MONITORING WELL COMPLETION LOG GRN01-0184

PROJECT UMTRA GROUND WATER
LOCATION GREEN RIVER, UT
SITE GREEN RIVER
WELL NUMBER 0184

NORTH COORD. (FT) 237094.00
EAST COORD. (FT) 2388555.47
HOLE DEPTH (FT) 187.00
WELL DEPTH (FT) 184.00

DATE DRILLED 06/20/2002 to 06/24/2002
SURFACE ELEV. (FT NGVD) 4189.80
TOP OF CASING (FT) 4192.98
MEAS. PT. ELEV. (FT) 4192.98
SLOT SIZE (IN) 0.020
BIT SIZE(S) (IN) 8.0

WELL INSTALLATION		INTERVAL (FT)		
SURFACE CASING:				
BLANK CASING:	4 in. PVC Sch 40	-3.18	to	169.0
WELL SCREEN:	4 in. 0.02 Slotted PVC	169.0	to	184.0
SUMP/END CAP:				
SURFACE SEAL:	Cement	0.0	to	2.0
GROUT:	Bentonite	2.0	to	156.0
SEAL:	Bentonite Pellets	156.0	to	162.0
UPPER PACK:	20-40 Silica Sand	162.0	to	164.0
LOWER PACK:	10-20 Silica Sand	164.0	to	184.0

DRILLING METHOD ROTASONIC
SAMPLING METHOD ROTASONIC CORE
DATE DEVELOPED
WATER LEVEL (FT BGS)
LOGGED BY Goodknight, C.
REMARKS Saved core from 47.0 ft. in middle sand unit of Cedar Mtn Fm to TD through the rest of the Fm. Well installed on6/24 Centralizers at 94.0 ft. and 184.0 ft.

DEPTH (FT BGL)	ELEV. (FT NGVD)	BLOW COUNTS	SAMPLE ID.	EXTENT	WELL DIAGRAM	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
5	4185				Cement		0-4.5 ft. SILTY GRAVEL (GM); 0-2.5 ft. very pale brown (10YR 8/2), 5-10% small pebbles. 2.5-3.5 ft pale brown (10YR 6/3), 5-10% pebbles. 3.5-4.0 ft. very pale brown (10YR 8/2), caliche zone, more pebbles at base. 4.5-6.5 ft. SANDY GRAVEL (GP-SP); fine grained sand with 10-20% pebbles, yellowish brown (10YR 5/4).
10	4180						6.5-185.0 ft. CEDAR MOUNTAIN FORMATION: 6.5-10.0 ft. SHALE; weathered shale with few thin siliceous siltstone beds, limonite-stained, pale yellow (2.5Y 7/3). @8.5 color changes to light olive gray (5Y 6/2). 10.0-12.0 ft. CLAYSTONE; slightly weathered, some limonite along fractures, light gray (N7), noncalcareous.
15	4175						12.5-35.0 ft. SHALE; dusky yellow (5Y 6/4), with limonite along fractures, noncalcareous.
20	4170				Bentonite		@20.0 ft. color change to greenish gray (5G 6/1), some limonite and some mottling. Some limonitic alteration and mottling at ~25.0 ft.
	4165						

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DEPTH (FT BGL)	ELEV. (FT NGVD)	BLOW COUNTS	SAMPLE ID.	EXTENT	WELL DIAGRAM	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
30	4160						@32.0 ft. becomes calcareous and color changes to more of a yellowish gray (5Y 8/1), some calcareous nodules, trace fine pyrite.
35	4155						35.0-42.0 ft. SILTSTONE; hard, calcareous, with fine grained calcareous nodules (almost porcelaneous in appearance, yellowish gray to light gray (N7), with trace of pyrite blebs.
40	4150						42.0-43.0 SANDSTONE; hard, very fine to fine grained, greenish gray (5GY 6/1), with pyrite blebs.
							43.0-48.0 ft. SHALE; calcareous shale with nodules (hard).
45	4145						@44.0 ft. shale is slightly calcareous, soft, light gray (N7), some limonitic stain at 45.5 and 47.5 ft.
							48.0-72.0 ft. SANDSTONE; hard, calcareous cemented, fine grained, light gray (N7) to medium light gray (N6), trace of pyrite blebs.
50	4140				PVC Sch 40		
							@53.0 ft. Limonite staining along fractures. Horizontal to low angle fractures at 53.0-54.0 ft.
55	4135						

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DEPTH (FT BGL)	ELEV. (FT NGVD)	BLOW COUNTS	SAMPLE ID.	EXTENT	WELL DIAGRAM	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
60	4130						@59.0 ft. vertical, limonite coated fracture.
							@62.0 ft. steeply inclined fractures coated with limonite at 62.0 63.0 ft.
65	4125				← Bentonite		64.0-67.0 ft. is darker colored, medium grained, calcareous, and higher porosity (vugs), not as hard, medium gray (N5).
							@67.0 and 68.0 ft. Hard, calcareous cemented, fine grained sandstone with vertical fractures.
70	4120						@70.0 ft. highly crossbedded.
							71.0-72.0 ft. some conglomerate (pebbles up to 3/4" diameter).
							72.0-80.5 ft. MUDSTONE; soft, greenish gray (5G 6/1), calcareous.
75	4115						75.0-76.0 ft. zone of lighter colored material and calcareous nodules, greenish gray (5GY 6/1). Gray nodular shale/siltstone, calcareous.
80	4110						80.5-95.0 ft. SILTSTONE; platy, hard, slightly calcareous , light bluish gray (5B 7/1), some disseminated pyrite and pyrite blebs. Horizontal fracturing.
85	4105						85.0-86.0 ft. vertical jointing with calcite coatings is obvious.
							@88.0 ft. vertical fractures coated with calcite.

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90	4100						@90.0 ft. platy, hard shale, ranges from light bluish gray (5B 7/1), to medium bluish gray (5B 5/1), non to slightly calcareous.
95	4095						95.0-100.5 ft. SHALE; alternating beds of platy, hard shale/siltstone, greenish gray (5G 6/1), and claystone, dark greenish gray (5G 4/1), noncalcareous, some vertical fractures.
100	4090				PVC Sch 40		100.0-100.5 ft. color change-grayish red (5R 4/2), noncalcareous. 100.5-101.5 ft. CLAYSTONE; light gray (N7) with light brownish gray (5YR 6/1) calcareous nodules. 101.5-103.5 ft. calcareous shale, some vug porosity, trace of pyrite, hard, brittle, light greenish gray (5G 8/1).
105	4085						103.5-106.5 SILTY SHALE; non to slightly calcareous, soft, platy, greenish gray (5GY 6/1). 106.5-108.0 ft. SILTSTONE; hard, brittle, shaley siltstone, noncalcareous, medium gray (N5), trace pyrite. 108-111.5 ft. SHALE; softer shale and silty shale, medium light gray (N6).
110	4080						111.5-112.5 ft. SILTSTONE; hard, brittle, calcareous, medium gray (N5). 112.5-116.0 ft. SILTY SHALE; soft, medium light gray (N6), noncalcareous.
115	4075				Bentonite		116.0-120.0 ft. SHALE; with calcareous infillings of septarian-like concretions, vugs. 117.0-120.0 ft. hard, brittle, noncalcareous, medium gray (N5) to greenish gray (5G 6/1).
120	4070						120.0-122.0 ft. CLAYSTONE; soft, noncalcareous, grayish brown

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							(5YR 3/2).
							122.0-125.0 ft. SHALE; medium gray (N5), noncalcareous, alternating with siliceous nodules, greenish gray (5G 6/1) and hard brittle shale, noncalcareous, grayish red (5R 4/2).
125	4065						125.0-130.0 ft. CLAYSTONE; soft, noncalcareous, grayish red (5R 4/2) to pale brown (5YR 5/2) and calcareous. Some mottling with lighter gray silty material.
130	4060						130.0-133.0 ft. SHALE; hard, medium gray (N5) slightly calcareous with calcareous nodules and trace of pyrite.
							133.0-135.5 ft. CLAYSTONE; soft, pale brown (5YR 5/2), calcareous.
135	4055						135.5-137.0 ft. SILTSTONE; siltstone and shale, medium light gray (N6), calcareous, with some nodules.
							137-138.5 ft. CLAYSTONE; silty, soft, grayish red (5R 4/2), noncalcareous.
							138.5-139.0 ft. SHALE; hard, medium light gray (N6), slightly calcareous.
140	4050						139.0-141.5 ft. SANDSTONE; very fine grained, noncalcareous, grayish red (5YR 4/2). Vertical fractures.
							141.5-143.5 ft. CLAYSTONE; soft, pale brown (5YR 5/2), calcareous.
145	4045						143.5-148.0 ft. SANDSTONE; very fine grained, light greenish gray (5GY 8/1), calcareous, mottled, some limonite stain, vugs, trace pyrite and high angle fractures.
							148.0-151.0 ft. CLAYSTONE; soft, medium gray (N5), with some harder shale layers.
150	4040						151.0-164.0 ft. SANDSTONE; very fine grained to fine grained, light greenish gray (5GY 8/1), to greenish gray (5GY 6/1), calcareous, some limonite staining near top. Some vertical calcite

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155	4035						filled fractures. Sandstone is fine to medium grained in places, with vug porosity and porosity along crossbedding planes, Color varies to light gray (N7). Dark chert fragments (up to 1/2" diameter). Sandstone highly crossbedded @162.0 to 164.0 ft.
160	4030				Bentonite Pellets; 20-40 Silica Sand		
165	4025				PVC Sch 40		164.0-185.0 ft. CONGLOMERATE; small pebbles, rounded black, white, tan, green, and gray chert fragments up to 1.0" diameter with groundmass of medium grained sand, some calcareous cement, overall rock color is medium light gray (N6), to medium gray (N5). Most clasts are approximately 1/4" diameter. Calcareous cement increases with depth. Most clasts are subrounded in ~1/2" diameter range. From 182.0 185.0 ft., conglomerate coarsens with clasts up to 2.5" diameter. Base of Cedar Mountain Formation @185.0 ft.
170	4020						
175	4015				10-20 Silica Sand 0.020" Slotted PVC		
180	4010						
	4005						

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