



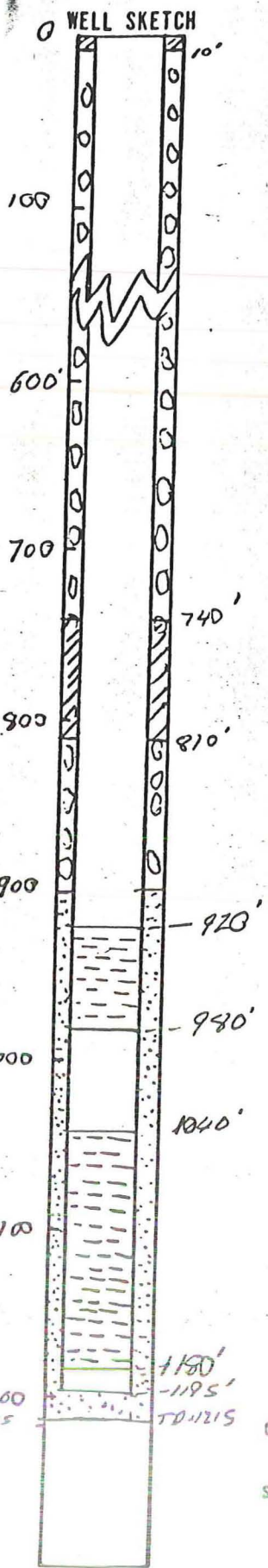
WELL NO. 5. D-1-T-1-L
 LOGGED BY JFM + LB
 DATE (S) FEB 29 TO MARCH 12

SHEET 1 OF 1
 PROJECT NO. 79-290-45
 PROJECT NAME 11X 4/2/79

Delamar

ELEVATION _____
 GROUND LEVEL _____
 TOP OF CASING _____

LOCATION OR COORDINATES T65/R63E-sec12d



DRILLING SUMMARY

TOTAL DEPTH DRILLED 1215'
 ROTARY CORE _____
 DRILLING CONTRACTOR BEYLIK
 RIG (S) USED BUCKET AUGER 0' to 40'
REVERSE ROTARY 40' TO 1215'
 SIZE (S) AND TYPE (S) OF BITES 18 3/8
DRAG, TRICONS & CLUSTER
 DRILLING FLUID POLYMER (12 SACKS)
+ WATER
 SAMPLING METHOD BACKLOG BUCKETS + SCREEN
FROM DISCHARGE PIPE
 SURFACE CASING 0 TO 40' 22" O.D. CASING
 COMMENTS (PROBLEMS, SHUTDOWNS, ETC) _____

PACKERS Ø
 CENTRALIZERS EVERY 100'
~~ADD~~ GRAVEL PACK 10'
WELL PACK 900' TO 1215'
 CEMENT (MIX) ✓ DEPTH (S) 970-810'
0-10' & 740-810'
 BENTONITE _____
 PELLETS _____
 SLURRY _____

DEVELOPMENT

TREME _____
 DEPTH _____
 TIME _____

TIME LOG

	START	FINISH	ELAPSED TIME	% OF TOTAL
DRILLING	2/29/80	3/10/80	192.5hr	79.7%
LOGGING	3/10/80	3/10/80	5hrs	2.1%
CASING	3/10/80	3/11/80	24hrs	9.9%
GRAVEL PACKING	3/11/80	3/12/80	14hrs	5.8%
CEMENTING	3/12/80	3/12/80	6hrs	2.5%
BENTONITE PELLETS SLURRY				
DEVELOPMENT				

DESIGN

BASIS DRILLER'S LOG
 GEOLOGIC LOG _____
 GEOPHYSICAL LOG
 COPIES ATTACHED — YES — NO
SCREEN
 STEEL ~~PIPE~~ STRING
 FROM 920' TO 980'
 FROM 1040' TO 1180'
 FROM _____ TO _____
 FROM _____ TO _____
 FROM _____ TO _____
 FROM _____ TO _____
 FROM _____ TO _____
 FROM _____ TO _____
 FROM _____ TO _____
 FROM _____ TO _____
 FROM _____ TO _____
 FROM _____ TO _____
 FROM _____ TO _____

CASING STEEL D76
 DIMENSIONS 10" ID
 SCREEN
 DIMENSIONS 10" ID
 SLOT SIZE 60

MISCELLANEOUS

A 22" DIAMETER STEEL CONDUCTOR CASING WAS INSTALLED TO 40' BELOW THE GROUND SURFACE.

FUGRO NATIONAL, INC.
DRILL CUTTINGS LOG

FIELD LOG OF WELL NUMBER TW-2

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY LB DATE 3-2-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
0	<u>Silt</u> : Tan silt.
10	<u>Sand and Silt</u> : Medium colored, poorly sorted, subrounded to subangular, very fine- to medium-grained sand and tan silt.
20	
30	<u>Silt</u> : Tan silt with occasional gravel to 1 inch.
40	<u>Gravel with Silt</u> : Dark colored, moderately sorted, subrounded to subangular, fine-grained to 1/4-inch gravel, with less than 30% tan silt.
50	<u>Gravel</u> : Dark colored, moderately sorted, subangular to angular (freshly broken by drilling), fine-grained to 1-inch gravel.
60	- - - increasing percentage of larger gravel.
70	- - - 10% gray silt present.
80	<u>Gravel</u> : Dark colored, well sorted, subangular, fine-grained (occasional 1/4-inch) gravel.
90	<u>Gravel</u> : Dark colored, moderately sorted, subangular to angular, fine-grained to 1/3-inch gravel.
100	

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 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY LB DATE 3/2/80
 CHECKED BY JAG DATE 4/10/80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
100	<u>Gravel</u> : Medium and dark colored, poorly sorted, subangular to angular, fine- to coarse-grained (to 2-inch) gravel.
110	
120	<u>Gravel and Silt</u> : Medium colored, poorly sorted, subangular to angular, fine- to coarse-grained (to 3/4-inch) gravel and less than 35% tan silt.
130	<u>Gravel</u> : Medium and dark colored, well sorted, angular, fine-grained to 1/2-in. gravel; organic matter (plant roots) present.
140	<u>Gravel</u> : Dark colored, well sorted, subangular, fine-grained gravel; organic matter (plant roots) present.
150	<u>Gravel</u> : Dark colored, moderately sorted, subrounded to angular, fine-grained to 1/2-inch gravel; organic matter (plant roots) present.
160	- - - increasing angularity.
170	- - - grain size decreasing.
180	<u>Silt</u> : Tan silt with less than 10% sand and gravel.
190	<u>Silt and Gravel</u> : Tan silt and dark colored, well sorted, subangular to angular, fine-grained gravel; organic matter (plant roots) present.
200	

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DRILL CUTTINGS LOG

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PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12c
 LOGGED BY LB DATE 3/3/80
 CHECKED BY JAG DATE 4/10/80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
200	<u>Gravel</u> : Dark colored, well sorted, subangular to angular, fine-grained to 1/4-inch gravel, with less than 20% brown silt.
210	<u>Gravel</u> : Dark colored, well sorted, subrounded to angular, fine-grained gravel, with organic matter (roots).
220	- - - Size increasing to 1/3 inch.
230	<u>Silt</u> : Brown silt with less than 20% very fine-grained sand; organic matter (roots) present.
240	
250	<u>Silt</u> : Brown silt with less than 5% fine-grained to 1/4-inch gravel; organic matter (roots) present.
260	<u>Silt and Gravel</u> : Brown silt and dark colored, well sorted, subrounded to angular, fine-grained to 1/4-inch gravel.
270	
280	<u>Silt</u> : Brown silt with less than 10% fine-grained gravel.
290	
300	<u>Gravel</u> : Dark colored, well sorted, subangular to angular, fine-grained to 1/3-inch gravel.

TRUPO NATIONAL, INC.
DRILL CUTTINGS LOG

FIELD LOG OF WELL NUMBER TW-2

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY LB DATE 3/4/80
 CHECKED BY JAG DATE 4/10/80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
300	<u>Gravel</u> : Medium colored, poorly sorted, subangular to angular, fine-grained to 1-inch gravel, with less than 5% tan silt.
310	<u>Silt</u> : Tan silt with less than 10% fine-grained to 1/3-inch gravel.
320	<u>Gravel and Silt</u> : Medium colored, poorly sorted, rounded to subrounded, fine-grained to 1-3/4-inch gravel and brown silt.
330	<u>Silt</u> : Tan silt with less than 5% fine-grained to 1/2-inch gravel.
340	<u>Silt</u> : Tan silt with less than 5% fine-grained to 1/2-inch gravel.
350	<u>Silt</u> : Tan silt.
360	
370	<u>Silt</u> : Tan silt, with less than 5% fine-grained to 1/2-inch gravel.
380	<u>Silt and Sand</u> : Tan silt and medium colored, poorly sorted, subrounded to subangular, very fine- to very coarse-grained sand.
390	Occasional gravel to 1/3-inch present.
400	

FIELD LOG OF WELL NUMBER TW-2

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY LB DATE 3/4/80
 CHECKED BY JAG DATE 4/10/80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
400	<u>Silt, Sand, and Gravel:</u> Tan silt and medium colored, poorly sorted, subrounded to subangular, very fine- to very coarse-grained sand, and fine-grained to 1/4-inch gravel.
410	- - - Increasing angularity.
420	<u>Gravel:</u> Dark colored, well sorted, subrounded to angular, fine-grained to 1/3-inch gravel.
430	<u>Silt:</u> Brown silt with less than 5% gravel to 1/4-inch.
440	
450	<u>Gravel and Silt:</u> Dark colored, well sorted, subrounded to subangular, fine-grained gravel and tan silt.
460	<u>Silt:</u> Brown silt, with less than 5% gravel to 1/4-inch.
470	- - - Organic matter present (roots).
480	- - - Gravel increasing to 10%.
490	
500	

UNITED NATURAL, INC.
DRILL CUTTINGS LOG

FIELD LOG OF WELL NUMBER TW-2

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY LB DATE 3-04-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
500	<u>Silt</u> : Tan silt with less than 15% gravel to 1/4-inch.
510	
520	
530	
540	<u>Silt</u> : Tan silt with less than 10% gravel to 3/4-inch.
550	<u>Silt</u> : Tan silt with less than 10% gravel to 1/2-inch.
560	<u>Gravel</u> : Medium and dark colored, moderately sorted, sub-rounded to subangular, very fine-grained to 1-inch gravel, with less than 20% tan silt.
570	<u>Silt</u> : Tan silt, occasional gravel to 1/3-inch.
580	
590	<u>Silt and Sand</u> : Tan silt and very fine-grained sand.
600	

DRILL CUTTINGS LOG

FIELD LOG OF WELL NUMBER TW-2

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY LB & JM DATE 3/05/80
 CHECKED BY JAG DATE 4/10/80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
600	<u>Sand and Gravel:</u> Dark colored, poorly sorted, subrounded to angular, very fine- to very coarse-grained sand, and very fine-grained gravel.
610	<u>Silt and Sand:</u> Tan silt and very fine-grained sand.
620	<u>Silt and Sand:</u> Tan silt and dark colored, poorly sorted, subrounded to subangular, very fine- to very coarse-grained sand; occasional gravel to 1/3-inch present.
630	<u>Silt and Sand:</u> Tan silt and very fine-grained sand.
640	
650	
660	<u>Silt and Sand:</u> Tan silt and dark colored, poorly sorted, subrounded to subangular, very fine- to very coarse-grained sand; occasional gravel to 1/4-inch.
670	
680	<u>Silt and Gravel:</u> Tan silt and medium colored, well sorted, angular, fine-grained to 1/4-in. gravel; organic matter (roots) present.
690	<u>Silt and Sand:</u> Tan silt and medium colored, well sorted, very fine-grained sand, with less than 5% gravel present.
700	

FIELD LOG OF WELL NUMBER TW-2

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY JM & LB DATE 3-05-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
700	<u>Silty Sand with Gravel</u> : Tan silty sand with less than 30% medium colored, moderately sorted, subangular to angular, fine-grained to 3/4-inch gravel.
710	<u>Silty Sand</u> : Tan silty sand.
720	
730	<u>Silty Sand and Gravel</u> : Silty sand and medium colored, well sorted, angular, fine-grained to 1/4-inch gravel.
740	<u>Silty Sand</u> : Tan, silty sand with less than 5% gravel up to 1/2-inch.
750	
760	<u>Sand and Silt</u> : Medium colored, moderately sorted, subangular to angular, very fine- to medium-grained sand, and tan colored silt.
770	<u>Clayey Silt with Sand</u> : Tan clayey silt with less than 30% medium colored, fine-grained sand.
780	- - - Organic matter present.
790	
800	

DRILL CUTTINGS LOG

FIELD LOG OF WELL NUMBER TW-2

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY LB & JM DATE 3-06-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
800	<u>Sand</u> : Medium colored, moderately sorted, angular to subangular, fine- to coarse-grained sand, with less than 5% fine-grained gravel to 1/4-inch.
810	
820	<u>Sand with Clayey Silt</u> : Medium colored, well sorted, angular, fine- to medium-grained sand, with less than 30% tan colored clayey silt.
830	
840	- - - Increasing clay.
850	<u>Sand with Clayey Silt</u> : Medium colored, well sorted, fine-grained sand with less than 30% tan colored clayey silt. Occasional coarse-grained sand.
860	<u>Gravel with Sand</u> : Medium colored, poorly sorted, angular to subangular, fine- to medium-grained (occasionally up to 1 1/4-in.) gravel with less than 25% medium- to coarse-grained sand.
870	<u>Clayey Silt and Sand</u> : Tan colored, clayey silt and medium colored, well sorted, fine-grained sand.
880	
890	
900	

DRILL CUTTINGS LOG

FIELD LOG OF WELL NUMBER TW-2

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY LB & JM DATE 3-07-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
900	<p><u>Clayey Silt with Sand:</u> Tan colored, clayey silt, with less than 40% medium colored, subangular, very fine- to medium-grained sand.</p>
910	<p>- - - - Occasional coarse-grained sand present.</p>
920	
930	<p><u>Gravel with Sand:</u> Medium to dark colored, poorly sorted, angular to subangular fine-grained gravel up to 1/2-inch, with less than 30% fine- to very coarse-grained sand and less than 10% clayey silt.</p>
940	<p><u>Clayey Silt with Sand:</u> Tan colored clayey silt, with less than 40% very fine-grained sand.</p>
950	
960	<p><u>Sand with Silt:</u> Medium colored, well sorted, fine- to medium-grained sand, with less than 30% tan colored silt.</p>
970	<p>- - - - Silt decreasing to 20%. Occasional gravel to 1/2-inch present.</p>
980	<p><u>Sand with Silt:</u> Medium colored, well sorted, subangular, fine- to medium-grained sand, with less than 10% tan colored silt.</p>
990	<p>- - - - Gravel up to 1/2-inch present.</p>
1000	

DRILL CUTTINGS LOG

FIELD LOG OF WELL NUMBER TW-2

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY JM, LB, DATE 3-08-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
1000	<u>Sand:</u> Medium colored, well sorted, subangular to angular, fine- to medium-grained sand, with less than 10% tan silt.
1010	- - - Grain size increasing.
1020	
1030	<u>Gravel:</u> Dark colored, well sorted, angular, fine-grained gravel to 1/2-inch, with less than 10% sand; organic matter (roots) present.
1040	<u>Sand with Clayey Silt:</u> Medium colored, moderately sorted, angular to subangular, fine- to medium- (predominantly fine) grained sand, with less than 35% tan colored clayey silt.
1050	
1060	<u>Sand with Clayey Silt:</u> Medium colored, moderately sorted, angular to subangular, fine- to coarse-grained (predominantly fine- to medium-grained) sand, with less than 25% clayey silt.
1070	<u>Gravel with Sand:</u> Medium colored, poorly sorted, angular to subangular, fine-grained to 1/3-in. gravel, with less than 35% fine- to coarse-grained (predominantly medium- to coarse-grained) sand.
1080	<u>Silt and Sand:</u> Tan silt and medium colored, well sorted subangular, very fine-grained sand, with less than 5% very fine-grained gravel.
1090	<u>Clayey Silt and Sand:</u> Tan clayey silt and medium colored, poorly sorted, angular to subangular, fine-grained (occasionally medium- to coarse-grained) sand.
1100	

FIELD LOG OF WELL NUMBER TW-2

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 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

VALLEY NAME Delamar
 LOCATION NUMBER T6S, R63E, Sect. 12d
 LOGGED BY LB, JM DATE 3-09-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
1100	<u>Clayey Silt and Sand</u> : Tan clayey silt and medium colored, poorly sorted, subangular to angular, fine- to coarse-grained (predominantly fine-grained) sand.
1110	<u>Gravel</u> : Dark colored, moderately sorted, angular to subangular, fine-grained to 1/2-inch gravel, with less than 10% coarse sand.
1120	<u>Gravel</u> : Medium to dark colored, well sorted, subangular to angular, fine-grained gravel up to 1 inch, with less than 5% coarse sand.
1130	<u>Sand with Silt</u> : Medium colored, moderately sorted, angular to subangular, fine- to coarse- (predominantly fine to medium) grained sand, with less than 30% silt.
1140	
1150	
1160	<u>Sand with Silt</u> : Medium colored, moderately sorted, angular to subangular, fine- to medium-grained sand, with less than 30% tan colored silt and occasional coarse sand grains.
1170	<u>Sand and Gravel</u> : Medium colored, poorly sorted, angular to subangular, fine- to coarse-grained (predominantly fine- to medium-grained) sand, and dark colored, angular to subangular, fine- to medium-grained gravel up to 1 inch.
1180	<u>Sand with Gravel</u> : Medium to dark colored, moderately sorted, angular to subangular, fine- to coarse-grained sand, with less than 25% fine-grained gravel up to 1/3 inch.
1190	<u>Sand with Silt</u> : Medium colored, well sorted, subangular, fine- to medium-grained sand, with less than 25% tan silt, with occasional fine-grained gravel up to 1/4 inch.
1200	

PROJECT NUMBER 79-290- 45
 PROJECT NAME MX SITING INVESTIGATION
 EQUIPMENT USED Reverse Rotary
 COMPANY Beylik
 OPERATOR J. Clyde

FIELD LOG OF WELL NUMBER TW-2
 VALLEY NAME Delamar
 LOCATION NUMBER T6S, R6W, Sect. 12d
 LOGGED BY LB BY LB DATE 3-10-80
 CHECKED BY JAG DATE 4-10-80
 TOTAL WELL DEPTH 1214 feet

DEPTH (FEET)	DESCRIPTION OF CUTTINGS OR SAMPLE
1200	Sand with Silt: Medium colored, well sorted, subangular, fine- to medium-grained sand, with less than 25% tan silt and occasional fine-grained gravel up to 1/4 inch.
1210	
	----- T.D. -----
20	
30	
40	
50	
60	
70	
80	
90	
00	