

M-W Drilling, Inc.

♦P.O. Box 110389♦ Anchorage, AK 99511♦
♦907-345-4000 ♦ 907-345-3287 Fax♦

Job No. 12-109

GROUNDWATER WELL AS-BUILT & LOG

Well Owner: UAA Use of Well: Sports Arena Cooling
Legal Description: Well #1
Anchorage, Alaska

CONSTRUCTION

Drill Method: Mud & Air Rotary Hole Size: 8" Hole Depth: 262'
Casing Size: _____ Cased to: _____ Material: A53, Grade B Wall: 0.322"

Well Completion: Open end Screen X Perforated Method: _____

No. 1: K Pkr & riser: 131.85 to 138.1; 0.060" slot 8TSSS to 164.3'; 0.080" slot to 180'; 7" Tailpipe & plate to 182'; No. 2: 109.7 To 115.69 K Pkr & riser; 0.100" slot to 130.67; 6" Tailpipe to 136'.

Screen/Perforation description: _____

Grout Notes: (10) Sack(s) Bentonite

Well Development: Air surge

Well Disinfected: Y/N Method: _____

Yield test at 299 GPM for 24 hour(s) with 50.98 of drawdown (DD) from static level(SWL).

Method: Submersible pump Static Water Level (SWL): 30.65

Start Date: 3/13/12 Completion Date: 6/28/12

Test Pump Date: 7/2-3/12 Final Pump Install Date: _____

WELL LOG

Depth in feet from top of casing.	Details of formations penetrated, size of material, color and miscellaneous details.
0 TO 3	Casing Stick Up
3 TO 43	Sandy gravel
43 TO 74	Silt: with sand layers
74 TO 115	Sandy gravel
TO	
115 TO 135	A/A coarser
TO	
135 TO 188	Gravel: water
TO	
188 TO 219	Sand: gravelly, water
TO	
219 TO 226	Gravel: coarse: water
TO	
226 TO 263	Sandy gravel: coarse; water
	As Built Notes: 1) Mud drill to 240' but kept plugging back to 160'
	Pull E Log to 160'
	2) Air drill & drive 160' to 262' with 8"
	3) Cut casing at 182' & installed 1 st screen - not enough water 138-182'
	4) Install screen No. 2: developed and tested 115-130'

Well: UAA Sports Arena Cooling Well No. 1
Log Measured From: ground surface
Drilling Measured From: top of casing (3.45 feet)

Date/Log April 4, 2012

Wellname UAA Sports Arena Cooling Well No. 1

Filename P:\2012 Projects\21208 - UAA Cooling wells - MWV Drilling\Cross Section and Well Logs\04-04-12\UAA Sports Arena Cooling Well 1 final.HDR

Depth Logger 261 Ft

Bit Fluid Bentonite first log, water additional logs

Location Corner of Elmora and Providence Drive

File Name Cooling Well 1 Total Depth

COMPANY TERRASAT, Inc.

Elevation: 0 Reference Ground Surface

Depth Driller 261 Ft

OTHER SERVICES

Witness: Kris Westberg, M-W Drilling, Inc

Location: Corner of Elmora and Providence Drive

Casing 3.45 Ft stick-up

Date DATE 4-4-12

Well WELL UAA Sports Arena Cooling Well No. 1

Logged by: Quenton Nelson, TERRASAT, Inc

OTHER

Temperature log (green) is from open hole w/ bentonite fluid
 additional temperature logs are in cased well w/ water

GAMM (CPS)
 Gamma
 Imported from: UAA Cooling Well 1 Total Depth Gamma Down Hole

TEMP (DEG_C)
 Temp.
 Imported from: UAA Cooling Well 1 Total Depth Temp-Fres

TEMP (DEG_C)
 Temp.
 Imported from: UAA Cooling Well Temp-Fres 4

TEMP (DEG_C)
 Temp.
 Imported from: UAA Cooling Well 1 Temp-Fres after 24 hrs Total Depth

F-RE (OHM-M)
 F-Res.
 Imported from: UAA Cooling Well Temp-Fres 4

R32 (OHM-M)
 R32
 Imported from: UAA Cooling Well Gamma Resistivity Down Hole

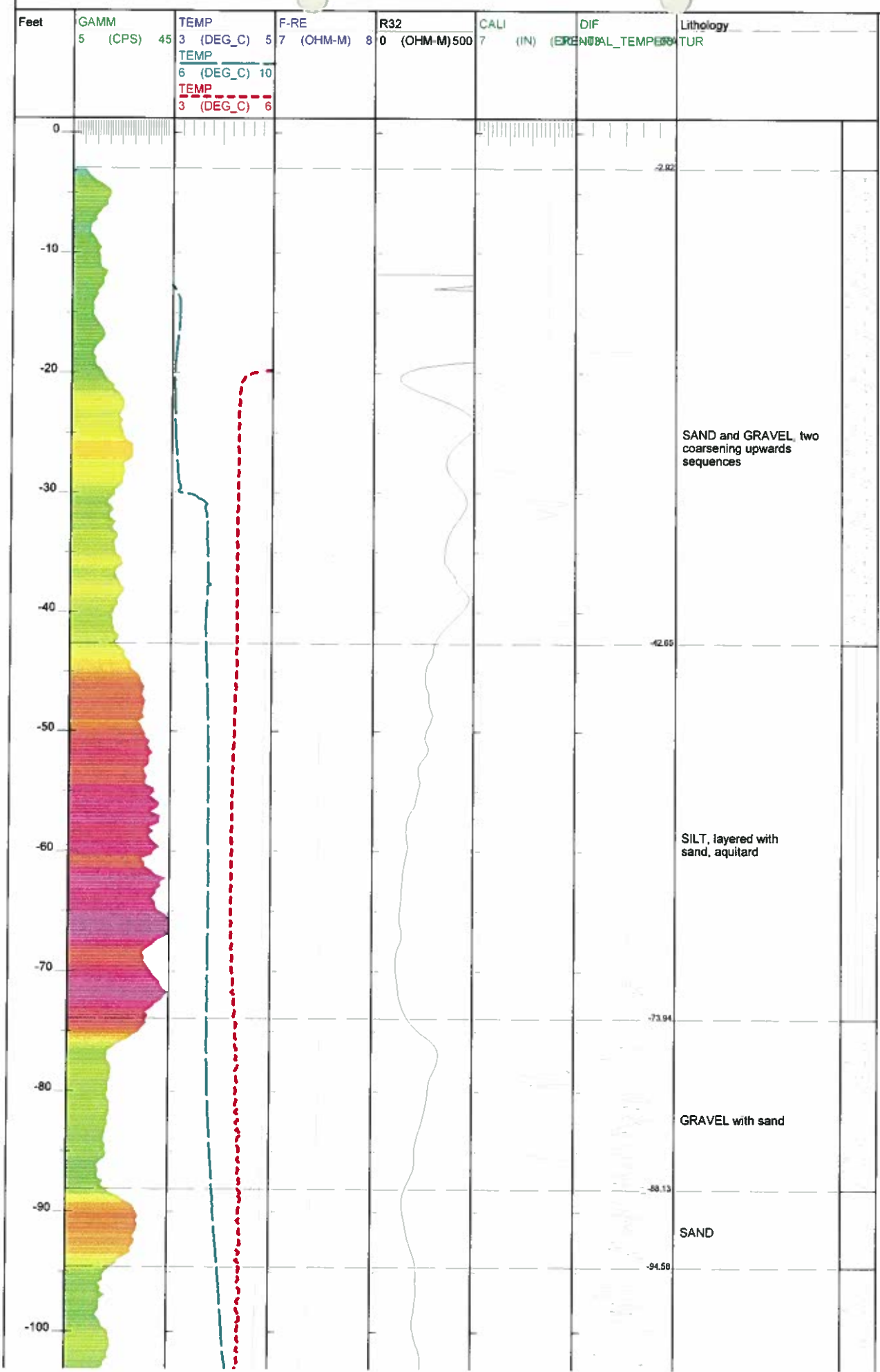
CALI (IN)
 Caliper
 Imported from: UAA Cooling Well Caliper

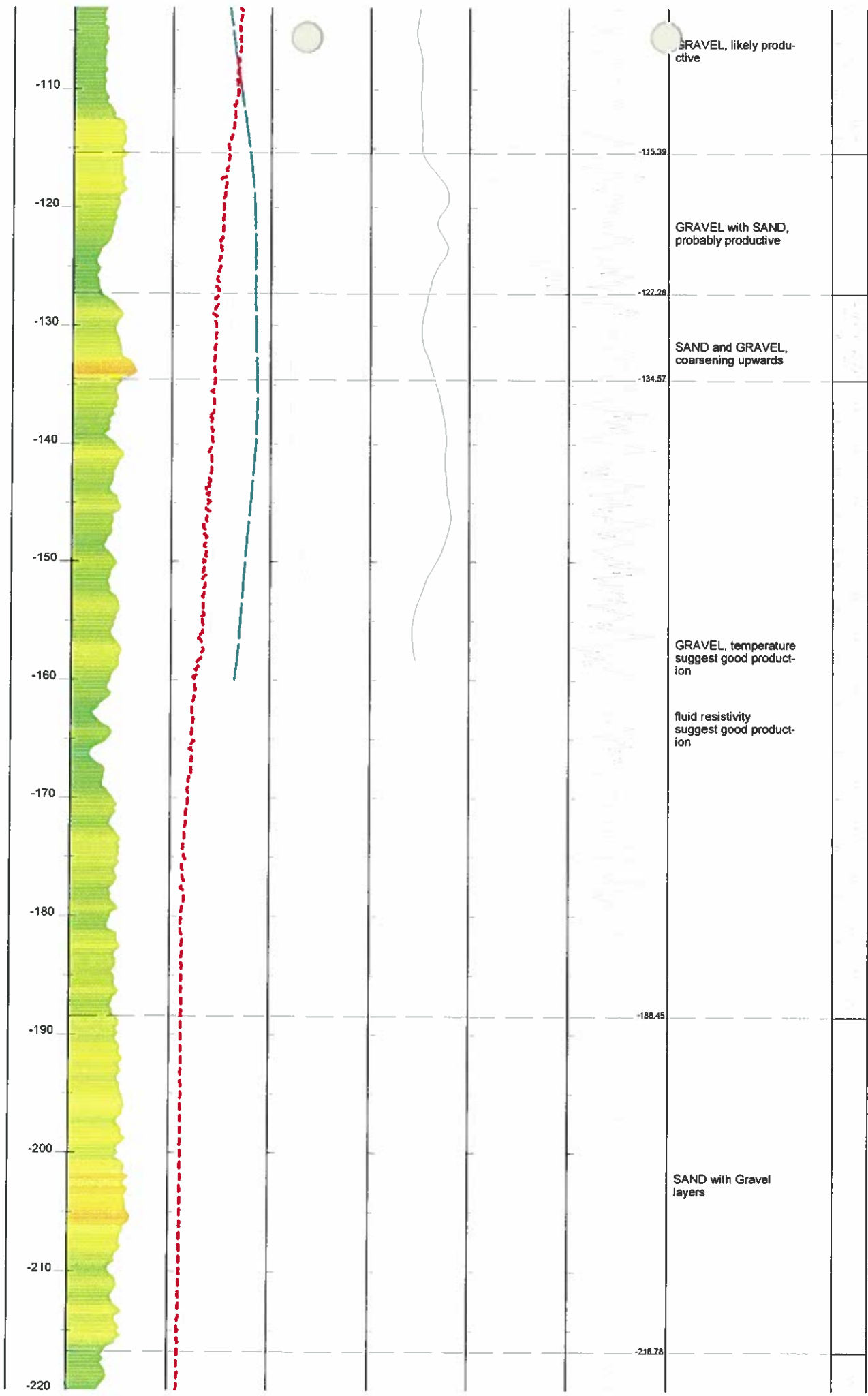
DIF (ERENTIAL_TEMPERATUR
 Differential Temperature Log
 Imported from: Temp Differential

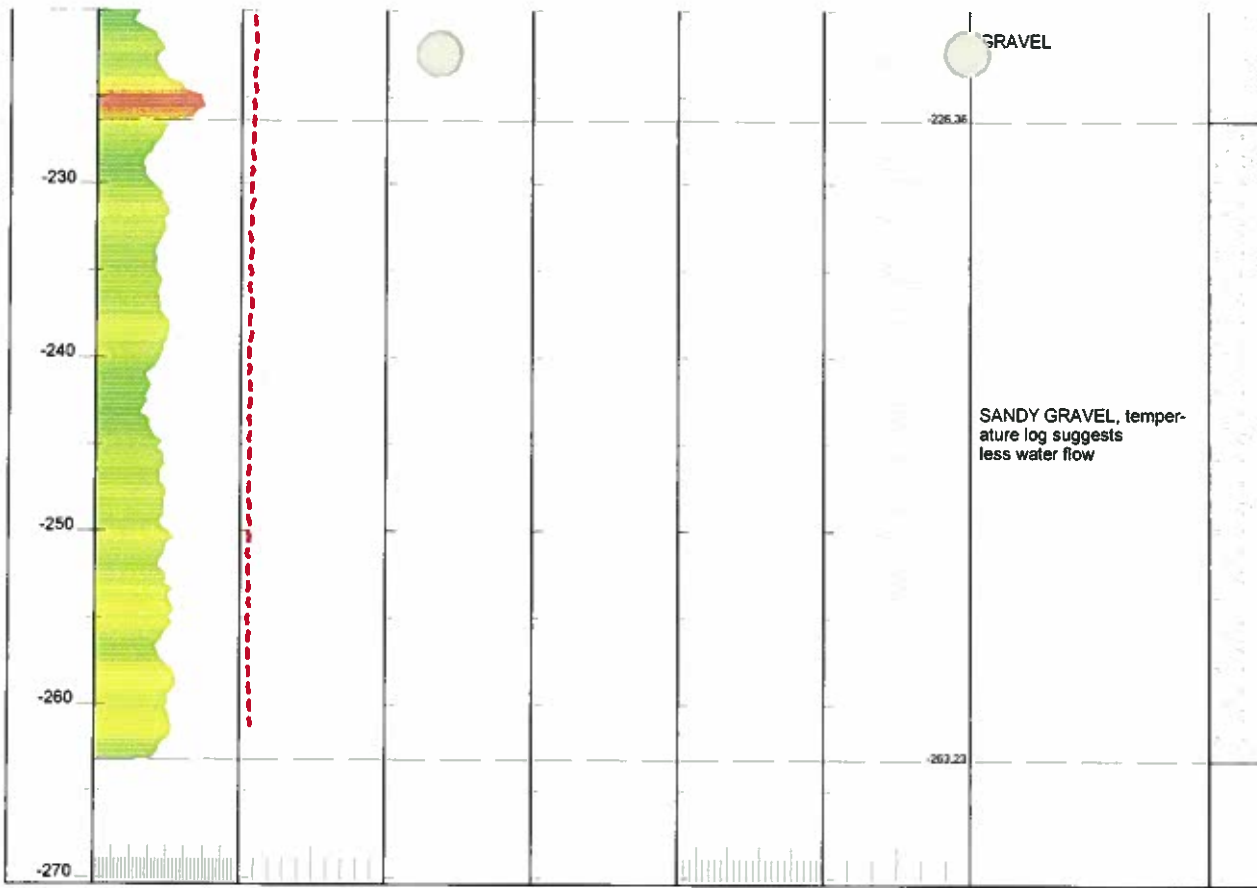
Comments:
 Initial E-Log March 28, 2012

second log April 4, 2012

Third log April 5, 2012, repeat of temperature and temperature differential







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Job No. 12-109-02

GROUNDWATER WELL AS-BUILT & LOG

Well Owner: UAA Sports Arena Use of Well: Cooling
Legal Description: Well #2
Anchorage, Alaska

CONSTRUCTION

Drill Method: Air rotary Hole Size: 8" Hole Depth: 282.61'
Casing Size: 8" Cased to: 282.61 Material: A53B Wall: .322
Well Completion: Open end Screen X Perforated Method: _____
K Packer & riser: 206-211'; 0.100" slot GPS SSS to 266'; tailpipe & plate bottom to 283'
Screen/Perforation description: 283'

Grout Notes: (15) Sack(s) of Bentonite CHIPJ - 3/4"
Well Development: 11 hrs of air surge
Well Disinfected: Y/N Method: _____
Yield test at 542.6 GPM for 24 hour(s) with 61.95' of drawdown (DD) from static level (SWL).
Method: Submersible pump Static Water Level (SWL): 37.88'
Start Date: 5/2/12 Completion Date: 5/28/12
Test Pump Date: 6/4-6/5/12 Final Pump Install Date: _____

WELL LOG

Depth in feet from top of casing.	Details of formations penetrated, size of material, color and miscellaneous details.
0 TO 3	Casing Stick Up
3 TO 17	Cobbles: sandy, silty
17 TO 41	Gravel: silty, clayee
41 TO 47	Gravel: damp, coarse
47 TO 57	Gravel: silty, clayee
57 TO 65	Water gravel: medium to coarse, 15-20 gpm
65 TO 73	Gravel: medium, silty, dry
73 TO 85	Gravel: silty, clayee
85 TO 106	Water gravel: medium, gravelly, silty, 5-10 gpm
106 TO 115	Water gravel: coarse, 50 gpm
115 TO 133	Water gravel: medium, very silty, mucky, 20-30 gpm
133 TO 143	Water gravel: medium, 20-30 gpm, clean water
143 TO 157	Gravel: silty, water shut back to 5 gpm
157 TO 167	Water gravel: coarse, 20 gpm
167 TO 198	Water gravel: medium to coarse, 30-50 gpm, heaving
198 TO 210	Water gravel: medium to coarse 20 gpm, no heave
210 TO 228	Water gravel: medium to coarse, 30-50 gpm
228 TO 253	Water gravel: coarse, 100 gpm
253 TO 264	Water gravel: medium to coarse, 50-60 gpm
264 TO 277	Water gravel: silty, some clay, 20-30 gpm
277 TO 283	Water gravel: medium to coarse, 50 gpm

Well: UAA Sports Arena Cooling Well No. 2
 Log Measured From: ground surface
 Drilling Measured From: top of casing (3.1 feet)

Date/Log May 10, 2012

Wellname UAA Sports Arena Cooling Well No. 2

Filename P:\2012 Projects\12208 - UAA Cooling wells - MW Drilling\Cross Section and Well Logs\05-10-12\UAA Cooling Well 2 Gam Res Up.HDR

Depth Logger 283 Ft

BH Fluid Air and static water

Location East of Wellness Drive and south of Providence Drive

File Name Cooling Well 2

COMPANY: TERRASAT, Inc.

Elevation 0 Reference Ground Surface

Logger: Quention Nelson, TERRASAT, Inc.

Depth Driller 282.8 Ft

OTHER SERVICES

Witness: Kris Westberg, M-W Drilling, Inc

Location: East of Wellness Drive and south of Providence Drive

Casing 3.1 Ft stick-up

Date 5-10-12

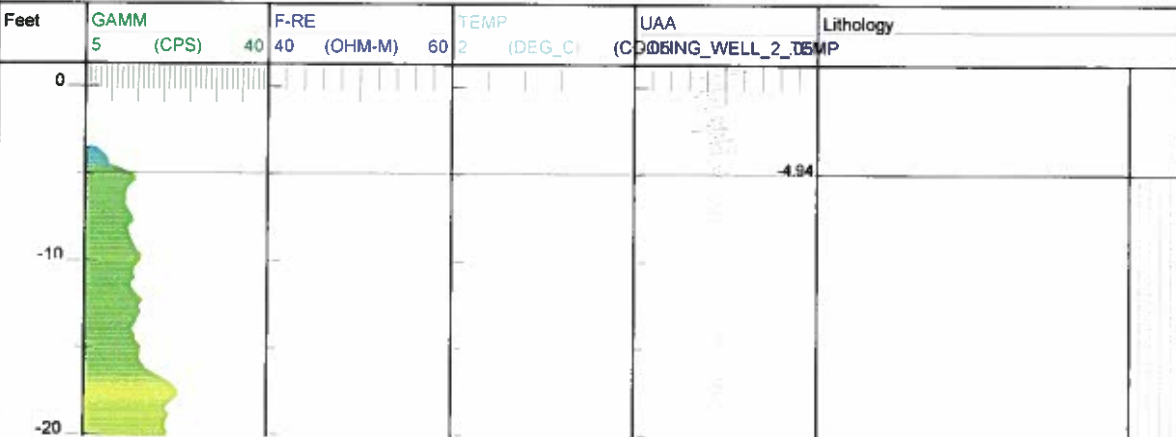
GAMM (CPS)
 Gamma
 Imported from: UAA Cooling Well 2 Gam Res Up

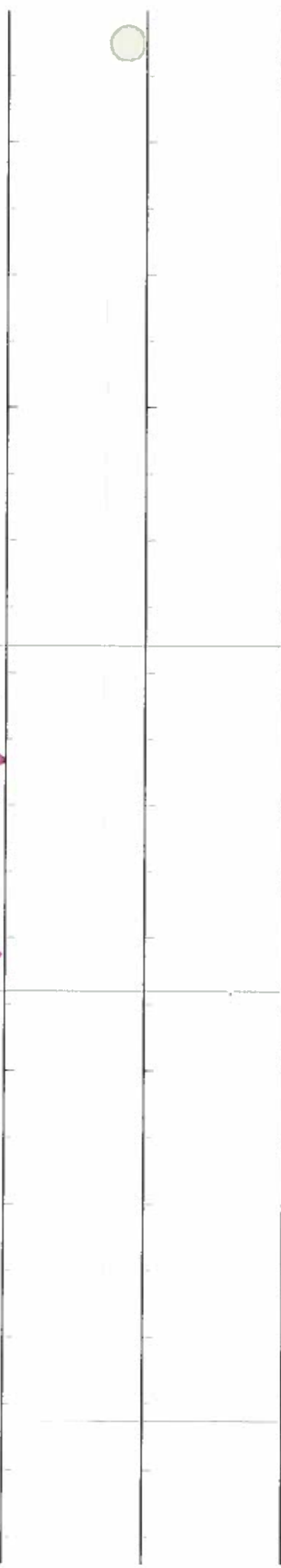
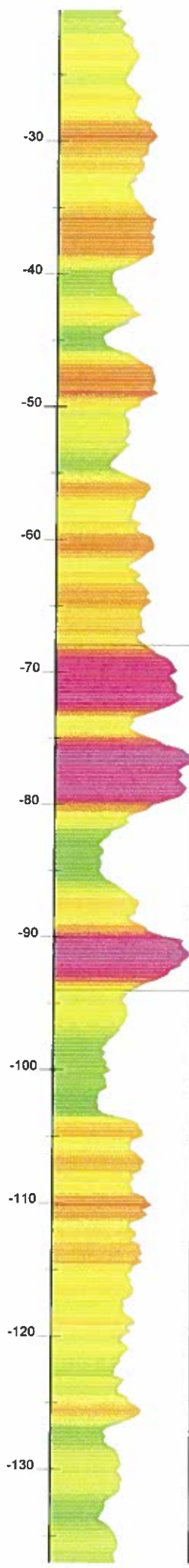
F-RE (OHM-M)
 F-Res.
 Imported from: UAA Cooling Well 2 Temp-Fres

TEMP (DEG_C)
 Temp.
 Imported from: UAA Cooling Well 2 Temp-Fres

UAA (COOLING_WELL_2_TEMP)
 UAA Cooling Well 2 Temperature Differential Log
 Imported from: UAA Cooling Well 2 Temperature Differential Log

Comments:





Handwritten notes in a vertical column, likely describing soil characteristics or test results. The text is mostly illegible due to blurring and orientation.

SAND and SILT, layered, finer-grained soil dominates

-67.95

SILT or CLAY, layered

-94

SAND, fine grained, possibly silty

-126.3

-140
-150
-160
-170
-180
-190
-200
-210
-220
-230
-240
-250



SAND and GRAVEL, water availability increases below 160 feet

Handwritten notes and data along the right edge of the log, including a vertical scale and various annotations.

