















GRAPHIC SYMBOL	USCS SYMBOL	DESCRIPTION OF SYMBOLS USED IN WELL/BORING LOGS
	NR	NO RECOVERY
	AS	ASPHALT
	FILL	FILL
	GW/GP	GRAVEL
	GM	SANDY AND SILTY GRAVEL
	SW	SAND well-graded
	SP	SAND poorly graded
	SM	SILTY SAND
	SC	CLAYEY SAND
	ML	SILT
	ML	SANDY SILT
	ML	CLAYEY SILT
	CL	SANDY CLAY
	ML/CL	SILTY CLAY
	CH	CLAY



Cement/Bentonite Grout



Bentonite Seal



Static Water Level



Bentonite Slurry



Filter Pack



First Water Level



Slotted Screen

**TSSB**

GEOLOGIC SUPPORT  
REGION I

# WELL EX-1 (Page 1 of 5)

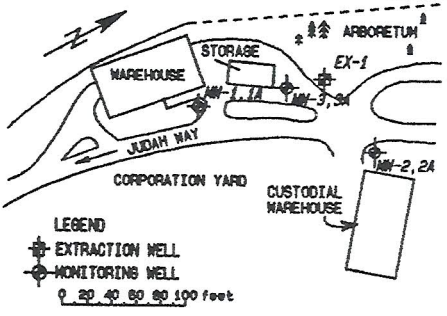
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/12/90

SURFACE ELEVATION 33.78 Feet MSL

TOTAL DEPTH 215.00 Feet

GEOLOGIST ALAN WINANS



DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0			0	TOPSOIL	
5	SP	[Dotted pattern]		SAND (SP): brown, very fine sand, silty, soft, dry  very slight moisture  becoming reddish brown	
15	SM ML	[Diagonal hatching]		SILTY SAND (SM): yellowish brown, mottled black and rust, siltier, hard SANDY SILT (ML): very fine sand, moderately soft	
20	SP	[Dotted pattern]		SAND (SP): brown gray, very fine sand, silty, soft	
25	SW	[Dotted pattern with circles]		SAND with GRAVEL (SW): cobbles in silty sandy matrix	
25	SP	[Dotted pattern]		SAND (SP): minor gravel	
30					8" Sch. 80 PVC
35					centralizer
40					sand/cement grout
45					
50					

# WELL EX-1 (Page 2 of 5)

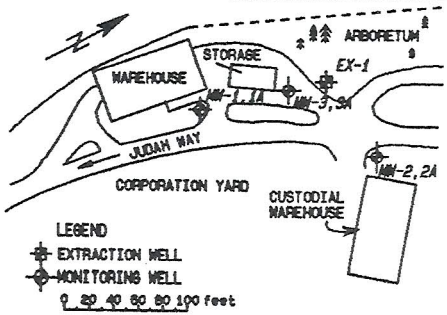
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/12/90

SURFACE ELEVATION 33.78 Feet MSL

TOTAL DEPTH 215.00 Feet

GEOLOGIST ALAN WINANS



DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0	SP	⊙	115		
55					
60					
65					
70					
75					
80					8" Sch. 80 PVC
85					centralizer
90					sand/cement grout
95					
100					

# WELL EX-1 (Page 3 of 5)

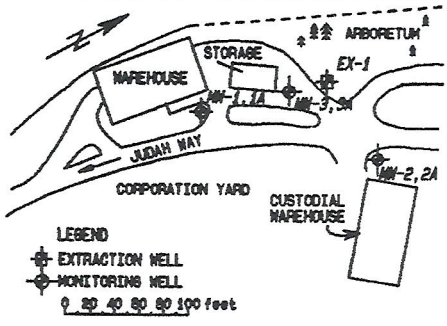
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/12/90

SURFACE ELEVATION 33.78 Feet MSL

TOTAL DEPTH 215.00 Feet

GEOLOGIST ALAN WINANS



DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0 - 105	SP	[Symbol: small dots]	0 - 115		
105 - 130	SW	[Symbol: larger dots]		SAND (SW): some coarse sands, indurated siltstone, very fine sandstone	centralizer
130 - 150	SP	[Symbol: small dots]		SAND (SP): clean, medium grained	8" Sch. 80 PVC sand/cement grout centralizer

# WELL EX-1 (Page 4 of 5)

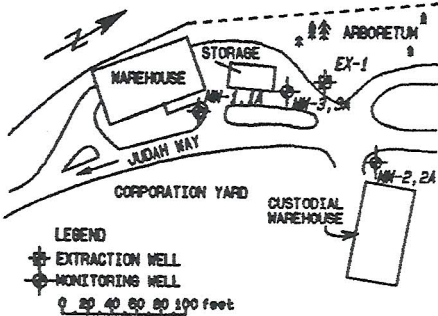
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/12/90

SURFACE ELEVATION 33.78 Feet MSL

TOTAL DEPTH 215.00 Feet

GEOLOGIST ALAN WINANS



LEGEND  
 \* EXTRACTION WELL  
 ○ MONITORING WELL  
 0 20 40 60 80 100 feet

DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
155			0		
160					
165					
170					
175	SP			SAND (SP): clean, medium grained	8" Sch. 80 PVC centralizer sand/cement grout
	SM			SILTY SAND (SM): gray	
	SP			SAND (SP): brown, fine grained	
180	SM/ML			SILT/SAND (SM/ML): gray	
	SM/ML			SILTY SAND/SANDY SILT (SM/ML): gypsum in silt	
	SP			SILTY SAND (SP): orange	
	ML			SANDY SILT (ML): gray, very fine sand	
185					
	SM			SILTY SAND (SM): coarse grained sand with hard clayey silt	
190				NO CORE	
	SP			SAND (SP): medium grained, biotite, clay plug@190'	
				NO CORE	
195					0.40 slotted screen centralizer #8 mesh sand
	SP			SAND (SP): sand up to 1.5mm in size, micaceous	
200					

**TSSB**  
 GEOLOGIC SUPPORT  
 REGION 1

# WELL EX-1 (Page 5 of 5)

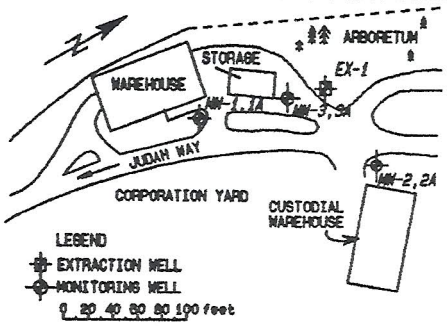
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/12/90

SURFACE ELEVATION 33.78 Feet MSL

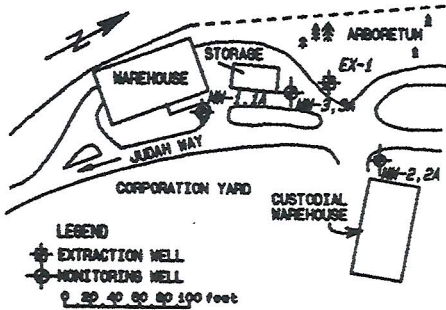
TOTAL DEPTH 215.00 Feet

GEOLOGIST ALAN WINANS



DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0			0		
205	SP	[Symbol]	115	sand up to 2mm in size	
	SM	[Symbol]		SILTY SAND (SM);	
	SM	[Symbol]		SILTY SAND (SM); cemented	
210	SP	[Symbol]		SAND (SP); coarse grained	
	SM	[Symbol]		SILTY SAND (SM); medium grained sand	
	SM	[Symbol]		SILT (SM);	
215	SP	[Symbol]		SAND (SP); coarse grained, clean	
220					
225					
230					
235					
240					
245					
250					

- NOTES:
- 1) WELL STARTED ON 06/07/90 AND COMPLETED ON 06/12/90.
  - 2) TOTAL DEPTH OF WELL IS 215 FEET.
  - 3) DRILL RIG: INGERSOLL RAND RO 300  
 DRILLING COMPANY: BEYLIK  
 DRILLING METHOD: MUD ROTARY  
 OPERATOR: JIM HOFFMAN
  - 4) DRILLED WITH A 6 INCH BIT TO 180 FEET BGS. REAMED TO 16 INCHES.
  - 5) CONTINUOUS CORE WITH A 94MM WIRE LINE SAMPLER FROM 177 TO 215 FEET BGS (SCREENED ZONE).
  - 6) 8 INCH SCH 80 PVC CASING INSTALLED FROM 0 TO 194 FEET BGS.  
 STAINLESS WIREWRAP SCREEN (.040) FROM 194 TO 209 FEET BGS.  
 .002 INCH SLOTTED SCREEN FROM 209 TO 214 FEET BGS.  
 #8 MESH FILTER PACK FROM 186 TO 215 FEET BGS.  
 BENTONITE SEAL FROM 180.5 TO 186 BGS.  
 #2 MONTEREY SAND/CEMENT GROUT FROM 0 TO 180.5 FEET BGS.
  - 7) CENTRALIZERS AT 30, 70, 110, 150, 190, AND 214.5 FEET BGS.
  - 8) E-LOG BY COLOG ON 06/09/90.



# WELL MW-1 (Page 1 of 5)

PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/04/90

SURFACE ELEVATION 33.00 Feet MSL

TOTAL DEPTH 215.00 Feet

GEOLOGIST JOHN WOODLING

DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0	ML	[Symbol]	15	SANDY SILT (ML): brown, moist, with 15% fine sand, few rock fragments, mica present	<p>4" Sch. 40 PVC casing</p> <p>centralizer</p> <p>bentonite/cement grout</p> <p>centralizer</p> <p>.020 slotted PVC screen</p> <p>centralizer</p> <p>bentonite seal</p> <p>#2 Monterey sand</p> <p>seal</p>
5	ML	[Symbol]		SANDY SILT (ML): as above with increased clay (10%) and drier, 15-20% fine sand, mica	
10	ML/CL	[Symbol]		CLAYEY SILT (ML/CL): dark brown, moist, slightly plastic, 15% clay, 10% sand	
15	ML	[Symbol]		SANDY SILT (ML): brown, slightly moist, non-plastic, 20% sand	
20	ML/CL	[Symbol]		CLAYEY SILT (ML/CL): light yellowish brown, dry low dry strength, slightly plastic	
21	CL	[Symbol]		CLAY (CL): buff to tan, lean, mottled, laminated slightly moist, medium plasticity, low dry strength, red iron staining	
22	SM	[Symbol]		SILTY SAND (SM): tan, slightly moist, very fine sand, 30% fines, 5% gravel (dark volcanic clasts)	
23	SC	[Symbol]		CLAYEY SAND (SC): tan, moist, very fine sand slightly plastic, 30% fines, 5% gravel as above	
24	SC	[Symbol]		CLAYEY SAND (SC): yellow brown, moist, slightly plastic 50% fine sand, 10% coarse sand, 40% fines, mica	
25	SC	[Symbol]		first water @ 33 feet bgs	
30	SM	[Symbol]		SILTY SAND (SM): medium brown, fine to medium sand, wet, 30% fines	
35	SM	[Symbol]		sharp contact at 39' bgs	
40	ML	[Symbol]		SANDY SILT (ML): brown, moist to dry, low plasticity	
41	SC	[Symbol]		CLAYEY SAND (SC): grayish brown	
42	SW	[Symbol]		SAND (SW): light grayish brown, well-graded, fine to medium sand, wet, abundant mica	
43	CL	[Symbol]		CLAY (CL): buff to yellow brown, lean, moist, 10% fine sand	
44	SW	[Symbol]		SAND (SW): dark brown, well-graded, wet, micaceous, subrounded grains	
45	CL	[Symbol]		CLAY (CL): lean, medium plasticity, stiff, moist some iron staining, gray sand stringers @50 feet bgs	

**TSSB**  
GEOLOGIC SUPPORT REGION 1

STATIC WATER LEVEL ▾ (02/08/91)  
FIRST WATER LEVEL ▾ (06/04/90)

# WELL MW-1 (Page 2 of 5)

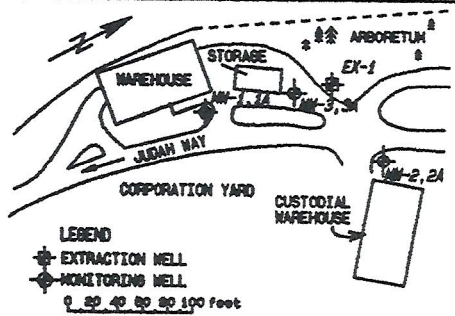
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/04/90

SURFACE ELEVATION 33.00 Feet MSL

TOTAL DEPTH 215.00 Feet

GEOLOGIST JOHN WOODLING



DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0	CL	[Symbol]	115		
55	SW	[Symbol]		SAND (SW): yellow to gray brown (salt & pepper appearance), fine to medium, no fines, 60% quartz, 40% dark minerals, subrounded olivine, thin cemented zones (0.5" wide), lower contact is caliche and clay	
60	SM	[Symbol]		SILTY SAND (SM): medium gray brown, slightly plastic, wet, thin iron stained zones (2.5Y4/2), 30% silt, 70% fine sand	
60	SM	[Symbol]		large (2") volcanic clasts from 56-58' bgs	
65	CL	[Symbol]		SILTY SAND (SM): fine sand, 15% silt	
65	SM	[Symbol]		SILTY CLAY (CL): iron cemented hard clay	
65	SM	[Symbol]		SILTY SAND (SM): wet	
65	SC	[Symbol]		CLAYEY SAND (SC): brown, fine sand, wet	
70	SW	[Symbol]		SAND (SW): fine to medium, cleaner sand than above	
70	SM/SW	[Symbol]		SILTY SAND (SM/SW): brown, wet, well-graded sand	
75	CL/ML	[Symbol]		SILTY CLAY (CL/ML): medium gray brown, sand lowermost	
75	SM	[Symbol]		SILTY SAND (SM): medium brown, slightly plastic, sandy with minor clay	
80	SP	[Symbol]		very fine to fine grained	
80	ML	[Symbol]		SAND (SP): medium brown, slightly silty	
85	ML	[Symbol]		CLAYEY SILT (ML): medium to light brown	
85	SP	[Symbol]		SAND (SP): medium to dark brown, very fine to medium grained	
85	ML/CL	[Symbol]		SILTY CLAY (ML/CL): medium grey-brown	
90	ML	[Symbol]		CLAYEY SILT (ML): medium grey-brown	
95	SP	[Symbol]		SAND (SP): fine to coarse grained, medium brown, 50% black sands, 30% opaques, metamorphic and sedimentary grains, 20% clear and frosted quartz	
100	ML	[Symbol]			



# WELL MW-1 (Page 3 of 5)

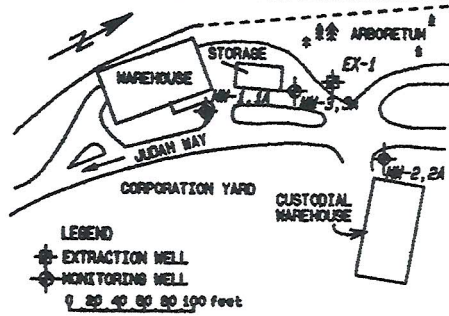
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/04/90

SURFACE ELEVATION 33.00 Feet MSL

TOTAL DEPTH 215.00 Feet

GEOLOGIST JOHN WOODLING



DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0	ML	[Symbol]	115	SANDY SILT (ML): gray brown, iron staining, calcite concretions, 1" stringers of fine sand, micaceous	<p style="text-align: center;">bentonite/cement grout</p>
105	ML/CL	[Symbol]		CLAYEY SILT (ML/CL): gray brown	
110	ML	[Symbol]		SILT (ML):	
	SM	[Symbol]		SILTY SAND (SM):	
	ML	[Symbol]		CLAYEY SILT (ML):	
115	ML	[Symbol]		CLAYEY SILT (ML):	
120	SM	[Symbol]		SILTY SAND (SM): fine to medium sand, 15% fines	
125	SM	[Symbol]		SILTY SAND (SM): fine sand	
	CL	[Symbol]		SILTY CLAY (CL): gray brown	
130	ML	[Symbol]		SILT (ML):	
	ML	[Symbol]		SILT (ML): brown	
	CL	[Symbol]		CLAY (CL): gray	
135	SM	[Symbol]		SILTY SAND (SM): grayish brown, very fine sand	
140	SW	[Symbol]		medium sand (3 inches wide) SAND (SW): well-graded, salt&pepper appearance, medium sand, <5% fines	
145					
150	ML	[Symbol]			

# WELL MW-1 (Page 4 of 5)

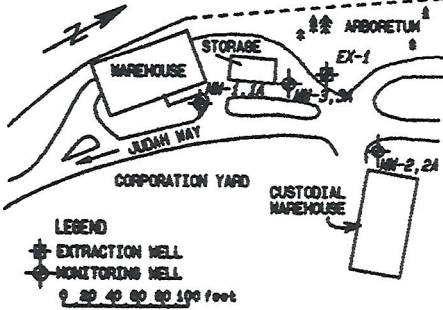
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/04/90

SURFACE ELEVATION 33.00 Feet MSL

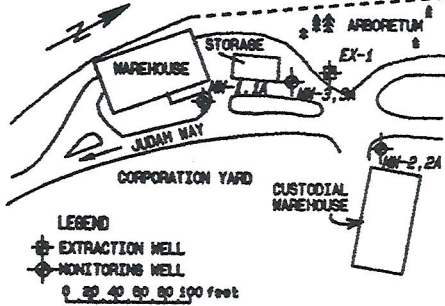
TOTAL DEPTH 215.00 Feet

GEOLOGIST JOHN WOODLING



DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
155	ML		0	CLAYEY SILT (ML): grayish brown, slightly plastic	bentonite/cement grout
	SC		15	CLAYEY SAND (SC):	
	SP			SAND (SP): yellow brown to medium gray brown, fine sand, some stringers of medium clean sand, 30% fines	
	SM			SILTY SAND (SM):	
160	SM			SILTY SAND (SM): gray brown, 60% fine to medium sand, 40% fines	
	SW			SAND (SW): grayish brown, well-graded, fine to medium sand, some stringers of silty sand, cleaner at bottom, 10% fines	
165	SW			SAND (SM,SW): gray brown, interbedded fine to medium sand with clayey and silty sand, 10% fines	
	SM				
170	SP			SAND (SP): clean, poorly graded, medium grained, subangular to subrounded, 60% quartz	
175	ML			SILT (ML): gray to gray brown at bottom, bottom 1-2" is calcite?, white mineralization	
180	ML			SILT/CLAY (ML/CL): gray brown, stiff, iron staining and calcite stringers	
	CL				
185	SM			SILTY SAND (SM): yellow brown, very fine sand, 30% fines	
	SP			SAND (SP): very fine sand with little fines	
	SM			SILT (SM):	
190	ML			SANDY SILT (ML): grades to a fine silty sand	
	SM			SILTY SAND (SM): fine sand	
195	SP			SAND (SP): fine to medium sand, clean	
200	SW			fine  medium	

# WELL MW-1 (Page 5 of 5)



PROJECT DHS/CSUS TRAINING WELL PROJECT  
 DATE DRILLED 06/04/90  
 SURFACE ELEVATION 33.00 Feet MSL  
 TOTAL DEPTH 215.00 Feet  
 GEOLOGIST JOHN WOODLING

DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0 - 205	SW	(dots)	0 - 15	SAND (SW): well-graded, clean, medium to coarse sand near bottom	
205 - 210	SW	(dots)		SAND (SW): same as above, but fines increasing to 10 to 15%	
210 - 215	ML/CL	(diagonal lines)		CLAYEY SILT (ML/CL): stiff, sharp contact with sand above	

**NOTES:**

- 1) WELL STARTED ON 05/30/90 AND COMPLETED ON 06/04/90.
- 2) TOTAL DEPTH OF WELL IS 50 FEET.  
TOTAL DEPTH OF BORING IS 215 FEET.
- 3) DRILL RIG: INGERSOLL RAND R0 300  
DRILLING COMPANY: BEYLIK  
DRILLING METHOD: MUD ROTARY  
OPERATOR: JIM HOFFMAN
- 4) AUGER TO 21 FEET BGS AND PLACE 10 3/4 INCH DIAMETER CONDUCTOR CASING. CONDUCTOR CASING LEFT IN PLACE.
- 5) CONTINUOUS CORE WITH A 94MM WIRE LINE SAMPLER FROM 21 FEET TO 215 FEET BGS. *w/ 9 3/8" bit*
- 6) AIR ROTARY TO FIRST WATER AT 33 FEET BGS.
- 7) 4 INCH SCH 40 PVC CASING INSTALLED FROM 0 TO 27 FEET BGS.  
PVC SLOTTED SCREEN (.020) FROM 27 TO 47 FEET BGS.  
#2 MONTEREY FILTER PACK FROM 25 TO 49 FEET BGS.  
BENTONITE SEAL (.25 INCH PELLETS) FROM 23 TO 25 FEET BGS AND 49 TO 50 BGS.  
BENTONITE/CEMENT GROUT FROM 0 TO 23 FEET AND 50 TO 215 FEET BGS.
- 8) CENTRALIZERS AT 26 AND 47 FEET BGS.
- 9) E-LOG BY COLOG ON 06/02/90.

# WELL MW-1A (Page 1 of 5)

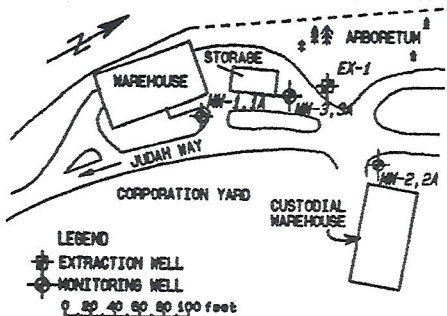
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/25/90

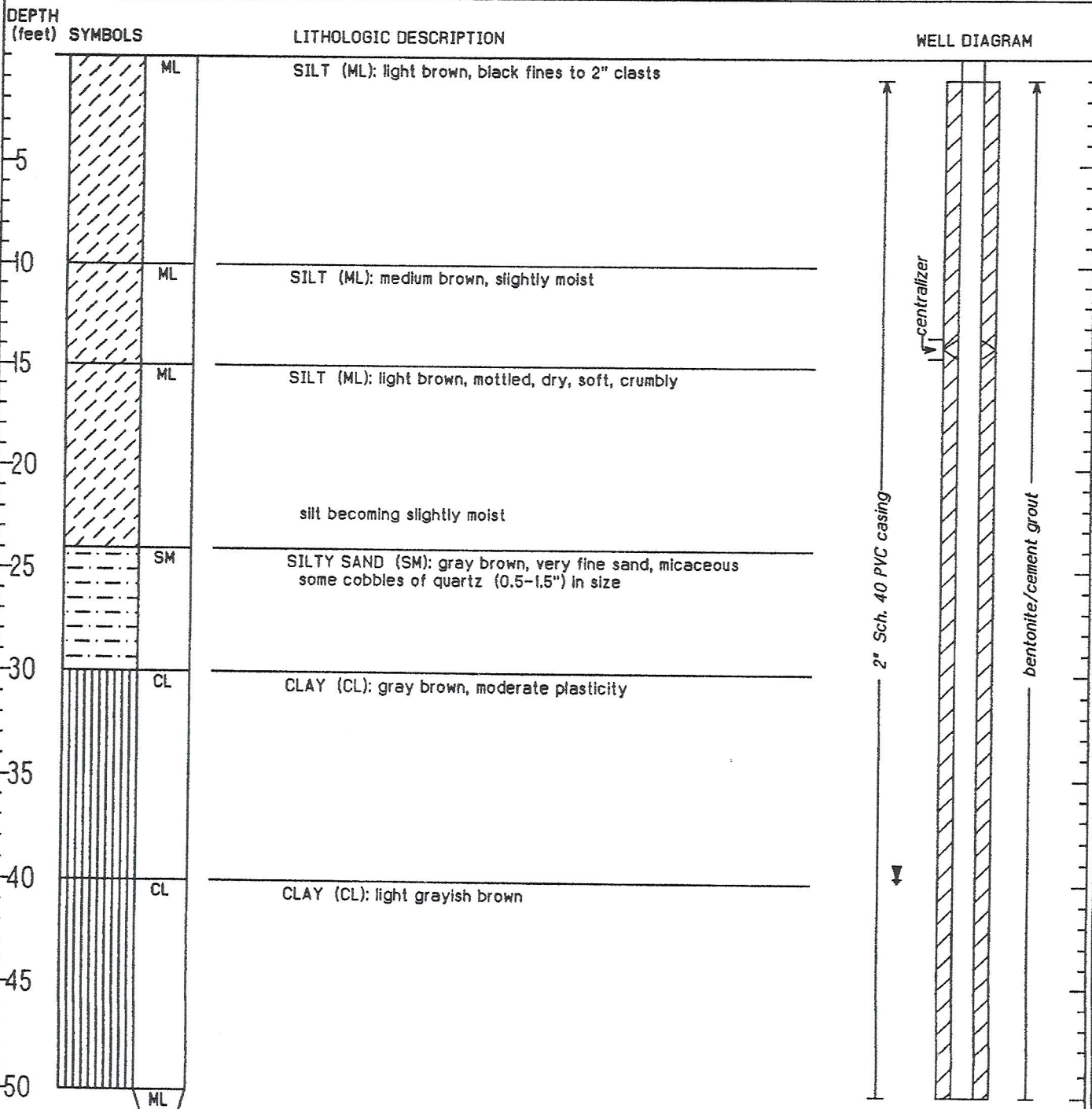
SURFACE ELEVATION 32.78 Feet MSL

TOTAL DEPTH 218.00 Feet

GEOLOGIST JOHN WOODLING



LEGEND  
 ⊕ EXTRACTION WELL  
 ⊙ MONITORING WELL  
 0 50 100 150 feet



**TSSB**  
 GEOLOGIC SUPPORT  
 REGION 1

STATIC WATER LEVEL ↓ (02/08/91)

# WELL MW-1A (Page 2 of 5)

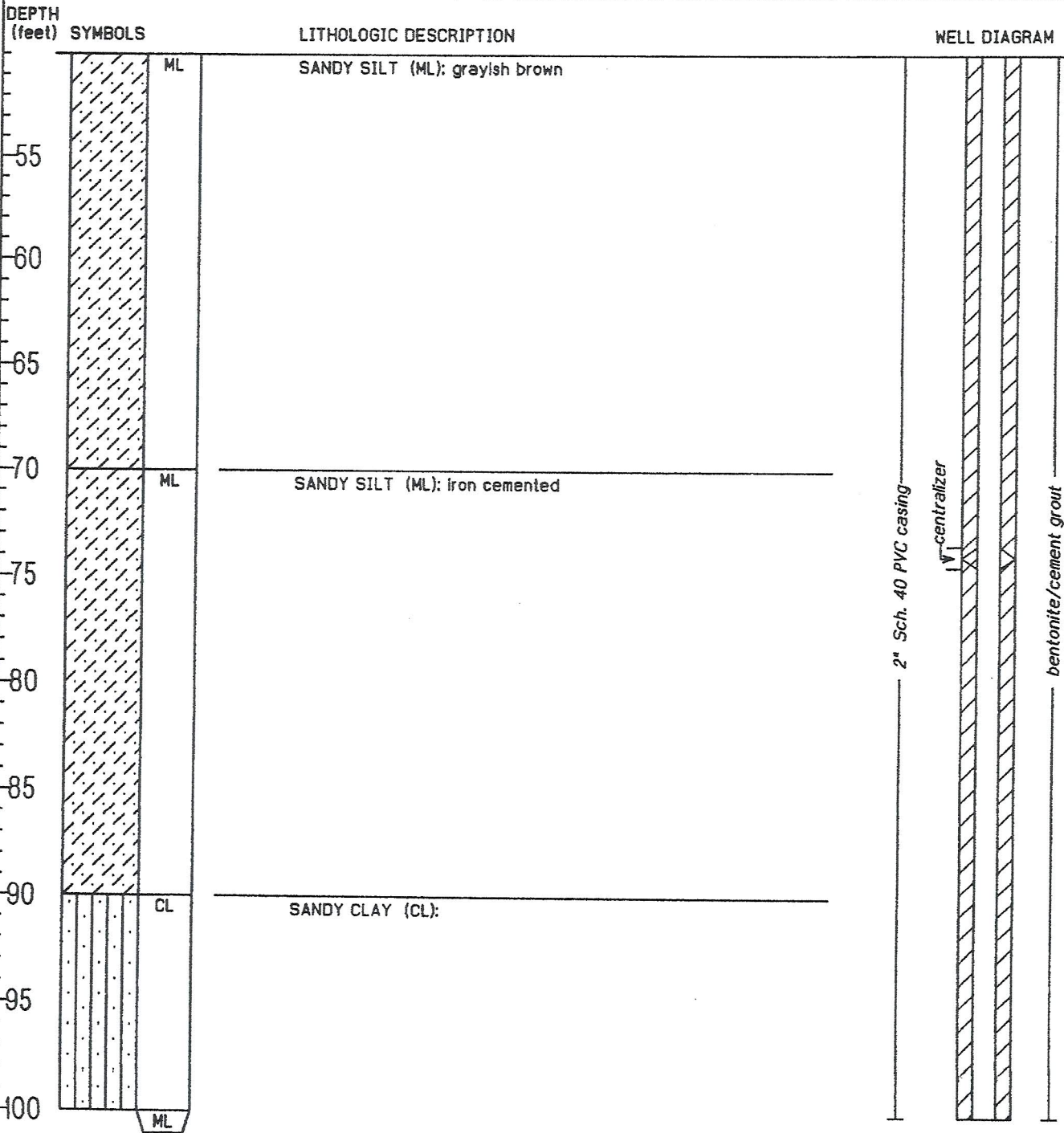
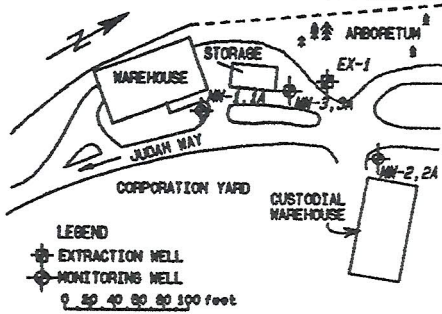
PROJECT DHS/CSUS TRAINING WELL PROJECT

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TOTAL DEPTH 218.00 Feet

GEOLOGIST JOHN WOODLING



# WELL MW-1A (Page 3 of 5)

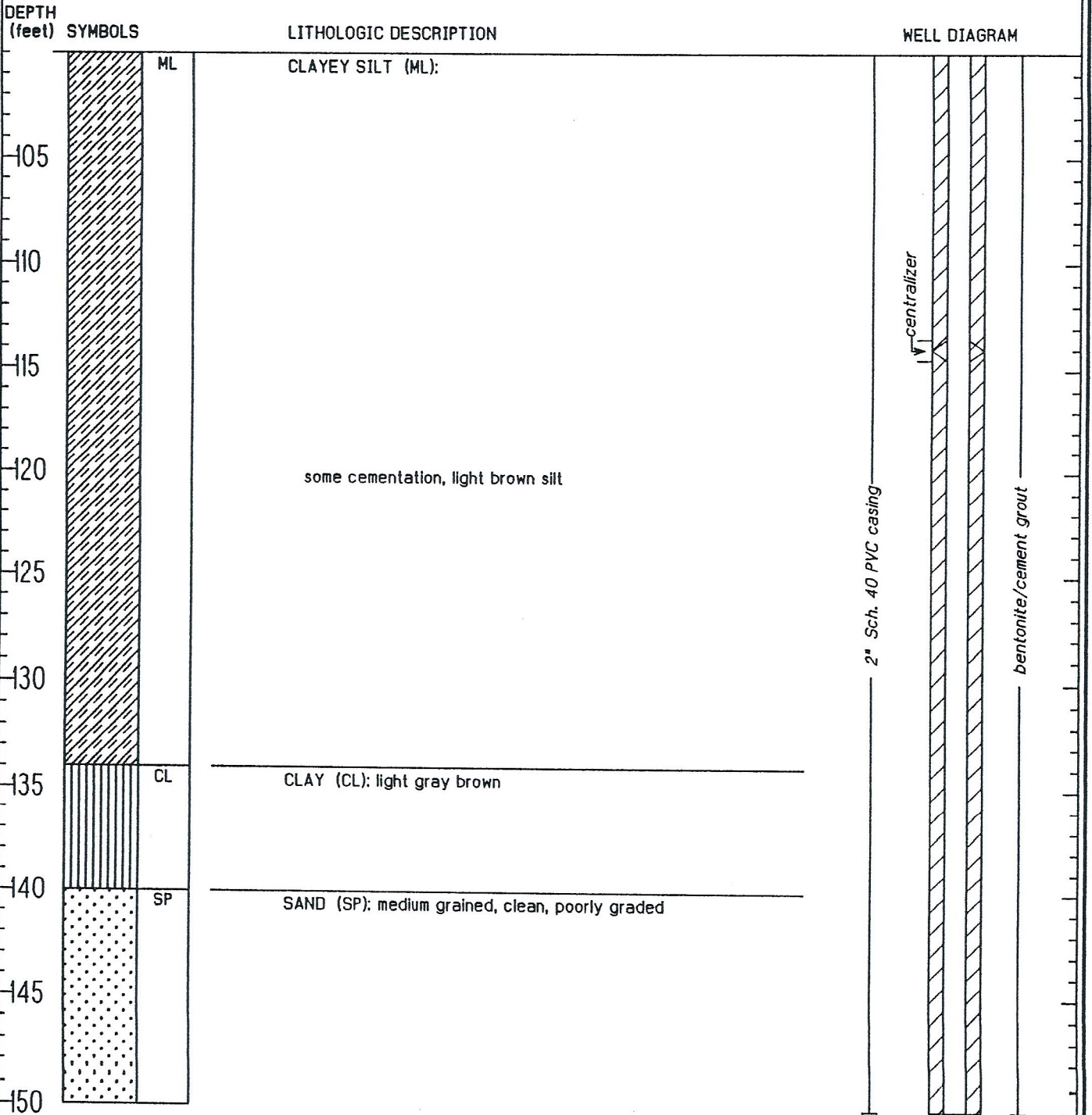
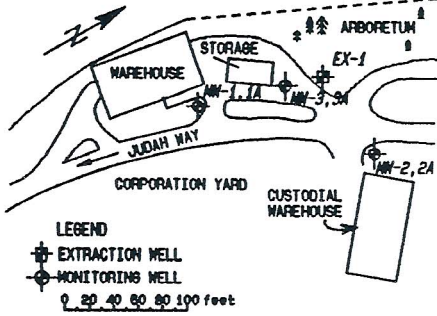
PROJECT DHS/CSUS TRAINING WELL PROJECT

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TOTAL DEPTH 218.00 Feet

GEOLOGIST JOHN WOODLING



# WELL MW-1A (Page 4 of 5)

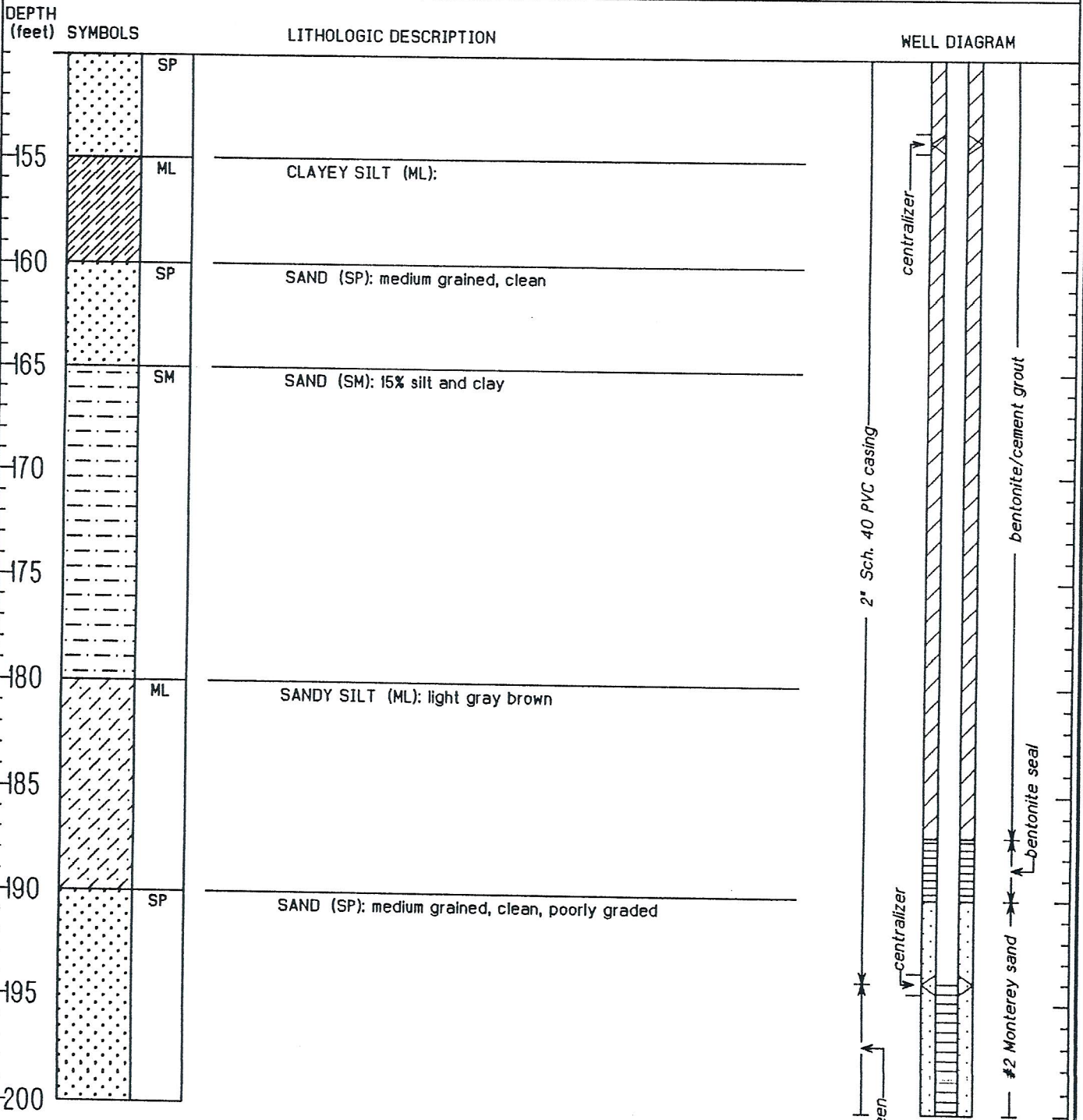
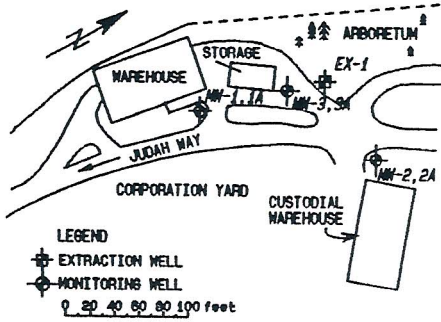
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/25/90

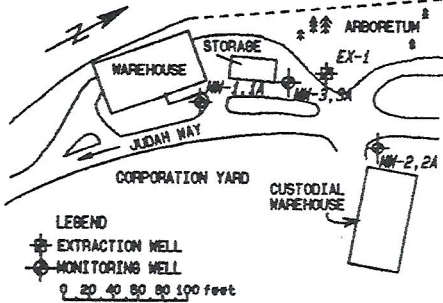
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TOTAL DEPTH 218.00 Feet

GEOLOGIST JOHN WOODLING



# WELL MW-1A (Page 5 of 5)



PROJECT DHS/CSUS TRAINING WELL PROJECT

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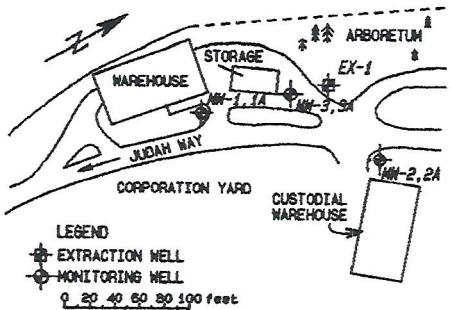
SURFACE ELEVATION 32.78 Feet MSL

TOTAL DEPTH 218.00 Feet

GEOLOGIST JOHN WOODLING

DEPTH (feet)	SYMBOLS	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
205  210  215  220  225  230  235  240  245  250		<p style="text-align: center;">slightly cemented</p>	
<p>NOTES:</p> <ol style="list-style-type: none"> <li>1) WELL STARTED ON 06/22/90 AND COMPLETED ON 06/25/90.</li> <li>2) TOTAL DEPTH OF WELL IS 210 FEET. TOTAL DEPTH OF BORING IS 218 FEET CAVED TO 210 FEET.</li> <li>3) DRILL RIG: INGERSOLL RAND RO 300 DRILLING COMPANY: BEYLIK DRILLING METHOD: MUD ROTARY OPERATOR: JIM HOFFMAN</li> <li>4) AUGER AND PLACE CONDUCTOR CASING TO 21.5 FEET BGS. DRILL TO 217 FEET BGS WITH A 7 7/8" TRICONE BIT.</li> <li>5) LOGGED BY DRILL CUTTINGS.</li> <li>6) 2 INCH SCH 40 PVC CASING INSTALLED FROM 0 TO 194 FEET BGS. PVC SLOTTED SCREEN (.020) FROM 194 TO 209 FEET BGS. #2 MONTEREY FILTER PACK FROM 190 TO 210 FEET BGS. BENTONITE SEAL (.25 INCH PELLETS) FROM 187 TO 190 FEET BGS. BENTONITE/CEMENT GROUT FROM 0 TO 187 FEET BGS.</li> <li>7) CENTRALIZERS AT 14, 74, 114, 154, 194, AND 208 FEET BGS.</li> </ol>			





# WELL MW-2 (Page 1 of 5)

PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/06/90

SURFACE ELEVATION 32.77 Feet MSL

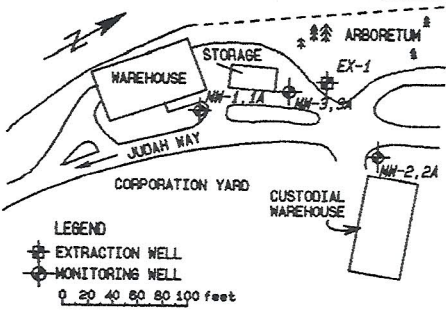
TOTAL DEPTH 220.00 Feet

GEOLOGIST JOHN WOODLING

DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0	ML	[Symbol]	15	SILT (ML): dark brown, 5% sand, micaceous, dry	
5					
10					
15	ML	[Symbol]		CLAYEY SILT (ML): dark reddish brown, slightly plastic, slow dilatancy, moist same as above	
20					
25	GM	[Symbol]		SANDY AND SILTY GRAVEL (GM): cobbles (2-3"), quartzite? and metavolcanics? clasts	
30	SM	[Symbol]		SILTY SAND (SM): medium brown, 75% fine sand, moist, fine gravel at top	
35	SP	[Symbol]		SAND (SP): fine, micaceous, moist, 10% gravel, up to 10mm dark metavolcanic clasts water @ 33.5 BGS	
40	SM	[Symbol]		SILTY SAND (SM): medium brown, fine sand, grades from 30% silt at top and 15% at bottom, moist	
45	SM	[Symbol]		SILT (SM): dark yellow brown, iron staining (cemented) organic stringers, moist, slightly plastic	
50	SM	[Symbol]		SILTY SAND (SM): brown, fine, wet	
	SP	[Symbol]		SAND (SP): fine sand with fine fine gravel at top, very micaceous, wet	
	ML	[Symbol]		SILT (ML): gray brown, iron stained, wet, chunky	

**TSSB**  
GEOLOGIC SUPPORT  
REGION 1

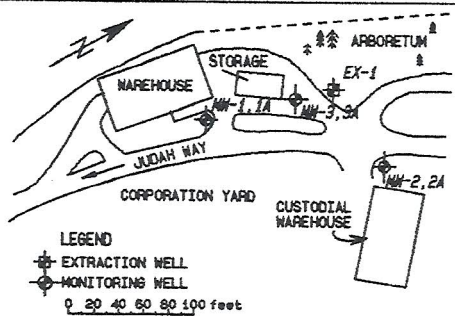
STATIC WATER LEVEL ▼ (02/08/91)  
FIRST WATER LEVEL ▼ (06/06/90)



# WELL MW-2 (Page 2 of 5)

PROJECT DHS/CSUS TRAINING WELL PROJECT  
 DATE DRILLED 06/06/90  
 SURFACE ELEVATION 32.77 Feet MSL  
 TOTAL DEPTH 220.00 Feet  
 GEOLOGIST JOHN WOODLING

DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0	ML	[Symbol]	115	CLAYEY SILT (ML): gray brown, moderate plasticity, 10-15% sand, coarse sand stringers, slow dilatancy	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">cement/bentonite grout seal</p>
55	SM	[Symbol]		SILTY SAND (SM): fine, micaceous	
	ML	[Symbol]		CLAYEY SILT (ML): iron staining	
60	SP	[Symbol]		SAND (SP): medium grained, 40% quartz, 30% feldspar, 30% lithics	
	GP	[Symbol]		GRAVEL (GP): gravel, clean, 80% lithics	
	SC	[Symbol]		SILTY SAND (SC): gray brown, very fine	
65	ML	[Symbol]		CLAYEY SILT (ML): iron cemented, blocky	
	SP	[Symbol]		SAND (SP): fine to medium grained	
70	ML	[Symbol]		CLAYEY SILT (ML): same as 65' bgs sample	
	ML	[Symbol]		SANDY SILT (ML):	
	SM	[Symbol]		CLAYEY/SILTY SAND (SM/SC): gray brown, very fine to fine, cleaner from 72-74', 6" of lithic (20%) gravels at top	
75	SC	[Symbol]		GRAVEL (GP): 6" layer of black clasts (up to 2.5" in size)	
	GP	[Symbol]		SANDY SILT (ML): reddish brown	
	ML	[Symbol]		SILTY SAND (SM): reddish brown, stiff iron staining, black organics, mottled	
80	SM	[Symbol]			
85	ML/CL	[Symbol]		CLAYEY SILT (ML/CL): gray brown	
	ML	[Symbol]		SANDY SILT (ML): gray, mottled, fine grained, 40% sand	
90	SM	[Symbol]		SILTY SAND (SM): gray brown, micaceous	
95	ML	[Symbol]		SILT (ML): gray brown, chunky	
	SM	[Symbol]		SILTY SAND (SM):	
	SP	[Symbol]		SAND (SP): clean, poorly graded, fine, black sand, iron staining	
100	SM	[Symbol]		SILTY SAND (SM):	



# WELL MW-2 (Page 3 of 5)

PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/06/90

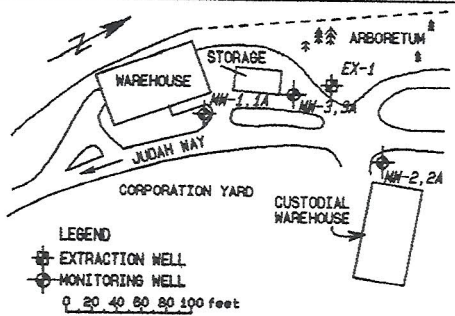
SURFACE ELEVATION 32.77 Feet MSL

TOTAL DEPTH 220.00 Feet

GEOLOGIST JOHN WOODLING

DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0	SM	[Symbol]	115	SILTY SAND (SM): gray brown, iron stained, organic stringers	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">cement/bentonite grout</p>
105	SP	[Symbol]		SAND (SP): dark brown, fine grained, 10% fines poorly graded	
110	ML	[Symbol]		CLAYEY SILT (ML): gray brown	
110	ML	[Symbol]		SILT (ML): same as 94-95', cemented silt, chunky	
115	SM	[Symbol]		SILTY SAND (SM):	
115	SM	[Symbol]		SILTY SAND (SM): gray brown, 30% silt at top and 20% at bottom	
120				same as above	
125	SP	[Symbol]		SAND (SP): fine, clean, poorly graded	
125	SC	[Symbol]		CLAYEY SAND (SC): gray brown	
125	ML/CL	[Symbol]		CLAYEY SILT (ML/CL): gray brown, stiff	
130	CL	[Symbol]		CLAY (CL): gray brown, lean, stiff, dark laminations	
135	SM	[Symbol]		SILTY SAND (SM): gray brown, fine sand, mottled, iron stained	
140	SP/SW	[Symbol]		SAND (SP/SW): fine to medium grained, clean, micaceous, same as MW-1 from 135 to 150' bgs medium grained sand	
145				same as above	
150	CL	[Symbol]		CLAY (CL): brown gray, stiff, moderate plasticity, lean	

# WELL MW-2 (Page 4 of 5)



PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/06/90

SURFACE ELEVATION 32.77 Feet MSL

TOTAL DEPTH 220.00 Feet

GEOLOGIST JOHN WOODLING

DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
	CL	[Symbol]	0		<p style="text-align: center;">cement/bentonite grout</p>
	CL/ML	[Symbol]	115	CLAYEY SILT (CL/ML);	
155	CL	[Symbol]		SANDY CLAY (CL): gray brown, stiff	
160	SM	[Symbol]		SILTY SAND (SM): gray brown, interbedded with silt, dark sand at bottom	
	ML	[Symbol]		SANDY SILT (ML): gray brown, stiff, slightly plastic	
165					
	SP	[Symbol]		SAND (SP): brown, fine grained, clean, subangular, micaceous	
170	ML	[Symbol]		SILT/CLAY (CL/ML): gray brown, moderate plasticity, clayier at bottom	
	CL	[Symbol]		same as above, siltier	
175	ML	[Symbol]		CLAYEY SILT (ML): gray brown, stiff gypsum, no HCL reaction	
180	ML	[Symbol]		SANDY SILT (ML): gray brown, gypsum cemented, chunky	
185					
	SP	[Symbol]		SAND (SP): gray brown, poorly graded, very fine, 5% fines	
190	SM	[Symbol]		SILTY SAND (SM): gray brown, fine sand, grades to sand below	
195	SW	[Symbol]		SAND (SW): fine to medium grained, clean, well-graded, subangular to subrounded	
	SP	[Symbol]		SAND (SP): medium grained, poorly graded, subrounded	
200					

# WELL MW-2 (Page 5 of 5)

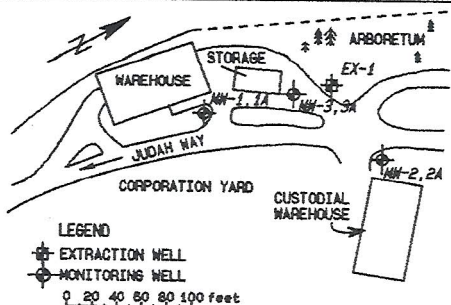
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/06/90

SURFACE ELEVATION 32.77 Feet MSL

TOTAL DEPTH 220.00 Feet

GEOLOGIST JOHN WOODLING



DEPTH (feet)	USCS	SYMBOLS	16 INCH NORMAL RESISTIVITY (ohms-meters)	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
0 - 205	SP	[Dotted pattern]	0 - 115	coarse (1") sand stringers, 70% quartz, 30% mica, dark lithics	[Well diagram showing casing and grout]
205 - 215	ML	[Diagonal hatching]		SANDY SILT (ML):	
215 - 220	SP ML	[Diagonal hatching]		SAND (SP): medium grained, clean SANDY SILT (ML): chunky, iron cemented	
220 - 225					

**NOTES:**

- 1) WELL STARTED ON 06/04/90 AND COMPLETED ON 06/06/90.
- 2) TOTAL DEPTH OF BORING IS 220 FEET.
- 3) DRILL RIG: INGERSOLL RAND RO 300  
DRILLING COMPANY: BEYLIK  
DRILLING METHOD: MUD ROTARY  
OPERATOR: JIM HOFFMAN
- 4) AUGER TO 21 FEET BGS AND PLACE 10 3/4 INCH CONDUCTOR CASING.
- 5) CONTINUOUS CORE WITH A 94MM WIRE LINE SAMPLER TO 220 FEET BGS.
- 6) 4 INCH SCH 40 PVC CASING INSTALLED FROM 0 TO 27 FEET BGS.  
.020 INCH PVC WELL SCREEN FROM 27 TO 47 FEET BGS.  
#2 MONTEREY FILTER PACK FROM 23 TO 49 FEET BGS.  
BENTONITE SEAL FROM 15 TO 23 FEET (GRANULAR SEAL: .25" TABLETS, 15-19.75 FEET BGS AND TRANSITION SEAL: .5" TABLETS, 19.75-23.0 FEET BGS) AND ENVIROPLUG (.25" TABLETS) FROM 49 TO 51 FEET BGS.  
CEMENT/BENTONITE GROUT FROM 0 TO 15 AND 51 TO 220 FEET BGS.
- 7) CENTRALIZERS AT 24 AND 47 FEET BGS.
- 8) E-LOG BY COLOG ON 06/06/90.

# WELL MW-2A (Page 1 of 5)

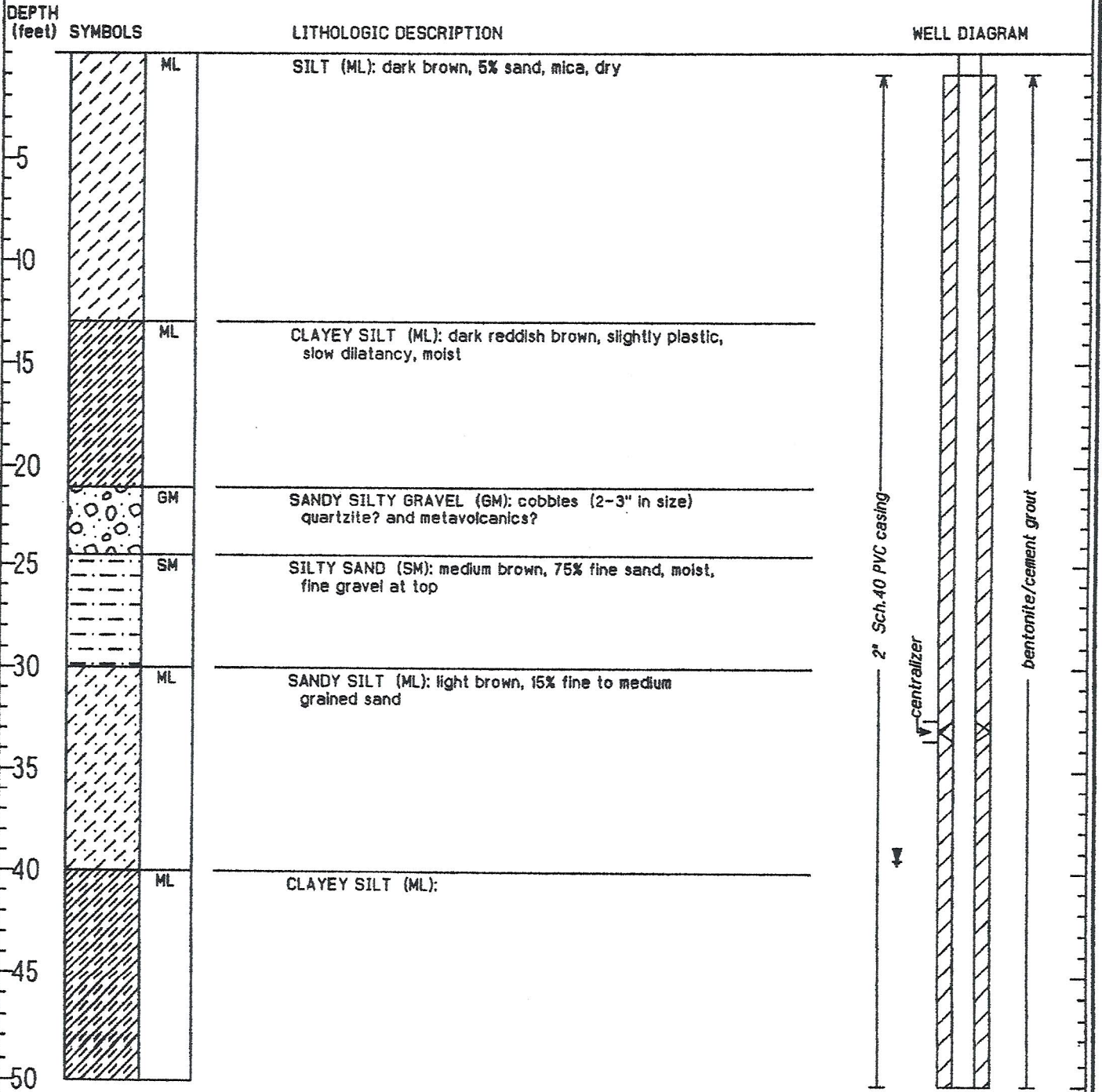
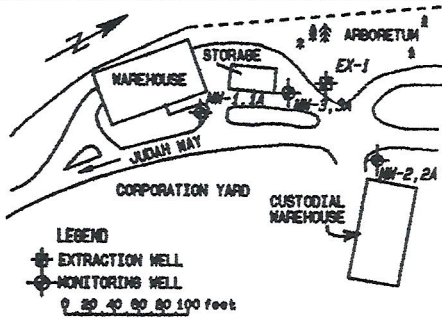
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/27/90

SURFACE ELEVATION 32.67 Feet MSL

TOTAL DEPTH 215.00 Feet

GEOLOGIST JOHN WOODLING



# WELL MW-2A (Page 2 of 5)

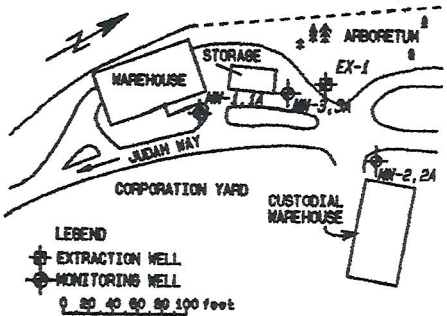
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/27/90

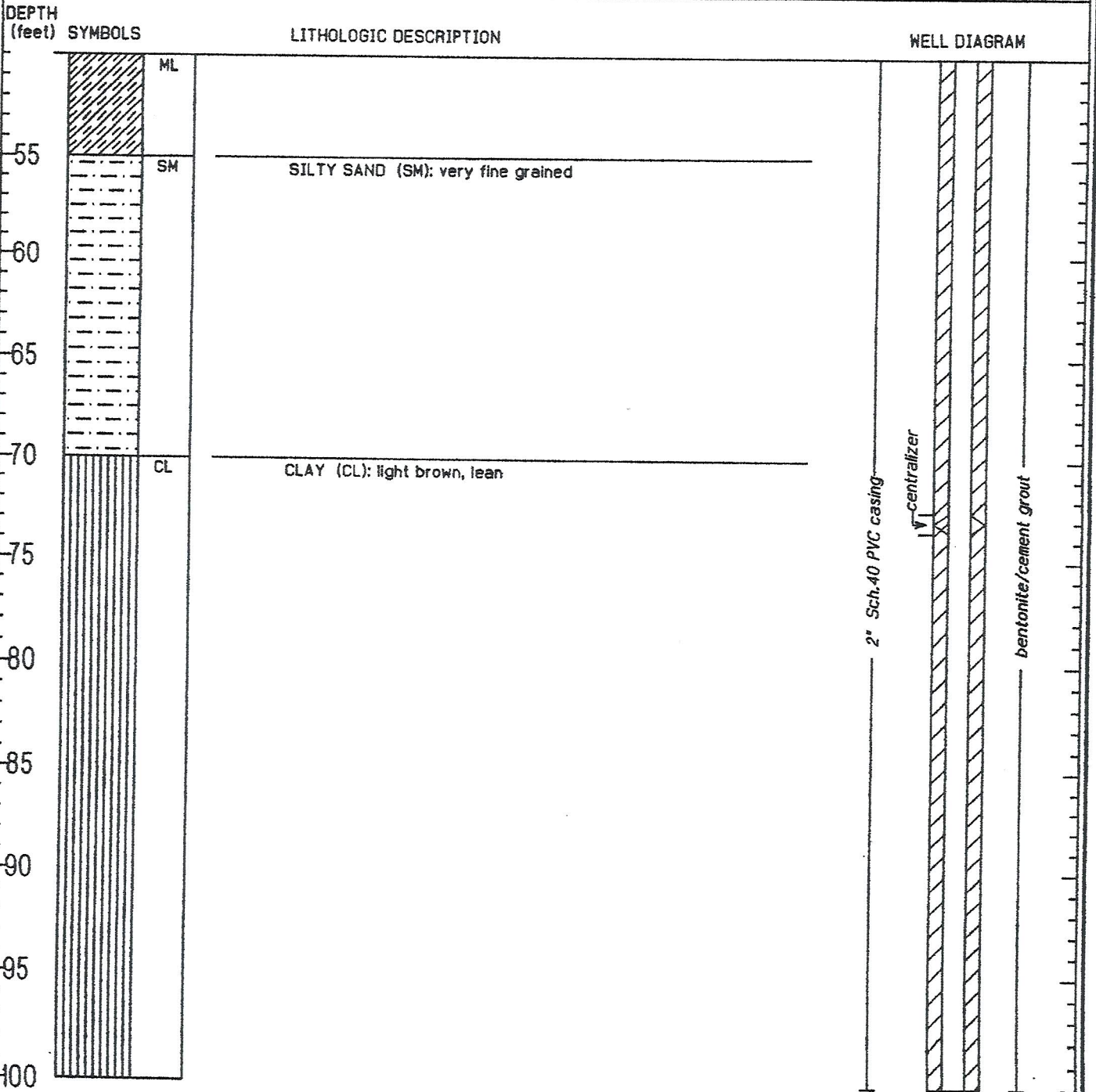
SURFACE ELEVATION 32.67 Feet MSL

TOTAL DEPTH 215.00 Feet

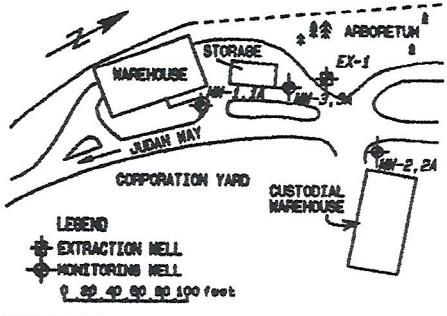
GEOLOGIST JOHN WOODLING



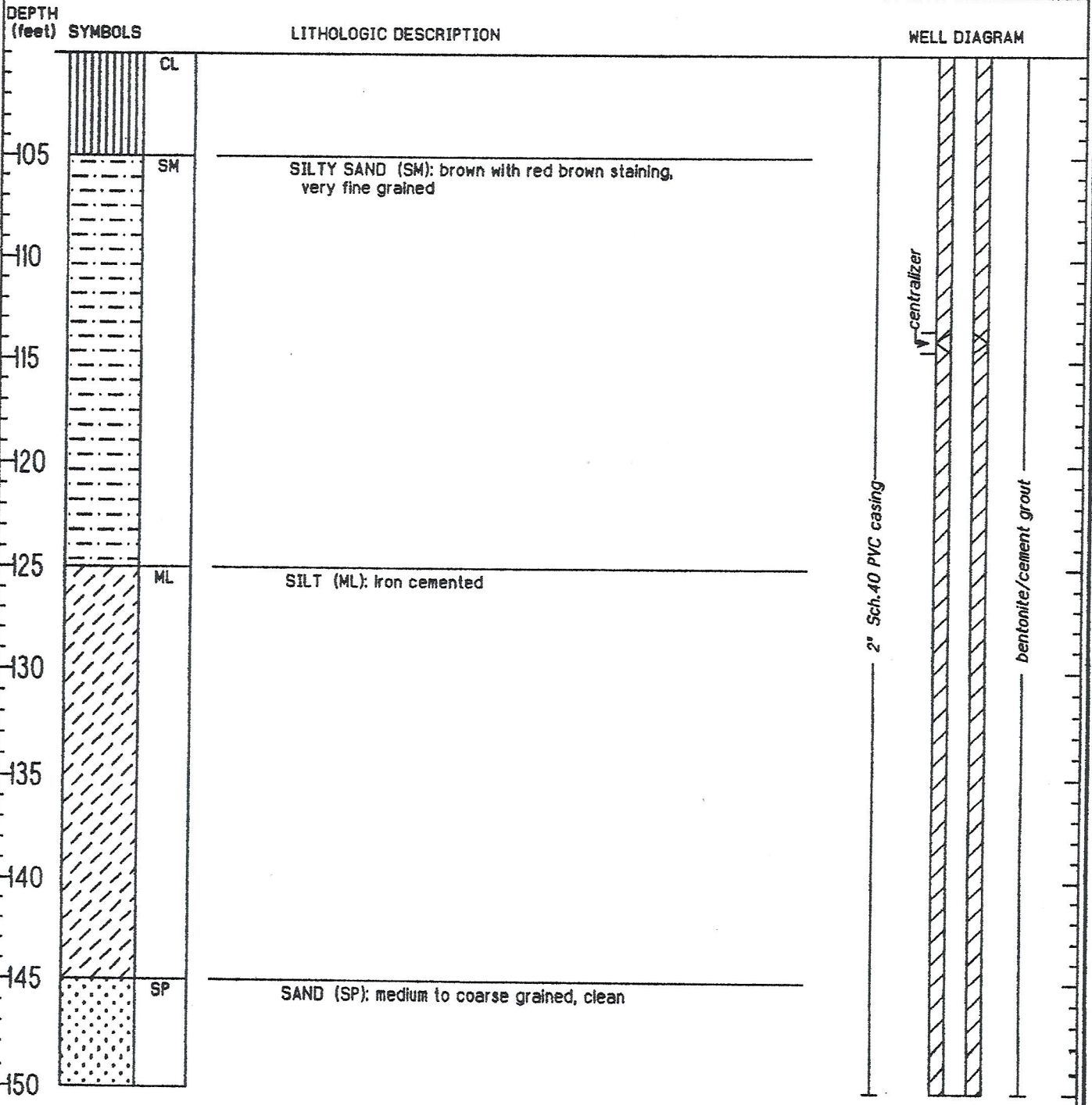
LEGEND  
 ⊕ EXTRACTION WELL  
 ⊙ MONITORING WELL  
 0 20 40 60 80 100 feet



# WELL MW-2A (Page 3 of 5)



PROJECT DHS/CSUS TRAINING WELL PROJECT  
 DATE DRILLED 06/27/90  
 SURFACE ELEVATION 32.87 Feet MSL  
 TOTAL DEPTH 215.00 Feet  
 GEOLOGIST JOHN WOODLING





# WELL MW-2A (Page 4 of 5)

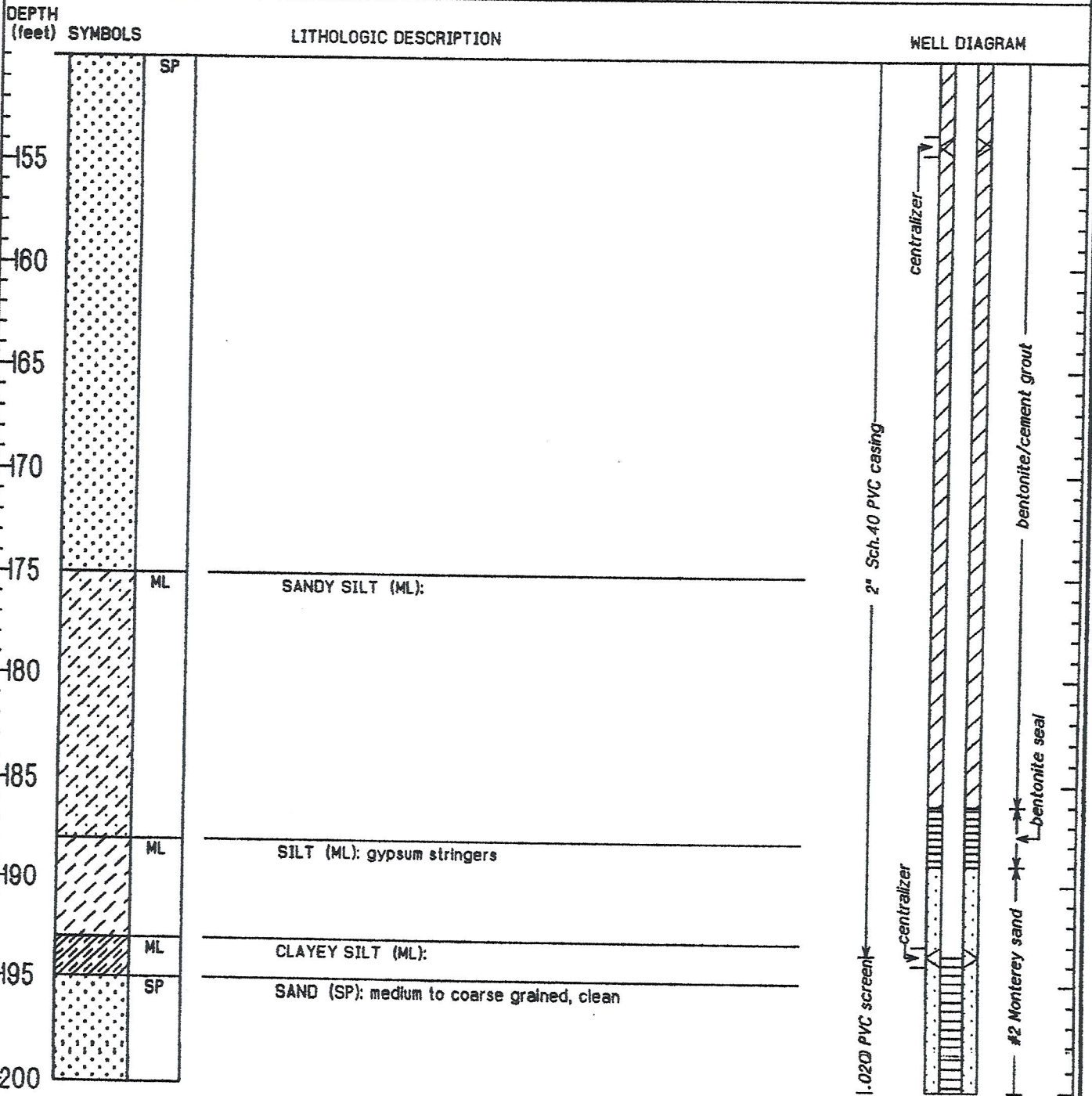
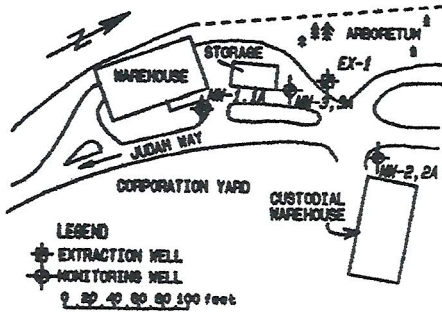
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/27/90

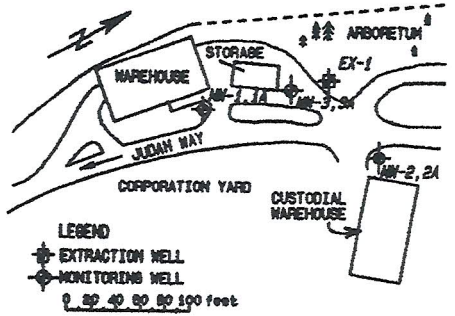
SURFACE ELEVATION 32.67 Feet MSL

TOTAL DEPTH 215.00 Feet

GEOLOGIST JOHN WOODLING



# WELL MW-2A (Page 5 of 5)



PROJECT DHS/CSUS TRAINING WELL PROJECT

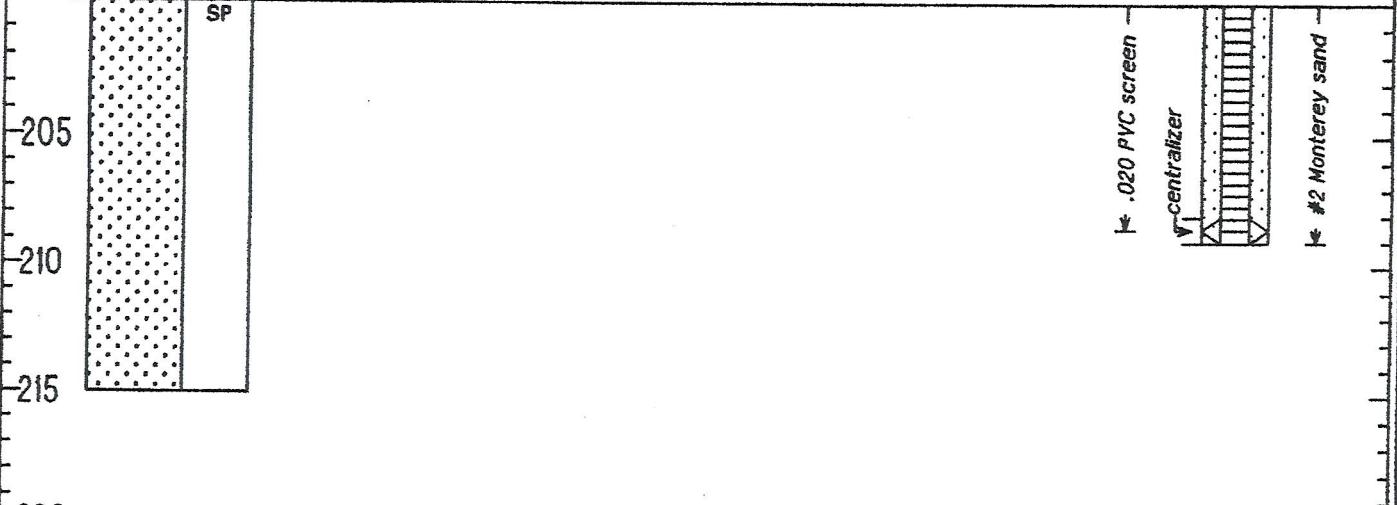
DATE DRILLED 06/27/90

SURFACE ELEVATION 32.67 Feet MSL

TOTAL DEPTH 215.00 Feet

GEOLOGIST JOHN WOODLING

DEPTH (feet)    SYMBOLS    LITHOLOGIC DESCRIPTION    WELL DIAGRAM



- NOTES:
- 1) WELL STARTED ON 06/26/90 AND COMPLETED ON 06/27/90.
  - 2) TOTAL DEPTH OF WELL IS 215 FEET (CAVED IN TO 209 FEET BGS).
  - 3) DRILL RIG: INGERSOLL RAND RO 300  
 DRILLING COMPANY: BEYLIK  
 DRILLING METHOD: MUD ROTARY  
 OPERATOR: JIM HOFFMAN
  - 4) DRILLED WITH AN 14 INCH HOLLOW STEM AUGER TO 215 FEET WITH A 7 7/8 INCH TRICONE BIT.
  - 5) LOGGED BY DRILL CUTTINGS.
  - 6) 2 INCH SCH 40 PVC CASING INSTALLED FROM 0 TO 193.5 FEET BGS.  
 PVC SLOTTED SCREEN (.020) FROM 193.5 TO 208.5 FEET BGS.  
 #2 MONTEREY FILTER PACK FROM 189 TO 209 FEET BGS.  
 BENTONITE SEAL FROM 186 TO 189 FEET BGS.  
 BENTONITE/CEMENT GROUT FROM 0 TO 186 FEET AND 209 TO 215 FEET BGS.
  - 7) CENTRALIZERS AT 33, 73, 113, 153, 193.5, AND 208.5 FEET BGS.

# WELL MW-3A (Page 1 of 5)

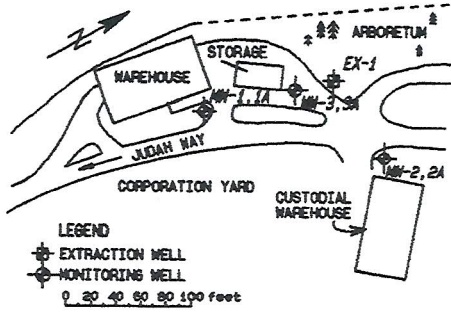
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/18/90

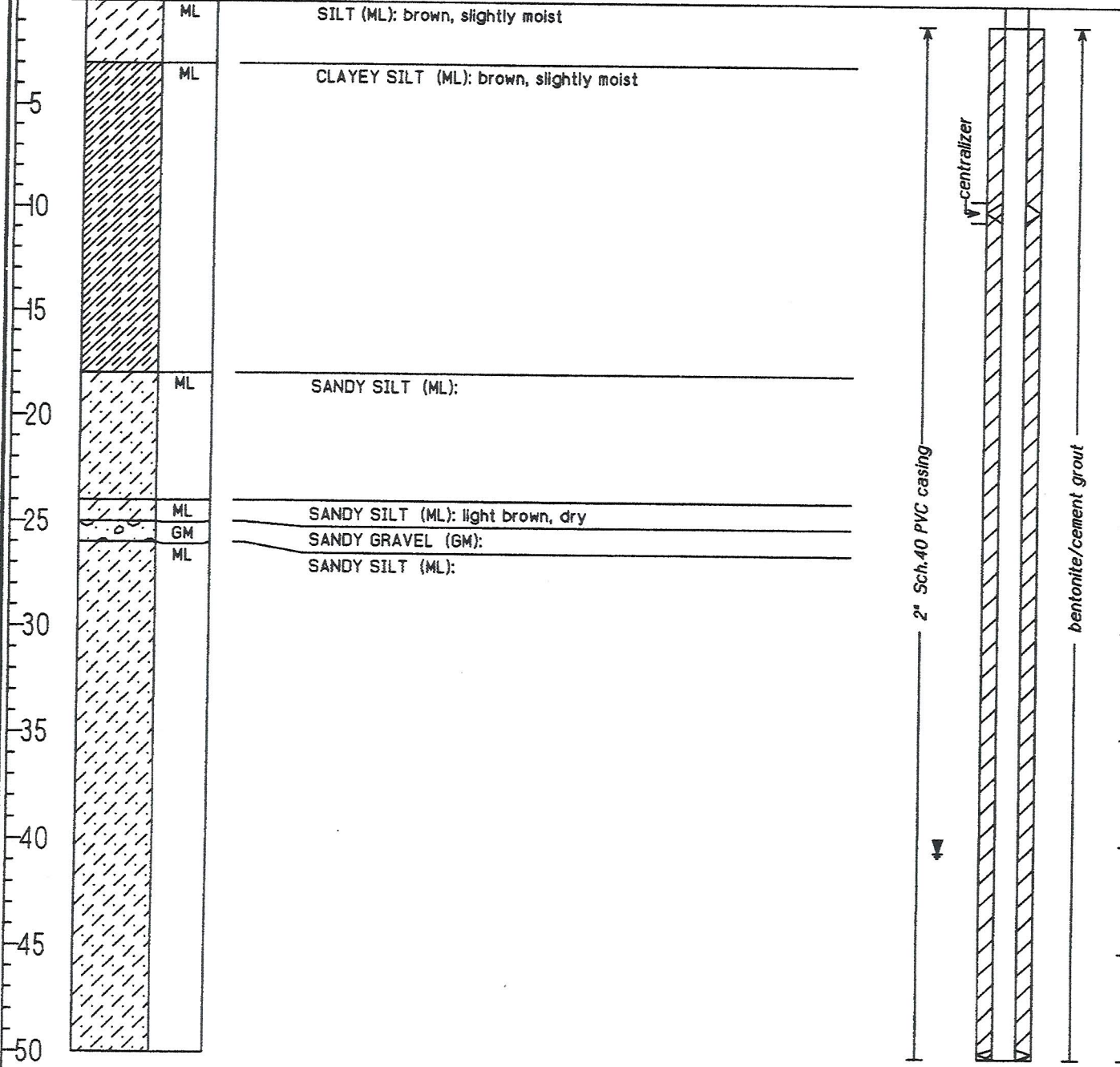
SURFACE ELEVATION 33.63 Feet MSL

TOTAL DEPTH 210.00 Feet

GEOLOGIST JOHN WOODLING



DEPTH (feet) SYMBOLS LITHOLOGIC DESCRIPTION WELL DIAGRAM



# WELL MW-3A (Page 2 of 5)

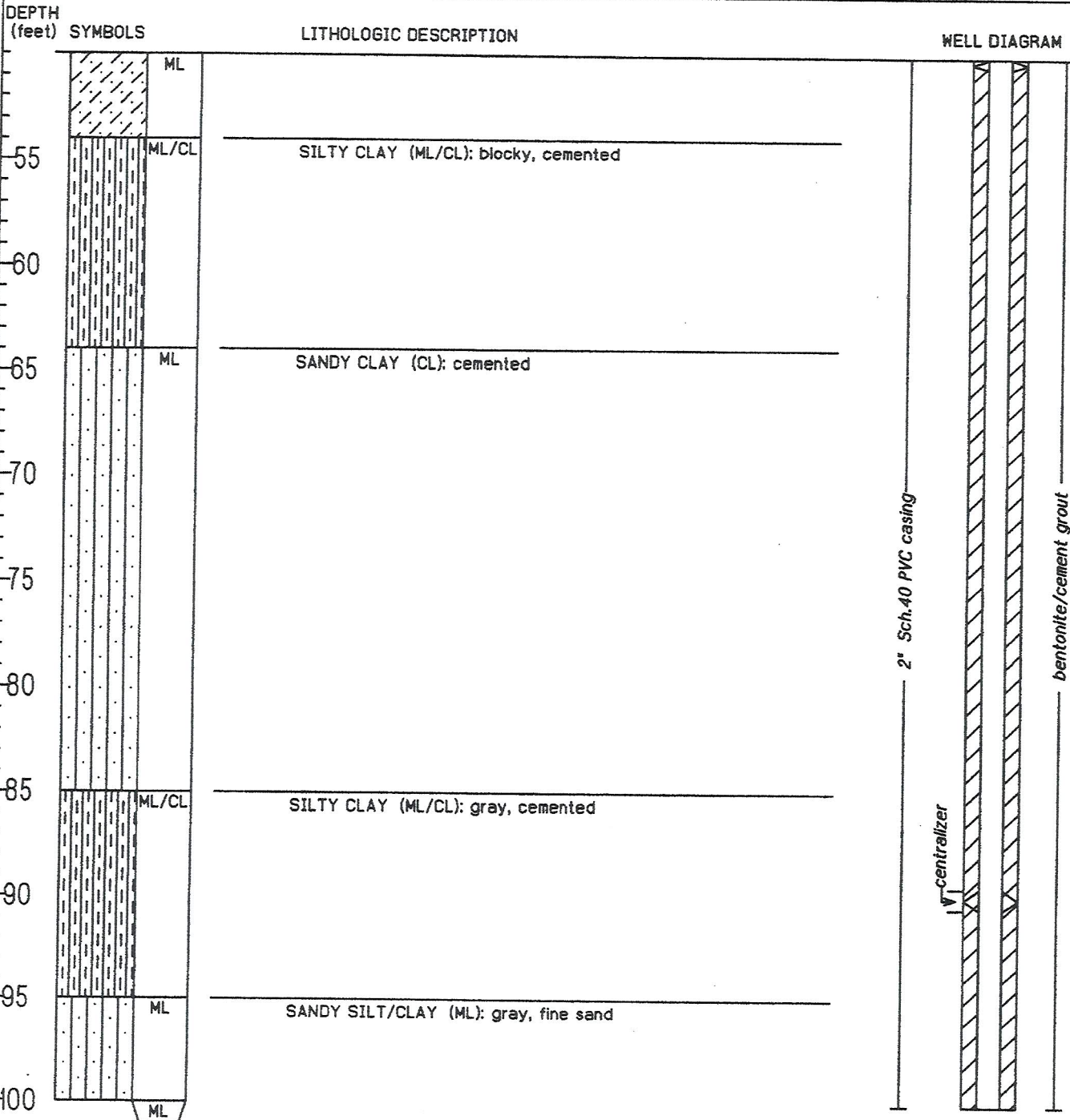
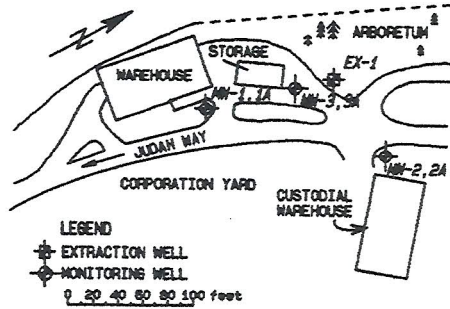
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/18/90

SURFACE ELEVATION 33.63 Feet MSL

TOTAL DEPTH 210.00 Feet

GEOLOGIST JOHN WOODLING



# WELL MW-3A (Page 3 of 5)

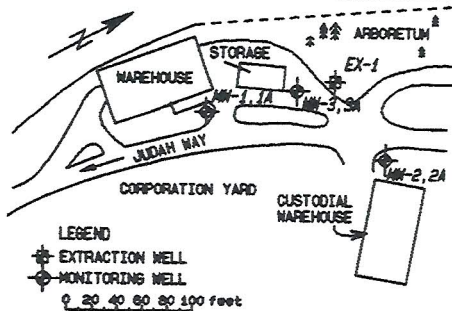
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/18/90

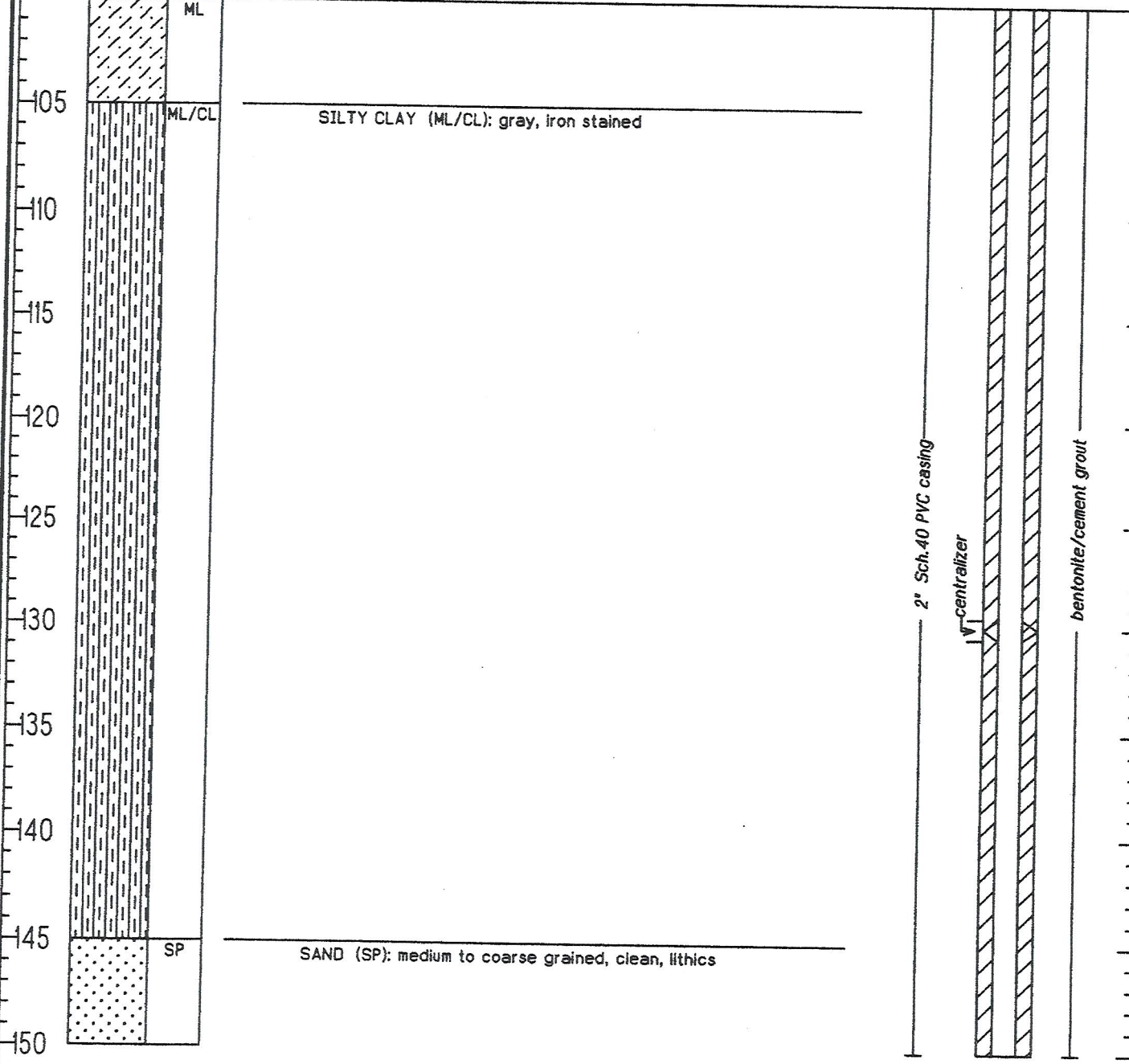
SURFACE ELEVATION 33.63 Feet MSL

TOTAL DEPTH 210.00 Feet

GEOLOGIST JOHN WOODLING



DEPTH (feet)    SYMBOLS    LITHOLOGIC DESCRIPTION    WELL DIAGRAM



# WELL MW-3A (Page 4 of 5)

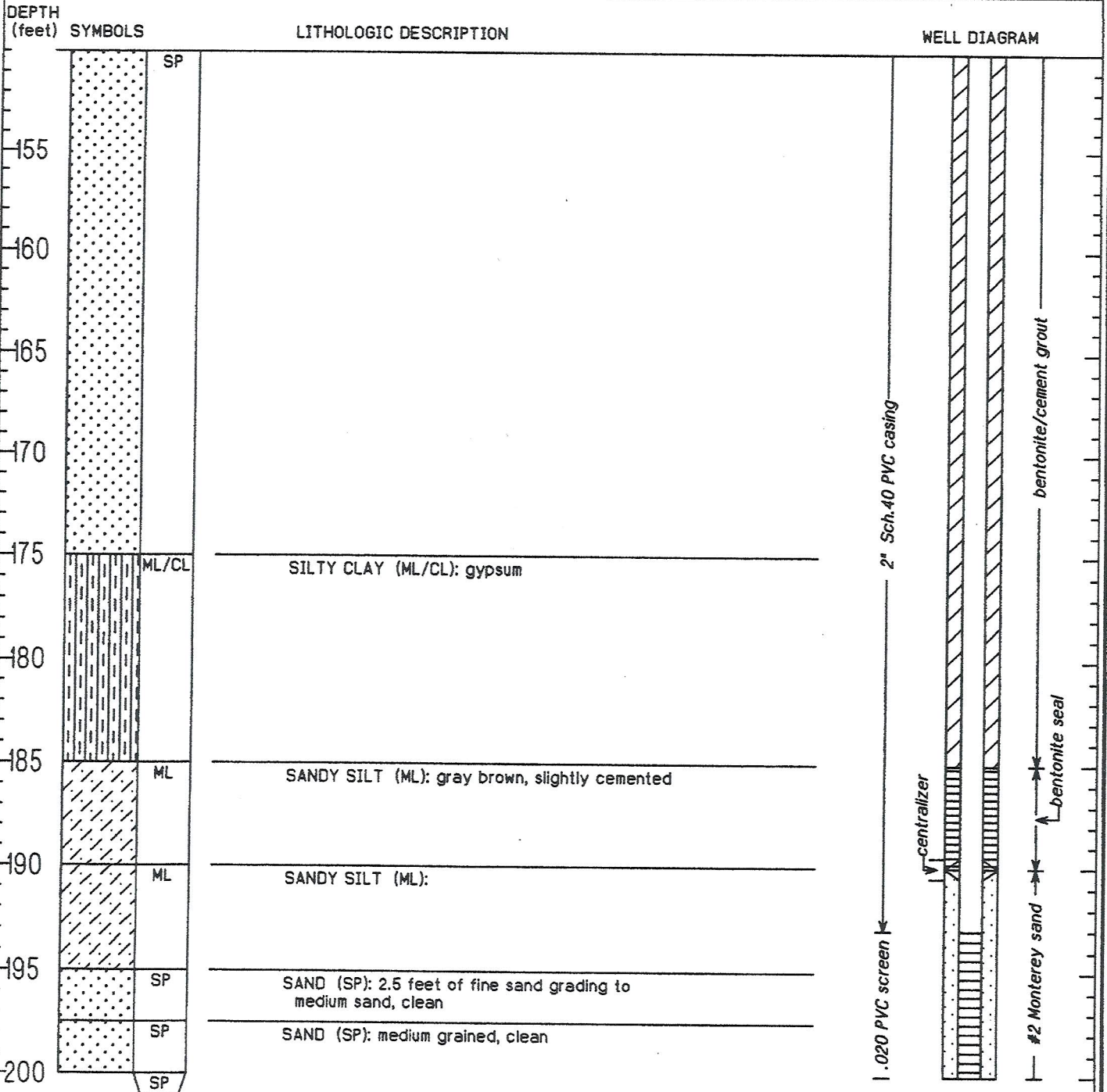
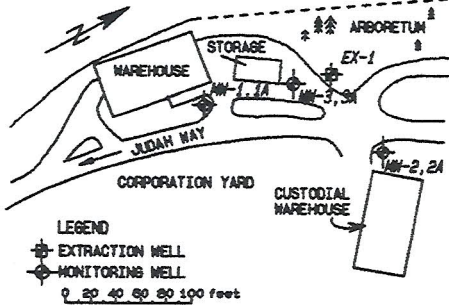
PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/18/90

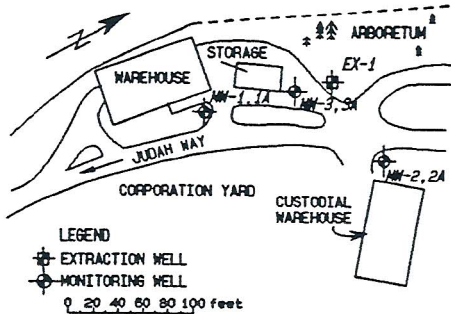
SURFACE ELEVATION 33.63 Feet MSL

TOTAL DEPTH 210.00 Feet

GEOLOGIST JOHN WOODLING



# WELL MW-3A (Page 5 of 5)



PROJECT DHS/CSUS TRAINING WELL PROJECT

DATE DRILLED 06/18/90

SURFACE ELEVATION 33.63 Feet MSL

TOTAL DEPTH 210.00 Feet

GEOLOGIST JOHN WOODLING

DEPTH (feet)	SYMBOLS	LITHOLOGIC DESCRIPTION	WELL DIAGRAM
-205	SP	SAND (SP): medium to coarse grained, clean, 70% quartz, 10% feldspar, 20% lithics and mica	
-210	SM	SILTY SAND (SM):	
-215			
-220			
-225			
-230			
-235			
-240			
-245			
-250			

- NOTES:**
- 1) WELL STARTED ON 06/14/90 AND COMPLETED ON 06/18/90.
  - 2) TOTAL DEPTH OF WELL IS 210 FEET.
  - 3) DRILL RIG: INGERSOLL RAND RO 300  
 DRILLING COMPANY: BEYLIK  
 DRILLING METHOD: MUD ROTARY  
 OPERATOR: JIM HOFFMAN
  - 4) DRILLED WITH A 7 5/8 INCH TRICONE BIT TO 210 FEET.
  - 5) LOGGED CUTTINGS TO 185 FEET BGS. CONTINUOUS CORE WITH A 94MM WIRE LINE SAMPLER FROM 185 TO 210 FEET BGS.
  - 6) 2 INCH SCH 40 PVC CASING INSTALLED FROM 0 TO 193 FEET BGS.  
 PVC SLOTTED SCREEN (.020) FROM 193 TO 208 FEET BGS.  
 #2 MONTEREY FILTER PACK FROM 190 TO 210 FEET BGS.  
 BENTONITE SEAL (.25 INCH PELLETS) FROM 185 TO 190 FEET BGS.  
 BENTONITE/CEMENT GROUT FROM 0 TO 185 FEET BGS.
  - 7) CENTRALIZERS AT 10, 50, 90, 130, 190, AND 208 FEET BGS.