

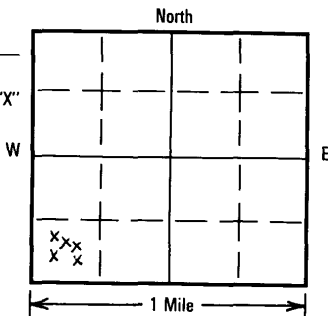
SOUTH DAKOTA WATER WELL COMPLETION REPORT

07-92

Location SW 1/4 SW 1/4 Sec 18 Twp 2N Rg 9E

County PENNINGTON

Please mark well location with an "X"

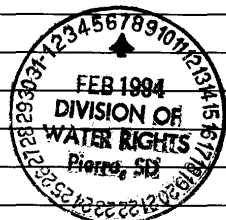


Well Completion Date See attached forms

Well Owner: U.S. Air Force
Business Name: Ellsworth Air Force Base
Address: Ellsworth, S.D. 57706

WELL LOG: See attached forms

Table with columns: FORMATION, DEPTH (FROM, TO). Multiple empty rows for data entry.



LOCATION:

Distance from nearest potential pollution source (septic tank, abandoned well, feed lot, etc.)? ft. from (identify source).

PROPOSED USE:

- Domestic/Stock, Municipal, Business, Test Holes, Irrigation, Industrial, Institutional, Monitoring well (checked)

METHOD OF DRILLING: 00-10.25" ID=6.25" ASA

CASING DATA:

- Steel, Plastic (checked), Other

If other describe

Table with columns: PIPEWEIGHT, DIAMETER, FROM, TO, HOLE DIAMETER. Includes handwritten values like 2 IN.

STATIC WATER LEVEL See attached forms

If flowing: closed in pressure, N/A
GPM flow, N/A
Controlled by, Valve, Reducers, Other, N/A
Reduced Flowrate, N/A
Can well be completely shut in?, N/A

GROUTING DATA: See attached forms

Table with columns: Grout Type, No. of Sacks, Grout Weight, From, To. Includes handwritten 'Cement/Bentonite'.

Describe grouting procedure Grout pump & tremied

WELL TEST DATA: N/A

Options: Pumped, Bailed, Other. Includes fields for Pumping Level Below Land Surface and Hrs. pumped.

SCREEN: Perforated pipe, Manufactured (checked)

Diameter 2 IN Length See attached FEET
Material See attached forms
Slot Size 0.010 Set From Feet to Feet

REMARKS Well Numbers:

mw 930210
0211
0212
0213
0214

WAS A PACKER OR SEAL USED? YES (checked) NO

If so, what material? Bentonite
Describe packer(s) and location? See attached forms

This well was drilled under license # 565

And this report is true and accurate.
Drilling firm Twin City Testing Corp.

DISINFECTION:

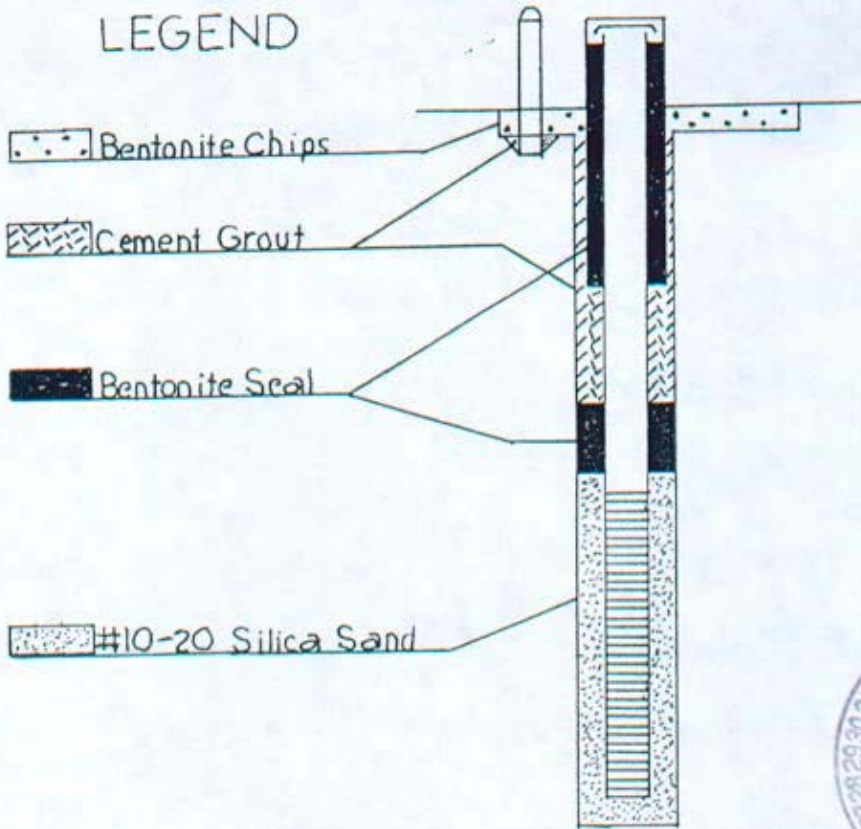
Was well disinfected upon completion? YES, How:
X NO, Why Not? Monitoring use only

Signature of License Representative: Roger B. Hodson
Signature of Well Owner or Equitable Property Holder:

Laboratory sent to for water quality analysis

Date: 2/3/94

LEGEND

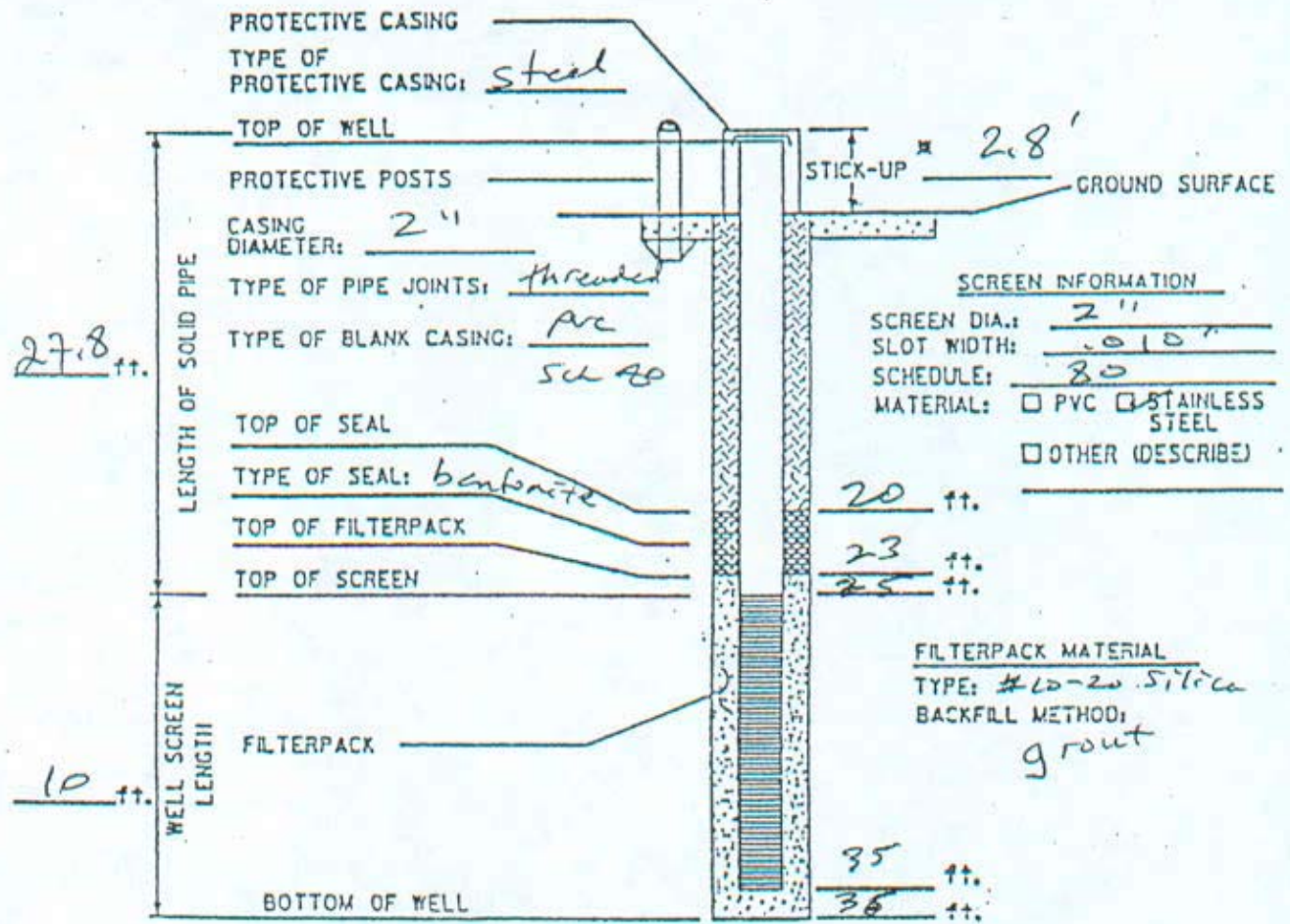


TITLE: MONITORING WELL MATERIALS DIAGRAM EA ENGINEERING ELLSWORTH AIR FORCE BASE	
PROJECT #: TCT NO. 6100-93-0130	
DATE: 1-28-94	SCALE: NONE
DRAWN BY: TSO	CHECKED BY: SDS

ELEVATION GROUND WATER			PROJECT	<u>KAFB</u>
DATE INSTALLED	STARTED	COMPLETED	LOCATION (Coordinates or Station)	
<u>5 JUN 93</u>	<u>25 JUN 93</u>	<u>27 JUN 93</u>	<u>DU-2, C-200</u>	
ELEVATION TOP OF HOLE			SIGNATURE OF INSPECTOR	
TOTAL DEPTH OF HOLE			HOLE NO. <u>MW990210</u>	

## MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



37

### WELL DEVELOPMENT

METHOD: \_\_\_\_\_  
 TIME SPENT DEVELOPMENT: \_\_\_\_\_  
 VOLUME OF WATER REMOVED: \_\_\_\_\_  
 VOLUME OF WATER ADDED: \_\_\_\_\_  
 DESCRIPTION OF PREDEVELOPMENT WATER: \_\_\_\_\_  
 \_\_\_\_\_  
 DESCRIPTION OF POST DEVELOPMENT WATER: \_\_\_\_\_  
 \_\_\_\_\_

### WATER LEVEL SUMMARY (Top of casing)

WATER LEVEL MEASUREMENTS 1404, 25.75  
 DATE/TIME/LEVEL 25 JUN 93 / 25.75 / 1409  
6.29.93 (1240) 26.75'  
T.P.C.  
 DEPTH FROM TOP CASING AFTER DEVELOPMENT: 35.65

HTW DRILLING LOG

MW 100 Y-  
SB930223  
Sheet 1 of 5

1. Company Name: EA Engineering		7. Drilling Sub: TCT		Sheet 1 of 5	
3. Project: Ellsworth AFB		4. Location: DU-2			
5. Name of Driller: H. Jacobson		6. Drill Rig Designation: CME 75			
7. Sizes and Types of Drilling and Sampling Equipment	6 1/4" I.O.		8. Hole Location: SB930223 / MW430210		
	hollow stem		9. Surface Elevation:		
	6" I.O.		10. Date Started: 25 JUN 93		
split spoon		11. Date Completed: 27 JUN 93			
12. Surface Composition: grass		15. Depth Groundwater Encountered (from samples): 27'			
13. Depth to Top Shale: 235'		16. Depth to Water & Time After Drilling Completed: 23.75' 2.25 hours after finishing			
14. Total Depth of Hole: 35'		17. Other Water Level Measurements/Times: 26.0' at 1930 28 Jun 93			
18. Geotechnical smpls		Disturbed	Undisturbed	19. Number & type of Cores Taken:	
20. Samples for Chemical Analyses (9) 26-27'		VOC X	Metals TAZ	Other PES	Other BNA CN

22. Disposition of Soil Boring	Backfilled	Monitoring Well	Other	23. Signature of Inspector <i>[Signature]</i>
		X		

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
1		0	CH	Brown, (10 yr 4/3). Clay and silt. High plasticity. Tree root hairs. Trace quartzite coarse gravel and cobbles, medium stiff.	
2		0	CH	same as above.	
3					
4		0	ML	Brown, (10 yr 4/3). Silt. Trace concrete, dry, loose. Trace root hairs. Trace sub rounded cobble quartzite. Fill.	
5					

HTW DRILLING LOG

Drilling No. 114 120 66  
38930223

Project: Ellsworth AFB

Inspector: Pete Muckenheupf

Sheet 2 of 5

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
6					
7			0 MH	Brown, (10 YR 4/3). Silt. Trace high plasticity clay. Trace concrete. Trace brick. Trace wood. Trace fine quartzite gravel, moist. loose. <u>Fill.</u>	
8					
9					
10					
11			0 CH	Dark grayish brown, (10 YR 4/3). Highly plastic clay and silt, moist, trace quartzite fine gravel. Stiff.	
12					
13					
14				No sample recovery, 13-18'. Cuttings indicate clay and silt.	

HTW DRILLING LOG

SB430223

Project: Ellsworth AFB

Inspector: *Pete Muckenhan*

Sheet 3 of 5

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
15					
16					
17					
18					
19		0	MH	Yellowish brown, (10YR 5/4) Silt and highly plastic clay. Moist. Soft	
20					
21		0	MH	same as above	
22					
23					

HTW DRILLING LOG

Drilling no. 73-11-58430223

Project: Ellsworth AFB

Inspector: *Pete Muckenkamp*

Sheet 4 of 5

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
24					
25					
26					
27	①	0	CH	Brown, (10 yr 5/3) clay and silt, little fine to coarse sand. Trace fine quartzite gravel, Morst. High plasticity. Medium stiff.	
28		0	SC	Brown, (10 yr 5/3), sand, fine to coarse, well sorted, little clay and silt. Little quartzite coarse gravel. Saturated. Loose.	
29		0	CH	Brown, (10 yr 5/3). Clay and silt. Trace Pierre shale, little fine to coarse sand. Trace quartzite coarse gravel. Saturated. Dirty. Highly plastic.	
30		0	CH	Brown, (10 yr 5/3). Clay and silt. Saturated. High plasticity. Soft.	
31				Brown, (10 yr 5/3). Clay and silt. Saturated. High plasticity. Little medium to coarse sand. Dirty.	
32					

HTW DRILLING LOG

SB930223

Project: Ellsworth AFB

Inspector: *Pete Muehlenberg*

Sheet 5 of 5

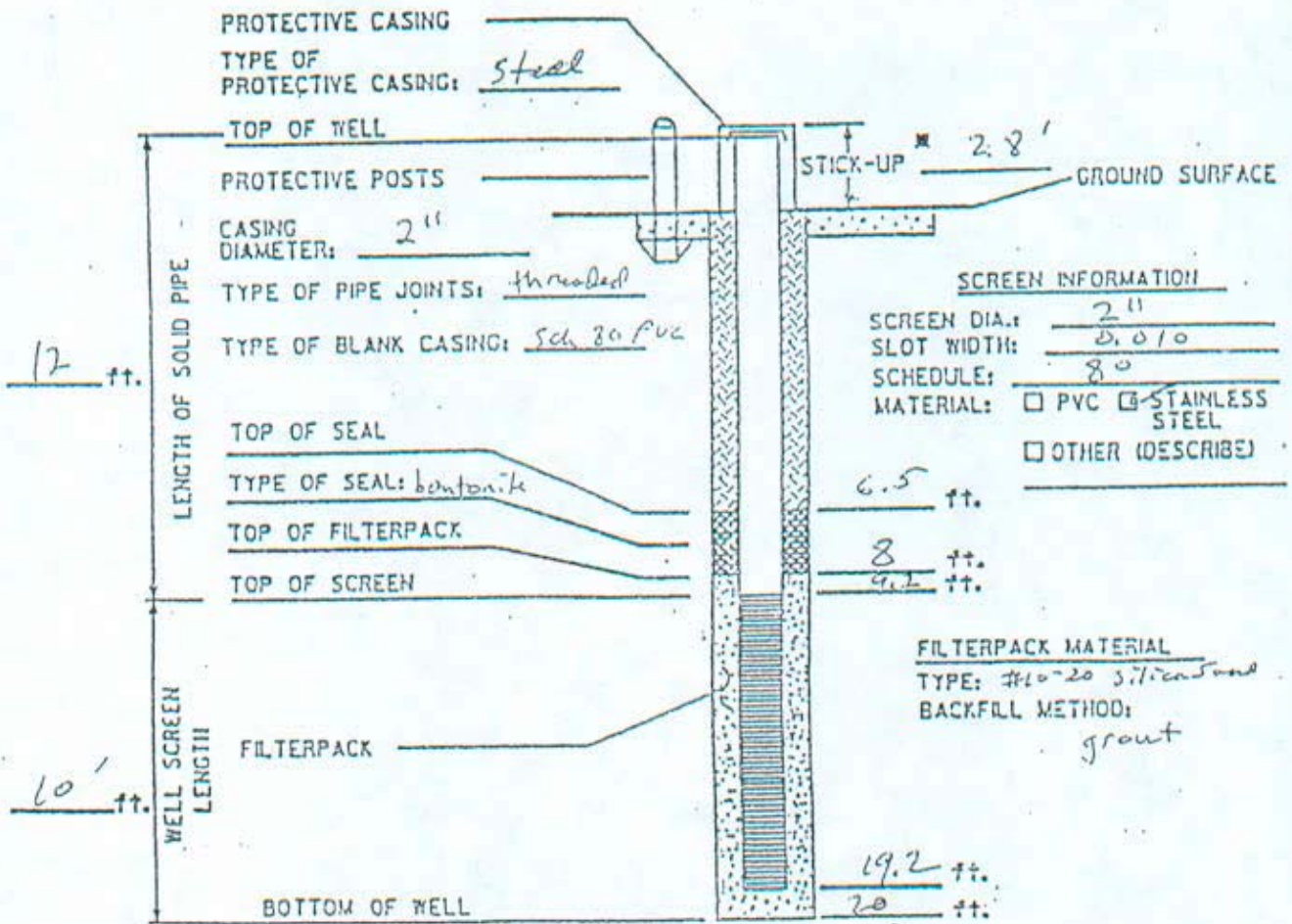
Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
33		0	CH	same as above.	
34					
35				TO 35'	Bottom of hole at 35'



ELEVATION GROUND WATER			PROJECT <i>EAFB</i>
DATE INSTALLED <i>23 JUN 93</i>	STARTED <i>23 JUN 93</i>	COMPLETED <i>25 JUN 93</i>	LOCATION (Coordinates or Station) <i>MW 930211 04-2</i>
ELEVATION TOP OF HOLE			SIGNATURE OF INSPECTOR <i>[Signature]</i>
TOTAL DEPTH OF HOLE <i>20'</i>			HOLE NO. <i>MW 930211</i>

## MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



### WELL DEVELOPMENT

METHOD: \_\_\_\_\_

TIME SPENT DEVELOPMENT: \_\_\_\_\_

VOLUME OF WATER REMOVED: \_\_\_\_\_

VOLUME OF WATER ADDED: \_\_\_\_\_

DESCRIPTION OF PREDEVELOPMENT WATER:  
\_\_\_\_\_  
\_\_\_\_\_

DESCRIPTION OF POST DEVELOPMENT WATER:  
\_\_\_\_\_  
\_\_\_\_\_

### WATER LEVEL SUMMARY

#### WATER LEVEL MEASUREMENTS

DATE/TIME/LEVEL *24 JUN 93 / 0700 / 10' 11.2" = 12*

*24 JUN 93 / 1400 / 13.21"*

*6-27-93 (1428) 13.35*  
*T.P.C.*

#### DEPTH FROM TOP CASING

AFTER DEVELOPMENT: *21.75*

HTW DRILLING LOG

MW 930211  
SB930224  
Sheet 1 of 3

1. Company Name: EA Engineering		7. Drilling Sub: TCT		Sheet 1 of 3		
3. Project: Ellsworth AFB		4. Location: OU-2				
5. Name of Driller: H. Jacobson		6. Drill Rig Designation: CME 75				
7. Sizes and Types of Drilling and Sampling Equipment	6 1/4" I.P.		8. Hole Location: SB930224 / MW930211			
	hollow stem		9. Surface Elevation:			
	6" I.D.		10. Date Started: 23 JUN 93			
Split spoon		11. Date Completed: 25 JUN 93				
12. Surface Composition: grass		15. Depth Groundwater Encountered (from samples): 12'				
13. Depth to Top Shale: 10'		16. Depth to Water & Time After Drilling Completed: 10' 14.5 hrs after completion				
14. Total Depth of Hole: 20'		17. Other Water Level Measurements/Times: 13.21 21.5 hrs after drilling (well casing)				
18. Geotechnical smpls		Disturbed	Undisturbed	19. Number & type of Cores Taken:		
20. Samples for Chemical Analyses @ 10-11'		VOC X	Metals X	Other PCB PEST	Other CN	Other TPH-D

22. Disposition of Soil Boring	Backfilled	Monitoring Well	Other	23. Signature of Inspector <i>[Signature]</i>
		X		

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
1		0	ML	Brown, (7.5 yr 4/13) silt, little clay. Moist. Slight plasticity. Trace angular quartzite - fine gravel. Little weathered Pierre Shale.	
2					
3				Concrete at 3-4'	
4					
5		0	CL	Dark yellowish brown, (10 yr 4/14) clay and little silt, moist,	

HTW DRILLING LOG

MW 75-211  
SB930224

Project: Ellsworth AFB

Inspector:

Pete Muckenhoupt

Sheet 2 of 3

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
6				slight plasticity, little angular quartzite gravel, medium stiff.	
7			CH	Brown, ( 7.5 YR 4/2 ). Clay and silt, highly plastic. Moist. Trace subrounded to sub- angular amphibolite fine gravel. Stiff.	
8					
9			SM	Dusky red, ( 2.5 YR 3/2 ). Coarse to fine sand, and fine gravel, subangular, quartzite. Dry, loose. Dirty. Trace nonplastic fines.	
10					
11	⊙		SH	Dark gray, ( 7.5 YR 4/1 ) Pierre shale, and clay and silt. Moist. Highly plastic.	
12				Saturated at 12'.	Water at 12'.
13					
14					

HTW DRILLING LOG

Drilling No. 130211  
SB930224

Project: Ellsworth AFB

Inspector:

*Pete Muckenhoupt*

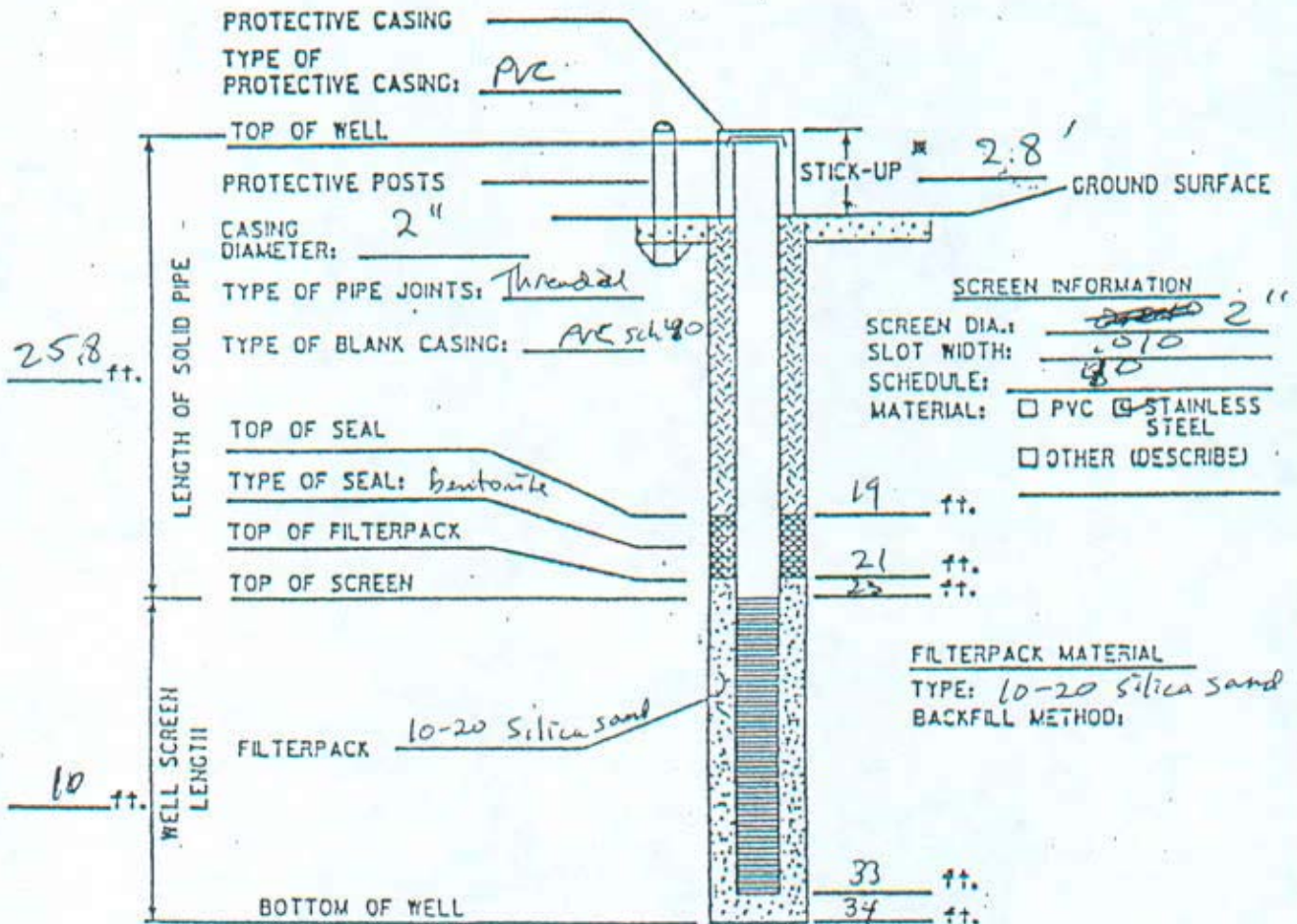
Sheet 3 of 3

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
15					
16			SH <del>SH</del>	Light olive brown, (2.5 y 5/3). Clay and silt, highly plastic. Saturated. Very stiff.	
17					
18					
19					Bottom of screen at 19'
20.				TO 20'	Bottom of hole at 20'

ELEVATION GROUND WATER			PROJECT <u>EAFB</u>
DATE INSTALLED <u>22 JUN 93</u>	STARTED <u>22 JUN 93</u>	COMPLETED <u>24 JUN 93</u>	LOCATION (Coordinates or Station) <u>MW 930212 OU-2</u>
ELEVATION TOP OF HOLE			SIGNATURE OF INSPECTOR <i>[Signature]</i>
TOTAL DEPTH OF HOLE <u>34'</u>			HOLE NO. <u>MW 930212</u>

## MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



### WELL DEVELOPMENT

METHOD: \_\_\_\_\_

TIME SPENT DEVELOPMENT: \_\_\_\_\_

VOLUME OF WATER REMOVED: \_\_\_\_\_

VOLUME OF WATER ADDED: \_\_\_\_\_

DESCRIPTION OF PREDEVELOPMENT WATER: \_\_\_\_\_

DESCRIPTION OF POST DEVELOPMENT WATER: \_\_\_\_\_

### WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS

DATE/TIME/LEVEL 22 JUN 93 / 0705 / 24.6 *gustin*

24 JUN 93 / 0720 / 24.69


~~6-27-73 (6930) 24.90~~

DEPTH FROM TOP CASING AFTER DEVELOPMENT: 35.4

HTW DRILLING LOG

SB930226  
Sheet 1 of 3

1. Company Name: RA Engineering		7. Drilling Sub: TCT		Sheet 1 of 3	
3. Project: Ellsworth AFB		4. Location: 04-2			
5. Name of Driller: H. Jacobson		6. Drill Rig Designation: CME 75			
7. Sizes and Types of Drilling and Sampling Equipment	6 1/4" I.D. hollow stem		8. Hole Location: SB930226		
	6" I.D.		9. Surface Elevation:		
	split spoon		10. Date Started: 22 JUN 93		11. Date Completed: 22 JUN 93
12. Surface Composition: grass		15. Depth Groundwater Encountered (from samples): 25'			
13. Depth to Top shale: 5'		16. Depth to Water & Time After Drilling Completed: 29.6' 15 hours after completion (top-casing)			
14. Total Depth of Hole: 34'		17. Other Water Level Measurements/Times:			
18. Geotechnical sample	Disturbed	Undisturbed	19. Number & type of Cores Taken:		
20. Samples for Chemical Analyses: 0 24-25'	VOC X	Metals TAL	Other PCB/PBT	Other CN	Other

22. Disposition of Soil Boring	Backfilled	Monitoring Well	Other	23. Signature of Inspector: 
		X		

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (f)
0			ML	Brown, (7.5 YR 4/3). Silt. Little clay. Dry. loose. Slight plasticity. Trace coarse gravel - amphibolite + quartzite, subrounded. Trace root hairs.	
1					
2					
3			ML	Brown, (L60 YR 4/3). Silt. True clay, dry, medium dense, no plasticity, trace fine subrounded quartzite gravel.	
4					
5			WSH	Dark gray, (2.5 Y 4/1). Pierre shale, highly weathered.	

HTW DRILLING LOG

Well No. MW 930212  
83930226

Project: Ellsworth AFB

Inspector: *Phil Muckenhampt*

Sheet 2 of 5

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
6				Little silt and clay. No plasticity. Some iron staining. Dry. Medium stiff.	
7					
8		0	WSH	same as above.	
9					
10					
11		0	WSH	Same as above except gypsum crystals 1cm. in thickness. 3cm apart with Pierre shale.	
12					
13					
14		0		Subrounded quartzite cobble 5" in diameter	

HTW DRILLING LOG

Drilling No. 17430-1-  
SB930226

Project: Ellsworth AFB

Inspector: *Pete Muckenhoupt*

Sheet 3 of 3

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
15					
16		0	FSH	Dark gray, (7.5 YR 4/1). Pierre shale. Fractured, trace gypsum crystals, little iron staining. Moist. Stiff.	
17					
18		0	<del>FSH</del>		
19					
20		0	WSH	Dark gray, (2.5 Y 4/1). Pierre shale. Highly weathered. Some clay and silt. Little iron staining. Soft. Trace gypsum. Dry. No plasticity.	
21					
22					
23					



HTW DRILLING LOG

58930226


Project: Ellsworth AFB

Inspector: *Pete Muckenhampt*

Sheet 4 of 5

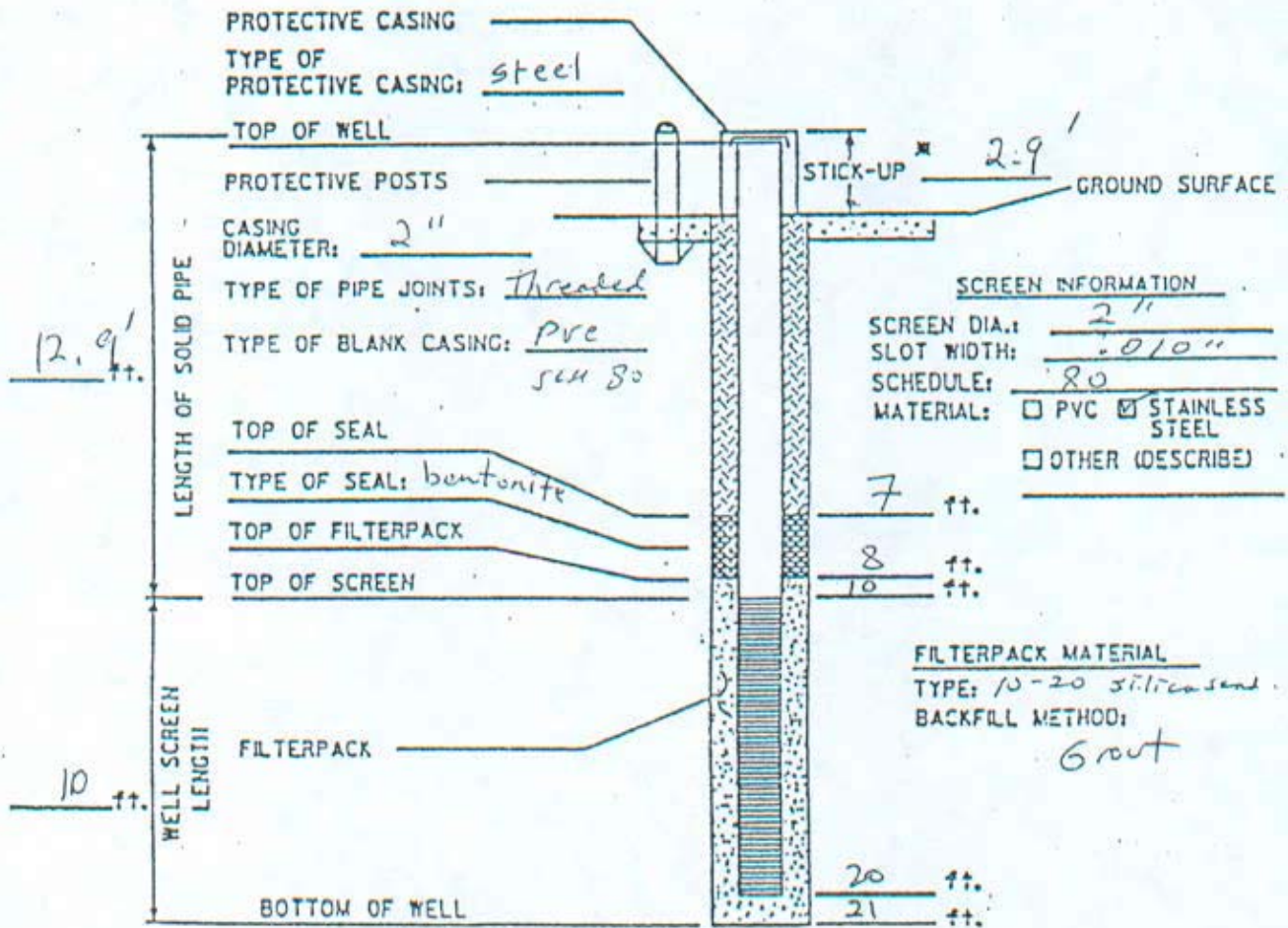
Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
24	①				
25		0	WSH	same as above but saturated.	water at 25'
26					
27					
28					
29		0	WSH	gray, (542 4/1). Pierre Shale. Weathered and fractured. Saturated. Some clay and silt. Highly plastic. Some iron staining. Soft.	
30					
31					
32					



ELEVATION GROUND WATER			PROJECT <u>EAFB</u>
DATE INSTALLED <u>23 JUN 93</u>	STARTED <u>23 JUN 93</u>	COMPLETED <u>25 JUN 93</u>	LOCATION (Coordinates or Station) <u>OU-2</u>
ELEVATION TOP OF HOLE			SIGNATURE OF INSPECTOR 
TOTAL DEPTH OF HOLE			HOLE NO. <u>MW 930213</u>

## MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



### WELL DEVELOPMENT

METHOD: \_\_\_\_\_

TIME SPENT DEVELOPMENT: \_\_\_\_\_

VOLUME OF WATER REMOVED: \_\_\_\_\_

VOLUME OF WATER ADDED: \_\_\_\_\_

DESCRIPTION OF PREDEVELOPMENT WATER:

\_\_\_\_\_

DESCRIPTION OF POST DEVELOPMENT WATER:

\_\_\_\_\_

### WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS

DATE/TIME/LEVEL 23 JUN 93 / 1030 / 7.86'

6-21-93 (1133) 7.10

T.P.V.C

DEPTH FROM TOP CASING AFTER DEVELOPMENT: 23.0

HTW DRILLING LOG

Drilling Unit 14-15  
SB930227  
Sheet 1 of 3

1. Company Name: EA Engineering		7. Drilling Sub: TCT		Sheet 1 of 3	
3. Project: Ellsworth AFB		4. Location: OU-2			
5. Name of Driller:		6. Drill Rig Designation: CME 75			
7. Sizes and Types of Drilling and Sampling Equipment	6 1/4" ID.	8. Hole Location: MW 930213 15B 930227			
	hollow stem	9. Surface Elevation:			
	6" ID.	10. Date Started: 23 JUN 93		11. Date Completed: 25 JUN 93	
12. Surface Composition: grass		15. Depth Groundwater Encountered (from samples): 8.4'			
13. Depth to Top Shale: 8.4'		16. Depth to Water & Time After Drilling Completed: 7.86' 1 hour after drilling			
14. Total Depth of Hole: 21'		17. Other Water Level Measurements/Times: 7-61' 0740 24 JUN 93 (casing)			
18. Geotechnical smpls	Disturbed	Undisturbed	19. Number & type of Cores Taken:		
20. Samples for Chemical Analyses ① 7-8'	VOC X	Metals X	Other PCB/PEST	Other CW	Other TAM-D

22. Disposition of Soil Boring	Backfilled	Monitoring Well	Other	23. Signature of Inspector 
		X		

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
1		0	ML	Brown, (7.5 YR 5/4). Silt, trace clay, no plasticity. Moist. Trace root hairs. Little gravel - subrounded to subangular, fine to coarse. Loose.	
2					
3		0	CL	Brown, (10 YR 4/3). Clay and silt. Moist. Slightly plastic. Soft. Trace calcite nodules.	
4					
5					

HTW DRILLING LOG

SB930227 750213

Project: Ellsworth AFB

Inspector: *Pete Muckenhardt*

Sheet 2 of 3

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
6		0	CH	Yellowish brown, (10 yr 5/4). Clay and silt. Trace highly weathered Pierre Shale. Moist. Highly plastic. Medium stiff.	
7					
8					
8.4					
9		0	WSH	Yellowish brown, (10 yr 5/4). Saturated. Weathered Pierre Shale, And clay. Highly plastic. Trace silt. Little iron staining. Medium stiff.	Water at 8.4'
10					
11		0	FSH	Yellowish brown, (10 yr 5/4). Saturated, fractured Pierre Shale. Trace clay, Highly plastic. Little silt. Stiff.	
12					
13					
14					

HTW DRILLING LOG

Drilling No. 1443-13  
SB930227

Project: Ellsworth AFB

Inspector: Pete Muckenaupt

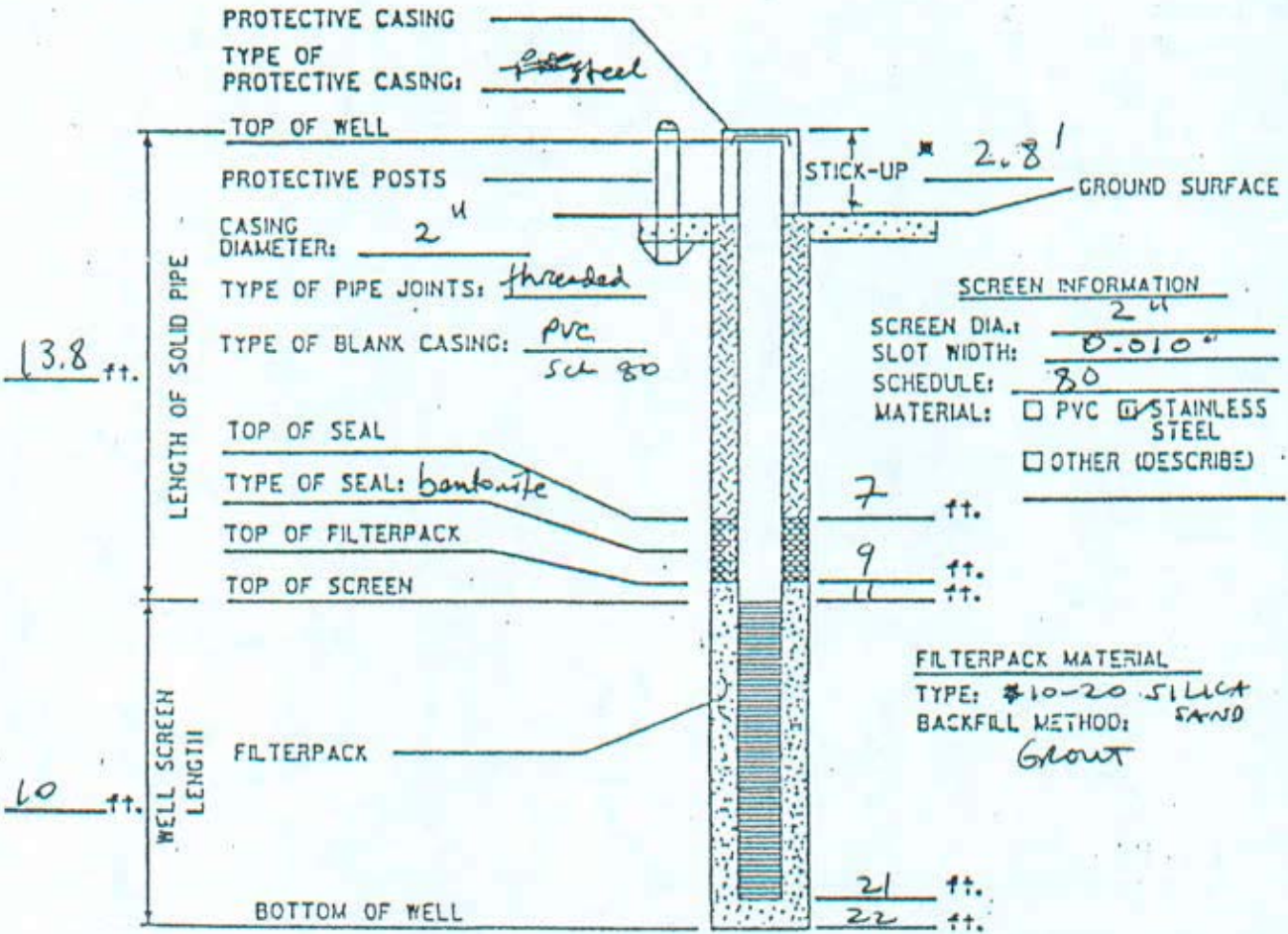
Sheet 3 of 3

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
15		0	WSH	Dark gray, (2.5 y 4/1) Pierre Shale, hard, slightly weathered. Trace silt. Dry.	
16					
17					
18					
19		0	WSH	Dark gray, (2.5 y 4/1). Saturated Pierre Shale. Weathered to fractured. Stiff to hard. Saturated. Trace silt.	
20					
21					Bottom of hole at 21'

ELEVATION GROUND WATER			PROJECT
DATE INSTALLED	STARTED	COMPLETED	LOCATION (Coordinates or Station)
6 Jul 93	6 Jul 93	7 Jul 93	MW 930214 On-2 LANOPHUB
ELEVATION TOP OF HOLE			SIGNATURE OF INSPECTOR
TOTAL DEPTH OF HOLE			HOLE NO.
			MW 930214

## MONITORING WELL CONSTRUCTION DIAGRAM

(ALL MEASUREMENTS FROM GROUND SURFACE)



### WELL DEVELOPMENT

METHOD: \_\_\_\_\_  
 TIME SPENT DEVELOPMENT: \_\_\_\_\_  
 VOLUME OF WATER REMOVED: \_\_\_\_\_  
 VOLUME OF WATER ADDED: \_\_\_\_\_  
 DESCRIPTION OF PREDEVELOPMENT WATER: \_\_\_\_\_  
 \_\_\_\_\_  
 DESCRIPTION OF POST DEVELOPMENT WATER: \_\_\_\_\_  
 \_\_\_\_\_

### WATER LEVEL SUMMARY

WATER LEVEL MEASUREMENTS  
 DATE/TIME/LEVEL 7 Jul 93 / 1600 / 8.5'  
7-10-93 (0915) 7.95'  
T.PVC

DEPTH FROM TOP CASING  
 AFTER DEVELOPMENT: 20.16'

# HTW DRILLING LOG

... MW-14  
SB930230  
Sheet 1 of 3

1. Company Name: EA Engineering		7. Drilling Sub: TCT		Sheet 1 of 3	
3. Project: Ellsworth AFB		4. Location: DU-2 Landfill 6			
5. Name of Driller: H. Jacobson		6. Drill Rig Designation: CME-75			
7. Sizes and Types of Drilling and Sampling Equipment	6 1/4" IO.	8. Hole Location: SB930230 1 MW 930214		24' west of SB930225	
	hollow stem	9. Surface Elevation:			
	6" IO.	10. Date Started: 6 Jul 93			
	split spoon	11. Date Completed: 7 Jul 93			
12. Surface Composition: grass		15. Depth Groundwater Encountered (from samples): 9.5'			
13. Depth to Top Shale: 14'		16. Depth to Water & Time After Drilling Completed: 8.5' 2.5 hours after completion.			
14. Total Depth of Hole: 22'		17. Other Water Level Measurements/Times:			
18. Geotechnical smpls	Disturbed	Undisturbed	19. Number & type of Cores Taken:		
20. Samples for Chemical Analyses	VOC	Metals	Other	Other	Other
① 0-6" ② 4-6.5' ③ 6.5'-9'	*	TAL	ALB BEST	CN	DIOXIN FURN

22. Disposition of Soil Boring	Backfilled	Monitoring Well	Other	23. Signature of Inspector
		*		

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
1	①	0	ML	Very dark grayish brown, (10 YR 3/2). Silt. Dry. root hairs. No clay or plasticity. Trace quartz gravel (angular) loose.	
2					
3		0	GP	white, (10 YR 8/1). Concrete fill. Coarse angular quartzite gravel. And silt and clay. Medium plasticity. Trace iron staining, trace fine quartzite gravel. Stiff. Clean.	
4					
5		0	GP	Same as previous interval except trace coarse sand.	



# HTW DRILLING LOG

Boring No: *Mw-14*  
*30930230*

Project: *Ellsworth AFB*

Inspector: *Pak Muckenhoupt*

Sheet *2* of *3*

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
0	②				
2	③	0	CH	Black, (10 YR 2/1). Clay and silt. Moist. Highly plastic. Trace iron staining. Stiff. Trace quartzite subrounded gravel.	
10		0	CH	Light brownish gray, (10 YR 6/2). Clay, highly plastic. Little Pierre Shale, trace silt, saturated, stiff.	water at 9.5'
13		0	MH	Black, (10 YR 2/1) Silt and clay, highly plastic. Moist. Trace root hairs. Soft.	
14					

HTW DRILLING LOG

Boring No: M430214  
58430230

Project: Ellsworth AFB

Inspector: *Pat Muckenaupt*

Sheet 3 of 3

Depth (a)	Analyt. Sample (b)	Heads pace (c)	Lith Column (d)	Lithologic Description (e)	Remarks (h)
14		0	SH	Light olive brown, (2-5 y 513). Pierre shale, stiff, and clay. Little silt. Highly plastic. Saturated.	
15					
16					
17		0	SH	same as above	
18					
19					
20		0	SH	Dark gray, (10 y 2 4/1). Pierre shale. Medium stiff. And clay. Little silt. highly plastic. Saturated.	
21					
22					Bottom of hole at 22'