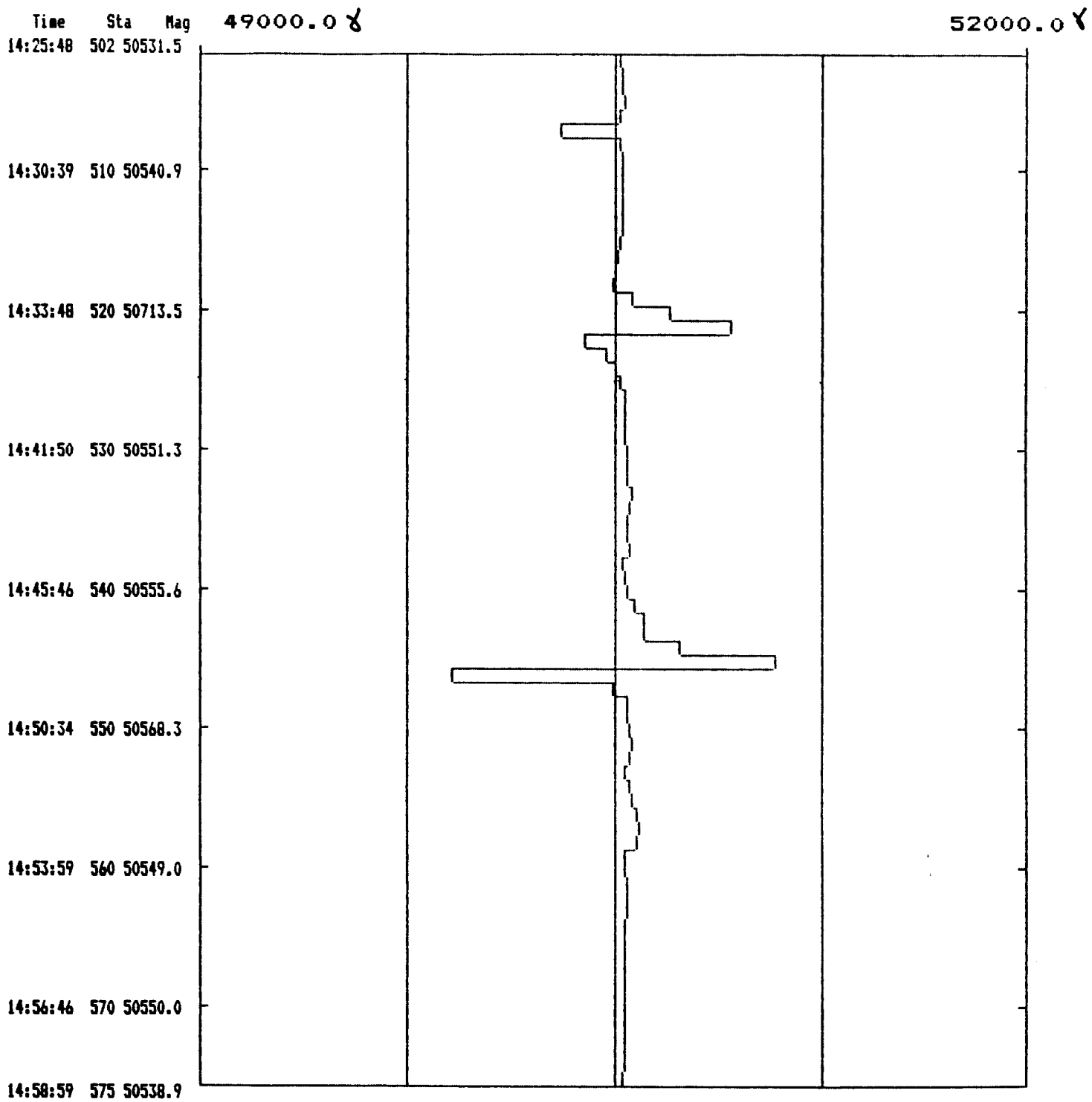
Profile - Line Number - 70



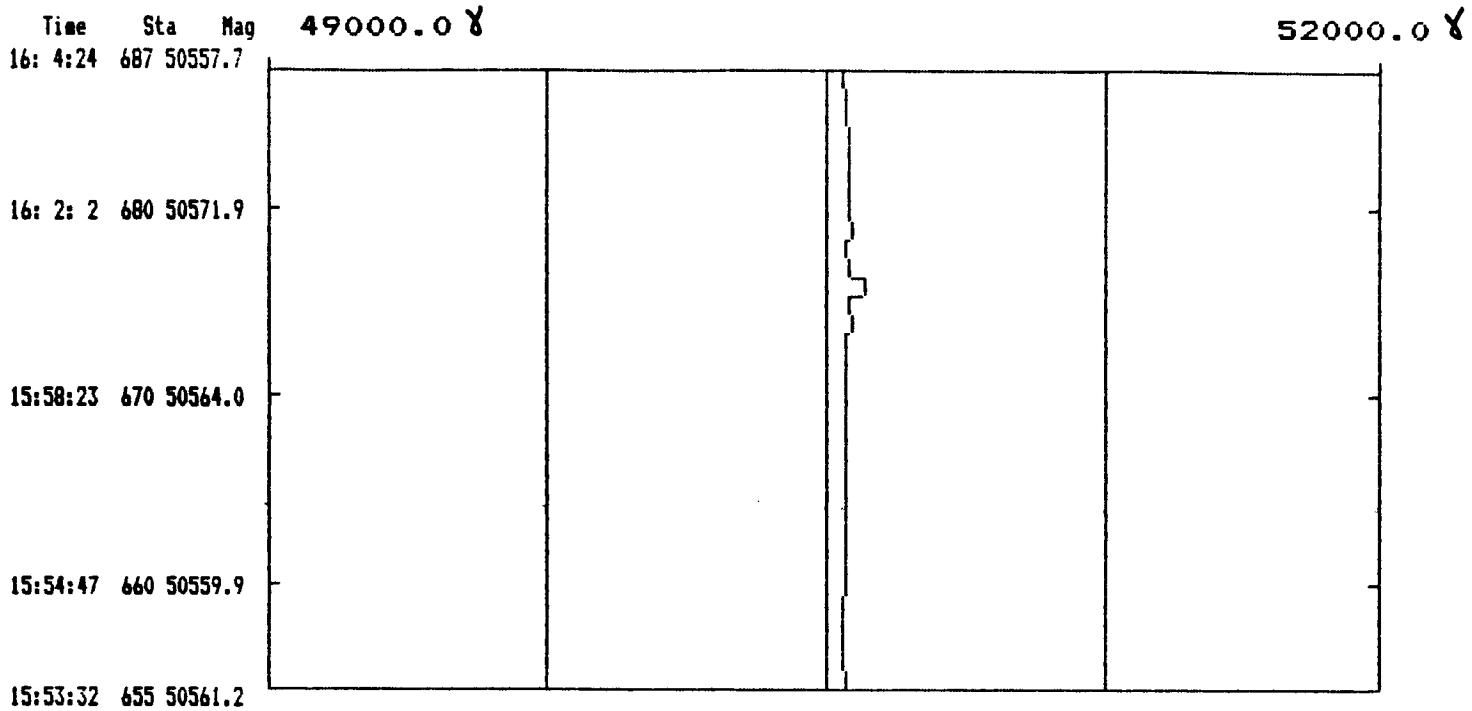
Profile - Line Number - 80



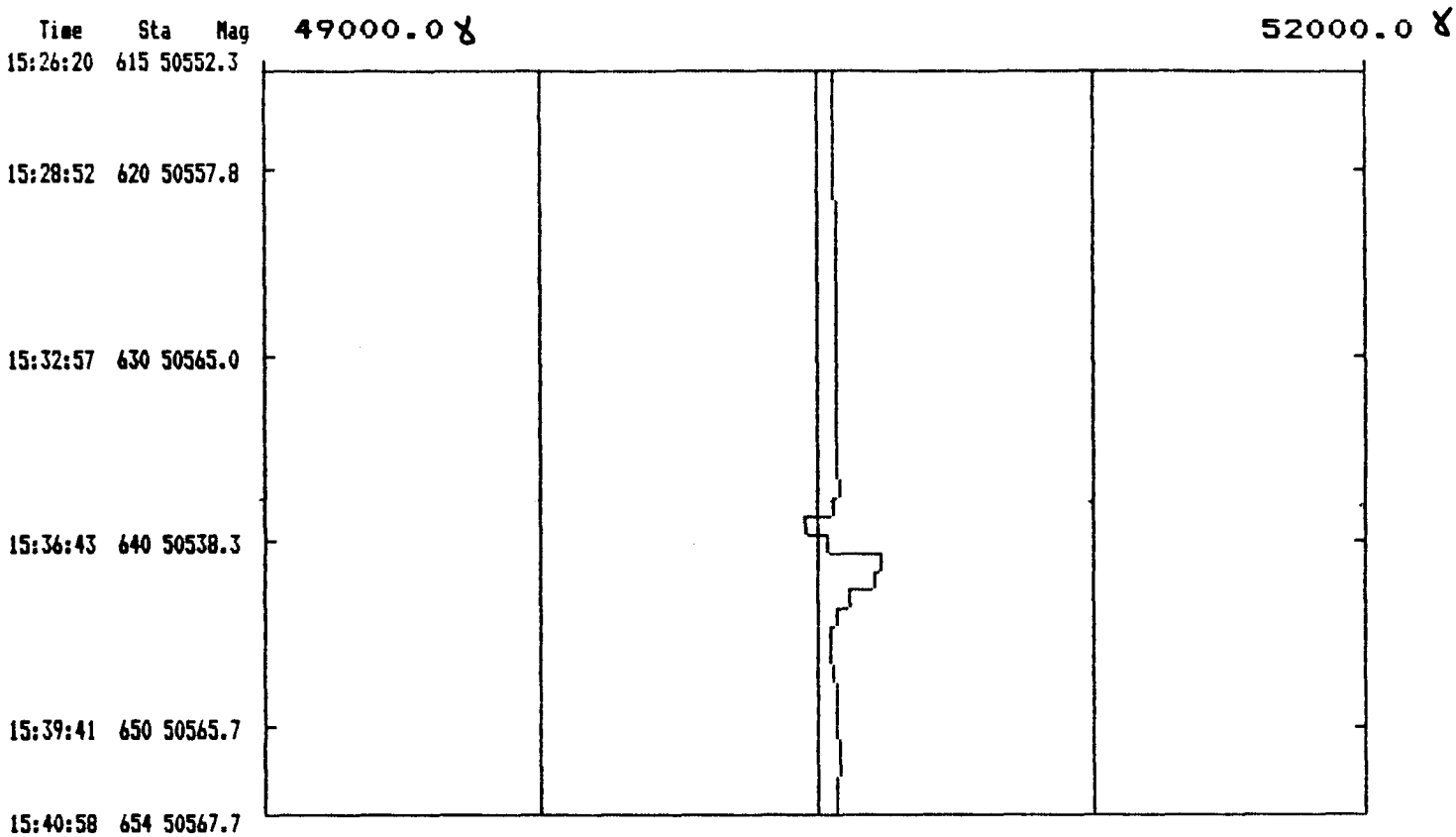
Profile - Line Number - 90



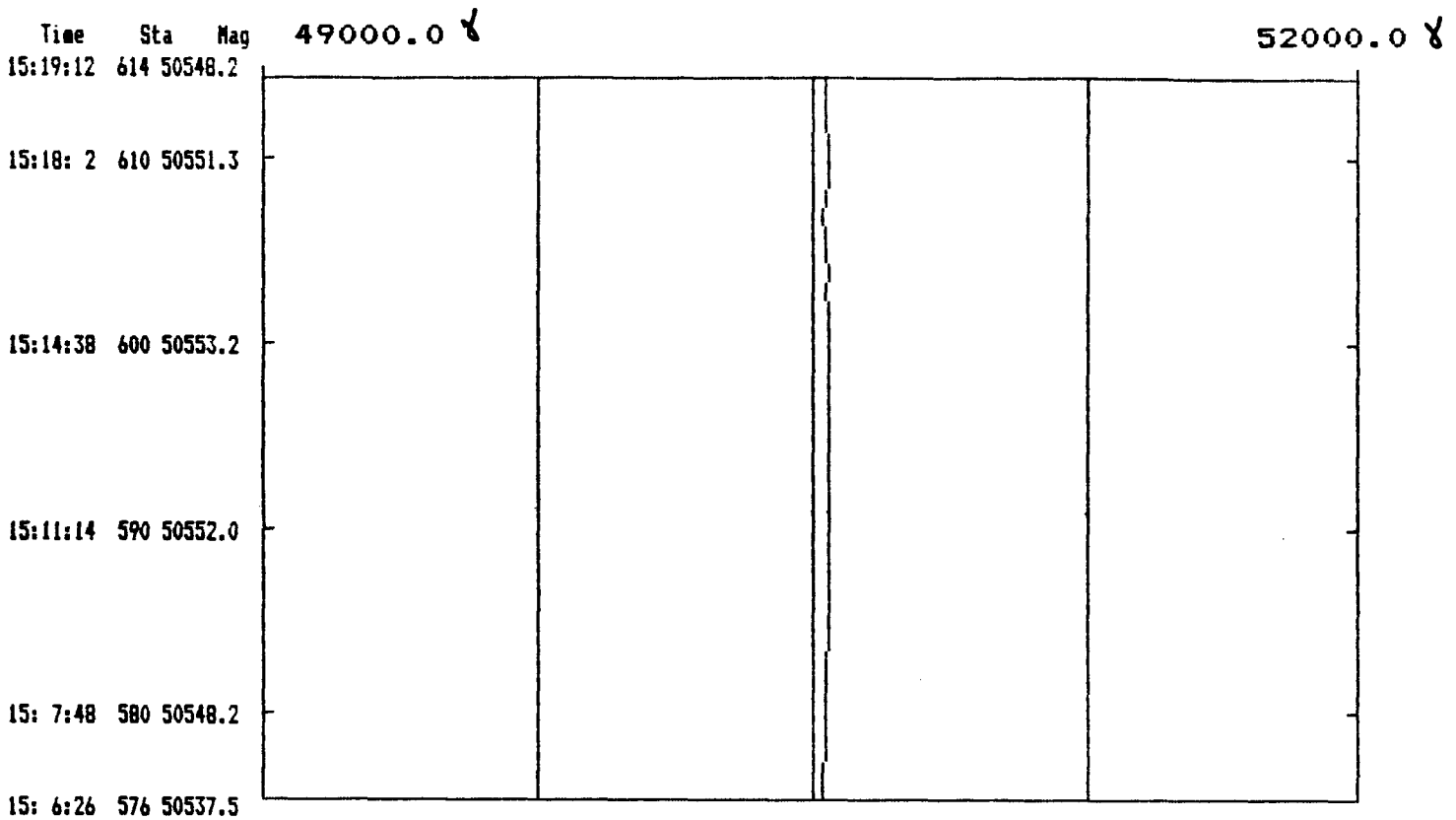
Profile - Line Number - 100



Profile - Line Number - 140



Profile - Line Number - 150



Profile - Line Number - 160

APPENDIX E

GROUNDWATER SAMPLING PROCEDURES

GROUNDWATER SAMPLING PROCEDURES

Three monthly groundwater samplings were carried out at Moffett Field NAS during the time periods shown on Table E-1. Also shown on this table are the number of wells sampled during each sampling period. This included the 33 new wells installed by ESA as part of this study, plus 17 of the existing wells previously installed by EMCON Associates.

TABLE E-1

SUMMARY OF GROUNDWATER SAMPLING AT MOFFETT FIELD NAS

Sampling Period	Sampling Dates	# of Wells Sampled	Remarks
1	Aug. 27-Sept. 18	51	Well W10-1A was sampled twice
2	Oct. 9-22	50	
3	Nov. 11-21	46	

Prior to sampling, each well was purged of from 2 to 10 casing volumes of water. Purging of the wells was done using a peristaltic pump and an air-lift pump. The peristaltic pump was used mainly for purging of the shallow "A" wells, whereas the air-lift pump was used for the "B" and "C" wells. All equipment and hoses were decontaminated using reagant methanol and distilled water after use in each well. Water obtained from purging of the wells was stored in 55 gallon metal drums. The content of these drums were later transported to the staging area at the north end of Site No. 2.

The total depth of the well and the depth to the water table in each well was measured and recorded during each sampling period. This information is tabulated on the accompanying tables together with pertinent purging data for each well.

Throughout the purging operations, temperature and conductivity measurements were made of the well water discharge using a portable meter. These parameters were monitored until they had stabilized which assures that the water contained within the well originates from the surrounding aquifer, and that the well has been completely purged of any stagnant water. For the "B" and "C" wells

where recharge was very slow the entire volume of water contained within the well casing was removed. The well was then allowed to recharge completely before purging. For these wells only 2 to 3 casing volumes were removed. All field temperature and conductivity readings taken after the first gallon purged, the final gallon purged, and at various points throughout the purging process are tabulated in the accompanying tables.

All temperature readings are in degrees Centigrade. All conductivity readings are expressed in units of micro-mhos per centimeter. Field conductivity measurements were not temperature compensated. The readings presented in the tables have been corrected by application of an appropriate correction factor. This correction factor is derived from calibration of the conductivity meter using a standard calibration solution (Y.S.I. #3163 - 10,000 micro mhos/cm at 25°C).

Calculation of the correction factor is in accordance with ASTM standard method 205 and is as follows:

$$\text{Correction Factor, } F = \frac{\text{Actual Calibration Solution Conductivity*}}{\text{Conductivity Meter Reading}}$$

* Calibration was performed as near as possible to 25°C, however, the conductivity of the standard solution was re-calculated to the actual temperature at the time of calibration.

$$F = \frac{9811.92}{9600}$$

Sample conductivity is then calculated for conductivity at 25°C.

$$K = \frac{K \times F}{1 + 0.0191\,(T_m - 25^{\circ})}$$

where,

K = sample conductivity at 25°C

K_m = measured conductivity

T_m = measured temperature of K_m

A water sample was also collected for pH measurement. This measurement is made in the field using an Orion portable pH meter with automatic temperature

compensation. The pH meter was calibrated daily using a standard buffer solution with a known pH. Values of pH are listed for each well sampled.

After purging of each well, sampling was immediately carried out using a stainless steel 1.66 inch diameter, 4 foot long single point source bailer. The bailer was thoroughly decontaminated between well samplings by rinsing with methanol and distilled water. Originally it had been planned to use a teflon bladder pump to perform the sampling. However, this would have required extensive decontamination of the pump and the teflon hoses which might not have been feasible. Based on discussions with Mr. Tom Berkins of the RWQCB, the use of a single point source bailer was adopted as an alternative sampling device. The bailer was carefully lowered by hand into the well by means of an attached stainless steel wire line. After filling, the bailer was carefully raised so as to reduce the possibility of agitating the water (which might cause an outgassing of volatile organics).

The number of required samples for analyses were obtained from each well and carefully transferred to pre-assigned bottles. For "heavy metals" testing, the sampled water was filtered by means of a vacuum pump prior to bottling in order to remove suspended solids. After all the sampling bottles were filled they were labelled and carefully packed into coolers containing padding and blue ice to insure that the samples would remain cool and not break during shipment. After completion of sampling for the day the coolers were taken to ESA's laboratory in Mountain View, California. There appropriate chain of custody forms were filled out for each cooler. The coolers were then labelled and taped for shipment to James M. Montgomery Laboratories in Pasadena, California. Each evening the samples obtained that day were picked up by an overnight courier service for delivery to Montgomery Laboratories the same day.

TABLE E-2
SUMMARY OF PARAMETERS FOR ANALYSIS
1ST SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 1

WELL NO	SAMPLE DATE	Ph	PP METALS	VOA	BNA	PCB	ORG Pb	N.N	TKN	ACID
MW-17A	8/27/85	7.02	1	2	1					1
MW-17B	8/27/85	7.82	1	2	1					1
MW-18	8/28/85	7.74	1	2	1					1
W3-1B	8/28/85	8.14	3	6	3					3
W3-1C	8/28/85	8.28	1	2	1					1
W3-2B	8/29/85	8.17	1	2	1					1
MW-19	8/29/85	7.25	1	2	1					1
W3-3B	8/29/85	8.80	1	2	1					1
MW-16	9/03/85	8.64	1	2	1					1
W4-1B	9/03/85	7.37	1	2	1					1
MW-12A	9/03/85	7.30	1	2	1					1
MW-12B	9/03/85	7.71	1	2	1					1
MW-1	9/04/85	7.15	1	2	1					1
MW-20B	9/05/85	7.85	1	2	1					1
MW-20A	9/05/85	7.22	1	2	1					1
W10-2B	9/05/85	11.21		2	1					1
W10-1B	9/05/85	8.14		2	1					1
MW-9	9/09/85	7.21	2	4	2					2
MW-11	9/09/85	7.29	1	2	1					1
MW-6	9/09/85	7.19	1	2	1					1
W6-1B	9/09/85	7.55	1	2	1					1
MW-7	9/09/85	7.31	1	2	1					1
MW-15	9/09/85	7.24	1	2	1					1
MW-4	9/10/85	6.93	1	2	1					1
W7-3B	9/10/85	8.55	1	2	1					1
MW-5	9/10/85	7.29	1	2	1					1

TABLE E-2
SUMMARY OF PARAMETERS FOR ANALYSIS
1ST SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 1

WELL NO	SAMPLE DATE	Ph	PP METALS	VOA	BNA	PCB	ORG Pb	N.N	TKN	ACID
W10-2A	9/10/85	7.30		2	1					1
W2-1A	9/11/85	7.50	3	6	3	3		3	3	3
W10-1A	9/11/85	7.41		2	1					1
W6-1A	9/11/85	7.32	1	2	1					1
W7-1A	9/11/85	7.50	1	2	1					1
W7-2A	9/11/85	7.31	1	2	1					1
W4-1A	9/12/85	7.22	1	2	1					1
W3-1A	9/12/85	7.19	1	2	1	1		1	1	1
W3-3A	9/12/85	7.02	1	2	1			1	1	1
W3-2A	9/12/85	6.96	1	2	1			1	1	1
W2-3A	9/12/85	7.41	1	2	1	1		1	1	1
W2-2A	9/12/85	7.01	1	2	1	1		1	1	1
W9-2A	9/16/85	7.62		2	1		1			1
W1-1A	9/16/85	7.18	1	2	1	1		1	1	1
W1-2A	9/16/85	6.85	1	2	1	1		1	1	1
W1-3A	9/16/85	7.01	1	2	1	1		1	1	1
W1-4A	9/16/85	6.90	1	2	1	1		1	1	1
W4-2A	9/17/85	7.19	1	2	1					1
W9-1A	9/17/85	7.15		2	1		3			1
W10-1A	9/17/85	7.40			1					1
W5-1A	9/17/85	7.58		2	1		1			1
W5-2A	9/17/85	7.27		2	1		1			1
W5-3A	9/17/85	7.64		2	1		1			1
W7-3A	9/18/85	7.23	1	2	1					1
W8-1A	9/18/85	7.22	3	2	1	1				1

TABLE E-3
WELL PURGING DATA
1ST SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 1

WELL NO	DEPTH OF WELL (FT)	WATER TABLE DEPTH (FT)	STARTING TIME	ENDING TIME	RECHARGE TIME	VOLUMES (GAL)	CASING VOLUMES
M17-A	14.5	4.8	16:30	16:40	CONTINUOUS	8.0	5
M17-B	72.2	3.2	17:00	17:40	CONTINUOUS	56.0	5
MW-18	18.1	4.4	8:00	8:15	CONTINUOUS	12.0	5
W3-1B	79.0	2.8	8:30	11:00	@ 30 min	65.0	5
W3-1C	225.0	0.0	8/27-8/28	~10 hrs	@ 60 min	75.0	2
W3-2B	80.3	0.9	8/28-8/29	~ 5 hrs	@ 2 hrs	20.0	2
MW-19	18.1	2.6	11:00	11:15	CONTINUOUS	13.0	5
W3-3B	79.6	2.2	12:00	15:00	CONTINUOUS	63.0	5
MW-16	19.1	6.5	8:35	8:50	CONTINUOUS	11.0	5
W4-1B	50.8	6.4	8:15	9:45	AIR PUMP CONTINUOUS	50.0	5
MW-12A	34.0	13.6	13:00	13:30	CONTINUOUS	17.0	5
MW-12B	43.5	13.6	13:45	14:30	CONTINUOUS	25.0	5
MW-1	15.5	8.1	14:15	14:25	CONTINUOUS	10.0	5
MW-20B	67.8	5.1	9:45	10:45	CONTINUOUS	52.0	5
MW-20A	23.7	5.2	11:30	11:45	CONTINUOUS	16.0	5
W10-2B	93.2	5.0	9:00	13:00	AIR PUMP CONTINUOUS	72.0	5
W10-1B	73.5	5.5	14:30	16:00	CONTINUOUS	55.0	5
MW-9	16.0	6.8	8:25	8:35	CONTINUOUS	15.0	10
MW-11	15.8	5.0	10:20	10:30	CONTINUOUS	15.0	10
MW-6	15.6	5.4	11:05	11:15	CONTINUOUS	15.0	10
W6-1B	43.5	5.5	11:45	12:30	CONTINUOUS	45.0	8
MW-7	15.7	6.5	13:45	13:55	CONTINUOUS	14.0	10
MW-15	18.6	6.2	14:45	15:00	CONTINUOUS	14.0	7
MW-4	15.5	9.3	8:45	9:00	CONTINUOUS	10.0	10
W7-3B	73.0	8.3	8:30	10:30	AIR PUMP CONTINUOUS	53.0	5
MW-5	24.3	6.8	11:45	12:00	CONTINUOUS	15.0	5

TABLE E-3
WELL PURGING DATA
1ST SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD

RUN # 1

WELL NO	DEPTH OF WELL (FT)	WATER TABLE DEPTH (FT)	STARTING TIME	ENDING TIME	RECHARGE TIME	VOLUMES (GAL)	CASING VOLUMES
W10-2A	30.8	5.3	14:00	14:20	CONTINUOUS	20.0	5
W2-1A	19.6	6.3	8:30	8:45	CONTINUOUS	20.0	10
W10-1A	30.3	6.5	11:30	11:45	CONTINUOUS	20.0	5
W6-1A	25.0	6.7	12:50	13:00	CONTINUOUS	15.0	5
W7-1A	30.6	5.3	14:30	14:45	CONTINUOUS	20.0	5
W7-2A	31.0	5.3	15:25	15:40	CONTINUOUS	21.0	5
W4-1A	20.5	6.0	8:15	8:30	CONTINUOUS	20.0	10
W3-1A	19.6	5.4	9:30	9:40	CONTINUOUS	20.0	10
W3-3A	18.1	4.0	11:00	11:10	CONTINUOUS	20.0	10
W3-2A	15.4	2.6	13:00	13:10	CONTINUOUS	20.0	10
W2-3A	20.9	4.8	13:55	14:05	CONTINUOUS	15.0	6
W2-2A	25.6	7.0	15:00	15:10	CONTINUOUS	15.0	5
W9-2A	31.4	8.1	8:30	8:50	CONTINUOUS	20.0	5
W1-1A	26.0	5.9	10:45	11:00	CONTINUOUS	20.0	6
W1-2A	26.2	7.4	12:00	12:20	CONTINUOUS	18.0	6
W1-3A	36.2	19.2	13:45	14:00	CONTINUOUS	14.0	5
W1-4A	15.8	4.7	16:30	16:45	CONTINUOUS	15.0	8
W4-2A	20.3	8.1	7:50	8:00	CONTINUOUS	15.0	8
W9-1A	31.3	8.5	8:55	9:15	CONTINUOUS	20.0	5
W10-1A	30.3	6.5	10:10	10:25	CONTINUOUS	20.0	5
W5-1A	32.3	7.5	11:45	12:05	CONTINUOUS	20.0	5
W5-2A	30.7	11.3	13:25	13:45	CONTINUOUS	10.0	3
W5-3A	30.4	6.7	14:40	14:55	CONTINUOUS	20.0	5
W7-3A	26.0	8.7	9:00	9:15	CONTINUOUS	15.0	5
W8-1A	30.7	8.6	10:20	10:35	CONTINUOUS	18.0	5

TABLE E-4
TEMPERATURE & CONDUCTIVITY MEASUREMENTS
1ST SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD

RUN # 1

WELL NO	TEMPERATURE (C°) / CONDUCTIVITY* (uMHOS/CM)				
	START				END
MW17-A	18.3 / 3317				19.9 / 2435
MW17-B	17.8 / 687				19.8 / 502
MW-18	20.0 / 3164				19.2 / 5494
W3-1B	17.9 / 686				19.2 / 667
W3-1C	18.9 / 434				19.0 / 431
W3-2B	22.5 / 837				17.3 / 815
MW-19	20.9 / 3804				19.3 / 3785
W3-3B	19.8 / 1237				20.0 / 1107
MW-16	19.2 / 1517	19.8 / 1532		20.0 / 1514	20.1 / 1522
W4-1B	17.8 / 571	18.4 / 592	19.8 / 658	20.1 / 668	20.1 / 679
MW-12A	22.3 / 776	22.5 / 1181		21.9 / 1217	20.2 / 1260
MW-12B	21.5 / 964	21.8 / 969	21.5 / 986	21.5 / 980	21.5 / 986
MW-1	22.8 / 1227	21.8 / 1285		21.8 / 1285	21.8 / 1285
MW-20B	20.5 / 477	20.8 / 495	20.3 / 494	20.3 / 494	20.4 / 493
MW-20A	22.2 / 1706	21.8 / 1720		21.8 / 1720	21.8 / 1720
W10-2B	20.0 / 443	20.2 / 360	20.5 / 362	20.5 / 380	20.5 / 386
W10-1B	21.0 / 372	21.5 / 451	21.4 / 461	21.3 / 462	21.3 / 462
MW-9	20.4 / 1277	20.6 / 1428	20.6 / 1395	20.6 / 1395	20.6 / 1395
MW-11	19.1 / 1348	19.2 / 1322		19.2 / 1322	19.2 / 1322
MW-6	20.9 / 1320	20.9 / 1309		20.9 / 1331	20.9 / 1331
W6-1B	20.1 / 699	20.2 / 1125	20.0 / 1119	20.0 / 1130	20.0 / 1130
MW-7	20.0 / 1277	20.3 / 1258		20.5 / 1264	20.5 / 1264
MW-15	20.6 / 1172		20.8 / 1167		20.8 / 1278
MW-4	19.8 / 1294	20.0 / 1356	20.0 / 1345	20.0 / 1345	20.0 / 1345
W7-3B	17.2 / 471	17.7 / 491	17.7 / 491	17.8 / 489	17.8 / 489
MW-5	20.8 / 1478	21.0 / 1439		21.0 / 1428	21.0 / 1428

* READINGS REPORTED AT 50000 WERE GREATER THAN THE RANGE OF THE CONDUCTIVITY METER

TABLE E-4
TEMPERATURE & CONDUCTIVITY MEASUREMENTS
1ST SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 1

WELL NO	TEMPERATURE (C°) / CONDUCTIVITY* (uMHOS/CM)				
	START				END
W10-2A	20.2 / 1688	20.0 / 1695		20.0 / 1695	20.0 / 1695
W2-1A	17.9 / 1537	17.7 / 1592	17.7 / 1544	17.7 / 1592	17.7 / 1592
W10-1A	18.3 / 1793	18.2 / 1762		18.3 / 1758	18.3 / 1758
W6-1A	21.0 / 1383	21.0 / 1417		21.0 / 1439	21.0 / 1439
W7-1A	22.8 / 1014	21.0 / 1029		21.0 / 1029	21.0 / 1029
W7-2A	21.0 / 1051	21.0 / 1051		20.9 / 1053	20.9 / 1053
W4-1A	17.9 / 1348	17.8 / 1244		18.5 / 1342	18.5 / 1342
W3-1A	20.0 / 1300	19.2 / 1333		20.0 / 1311	20.0 / 1311
W3-3A	19.2 / 10575	19.0 / 10159	19.0 / 9812	19.0 / 9812	19.0 / 9812
W3-2A	19.2 / 15862	19.5 / 16560		19.5 / 16560	19.5 / 16560
W2-3A	19.4 / 13734	19.0 / 13853		19.0 / 13853	19.0 / 13853
W2-2A	19.5 / 1062	18.6 / 1106		18.7 / 1104	18.7 / 1104
W9-2A	20.1 / 1331	20.1 / 1308	20.3 / 1325	20.3 / 1314	20.3 / 1325
W1-1A	18.9 / 50000	19.2 / 50000		19.2 / 50000	19.2 / 50000
W1-2A	20.9 / 50000	20.0 / 50000	20.1 / 50000	20.1 / 50000	20.1 / 50000
W1-3A	25.2 / 50000	24.7 / 50000		24.7 / 50000	24.7 / 50000
W1-4A	21.0 / 50000	20.6 / 50000		20.6 / 50000	20.6 / 50000
W4-2A	17.3 / 1282		17.0 / 1375		17.0 / 1375
W9-1A	19.0 / 1443	20.0 / 1424	20.0 / 1356	20.0 / 1424	20.0 / 1424
W10-1A	19.5 / 1690	18.5 / 1739	18.3 / 1758	18.3 / 1758	18.3 / 1758
W5-1A	20.0 / 938	20.2 / 900	20.2 / 900	20.2 / 900	20.2 / 900
W5-2A	20.0 / 1096	20.5 / 1073	20.0 / 1085	20.0 / 1085	20.0 / 1085
W5-3A	20.6 / 703	20.2 / 709		20.2 / 709	20.2 / 709
W7-3A	17.5 / 1408	17.6 / 1405	17.6 / 1440	17.6 / 1440	17.6 / 1440
W8-1A	20.2 / 1463	19.8 / 1475		19.9 / 1472	19.9 / 1472

* READINGS REPORTED AT 50000 WERE GREATER THAN THE RANGE OF THE CONDUCTIVITY METER

TABLE E-5
SUMMARY OF PARAMETERS FOR ANALYSIS
2ND SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 2

WELL NO	SAMPLE DATE	Ph	PP METALS	VOA	BNA	PCB	ORG Pb	N.N	TKN	ACID
MW-17A	10/07/85	7.11	1	2	1					1
MW-17B	10/07/85	8.13	1	2	1					1
MW-19	10/07/85	7.09	1	1	1					1
W3-1A	10/07/85	7.19	1	2	1					1
W3-1C	10/08/85	8.30	1	2	1					1
W3-2B	10/08/85	7.94	1	2	1					1
W3-2A	10/08/85	7.25	3	6	3					3
W3-3B	10/09/85	8.22	1	2	1					1
W3-3A	10/09/85	7.00	1	2	1					1
W3-1B	10/09/85	8.12	1	2	1					1
MW-1B	10/09/85	7.76	1	2	1					1
W4-1B	10/10/85	8.40	1	2	1					1
MW-9	10/10/85	7.15	1	2	1					1
MW-11	10/10/85	7.29	1	2	1					1
MW-16	10/10/85	7.88	1	2	1					1
W4-1A	10/10/85	7.20	1	2	1					1
W4-2A	10/10/85	7.19	1	2	1					1
MW-15	10/14/85	7.24	1	2	1					1
MW-7	10/14/85	7.30	3	6	3					3
MW-6	10/14/85	7.21	1	2	1					1
W6-1B	10/14/85	7.55	1	2	1					1
MW-12A	10/14/85	7.35	1	2	1					1
MW-12B	10/14/85	8.01	1	2	1					1
MW-4	10/14/85	6.91	1	2	1					1
W6-1A	10/14/85	7.32	1	2	1					1

TABLE E-5
SUMMARY OF PARAMETERS FOR ANALYSIS
2ND SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 2

WELL NO	SAMPLE DATE	Ph	PP METALS	VOA	BNA	PCB	ORG Pb	N.N	TKN	ACID
W7-3B	10/15/85	8.50	1	2	1					1
W7-3A	10/15/85	7.23	1	2	1					1
MW-1	10/15/85	7.10	3	6	3					3
MW-5	10/15/85	7.28	1	2	1					1
MW-20A	10/16/85	6.99	1	2	1					1
MW-20B	10/16/85	7.77	1	2	1					1
W7-1A	10/16/85	7.43	1	2	1					1
W7-2A	10/16/85	7.31	1	2	1					1
W9-2A	10/16/85	7.17		2	1		1			1
W9-1A	10/16/85	7.16		2	1		1			1
W10-1A	10/17/85	7.30		2	1					1
W10-1B	10/17/85	7.87		2	1					1
W10-2A	10/17/85	7.10		2	1					1
W10-2B	10/17/85	8.11		2	1					1
W2-1A	10/17/85	7.34	1	2	1	1		1	1	1
W2-2A	10/17/85	6.95	3	2	1	2		3	3	1
W2-3A	10/21/85	7.29	1	2	1	1		1	1	1
W5-3A	10/21/85	7.48		2	1		3			1
W5-2A	10/21/85	7.26		2	1		1			1
W5-1A	10/21/85	7.38		2	1		1			1
W1-1A	10/21/85	6.61	1	2	1	1		1	1	1
W1-4A	10/22/85	6.86	1	2	1	1		1	1	1
W1-2A	10/22/85	6.87	1	2	1	1		1	1	1
W1-3A	10/22/85	6.80	1	2	1	1		1	1	1
W8-1A	10/22/85	7.33	1	2	1	1				1

TABLE E-6
WELL PURGING DATA
2ND SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 2

WELL NO	DEPTH OF WELL (FT)	WATER TABLE DEPTH (FT)	STARTING TIME	ENDING TIME	RECHARGE TIME	VOLUMES (GAL)	CASING VOLUMES
M17-A	14.5	4.625	11:00	11:10	CONTINUOUS	12.0	6
M17-B	72.2	3.083	11:30	12:20	CONTINUOUS	57.0	5
MW-19	18.1	2.885	13:25	13:40	CONTINUOUS	13.0	5
W3-1A	19.6	5.438	14:40	14:50	CONTINUOUS	20.0	10
W3-1C	225.0	0.208	11:00	14:45	AIR PUMP CONTINUOUS	165.0	4.5
W3-2B	80.3	0.708	11:45	13:30	CONTINUOUS	20.0	2
W3-2A	15.4	2.479	13:50	14:00	CONTINUOUS	20.0	10
W3-3B	79.6	2.156	8:45	9:50	AIR PUMP CONTINUOUS	63.0	5
W3-3A	18.1	3.885	8:50	9:00	CONTINUOUS	20.0	10
W3-1B	79.0	2.745	11:10	14:30	AIR PUMP CONTINUOUS	65.0	5
MW-18	18.1	4.260	12:25	12:35	CONTINUOUS	15.0	7
W4-1B	50.8	6.542	8:15	9:30	AIR PUMP CONTINUOUS	60.0	8
MW-9	16.0	6.884	8:45	8:55	CONTINUOUS	15.0	10
MW-11	15.8	4.990	10:40	11:00	CONTINUOUS	15.0	10
MW-16	19.1	6.281	12:25	12:35	CONTINUOUS	11.0	5
W4-1A	20.5	5.958	13:40	13:55	CONTINUOUS	20.0	10
W4-2A	20.3	6.073	14:50	15:00	CONTINUOUS	15.0	8
MW-15	18.6	6.104	8:55	9:10	CONTINUOUS	14.0	7
MW-7	15.7	6.490	9:45	10:00	CONTINUOUS	14.0	10
MW-6	15.6	5.542	11:00	11:15	CONTINUOUS	15.0	10
W6-1B	43.5	5.573	11:20	11:55	CONTINUOUS	43.0	7
MW-12A	34.0	9.115	12:50	13:15	CONTINUOUS	17.0	5
MW-12B	43.5	9.146	13:15	13:50	CONTINUOUS	25.0	5
MW-4	15.5	9.359	14:15	14:25	CONTINUOUS	10.0	10
W6-1A	25.0	6.792	15:40	15:50	CONTINUOUS	15.0	5

TABLE E-6
WELL PURGING DATA
2ND SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 2

WELL NO	DEPTH OF WELL (FT)	WATER TABLE DEPTH (FT)	STARTING TIME	ENDING TIME	RECHARGE TIME	VOLUMES (GAL)	CASING VOLUMES
W7-3B	73.0	8.323	8:50	9:55	AIR PUMP CONTINUOUS	53.0	5
W7-3A	26.0	8.766	9:00	9:15	CONTINUOUS	15.0	5
MW-1	15.5	8.125	12:10	12:30	CONTINUOUS	20.0	10
MW-5	24.3	6.943	13:20	13:35	CONTINUOUS	15.0	5
MW-20A	23.7	5.115	8:20	8:35	CONTINUOUS	16.0	5
MW-20B	67.8	5.083	8:35	9:15	CONTINUOUS	52.0	5
W7-1A	30.6	5.375	10:25	10:35	CONTINUOUS	20.0	5
W7-2A	31.0	5.302	11:15	11:30	CONTINUOUS	21.0	5
W9-2A	31.4	8.167	12:55	13:25	CONTINUOUS	20.0	5
W9-1A	31.3	6.646	14:05	14:50	CONTINUOUS	20.0	5
W10-1A	30.3	5.552	13:45	14:00	CONTINUOUS	20.0	5
W10-1B	73.5	5.375	13:45	14:35	AIR PUMP CONTINUOUS	55.0	5
W10-2A	30.8	5.125	11:40	11:55	CONTINUOUS	20.0	5
W10-2B	93.2	4.849	11:40	12:50	AIR PUMP CONTINUOUS	72.0	5
W2-1A	19.6	6.375	8:45	9:00	CONTINUOUS	20.0	10
W2-2A	25.6	6.589	9:45	9:55	CONTINUOUS	15.0	5
W2-3A	20.9	4.750	8:30	8:45	CONTINUOUS	15.0	6
W5-3A	30.4	6.859	10:00	10:10	CONTINUOUS	20.0	5
W5-2A	30.7	11.531	11:45	12:05	CONTINUOUS	10.0	3
W5-1A	32.3	7.854	10:40	11:05	CONTINUOUS	20.0	5
W1-1A	26.0	6.031	14:00	14:20	CONTINUOUS	20.0	6
W1-4A	15.8	4.938	8:15	8:30	CONTINUOUS	15.0	8
W1-2A	26.2	7.490	9:25	9:45	CONTINUOUS	15.0	5
W1-3A	36.2	19.906	10:30	11:10	CONTINUOUS	8.0	3
W8-1A	30.7	8.563	13:00	13:25	CONTINUOUS	18.0	5

TABLE E-7
TEMPERATURE & CONDUCTIVITY MEASUREMENTS
2ND SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 2

WELL NO	TEMPERATURE (C) / CONDUCTIVITY* (uMHOS/CM)				
	START				END
MW-17A	20.8 / 5334	20.2 / 4501		20.5 / 4236	20.5 / 4473
MW-17B	20.1 / 494	19.7 / 529	19.6 / 473	19.6 / 467	19.6 / 467
MW-19	20.5 / 3757	20.0 / 3774		20.0 / 3774	20.0 / 3774
W3-1A	22.0 / 1301	21.0 / 1273		21.0 / 1273	21.0 / 1273
W3-1C	19.8 / 424	19.0 / 425	19.4 / 437	19.3 / 424	19.3 / 419
W3-2B	19.6 / 775	19.8 / 794	20.0 / 814	20.8 / 778	20.8 / 778
W3-2A	19.6 / 15613		18.8 / 17159		18.8 / 17159
W3-3B	17.5 / 775	17.5 / 811		17.3 / 863	17.3 / 863
W3-3A	17.6 / 9880	17.7 / 9502		17.7 / 9502	17.7 / 9502
W3-1B	17.9 / 585	18.3 / 513	18.2 / 511	19.0 / 502	19.0 / 502
MW-18	18.3 / 4313	18.2 / 4699		18.2 / 5051	18.2 / 5051
W4-1B	17.3 / 1031		18.0 / 1062		18.0 / 1062
MW-9	19.9 / 1302	19.8 / 1475		20.0 / 1469	20.0 / 1469
MW-11	20.8 / 1133		20.2 / 1328		20.2 / 1328
MW-16	22.0 / 1561		21.2 / 1565		21.2 / 1565
W4-1A	22.2 / 1339	21.0 / 1350		20.8 / 1333	20.8 / 1333
W4-2A	19.8 / 1419	19.4 / 1396		19.2 / 1379	19.2 / 1379
MW-15	21.6 / 1148	21.0 / 1162		21.0 / 1184	21.0 / 1184
MW-7	19.5 / 1279	19.7 / 1274		19.7 / 1274	19.7 / 1274
MW-6	21.5 / 1314	21.5 / 1347		21.5 / 1347	21.5 / 1347
W6-1B	20.8 / 1178	20.8 / 1333		20.8 / 1333	20.8 / 1333
MW-12A	22.8 / 1163	21.2 / 1256		21.2 / 1256	21.2 / 1256
MW-12B	24.0 / 938	21.7 / 982	21.3 / 946	21.0 / 974	21.0 / 974
MW-4	24.3 / 1399	23.2 / 1334		23.2 / 1334	23.2 / 1334
W6-1A	24.8 / 1467	22.9 / 1469		23.0 / 1467	23.0 / 1467
W7-3B	16.8 / 487	17.6 / 517	17.8 / 493	17.8 / 510	17.8 / 510

* READINGS REPORTED AT 50000 WERE GREATER THAN THE RANGE OF THE CONDUCTIVITY METER

TABLE E-7
TEMPERATURE & CONDUCTIVITY MEASUREMENTS
2ND SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 2

WELL NO	TEMPERATURE (C) / CONDUCTIVITY* (uMHOS/CM) START				END
W7-3A	17.3 / 1462	17.2 / 1465		17.2 / 1465	17.2 / 1465
MW-1	23.0 / 1254	21.9 / 1304		22.0 / 1301	22.0 / 1301
MW-5	23.4 / 1476	21.8 / 1470		21.8 / 1415	21.8 / 1415
MW-20A	21.0 / 1737		20.6 / 1808		20.6 / 1808
MW-20B	20.5 / 489	19.3 / 505		19.3 / 505	19.3 / 505
W7-1A	22.0 / 1030	20.1 / 1071		20.1 / 1071	20.1 / 1071
W7-2A	22.8 / 1302	21.5 / 1095		21.5 / 1095	21.5 / 1095
W9-2A	23.5 / 1336	23.1 / 1326		23.5 / 1315	23.5 / 1315
W9-1A	25.9 / 1407	22.6 / 1360		22.6 / 1414	22.6 / 1414
W10-1A	21.0 / 1771	20.5 / 1565		20.3 / 1696	20.3 / 1696
W10-1B	20.2 / 457	20.3 / 460		20.3 / 463	20.3 / 463
W10-2A	19.4 / 1717	20.0 / 1695		20.0 / 1695	20.0 / 1695
W10-2B	19.7 / 396	20.2 / 433	20.2 / 430	20.4 / 430	20.4 / 430
W2-1A	18.3 / 1606	18.6 / 1607		18.6 / 1607	18.6 / 1607
W2-2A	18.0 / 9439	18.0 / 10855		18.1 / 10831	18.1 / 10831
W2-3A	18.3 / 12776	18.6 / 13042		18.6 / 13042	18.6 / 13042
W5-3A	21.3 / 704	19.9 / 713		19.9 / 713	19.9 / 713
W5-2A	20.3 / 1044	19.1 / 1117		18.6 / 1118	18.6 / 1118
W5-1A	20.2 / 923	19.0 / 924		19.0 / 924	19.0 / 924
W1-1A	19.0 / 50000	18.9 / 50000		18.9 / 50000	18.9 / 50000
W1-4A	17.8 / 50000	18.2 / 50000		18.2 / 50000	18.2 / 50000
W1-2A	18.0 / 50000	18.0 / 50000	19.0 / 50000	19.0 / 50000	19.0 / 50000
W1-3A	22.3 / 50000	22.6 / 50000	22.9 / 50000	23.3 / 50000	23.3 / 50000
W8-1A	22.8 / 1515	22.2 / 1479		21.8 / 1437	21.8 / 1437

* READINGS REPORTED AT 50000 WERE GREATER THAN THE RANGE OF THE CONDUCTIVITY METER

TABLE E-8
SUMMARY OF PARAMETERS FOR ANALYSIS
3RD SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 3

WELL NO	SAMPLE DATE	Ph	PP METALS	VOA	BNA	PCB	ORG Pb	N.N	TKN	ACID
MW-17A	11/11/85	7.11	1	2	1					1
MW-17B	11/11/85	7.79	1	2	1					1
W3-1C	11/11/85	8.37	1	2	1					1
W3-1A	11/11/85	7.18	1	2	1					1
W3-2A	11/11/85	7.19	3	6	3					3
W3-2B	11/11/85	7.62	1	2	1					1
W3-3A	11/12/85	7.00	1	2	1					1
W3-3B	11/12/85	7.96	1	2	1					1
MW-18	11/12/85	7.76	1	2	1					1
W3-1B	11/12/85	8.12	1	2	1					1
MW-9	11/12/85	7.16	1	2	1					1
MW-11	11/12/85	7.29	1	2	1					1
W4-1B	11/12/85	8.40	1	2	1					1
W4-1A	11/13/85	7.20	1	2	1					1
W4-2A	11/13/85	7.20	1	2	1					1
MW-15	11/13/85	7.24	1	2	1					1
MW-7	11/13/85	7.25	3	6	3					3
MW-6	11/13/85	7.20	1	2	1					1
W6-1B	11/13/85	7.50	1	2	1					1
W6-1A	11/13/85	7.32	1	2	1					1
W7-3A	11/14/85	7.20	1	2	1					1
W7-3B	11/14/85	8.22	1	2	1					1
MW-12A	11/14/85	7.71	1	2	1					1

TABLE E-8
SUMMARY OF PARAMETERS FOR ANALYSIS
3RD SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 3

WELL NO	SAMPLE DATE	Ph	PP METALS	VOA	BNA	PCB	ORG Pb	N.N	TKN	ACID
MW-4	11/14/85	7.19	1	2	1					1
MW-1	11/14/85	7.10	1	2	1					1
MW-13	11/18/85	7.18		2						
MW-3	11/18/85	7.39	1	4	1					1
W7-1A	11/18/85	7.42	1	2	1					1
W7-2A	11/18/85	7.42	1	2	1					1
W9-1A	11/18/85	7.16		2	1		1			1
W9-2A	11/18/85	7.18		2	1		1			1
W10-2A	11/19/85	7.42		2	1					1
W10-2B	11/19/85	8.14		2	1					1
W10-1A	11/19/85	7.42		2	1					1
W10-1B	11/19/85	7.85		2	1					1
W2-1A	11/19/85	7.33	1	2	1	1		1	1	1
W2-2A	11/19/85	6.95	3	2	1	3		3	3	1
W2-3A	11/20/85	7.35	1	2	1	1		1	1	1
W5-1A	11/20/85	7.37		2	1		3			1
W5-2A	11/20/85	7.46		2	1		1			1
W5-3A	11/20/85	7.75		2	1		1			1
W1-1A	11/20/85	6.61	1	2	1	1		1	1	1
W1-4A	11/20/85	6.88	1	2	1	1		1	1	1
W1-2A	11/21/85	6.62	1	2	1	1		1	1	1
W1-3A	11/21/85	6.83	1	2	1	1		1	1	1
W8-1A	11/21/85	7.40	1	2	1	1				1

TABLE E-9
WELL PURGING DATA
3RD SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 3

WELL NO	DEPTH OF WELL (FT)	WATER TABLE DEPTH (FT)	STARTING TIME	ENDING TIME	RECHARGE TIME	VOLUMES (GAL)	CASING VOLUMES
MW-17A	14.5	4.625	9:25	9:35	CONTINUOUS	12.0	6
MW-17B	72.2	3.083	9:40	10:10	CONTINUOUS	57.0	5
W3-1C	225.0	0.750	9:15	12:20	AIR PUMP CONTINUOUS	185.0	5
W3-1A	19.6	5.333	11:05	11:20	CONTINUOUS	20.0	10
W3-2A	15.4	2.427	13:25	13:35	CONTINUOUS	20.0	10
W3-2B	80.3	0.677	13:40	14:40	CONTINUOUS	20.0	2
W3-3A	18.1	3.875	7:45	8:00	CONTINUOUS	20.0	10
W3-3B	79.6	2.000	8:00	9:50	CONTINUOUS	38.0	3
MW-1B	18.1	4.167	10:20	10:45	CONTINUOUS	15.0	7
W3-1B	79.0	2.750	9:00	10:20	AIR PUMP CONTINUOUS	65.0	5
MW-9	16.0	6.844	13:10	13:20	CONTINUOUS	15.0	10
MW-11	15.8	4.990	14:30	14:45	CONTINUOUS	15.0	10
W4-1B	50.8	6.354	12:30	13:40	AIR PUMP CONTINUOUS	37.0	5
W4-1A	20.5	5.833	7:45	8:00	CONTINUOUS	20.0	10
W4-2A	20.3	5.927	8:45	9:00	CONTINUOUS	15.0	8
MW-15	18.6	6.000	10:10	10:20	CONTINUOUS	14.0	7
MW-7	15.7	6.292	10:45	10:55	CONTINUOUS	14.0	10
MW-6	15.6	5.365	11:45	11:55	CONTINUOUS	15.0	10
W6-1B	43.5	5.406	11:45	11:55	CONTINUOUS	15.0	10
W6-1A	25.0	6.740	13:10	13:20	CONTINUOUS	15.0	5
W7-3A	26.0	8.646	7:50	8:10	CONTINUOUS	15.0	5
W7-3B	73.0	8.229	8:15	9:50	CONTINUOUS	32.0	3
MW-12A	34.0	9.031	10.50	11:15	CONTINUOUS	17.0	5

TABLE E-9
WELL PURGING DATA
3RD SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN # 3

WELL NO	DEPTH OF WELL (FT)	WATER TABLE DEPTH (FT)	STARTING TIME	ENDING TIME	RECHARGE TIME	VOLUMES (GAL)	CASING VOLUMES
MW-4	15.5	9.323	11:30	11:45	CONTINUOUS	10.0	10
MW-1	15.5	8.052	12:30	12:45	CONTINUOUS	20.0	10
MW-13	13.6	9.073	11:50	12:00	CONTINUOUS	20.0	5
MW-3	18.6	9.229	12:20	12:30	CONTINUOUS	7.0	5
W7-1A	30.6	5.375	13:45	14:00	CONTINUOUS	20.0	5
W7-2A	31.0	5.292	14:25	14:40	CONTINUOUS	21.0	5
W9-1A	31.3	8.573	10:20	11:00	CONTINUOUS	12.0	3
W9-2A	31.4	8.083	9:30	10:00	CONTINUOUS	20.0	5
W10-2A	30.8	5.094	10:50	11:00	CONTINUOUS	20.0	5
W10-2B	93.2	4.854	10:45	12:00	AIR PUMP CONTINUOUS	72.0	5
W10-1A	30.3	5.427	12:30	12:45	CONTINUOUS	20.0	5
W10-1B	73.5	5.281	12:35	13:15	AIR PUMP CONTINUOUS	55.0	5
W2-1A	19.6	6.260	8:00	8:15	CONTINUOUS	20.0	10
W2-2A	25.6	6.583	9:05	9:15	CONTINUOUS	15.0	5
W2-3A	20.9	4.719	10:15	10:25	CONTINUOUS	15.0	6
W5-1A	32.3	7.938	11:00	11:20	CONTINUOUS	20.0	5
W5-2A	30.7	11.542	12:40	13:05	CONTINUOUS	10.0	3
W5-3A	30.4	6.740	11:55	12:10	CONTINUOUS	20.0	5
W1-1A	26.0	6.073	14:25	14:45	CONTINUOUS	17.0	5
W1-4A	15.8	4.896	15:05	15:15	CONTINUOUS	10.0	5
W1-2A	26.2	7.458	8:20	8:40	CONTINUOUS	15.0	5
W1-3A	36.2	19.854	9.40	10:20	CONTINUOUS	8.0	3
W8-1A	30.7	8.479	11:20	11:40	CONTINUOUS	18.0	5

TABLE E-10
TEMPERATURE & CONDUCTIVITY MEASUREMENTS
3RD SAMPLING

CLIENT: U.S. NAVY MOFFETT FIELD RUN £ 3

WELL NO	TEMPERATURE (C) / CONDUCTIVITY* (uMHOS/CM)				
	START				END
MW-17A	19.0 / 435	19.2 / 444		19.2 / 444	19.2 / 444
MW-17B	18.5 / 499	17.5 / 543	17.5 / 509	18.0 / 499	18.0 / 499
W3-1C	16.8 / 424	18.8 / 415	19.0 / 420	19.8 / 413	19.8 / 413
W3-1A	19.3 / 1250	19.0 / 1293		19.0 / 1293	19.0 / 1293
W3-2A	17.0 / 15081	17.8 / 16235		17.8 / 17065	17.8 / 17065
W3-2B	15.9 / 693	16.5 / 696	16.1 / 714	16.1 / 714	16.1 / 714
W3-3A	15.2 / 8551	16.4 / 9295		16.6 / 9131	16.6 / 9131
W3-3B	15.2 / 754	16.1 / 677	16.6 / 694	16.6 / 694	16.6 / 694
MW-1B	13.6 / 3567	16.5 / 4417		17.2 / 4504	17.2 / 4504
W3-1B	16.3 / 530	16.5 / 503		16.5 / 503	16.5 / 503
MW-9	20.8 / 1245	20.7 / 1414		20.8 / 1411	20.8 / 1411
MW-11	18.9 / 1296	19.4 / 1316		19.6 / 1311	19.6 / 1311
W4-1B	17.6 / 1048	18.8 / 1043		18.0 / 1062	18.0 / 1062
W4-1A	17.3 / 1318	18.5 / 1284		18.5 / 1307	18.5 / 1307
W4-2A	15.2 / 1408	16.0 / 1382		16.0 / 1382	16.0 / 1382
MW-15	17.6 / 264	19.0 / 1131		19.4 / 1145	19.4 / 1145
MW-7	15.8 / 1240	18.0 / 1262		18.4 / 1263	18.4 / 1263
MW-6	18.5 / 1284	20.2 / 1317		20.6 / 1317	20.6 / 1317
W6-1B	19.0 / 925	19.3 / 1216		19.8 / 1203	19.8 / 1203
W6-1A	21.0 / 165	21.2 / 1455		21.2 / 1466	21.2 / 1466
W7-3A	14.6 / 1403	16.7 / 1433		17.0 / 1424	17.0 / 1424
W7-3B	13.7 / 533	16.0 / 491	17.0 / 506	16.8 / 490	16.8 / 490
MW-12A	18.0 / 1239	17.5 / 1265		17.0 / 1279	17.0 / 1279

* READINGS REPORTED AT 50000 WERE GREATER THAN THE RANGE OF THE CONDUCTIVITY METER

TABLE E-10
TEMPERATURE & CONDUCTIVITY MEASUREMENTS
3RD SAMPLING

CLIENT: U.S NAVY MOFFETT FIELD RUN £ 3

WELL NO	TEMPERATURE (C) / CONDUCTIVITY* (uMHOS/CM) START				END
MW-4	17.7 / 1449	19.0 / 1328		20.0 / 1322	20.0 / 1322
MW-1	17.6 / 1309	19.0 / 1304		19.0 / 1304	19.0 / 1304
MW-13	17.2 / 1009	19.0 / 1270		20.0 / 1243	20.0 / 1243
MW-3	15.0 / 1175	17.9 / 1301		17.8 / 1304	17.8 / 1304
W7-1A	17.0 / 989	19.5 / 1051		19.9 / 1019	19.9 / 1019
W7-2A	19.9 / 1053	20.0 / 1096		20.0 / 1074	20.0 / 1074
W9-1A	20.2 / 1305	20.8 / 1367	20.9 / 1353	21.6 / 1355	21.6 / 1355
W9-2A	20.2 / 866	20.2 / 1238		21.0 / 1295	21.0 / 1295
W10-2A	19.4 / 1682	18.5 / 1704		19.0 / 1685	19.0 / 1685
W10-2B	19.0 / 413	18.9 / 440	19.0 / 441	19.2 / 432	19.2 / 432
W10-1A	19.8 / 1657	19.2 / 1690		19.0 / 1674	19.0 / 1674
W10-1B	18.1 / 445	19.1 / 443		19.0 / 446	19.0 / 446
W2-1A	13.2 / 1478	17.3 / 1582		17.8 / 1576	17.8 / 1576
W2-2A	16.6 / 8278	17.0 / 10858		18.5 / 10503	18.5 / 10503
W2-3A	17.3 / 11864	18.6 / 12576		18.7 / 12781	18.7 / 12781
W5-1A	17.9 / 946	18.8 / 904		19.0 / 877	19.0 / 877
W5-2A	16.2 / 946	17.6 / 1107	17.5 / 1098	17.7 / 1093	17.7 / 1093
W5-3A	19.1 / 560	18.7 / 697		18.9 / 694	18.9 / 694
W1-1A	17.2 / 50000	17.6 / 50000		17.8 / 50000	17.8 / 50000
W1-4A	14.3 / 50000	18.0 / 50000	18.0 / 50000	18.0 / 50000	18.7 / 50000
W1-2A	17.5 / 50000	18.5 / 50000		18.6 / 50000	18.6 / 50000
W1-3A	17.0 / 50000	20.3 / 50000	20.5 / 50000	20.6 / 50000	20.6 / 50000
W8-1A	19.7 / 1524	19.5 / 1439		20.0 / 1413	20.0 / 1413

* READINGS REPORTED AT 50000 WERE GREATER THAN THE RANGE OF THE CONDUCTIVITY METER

APPENDIX F

HEALTH AND SAFETY PROCEDURES

HEALTH AND SAFETY PROCEDURES

A Health and Safety Plan was prepared specifically for the Moffett Field site investigation. Procedures on training, medical surveillance, hazard monitoring, and site control were developed. The Project Safety Officer was onsite at all times during drilling operations to monitor site conditions and to ensure compliance with the health and safety procedures. The following material briefly describes the general monitoring procedures and the hazards encountered and level of protection required at each site.

During the drilling phase of the site investigation, atmospheric monitoring was conducted to preclude immediate hazards to NAS personnel, on-site team personnel, and the environment. Potential hazards of concern were fire, explosion, oxygen-deficient atmospheres, airborne contaminants, and containerized or pooled substances that could affect workers during subsequent operations.

The atmosphere directly above the excavated area during drilling was continuously monitored for oxygen deficiency and the presence of explosive gases measured as percent lower explosive limit (LEL). The monitor used was either an ENMET Tritector or a BioMarine gas monitor. Both of these instruments contain an audible alarm that is activated if the oxygen drops below 19.5 percent or if the LEL gets above 20 percent. The alarms were tested each morning to assure that they were functional.

An organic vapor meter with a photoionization detector (PID) was also set up on-site to continuously monitor for toxic organic vapors. This meter also has an audible alarm which was tested each morning. The PID meter alarm was set to activate when the atmosphere contained organic vapors in concentrations 5 ppm above background. Readings from these meters were observed by the Project Safety Officer every half hour and recorded in the project safety log book. Wind direction and estimated speed were also recorded every half hour.

At those sites with known or suspected traces of vinyl chloride, periodic samples (every half hour or every 10 feet of drilling - whichever came first) of the drill cuttings were collected in a plastic bag. Vapor inside the bag was analyzed with a Draeger tube sampler and vinyl chloride colorimetric tubes. Vinyl chloride was not detected at or above 0.5 ppm during the investigation.

SITE 1

Level D was initially used at all Site 1 locations. It was often necessary to wear respirators when garbage odors were strong. Combustible gas was encountered at many of the monitoring well and auger boring locations at this site. Well W1-4A was the first drilling location and was located atop the landfill. After drilling 20 feet through concrete, rebar, and loose garbage, a strong odor was noted. Measurements of combustible gas showed increasing explosivity as the probe was lowered into the augers. The reading was 100 percent LEL at six feet below grade. The location was abandoned and monitored daily for any change in combustible gas. The gas did not dissipate and was eventually displaced from the hole by flooding with water. The auger was carefully removed after the combustible gas was displaced. Well W1-4A was relocated and drilled at the base of the landfill.

All locations at Site 1 had garbage odor and hydrogen sulfide was suspected. The native soil was an anaerobic black silty clay. The drillers often encountered obstacles that were hard to drill through. Organic vapors were detected at two sites. Although no vapors exceeded 5 ppm in the breathing zone, levels greater than 5 ppm were noted inside the augers.

The runway landfill site was difficult to drill in and appears to have hydrogen sulfide and methane throughout the decomposing layers. Polychlorinated biphenyls (PCBs) were also detected in the soils at this site. Further investigations at this site will have to be conducted carefully with ventilation and Level C protection. The Level C protection recommended would be Tyvek suits, taped at the arms and legs for skin protection, and respirators with organic

cartridges and dust filters to remove dust and organic vapors. Organic cartridges were used at this site. Strong garbage odors were not detectable by personnel wearing respirators. Breakthrough of hydrogen sulfide was also not detected.

SITE 2

Onsite air monitoring did not indicate hazards at Site 2. This site had PCBs in the soils and Level C protection is warranted. The Level C protection described for Site 1, with dust filters only on the respirators, is recommended.

SITE 3

There were no measured hazards at any of the Site 3 locations. Level D protection was adequate at Site 3.

SITE 4

There were no measured hazards at any of the Site 4 loctions. Level D protection was adequate at Site 4.

SITE 5

Combustible gasses and organic vapors were encountered at Site 5. It is very likely that a fuel layer is floating on the groundwater at this site. The soils smell of gasoline. Investigations at Site 5 should be carried out carefully due to the potential for fire and explosion. Respiratory protection should be available in case the gasoline odors become strong. Organic vapor cartridges are acceptable for gasoline vapors.

SITE 6

There were no measured hazards at the Site 6 location. Level D protection was adequate at Site 6.

SITE 7

There were organic vapors detectable from soils at Site 7. Fuel odors were noticed in soils under the asphalt. Level D was adequate for Site 7, but anyone working at this site should be able to upgrade to Level C, with organic vapor respirators, when the odors become noticeable in the breathing zone.

SITE 8

Site 8 should not be investigated in anything less than Level C protection due to the known concentrations of PCBs found at this site. There were no other hazards detectable with the PID meter, combustible gas meter, or oxygen meter. None of the workers detected any odors at this site. Therefore respirators equipped with dust filters should be used.

SITE 9

Fuel odors and organic vapors were detected at locations at Site 9. Further investigations at Site 9 should be done in Level D, but the workers should be prepared to upgrade to organic vapor respirators if gasoline odors are detected in the breathing zone.

SITE 10

There were no measured hazards at either of the Site 10 locations. Level D protection was adequate at this site.

APPENDIX G

SURVEY OF PRIVATE WELLS ON MOFFETT FIELD NAS

SURVEY OF PRIVATE WELLS ON MOFFETT FIELD NAS

The results of a private well survey conducted by Earth Sciences Associates during August thru September, 1985 are presented in this Appendix. The survey was conducted to identify both abandoned, and public and private wells located within the boundaries of the Moffett Field NAS, that could be serving as conduits for transport of water and chemicals between different aquifer zones. The study area and wells identified are shown in Figure G-1.

A thorough review of all available reports, files, and aerial photographs was made to locate and acquire information on wells located within, and in the immediate vicinity, of the Moffett Field NAS. Personal interviews were also held with the personnel listed in Table G-1. No information was obtained from the U.S. Navy since most of their records were reportedly destroyed in a fire several years ago. The most extensive collection of records was in the possession of the Santa Clara Valley Waster District (SCVWD). However, these records were incomplete and quite difficult to understand. Many of the available logs were identified using a previous well numbering system which had not been updated.

Conversations with personnel of the USGS did not produce any additional data, as neither did inquiries to staff of the California Dept. of Water Resources. Copies of the original well logs for wells 14M1 and 14M2 were obtained from Mr. Bradford of Western Well Drilling Company.

A one day field reconnaissance was also made by Mr. Julio Valera of ESA accompanied by Mr. Paul Prater of the Public Works Dept. During this field trip Mr. Valera spoke with Mr. Navarro, who leases and farms some of the land within the boundaries of the Moffett Field NAS. This interview proved to be quite useful.

The location of the wells identified during this survey are plotted in Figure G-1. Some of the wells shown on this figure are actually situated outside of the Naval Air Station boundaries but have been included for completeness. Pertinent information on the wells is presented in Table G-2.

A total of 14 wells were identified during this survey. Only 10 of these are located within the Moffett Field NAS. These ten wells can be classified as follows:

- 1 well is currently active - 24D1
- 7 wells - covered or no evidence exists
- 2 wells - inactive but location of wells is known and wells are accessible (14M1 and 14M2)

Boring logs for wells 14M1 and 14M2 are included at the end of this appendix.

Table G-1

PERSONNEL INTERVIEWED AS PART OF WELL SURVEY ON MOFFETT FIELD NAS

1. Mr. Paul Prater - Grounds Foreman
   Moffett Field NAS

2. Lt. J.G. Steve Bonezek
   Public Works
   Moffett Field NAS

3. Mr. Navarro
   Farmer who leases land on Moffett Field

4. Mr. Thomas Iwamura
   Engineering Geologist - SCVWD

5. Ms. Laurell Moll and Mr. Fujita
   SCVWD

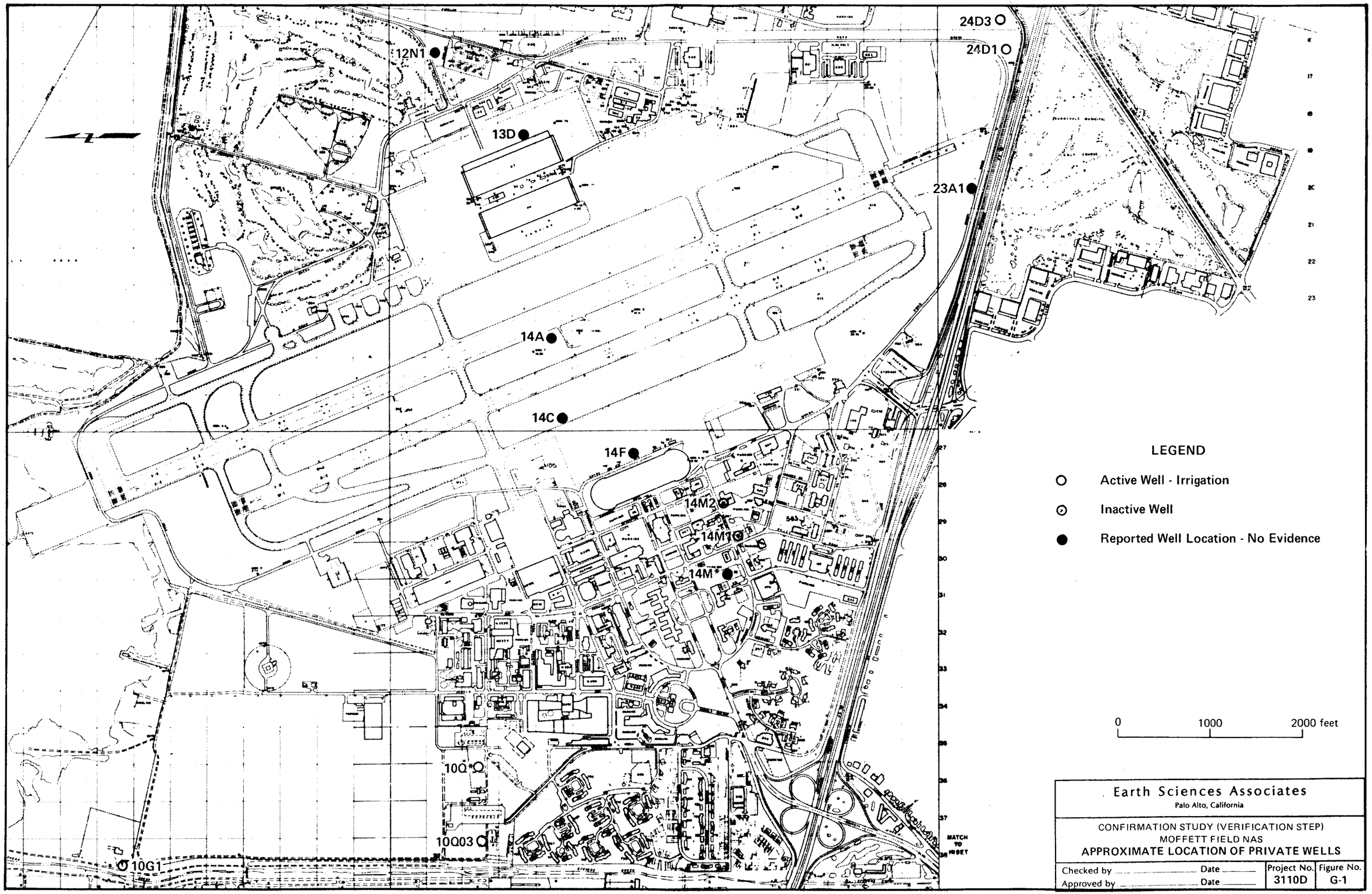
6. Mr. Byron Aldrige, Mr. Ronald Fogelman and Ms. Gail Keeter
   USGS Water Resources Division

7. Mr. N.T. Bradford
   Wester Well Drilling Co., Ltd.

Table G-2

SUMMARY OF PRIVATE WELL SURVEY
MOFFETT FIELD NAS

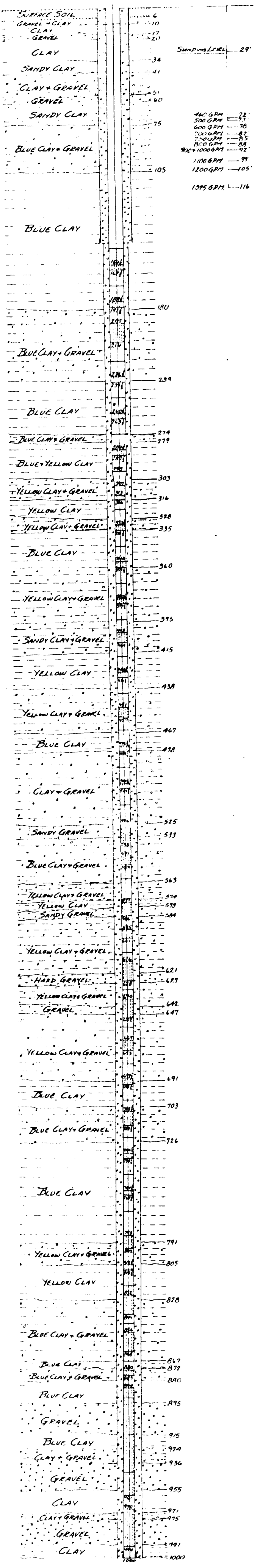
Well No.	Total Depth (ft)	Source of Information	Log Availability	Present Condition	Owner	Comments
I.	Wells that are currently active					
24D1	655	SCVWD & Navy	no	used for agriculture	U.S. Navy	Active pumping well
24D3	722	SCVWD	yes	used for agriculture	Lockheed	Active pumping well; outside of Moffett
10G1(?)	200	SCWD & Mr. Navarro	no	used for agriculture	SCVWD	Active pumping well; outside of Moffett
10Q03	400	Mr. Navarro	no	used for agriculture	PG&E	Active pumping well; outside of Moffett
10Q*	1423	SCVWD	E-Log	used for agriculture	NASA	Active pumping well; outside of Moffett
II.	Wells that are either known to be covered or for which no evidence exists					
14A	unknown	HLA (85)	no	no evidence	U.S. Navy	Most of the records regarding wells on the Naval Air Station Moffett Field were reportedly destroyed in a fire several years ago
14C	unknown	HLA (85)	no	no evidence	U.S. Navy	
14F	unknown	HLA (85)	no	no evidence	U.S. Navy	
13D	unknown	HLA (85)	no	no evidence	U.S. Navy	
12N1	unknown	HLA (85)	no	no evidence	U.S. Navy	Old irrigation well, reportedly destroyed years ago
23A1	783	HLA (85)	no	covered	U.S. Navy	Adjacent to Moffett Field south perimeter, under roadway
14M*	unknown	U.S. Navy	no	covered		Steel well casing if filled with concrete and exposed
III.	Wells that are inactive					
14M1	1000	SCVWD/ U.S. Navy	yes	inactive	U.S. Navy	Located in Bldg. 532; plugged at a depth of 33 feet
14M2	1020	SCVWD/ U.S. Navy	yes	inactive	U.S. Navy	Located in Bldg. 530; plugged at a depth of 96 feet



Earth Sciences Associates
Palo Alto, California

CONFIRMATION STUDY (VERIFICATION STEP)
MOFFETT FIELD NAS
APPROXIMATE LOCATION OF PRIVATE WELLS

Checked by ____ Date ____	Project No.	Figure No.
Approved by ____ Date ____	3110D	G-1

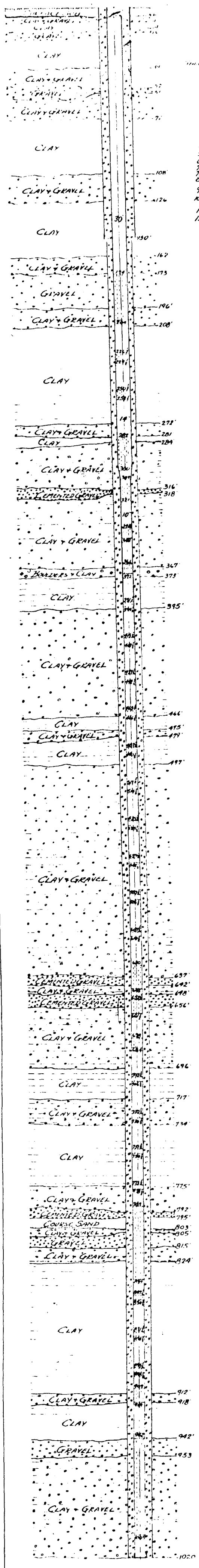


LOG AND TEST DATA
GRAVEL ENVELOPE WELL
SUNNYVALE NAVAL AIR STATION - WELL "B"
CONSTRUCTED BY
WESTERN PUMP COMPANY LTD.
SAN JOSE, CALIFORNIA

(M1)

WELL 14M1

Log of Well 14M1
Figure G-2



WELL 14M2

(M2)

LOG AND TEST DATA
GRAVEL ENVELOPE WELL
SUNNYVALE AIR STATION WELL A
CONSTRUCTED BY
WESTERN PUMP COMPANY, LTD.
SAN JOSE, CALIFORNIA

Log of Well 14M2
Figure G-3

LIST OF REFERENCES

Atchley, Frank W., 1959, Engineering Geology of Moffett Field and Coyote Hills, Santa Clara and Alameda Counties, California, Prepared for John Blume & Assoc.

Canonie Engineers, 1985, Status Report, Fairchild Camera and Instrument Corporation, Mountain View Facility, Vol. II, June.

Canonie Engineers, 1985, Status Report, Fairchild Camera and Instrument Corporation, Mountain View Facility, Vol. I, July-August.

Clark, William O., 1924, Groundwater in the Santa Clara Valley, California, U.S. Geological Survey Water Supply Paper 519.

Harding, Lawson Associates, 1985, Private Well Survey, Ratheon Company, Mountain View, California, October 4.

Santa Clara Valley Water District, 1973, Well Location Map, Mountain View Quadrangle, 1:12,000, SCVWD.

_____, 1985, Registered Water Producing Wells, 06S2W, Sections 10-24 inclusive, August 6, SCVWD.

_____, 1985, Inactive Well Files, SCVWD.

Valera, Julio E., 1985, Principal Engineer Earth Sciences Associates, Field Inspection of Moffett Field Naval Air Station, August 13.

U.S. Navy, District Public Works Office, 12th Naval District, 1960, Interim Engineering Report for Rehabilitation of Two Non-potable Wells, Bureau of Yards and Docks, Dept. of Navy, June.

APPENDIX H

ALTERNATE CHEMICAL NAMES

ALTERNATE CHEMICAL NAMES

Compound	Alternate Names
Priority & Nonpriority Pollutants	
Chloromethane	Methyl chloride
Bromomethane	Methyl bromide
Chloroethane	Ethyl chloride
Vinyl chloride	Chloroethene, Chloroethylene
1,1-Dichloroethene	1,1-Dichloroethylene, Vinylidene chloride
cis-1,2-Dichloroethene	cis-1,2-Dichloroethylene, 1,2-cis-Dichloroethylene, Acetylene dichloride
trans-1,2-Dichloroethene	trans-1,2-Dichloroethylene, 1,2-trans-Dichloroethylene, Acetylene dichloride
Methylene chloride	Dichloromethane, Methylene dichloride
1,1-Dichloroethane	Ethylidene chloride
Trichlorofluoromethane	Freon 11
Chloroform	Trichloromethane
1,1,1-Trichloroethane	Methylchloroform
Carbon tetrachloride	Tetrachloromethane, Perchloromethane
Benzene	Benzol
1,2-Dichloroethane	Ethylene dichloride
Trichloroethane	Trichloroethylene, TCE
Dichlorobromomethane	Bromodichloromethane, DCBM
cis-1,3-Dichloropropene	cis-1,3-Dichloropropylene
trans-1,3-Dichloropropene	trans-1,3-Dichloropropylene
1,1,2-Trichloroethane	Vinyl trichloride
Toluene	Methylbenzene, toluol
Dibromochloromethane	Chlorodibromomethane, DBCM
Tetrachloroethene	Tetrachloroethylene, Perchloroethylene, PCE, Ethylene tetrachloride
Chlorobenzene	Benzene chloride
Ethylbenzene	
o-Xylene	1,2-Dimethylbenzene, Xylol
m-Xylene	1,3-Dimethylbenzene, Xylol
p-Xylene	1,4-Dimethylbenzene, Xylol
1,1,2,2-Tetrachloroethane	Acetylene tetrachloride
1,2-Dichloropropane	Propylene dichloride
Bromoform	Tribromomethane
Dichlorodifluoromethane	Freon 12, Difluorodichloromethane
Acrolein	2-Propenal, Acrylic aldehyde
Acrylonitrile	Propenamide

ALTERNATE CHEMICAL NAMES (Continued)

Compound	Alternate Names
Acetone	Propanone, Dimethyl ketone
Methylethylketone	MEK, 2-Butanone, Ethylmethylketone
Tetrahydrofuran	THF, Diethylene oxide
Other Compounds	
1,2-Dichloro-1,1,2-trifluoroethane	
2,2'-oxybis-Propane	Isopropyl ether
Trifluorotrichloroethane	Freon 113, 1,1,2-Trichloro-1,2,2-trifluoroethane
Trimethyl cyclohexane	
Dimethyl cylcooctane	
Dimethyl cyclohexane	
2,4-Dimethylpentane	
2,2,3,3-Tetramethylpentane	
Methylbutane	
3-Methylhexane	
2,3-Dimethylhexane	
2,3,3-Trimethylpentane	
2,2,5-Trimethylhexane	
Trimethyl cyclopentane	
1,2-Diethyoxyethane	
1-(1-Methylpropoxy)-butane	
Cyclopentane	
3-Methylpentane	