

Report No: 1 **Report For 22-Sep-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No. AFE (\$) Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	--- --- ---
Proposed TD (ft): 10000	Days On Location: 1	Last BOP Test:	--- --- ---
Hole Made (ft) / Hrs: 10,060 / 0.0	Last Casing: 7.000 at 9,990		Totals --- ---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---
Personnel: Operator:	Contractor:	Service:	Other: Total: 0

Current Operations: Rigged up and begin inject to cool operations around 19:15. Set-up DTS onsite and prepare to run in hole tomorrow.
Planned Operations: Continue to run stim pump 1 to cool wellbore overnight. Install DTS and continue injection test at 1200 psi, 1600psi, 1800 psi and 2000 psi.

Wellsite Supervisors: Michael Moore, Ted De Rocher **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
8:00	19:15	11.25		TEST	Pick-up DTS from storage yard this morning. WAC onsite, rigging up lubricator to RIH with DTS tomorrow. Coastcom onsite for fiber optic splicing. Configuring instrumentation and testing pump	
19:15	0:00	4.75		INJ	Started pump 1: Stim rpm = 46.8 hz, Bypass open full WHP = 855 psi, Downhole flow = 30 gpm (ultrasonic) to 40 gpm (Weir box subtraction). Inlet flow = 550 gpm; Current outside Temp = 54 F	

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Safety Information

First Aid:	Medical:	Lost Time Accidents:	Days Since LTA: 0
<input type="checkbox"/> BOP Test	<input type="checkbox"/> Crownamatic Check		

Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 54.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:

Report No: 2 **Report For 23-Sep-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No. AFE (\$) Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	--- --- ---
Proposed TD (ft): 10000	Days On Location: 2	Last BOP Test:	--- --- ---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals --- ---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---
Personnel: Operator:	Contractor:	Service:	Other: Total: 0

Current Operations: RIH with DTS. 30 degrees of cooling achieve at the bottom of the DTS (~8500 ft) as of this AM.

Planned Operations: Conduct injectivity test over night at 1200 psi, 1400 psi, 1600 psi and 1800 psi. Then begin stimulation.

Wellsite Supervisors: Trenton Cladouhos, Ted De Rocher **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	12:00	12.00		INJ	Injecting overnight to cool the wellbore in preparation for the DTS install. Stim pump 1 running, approximately 850-860psi WHP and 20-25gpm. Coastcom onsite at 9AM to prep the DTS connectors.	
12:00	18:00	6.00		RIH	12:30 DTS started to run in hole. Weight tested every 1000ft. Tested fiber at 7000' with power meter to ensure good signal return with the dual ended configuration. 16:00 DTS reached 9556'. Testing with power meter showed no signal returns. Connected the DTS to the signal box and shot both multi-mode fibers. Signal loss showed fiber break at approximately 7800-7850 ft downhole in both channels. (~9300 ft from the surface. Total fiber length was approximately 10,760 ft). Lowered the cable another 59ft to a final setting depth of 9615ft. 18:00 release WAC. Spooling truck left on site.	
18:00	18:30	0.50		INJ	Stim pump 1 started at 18:05, 612 WHP. Stim pump 2 started at 18:20, 1104 WHP. Water leak in lubricator detected, shut pumps down at 18:30 to tighten.	
18:30	22:10	3.67		SERV	Leak in lubricator. Welder onsite repairing leaks.	
22:10	0:00	1.83		INJ	22:10 Stim pump 1 started, 598 psi WHP. 22:45 stim pump 2 started, 900 WHP. 23:07 WHP reached 1200 psi, flow rate approximately 23 gpm from ultrasonic meter read. Begin step-rate injection test overnight.	

Comments

Seismic System operational. 16 stations.
No microseismic events detected. Results can be viewed at
http://esd.lbl.gov/research/projects/induced_seismicity/egs/newberry.html and <http://pnsn.org/volcanoes/newberry>

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Report No: 3 **Report For 24-Sep-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No. AFE (\$) Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---
Proposed TD (ft): 10000	Days On Location: 3	Last BOP Test:	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals ---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---
Personnel: Operator:	Contractor:	Service:	Other: Total: 0

Current Operations: Step rate injection test started last on previous day was completed by 11:00. Flow rates into well were very low, indicating an injectivity index of 0.012 gpm/psi. This is lower than 2012 baseline injectivity of 0.035 gpm/psi, likely due to smaller casing diameter, perforated liner in open hole, and isolation of PAS line on 9 5/8" casing.

Varying pumping pressures today as repairs continued to seal leaks around the wellhead when operating at high pressures. Maximum pressure reached: 2252 psi with approximately 36-42 gpm going downhole.

Planned Operations: Hold steady at 2200 psi WHP overnight. In daytime, ramp up WHP further until permeability increase occur. Maximum allowable WHP is 3000 psi; however, practical maximum is close to 2600 psi.

Wellsite Supervisors: Susan Petty, Ted De Rocher **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	0:20	0.33		INJ	Step 1 of injection test ongoing, WHP at 1200 psi, flow stabilizes at average of 17 gpm	
0:20	2:20	2.00		INJ	Step 2: Increase to WHP of 1400 psi, flow stabilizes at average of 19 gpm	
2:20	4:42	2.37		INJ	Step 3: Increase to WHP of 1600 psi, flow stabilizes at average of 19 gpm	
4:42	5:04	0.37		INJ	Step 3.5: Increase to WHP of 1700 psi, hold for 15 minutes before continuing to next step	
5:04	8:48	3.73		INJ	Step 4: Increased to WHP of 1800 psi, flow stabilizes at average of 24 gpm	
8:48	10:12	1.40		INJ	Step 5: Increased to WHP of 2000 psi, flow stabilizes at average of 23 gpm	
10:12	12:09	1.95		INJ	WHP increases 18 psi in 5 minutes with no change in pump parameters (unknown cause). 11:12 starting to use bypass throttle valve to increase WHP. 12:09 at 2158 psi WHP, new leaks are detected. Lowered stimulation pressures down to approximately 1000 psi to fix leaks.	
12:09	18:38	6.48		REPR	12:09 WHP reached 2158, new leaks are detected. Lowered pressure to fix leaks. Stim pump 2 trip at 14:06, reset and troubleshoot pump 2 fail to start. Bypass valve not fully opened caused failed to start. Injection mostly continued downhole during this period with stim pump 1 running. Both pumps down during 18:00 to 18:38	
18:38	0:00	5.37		INJ	Restarted pumps and ramp up pressure. 19:50 WHP reached 2252, new leaks are detected, pressure lowered to 735 to fix leaks. 22:05 WHP at 2012 psi, downhole flow at 23 gpm. 22:50 increased WHP to 2200 psi, small leak on lubricator but not of concern. Downhole flow at 34gpm. Bypass throttle valve at 40%. Staying steady overnight.	

Comments

Flow rates are measured using an Ultra-sonic flow meter on the high pressure inlet. At each step the rate would fluctuate by +/- 2gpm around the average reported above. We were skeptical of the low flows being reported, so compared this flow to weir box calculations, draw down rate of sump, and (after it was installed at 11:00) a mag meter on the bypass return flow line. By these comparisons (none very precise), we concluded that average flows into the well were less than 30 gpm.

No induced microseismicity has been detected.

Transfer pump installed to move water from south sump to north sump; working well.

Began installing heat tape on instrumentation in preparation for freezing weather ahead.

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Rainy	Visibility:
Air Temperature: 60.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:

Report No: 4 **Report For 25-Sep-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 4	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Increasing WHP and stimulate well

Planned Operations: Continue to inject and stimulate well. We intend to drop the pressures down to 1500 psi or less for a period of time to test the apparatus that we have built to inject diverter. It is a secondary line and has ports for adding diverter. No diverter will be injected, just water.

Wellsite Supervisors: Susan Petty, Ted De Rocher **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	10:30	10.50		INJ	WHP held steady near 2200 psi overnight, approximately 31-34 gpm going downhole	
10:30	12:30	2.00		INJ	WHP increased to 2400 psi, approximately 50 gpm going downhole	
12:30	15:50	3.33		INJ	WHP increased to 2550 psi, approximately 55 gpm going downhole	
15:50	0:00	8.17		INJ	WHP increased to 2580 psi, approximately 65 gpm going downhole. 20:30 Average flow rate increased to 70 gpm at steady WHP OF 2580 psi. WHP held steady near 2580 psi overnight, ~68-72 gpm going downhole	

Comments

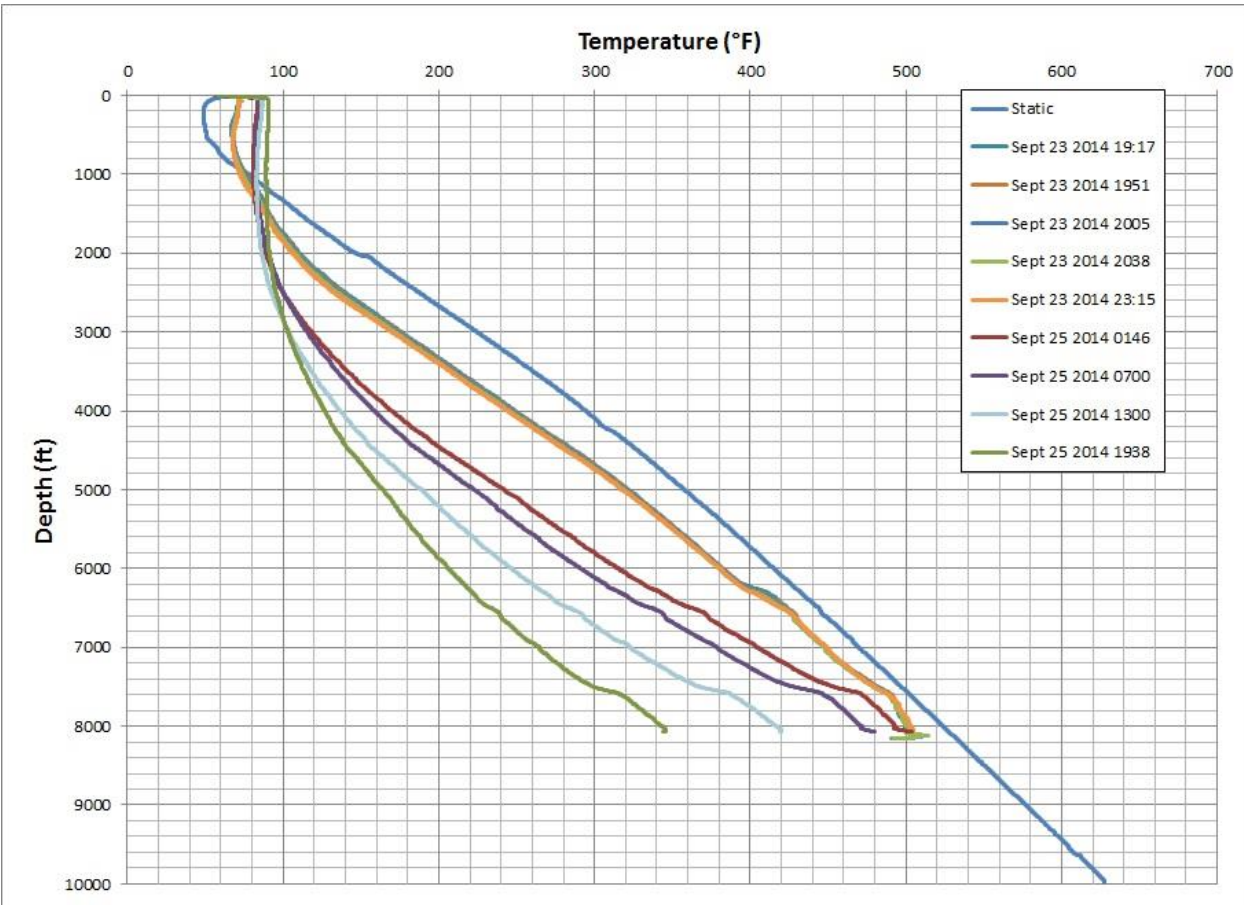
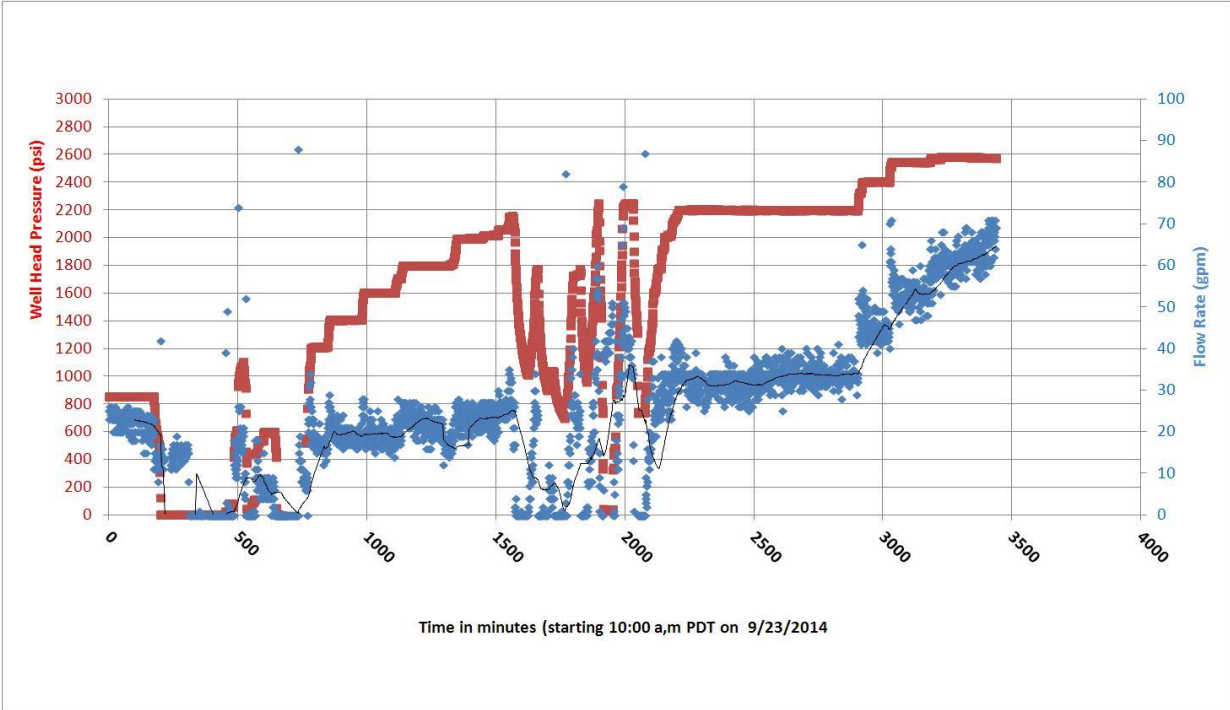
All instruments have been heat taped to prepare for freezing temperatures.
2580 psi is close to the maximum pressure that pumps can achieve in current configuration. We will try other measures such as throttling the bypass valve to reach higher pressures.
The bottom of the DTS at 8000ft has been cooled from 520 deg. F down to 340 deg. F. Thermal stimulation (cracking due to thermal contraction) may be occurring, which we hope will lead to mechanical stimulation as well.
See attached graphs of pressure and flow histories and temperature profiles.

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Rainy	Visibility:
Air Temperature: 60.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:



Report No: 5 **Report For 26-Sep-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No. AFE (\$) Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	--- --- ---
Proposed TD (ft): 10000	Days On Location: 5	Last BOP Test:	--- --- ---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals --- ---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---

Personnel: Operator:	Contractor:	Service:	Other:	Total: 0
-----------------------------	--------------------	-----------------	---------------	-----------------

Current Operations: Ramp down pumps and fix leaks. Test diverter injection spool. Re-start pumps and increase pressure in step-wise fashion to see if permeability improvement is permanent. Continue stimulation.

Planned Operations: Reach previous high pressure of 2580 psi. During the shutdown, adjustments were made to the pump drives that should allow higher pressures to be achieved.

Wellsite Supervisors: Michael Moore, Trenton Cladouhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	10:40	10.67		INJ	WHP and flow held steady overnight at 2580 psi and approximately 70 gpm.	
10:40	12:20	1.67		INJ	Slowly ramping down pumps.	
12:20	16:50	4.50		REPR	Welder on site repairing lubricator leak. Pressure tested lubricator.	
16:50	19:15	2.42		TEST	Diverter injection spool tested. Inlet valve was found to be faulty. Replaced inlet valve.	
19:15	20:00	0.75		INJ	Injection resumed. Pressure will be increased in steps to measure injectivity changes.	
20:00	20:45	0.75		INJ	1600 psi WHP and held for 45 minutes.	
20:45	22:56	2.18		INJ	1800 psi WHP and flowrate stablized around 42 gpm.	
22:56	0:00	1.07		INJ	2000 psi WHP and flowrate stablized around 50 gpm.	

Comments

Seismicity: Attached see the preliminary email report for the first seismic event on Sept 25 at 23:18 and a map of the location after reiew by a seismologist.

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Safety Information

First Aid:	Medical:	Lost Time Accidents:	Days Since LTA: 1
<input type="checkbox"/> BOP Test	<input type="checkbox"/> Crownamatic Check		

Weather Information

Sky Condition: Partly Cloudy	Visibility:
Air Temperature: 60.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:

Report No: 6 **Report For 27-Sep-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 6	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: GRC field tour on site 10:30 am - noon.
2765 psi is close to maximum pump pressure.
Well bore continues to cool. Bottom of DTS 265F

Planned Operations: Continue to stimulate

Wellsite Supervisors: Michael Moore, Trenton Cladouhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	1:08	1.13		INJ	Held third step at 2000 psi for two hours. Flowrate stabilized around 50 gpm.	
1:08	3:05	1.95		INJ	Fourth step at 2200 psi. Held for two hours. Flowrate stabilized around 60 gpm.	
3:05	5:15	2.17		INJ	Fifth step at 2400 psi. Held for two hours. Flowrate stabilized around 70 gpm.	
5:15	14:05	8.83		INJ	Increased WHP to 2690 psi at 05:15. Then gradually increasing pumping pressures. 13:11-14:05 WHP up to 2752 psi.	
14:05	23:59	9.90		INJ	WHP up to 2765 psi and hold overnight. Flowrates approximately 90 gpm at midnight.	

Comments

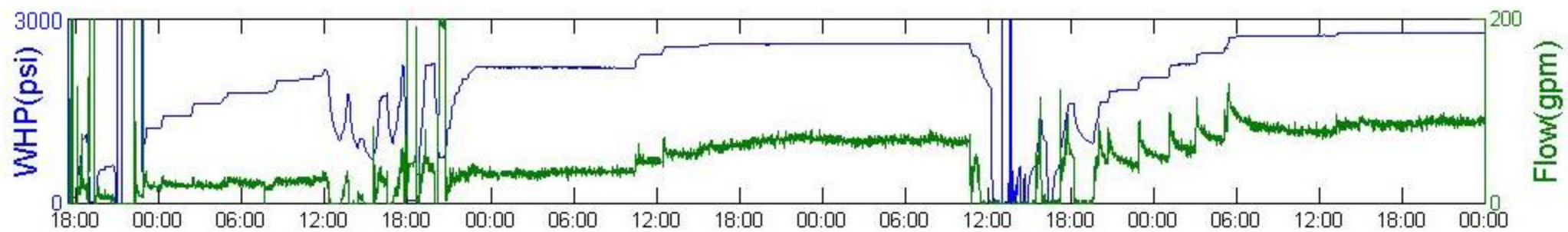
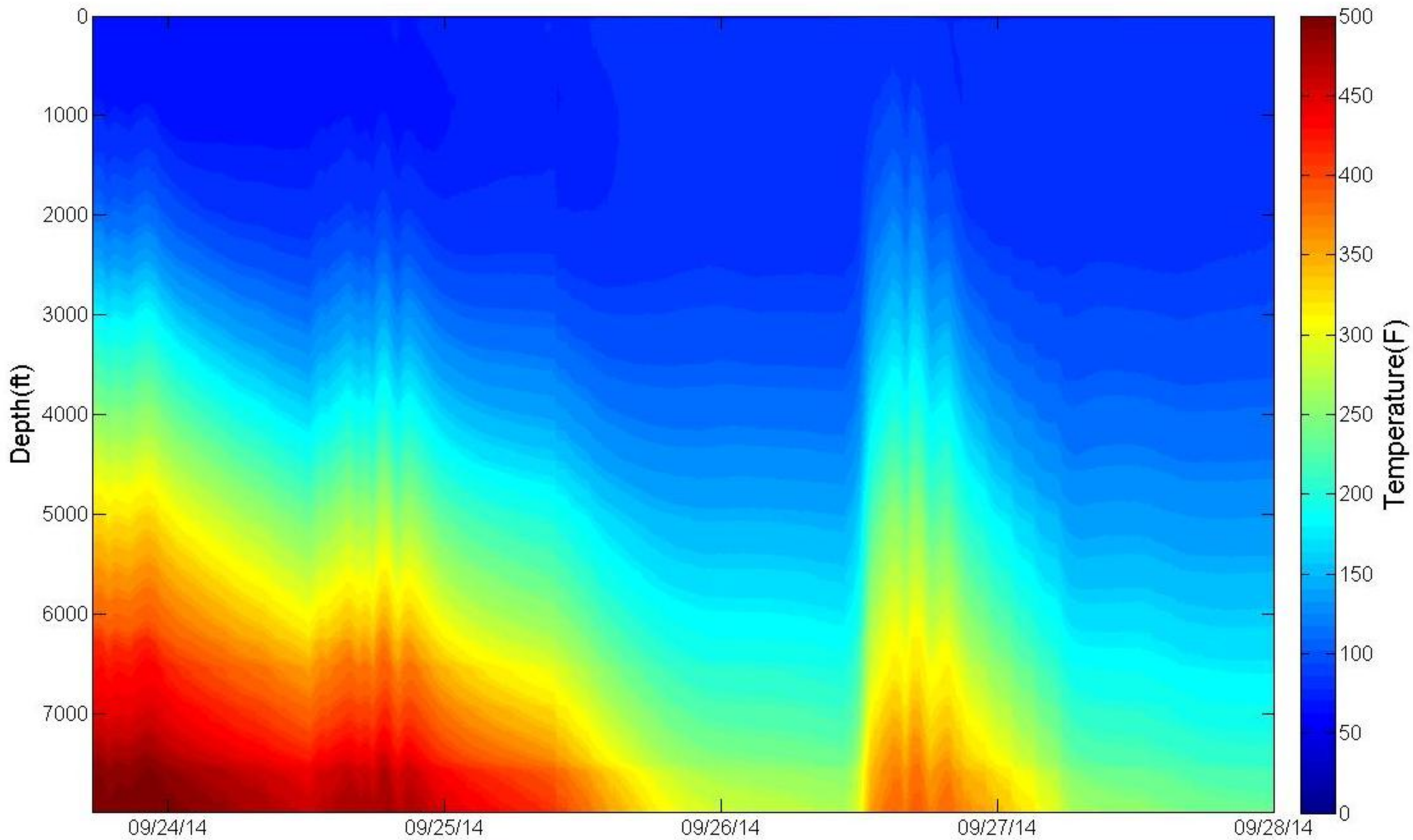
Cumulative injected Volume = 331,241 gallons

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Rainy/Partly cloudy	Visibility:
Air Temperature: 47.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:



Report No: 7 **Report For 28-Sep-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 7	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals ---		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue stimulation

Planned Operations: Continue pumping at current rate. Monitor seismicity and injectivity improvement.

Wellsite Supervisors: Michael Moore, Trenton Cladouhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	11:30	11.50		INJ	Pumps held steady, WHP slowly decreased from 2765 to 2757, injecting 80-96 gpm	
11:30	18:57	7.45		INJ	Pressure increased and held at 2777 psi by throttling bypass valve, injecting 105 gpm	
18:57	19:04	0.12		INJ	Pressure increase and held at 2820 psi by throttling bypass valve, injecting 110 gpm	
19:04	23:59	4.92		INJ	Hold pressure at 2820 psi and inject overnight.	

Comments

Bottom of DTS: 204 deg. F
Seismicity: 6 microseismic events. Seismologist will review and provide locations on Monday.

Cumulative injected Volume 477,540 gallons.

Casing/Tubular Information

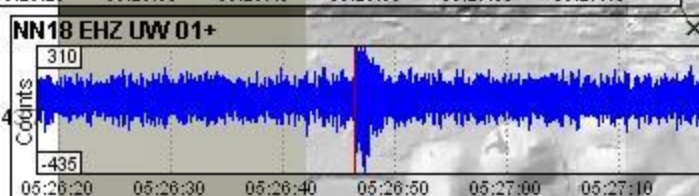
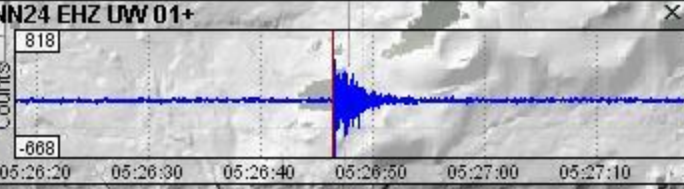
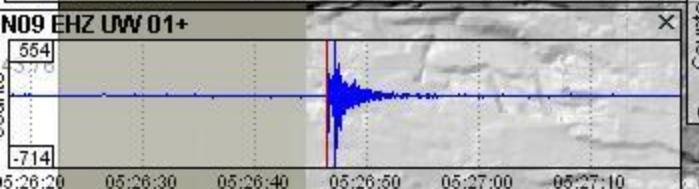
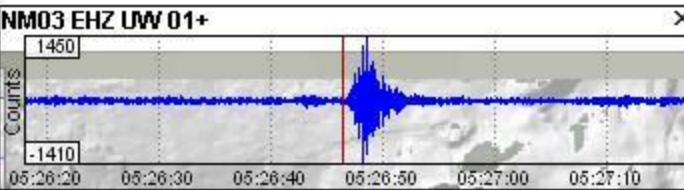
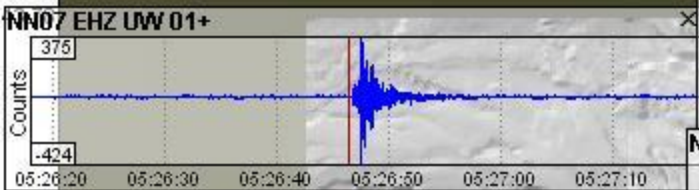
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Partly cloudy	Visibility:
Air Temperature: 47.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:

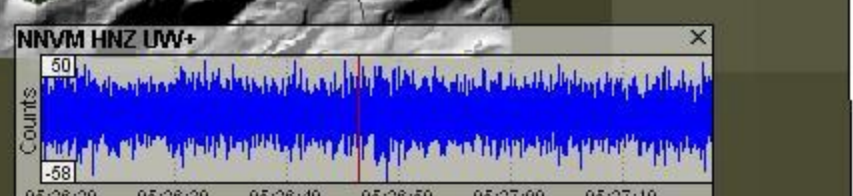
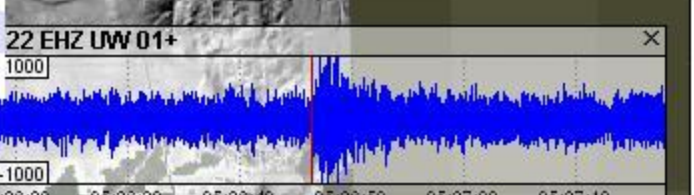
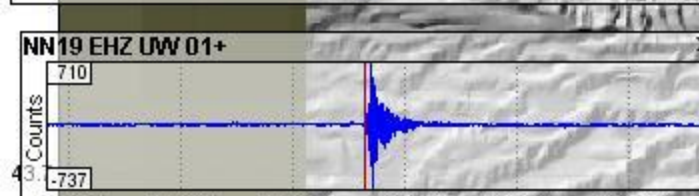
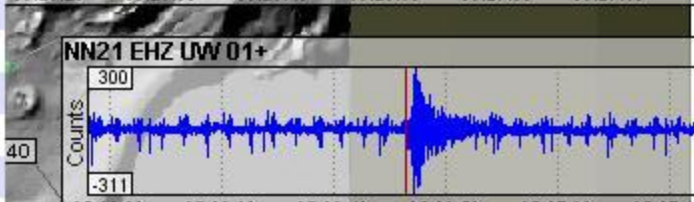
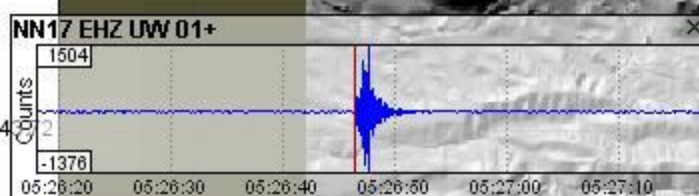
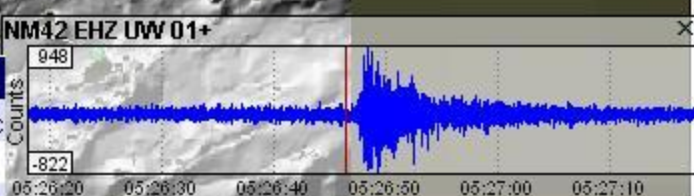
2.0 km

Transverse Mercator Projection



EW Event ID: 49

Origin time:	2014.09.29 05:26:45 UTC
Latitude:	43.7262
Longitude:	-121.3072
Depth:	3.8 km
Coda Magnitude:	0.3 Md nobs=1
<u>Local Magnitude:</u>	0.9 ±0.2 ML nobs=24
RMS Error:	0.04 s
Horizontal Error:	0.42 km
Depth Error:	0.44 km
Azimuthal Gap:	111 Degrees
Total Phases:	18
Total Phases Used:	15
Num S Phases Used:	8
Quality:	B

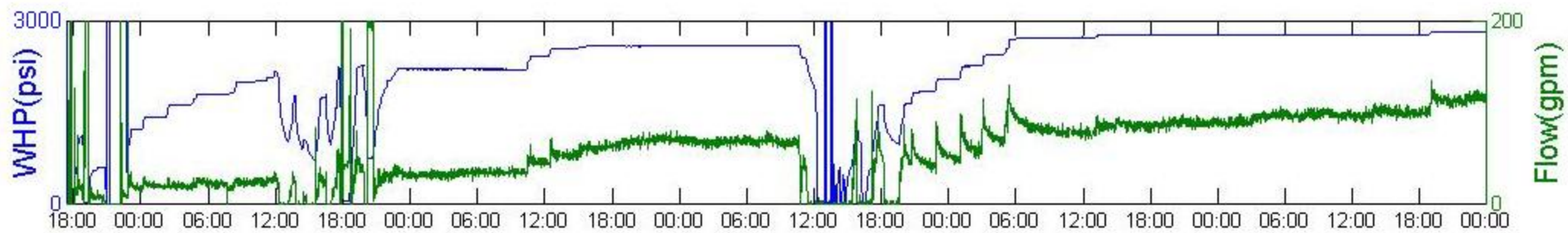
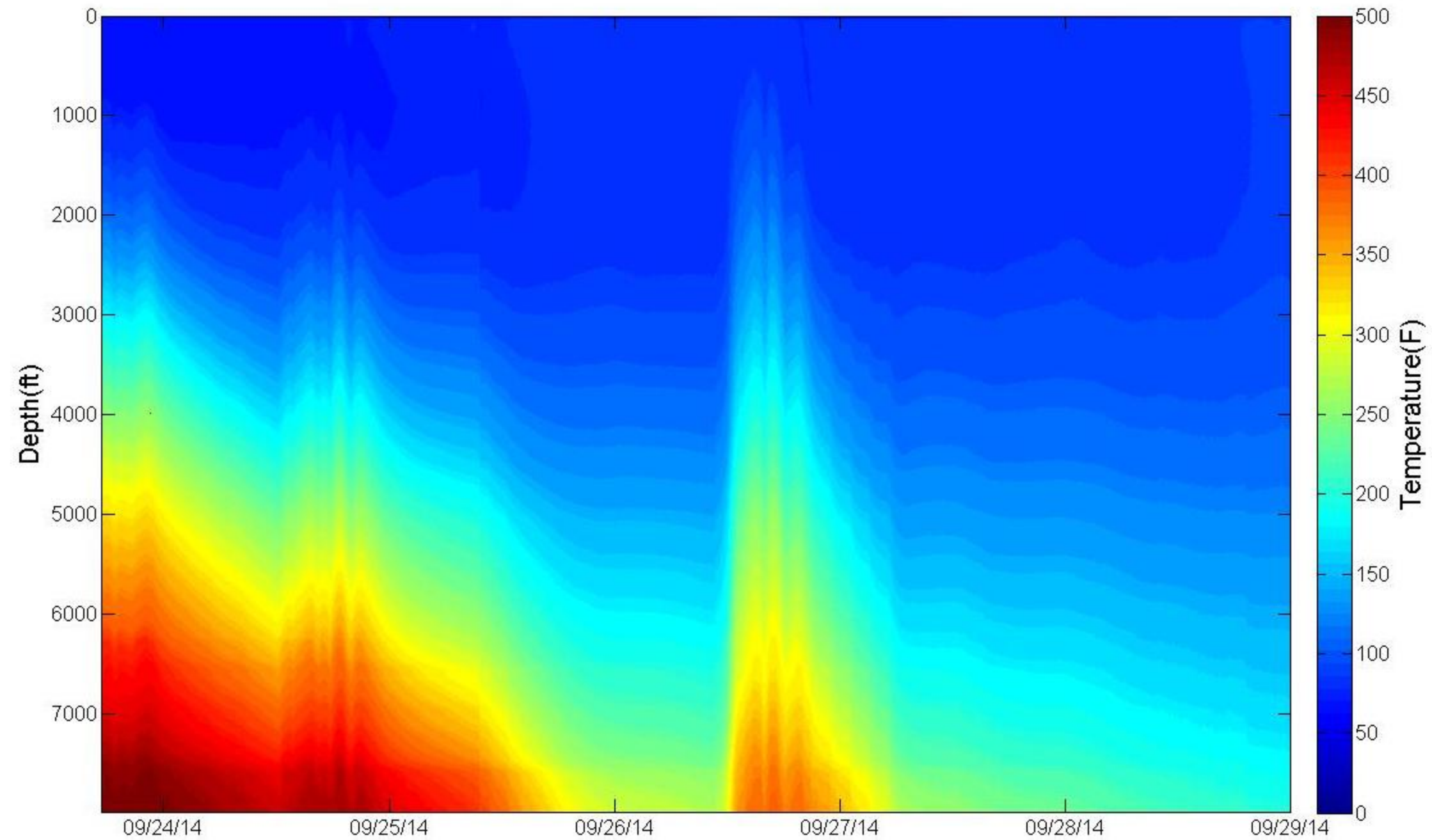


-121.4

-121.35

-121.3

-121.25



Report No: 8 **Report For 29-Sep-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 8	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals	---	---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Stimulation. Bottom (8056ft) of DTS 204 deg. F. Well temperature equilibrated at current injection rates.

Planned Operations: Continue stimulation. Inject at current rate. Monitoring seismicity and injectivity improvements.

Wellsite Supervisors: Michael Moore, Trenton Cladouhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	11:35	11.58		INJ	Pumps held steady, WHP gradually increased from 2819 to 2827 psi. Flowrate between 120-100 gpm.	
11:35	14:08	2.55		INJ	Bypass valve opened slightly, resulting in WHP dropping back to 2819 psi. Flowrate approximately 100 gpm.	
14:08	23:59	9.85		INJ	Slight WHP pressure drop at 14:08 to 2809 psi with no operational change. Injecting approximately 100-110 gpm.	

Comments

Seismicity: Four more microseismic events. Seven microseismic events on 9/28/2014, for total of 11. Events have magnitudes between 0.6 and 1.3 and preliminary depths of 2.33 – 2.73 km below sea level. The bottom of the hole is at about 1 km below sea level, so these events are below the bottom of the well. See attached map for PRELIMINARY locations.

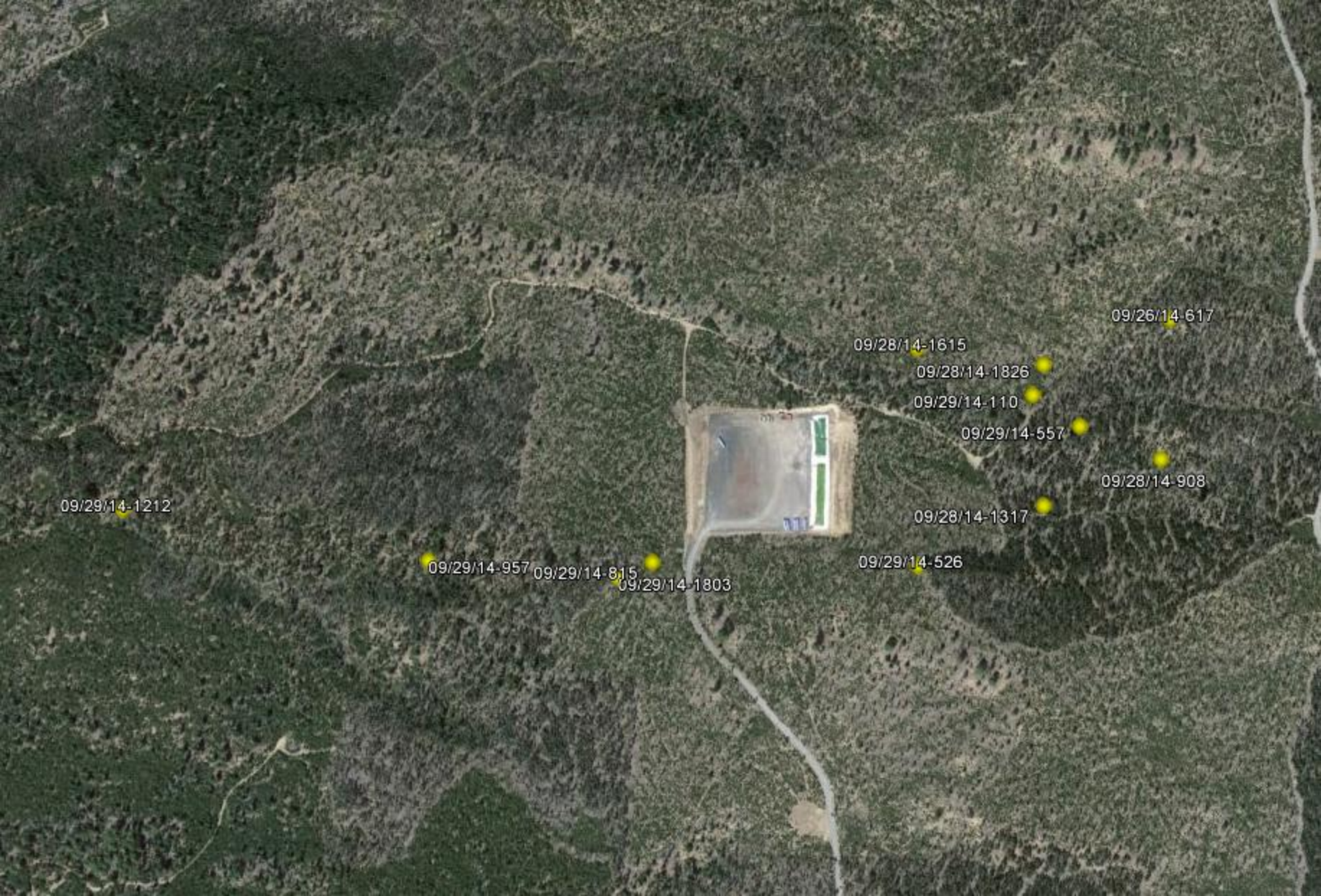
Cumulative injected Volume 635,030 gallons

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Clear to overcast to drizzly	Visibility:
Air Temperature: 41.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Hi 60, low 41. Some wind.	



09/29/14-1212

09/29/14-957

09/29/14-815

09/29/14-1803

09/28/14-1615

09/28/14-1826

09/29/14-110

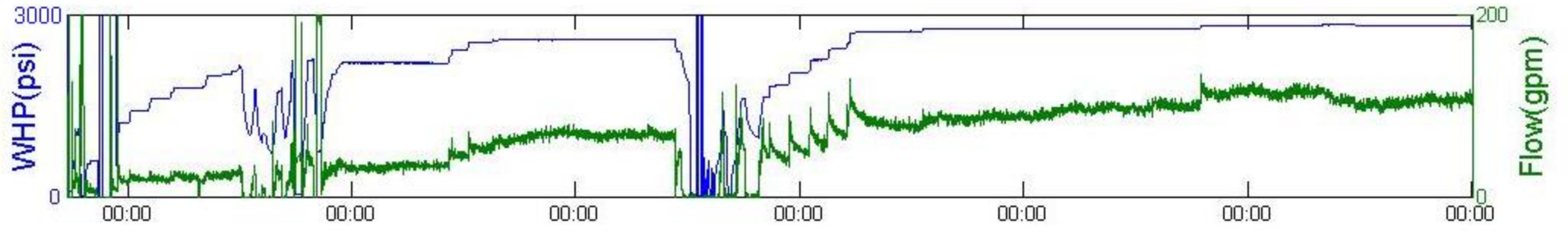
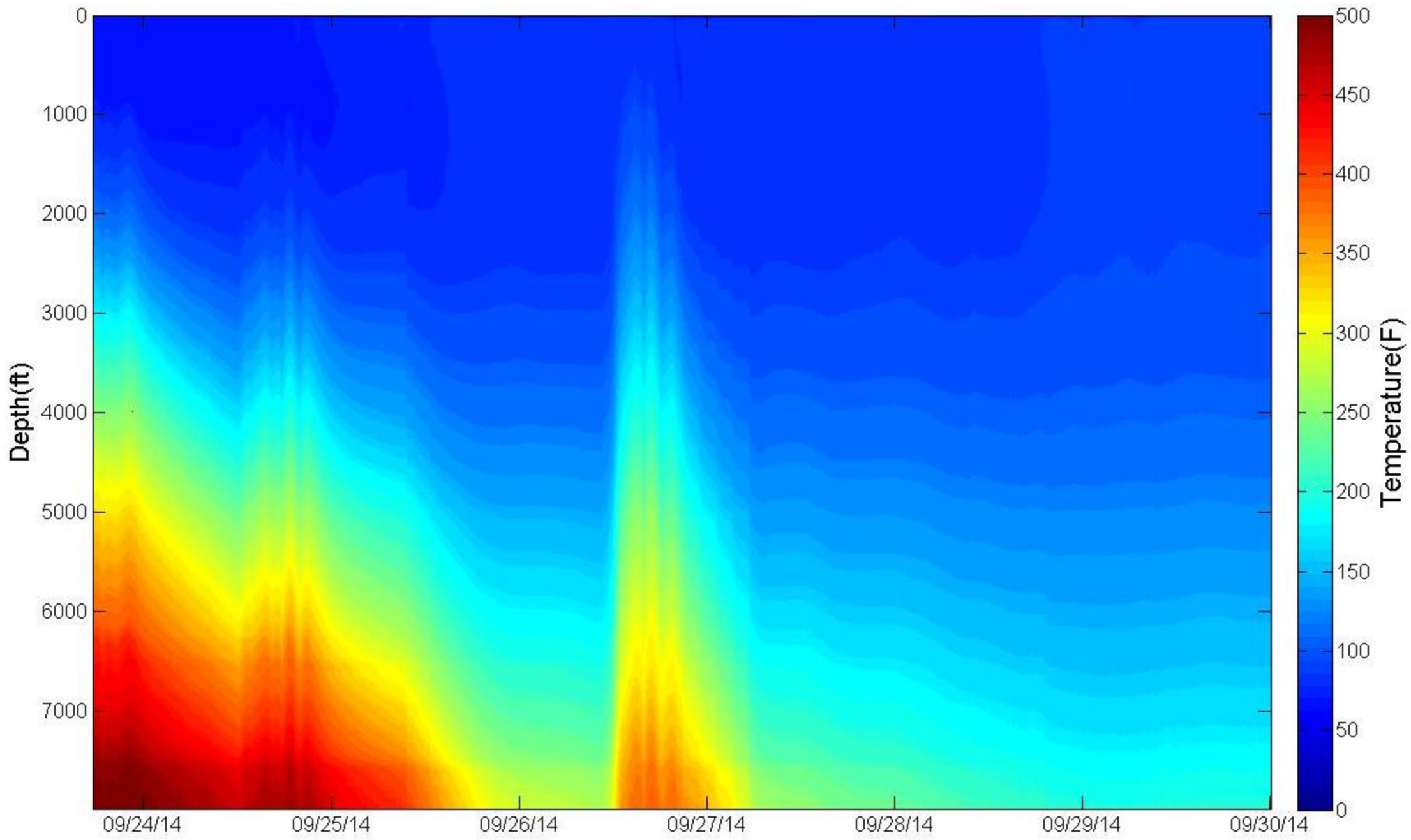
09/29/14-557

09/28/14-1317

09/29/14-526

09/26/14-617

09/28/14-908



Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 9 **Report For 30-Sep-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 9	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue to stimulate. Bottom (8056ft) of DTS 194 deg. F. Well temperature has equilibrated.

Planned Operations: Continue injecting at current rate, and monitoring seismicity and injectivity improvement.

Wellsite Supervisors: Michael Moore, Trenton Cladouhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	10:20	10.33		INJ	Pumps held steady, WHP at 2806. Injection rate between 100-110 gpm.	
10:20	11:00	0.67		INJ	Bypass shut 2% resulting in 20 psi WHP increase to 2826 psi.	
11:00	14:00	3.00		INJ	Globe valve close 1/2 resulting in 12 psi WHP increase to 2838 psi. Water well turned on. resulting in 12 deg. F reduction in injection temp to 76 deg. F.	
14:00	23:59	9.98		INJ	Gradual increase in WHP to 2847 psi. Injection rate about 123 gpm. Hold flowrate and pressure overnight.	

Comments

Seismicity: Thirty-one more microseismic events, for total of 45 events. Events have PRELIMINARY magnitudes between 0.6 and 1.7 and PRELIMINARY depths of -0.15 – 3.0 km below sea level. The bottom of the hole is at about 1 km below sea level, so most of these events are below the bottom of the well. New hand processed locations should be available tomorrow. Foulger Consulting has started processing seismic data for moment tensor solutions.

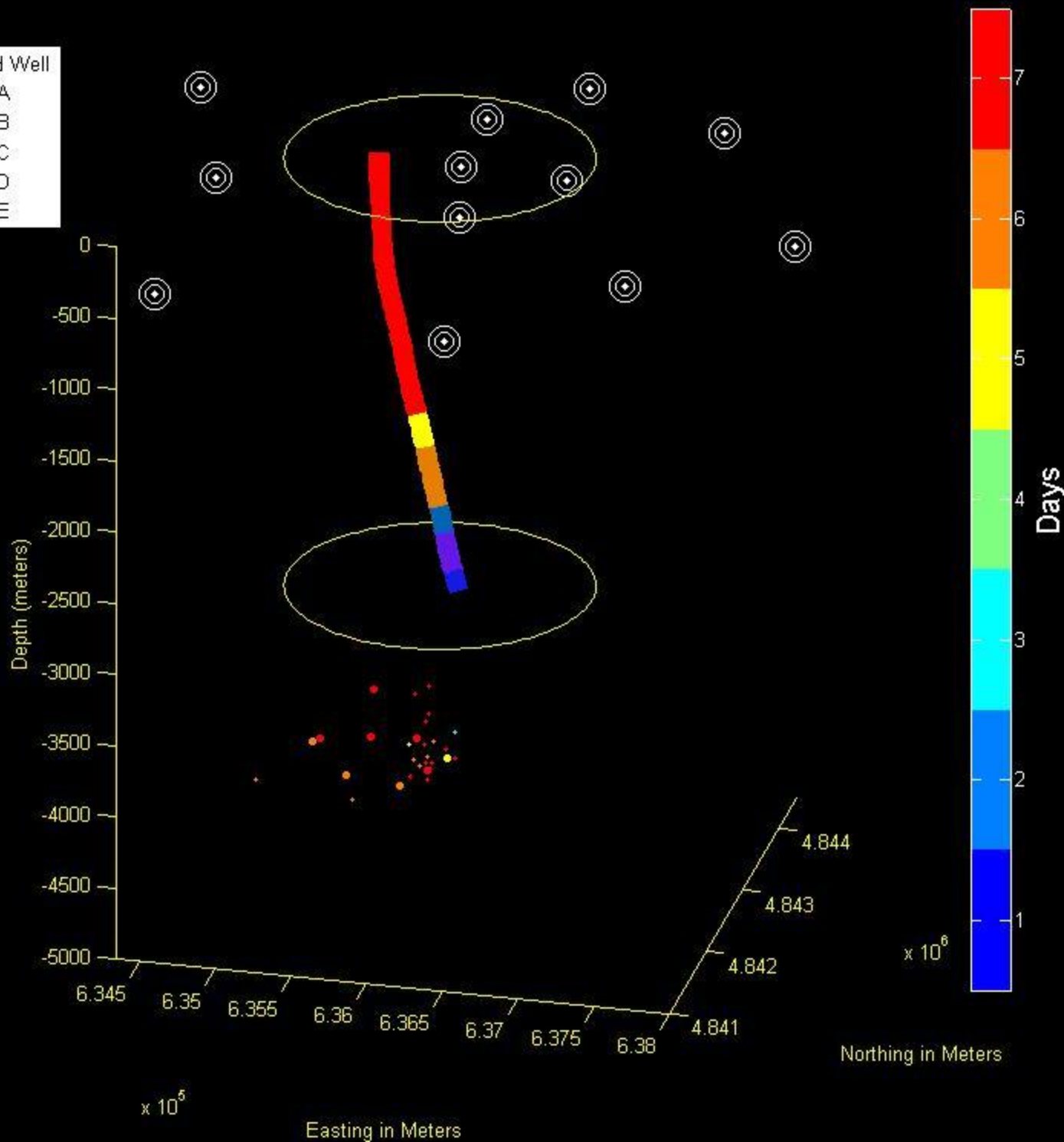
Cumulative injected volume: 800,200 gallons

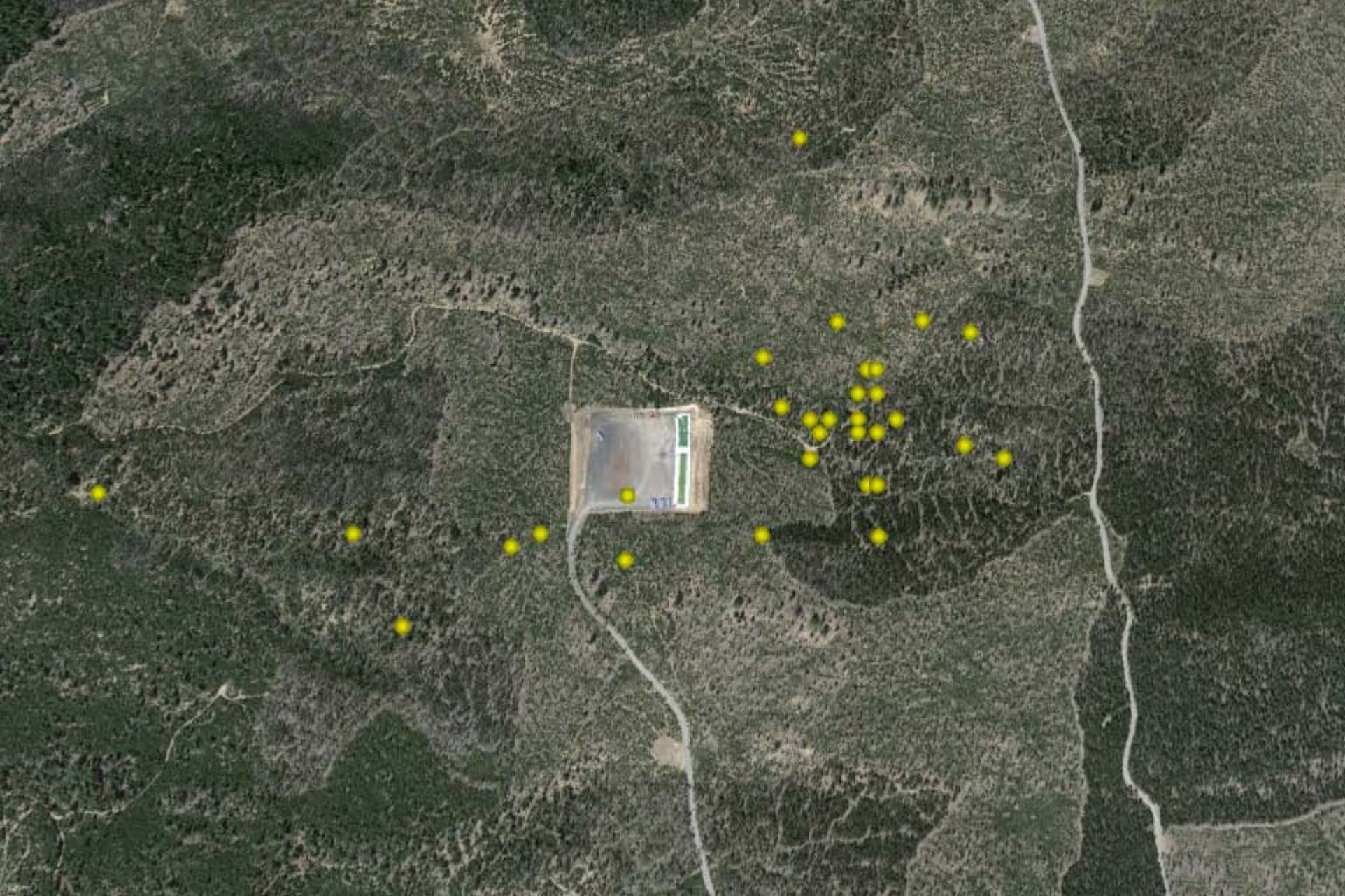
Casing/Tubular Information

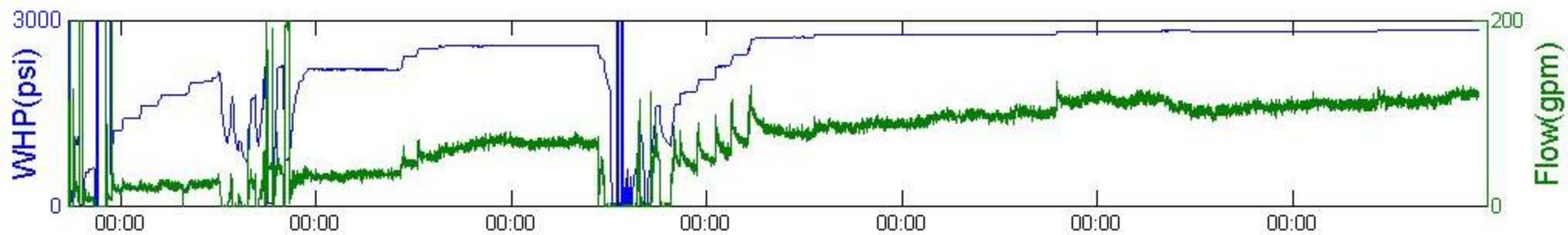
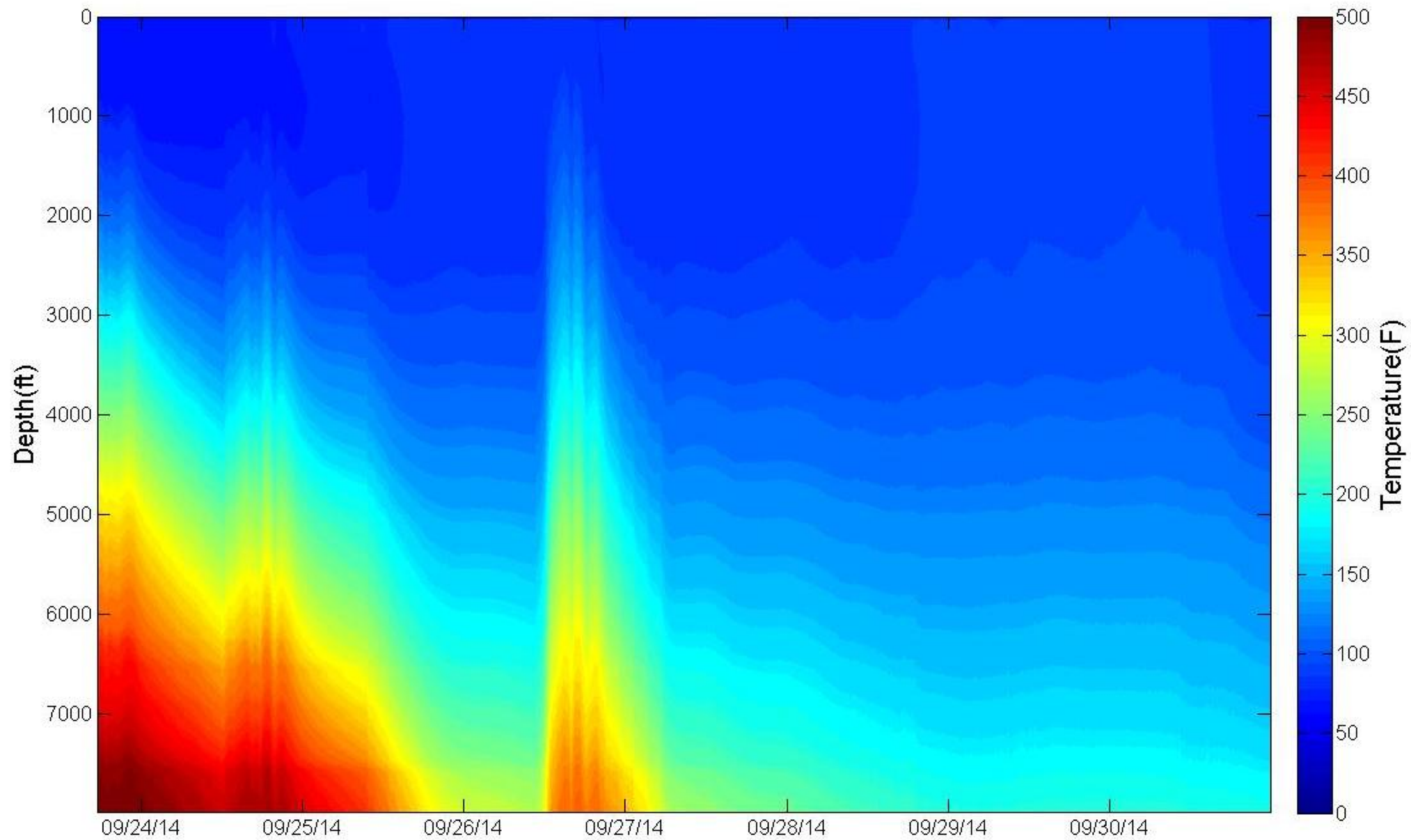
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Overcast to partly cloudy	Visibility:
Air Temperature: 35.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Some wind, Hi 50, low 35	







Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 10 **Report For 01-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No. AFE (\$) Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---
Proposed TD (ft): 10000	Days On Location: 10	Last BOP Test:	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals ---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---
Personnel: Operator:	Contractor:	Service:	Other: Total: 0

Current Operations: Stimulation and testing diverter (TZIM) injection methods

Planned Operations: Continue injecting at current rate, and monitoring seismicity and injectivity improvement.

Wellsite Supervisors: Michael Moore, Trenton Cladouhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	7:25	7.42		INJ	Pumps running stead overnight, WHP at 2795 psi with injection rates averaging 120 gpm. (The inlet flow dropped to 627 gpm at 02:45, but injection downhole remained unchanged)	
7:25	14:15	6.83		INJ	Opened globe valve 2/3 turn, now at 7-5/6 turns. WHP reached 2841 psi. Injection down the well between 100-110 gpm.	
14:15	15:20	1.08		INJ	Stepped pressure down to test Diverter Injection Vessel Assembly (D.I.V.A.). WHP reached 2443 psi. Reduction in WHP resulted in no flow going into the well.	
15:20	17:30	2.17		INJ	Flow resumed to well at 2461 psi. WHP increased to 2529 psi at 16:00 and held.	
17:30	21:39	4.15		INJ	17:30 - 18:45 WHP increased to 2550 psi and held 18:45 - 19:45 WHP increased to 2600 psi and held 19:45 - 20:30 WHP increased to 2650 psi and held	
21:39	23:59	2.33		INJ	WHP increased to 2800 psi, increased to 2856 psi over next hour. Hold pressure and inject overnight	

Comments

Seismicity: 43 additional microseismic events, for a total of 88. Depths for the 32 handpicked events range from 1.97 to 2.73 km bgs and magnitudes for handpicked events range from 0.6 - 1.7. Depths of the 78 auto-picked events with vertical errors less than 1 km range from 0.26 to 4.55 km bgs.

In the one hour period, when well head pressure lowered from 2841 to 2443, there were three microseismic events.

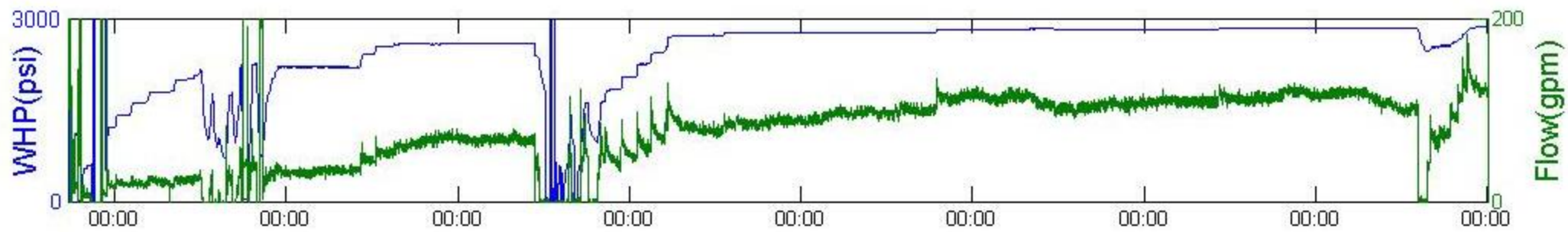
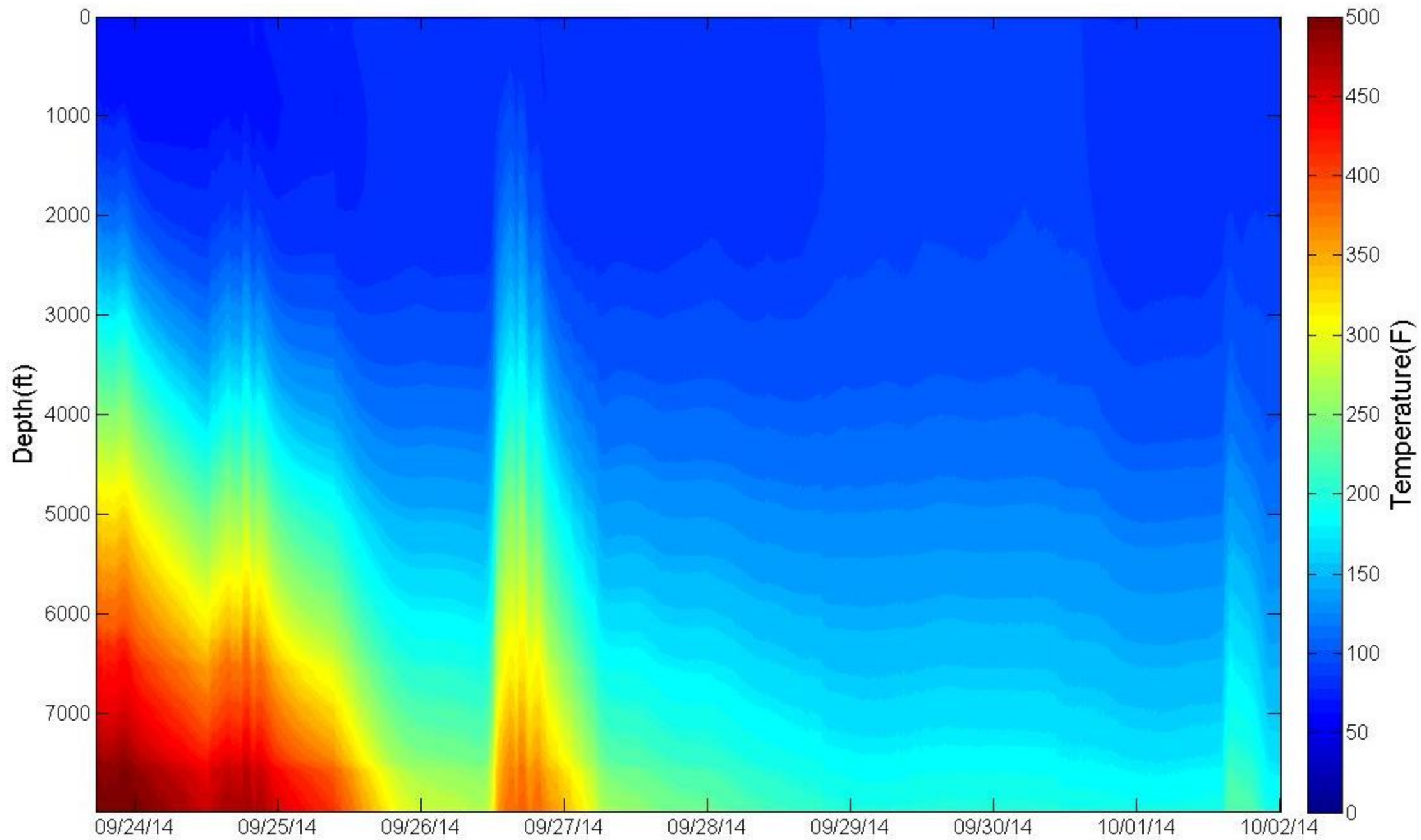
Cumulative injected Volume 950,080 gallons

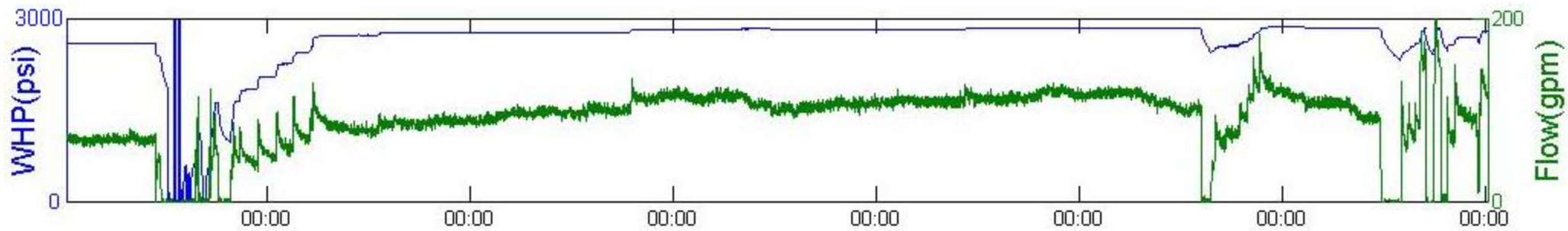
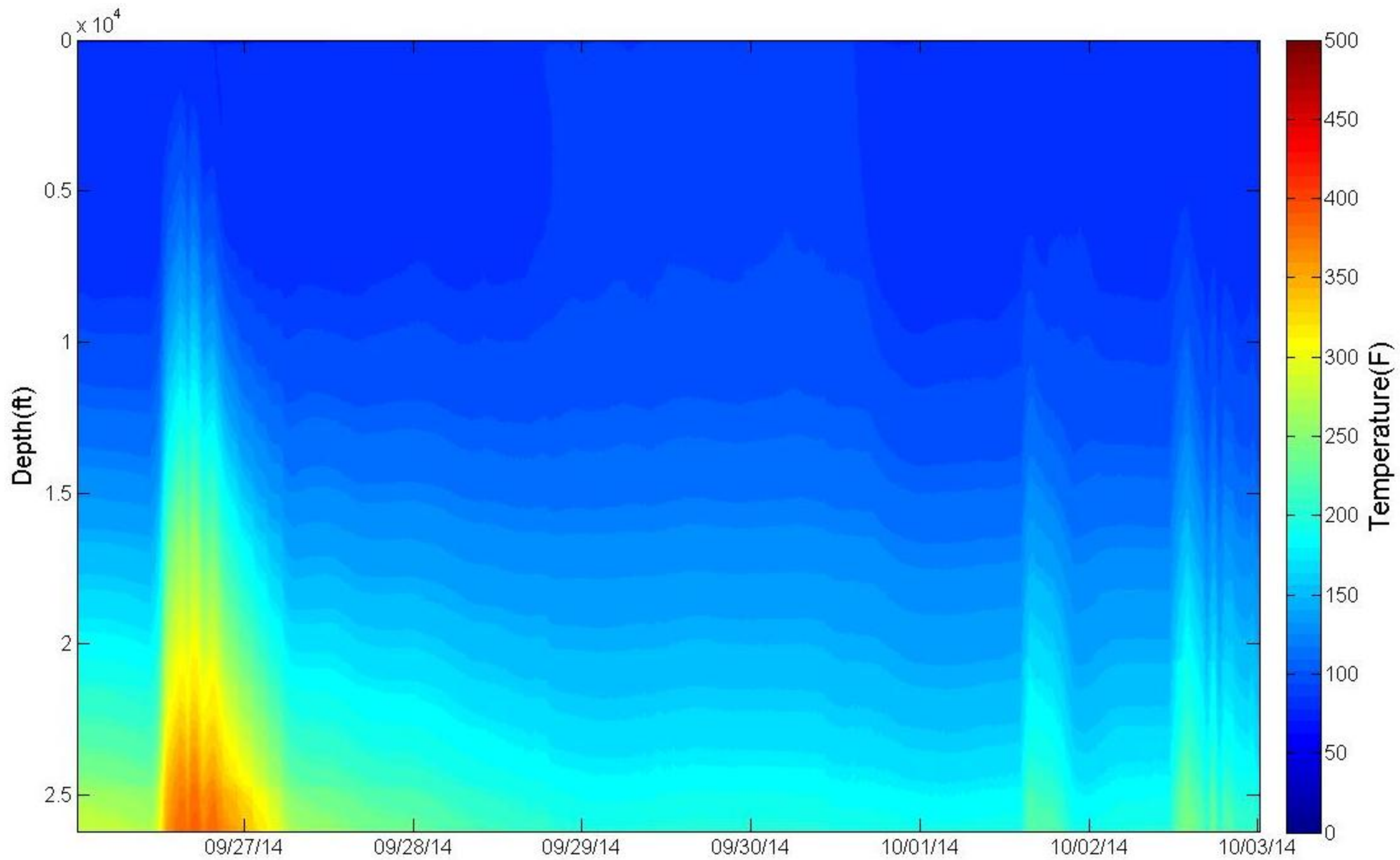
Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 24.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Some wind, Hi 53, low 24	





Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 11 **Report For 02-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 11	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue stimulation. Lauren Boyd, Ben Phillips, and Elisabeth Metcalfe of DOE visited site in morning.

Planned Operations: Continue injecting at current rate, and monitoring seismicity and injectivity improvement

Wellsite Supervisors: Michael Moore, Trenton Cladouhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	11:30	11.50		INJ	Pumps running steady overnight. WHP between 2871-2860 psi.	
11:30	14:16	2.77		REPR	Shut down pumps to replace bypass ball valve and service generator. WHP falling off at ~100 psi/hr. 13:30 restarted stim pumps and began ramping up speed.	
14:16	17:05	2.82		INJ	Ramping up pumps. 16:00-17:00 stim pump 2 tripped because the Hz setting was higher than the actual Hz reading during ramp up from last shut down. Slowed stim pump 1 down to 42 Hz.	
17:05	22:50	5.75		INJ	17:05 stim pump 2 start-up initiated. Followed ramp up procedures not allowing Hz-setting and Hz-actual deviate by more than 0.5 Hz and allowing Hz-actual to catch up before increasing speed.	
22:50	23:59	1.15		INJ	Opened bypass to 46% . Ramped up stim pumps to full speed. Hold flow and pressure for 1 hour then throttle bypass and globe valve. WHP at approximately 2800psi	

Comments

Seismicity: 39 additional seismic events for a total of 128. Error in station elevations had been made in the seismic software inputs - all stations had been put near sea level. With correct station elevations (4700 to 6400 feet) the seismic depths are now adjacent to the open hole. Event magnitudes are being re-calculated. See attached maps of hand-picked event locations.

Cumulative injected volume 1,076,00 gallons

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 27.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Light breeze, Hi 64	

Report No: 12 **Report For 03-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 12	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue Stimulation

Planned Operations: Continue injecting at current rate, and monitoring seismicity and injectivity improvement.

Wellsite Supervisors: Michael Moore, Marc Steffen **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	0:50	0.83		INJ	Throttled bypass to 35%. WHP reached 2835psi.	
0:50	2:17	1.45		INJ	Pump 2 tripped. Ramped down pump 1 and re-started pump 2. Ramped back up to full pump speed and closed bypass to 39%.	
2:17	9:45	7.47		INJ	Ramp up pumps to reach 2840 WHP. Closed bypass valve to 45%.	
9:45	11:40	1.92		INJ	Pump 2 tripped. Reset drive breaker and manually turn the drive shaft to re-start pump.	
11:40	23:59	12.32		INJ	Increase Hz to 62.9 on Stim pump 1 and 60.1 on Stim pump 2; WHP between 2550-2700 psi. Injection rate approximately 100gpm.	

Management Summary

Checked globe valve to see if working. With the auto valve set at 40% we made 7.5 turns on the globe valve and the pressure went up, meaning the globe valve is operational.

Comments

Seismicity: 42 additional seismic events for a total of 150. See attached visual for event locations.

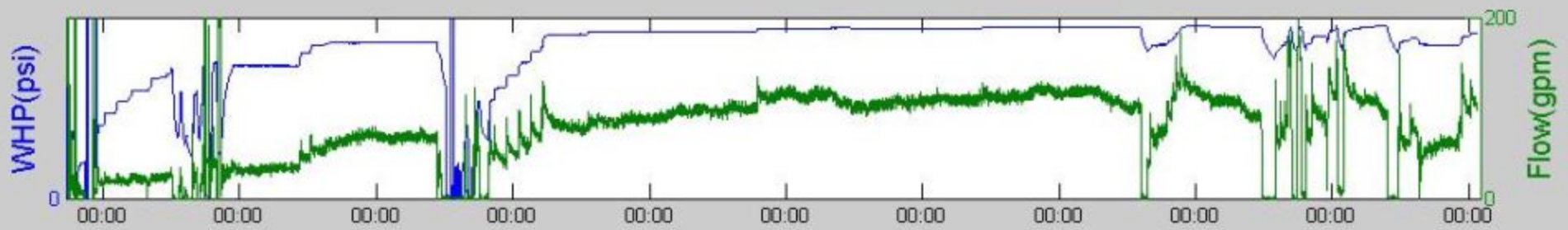
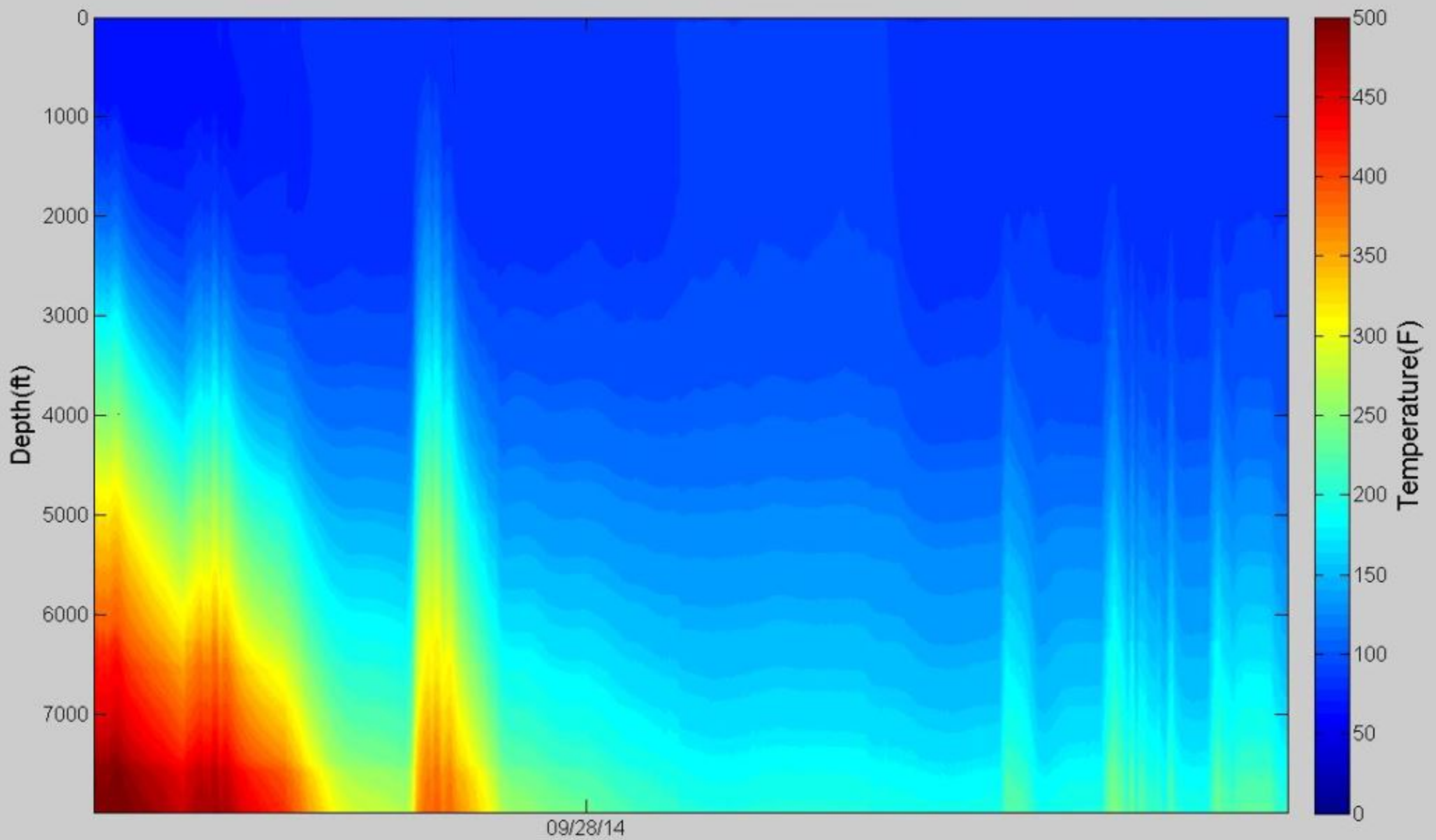
Cumulative injected volume 1,186,000 gallons

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 33.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Light breeze, Hi 65	



Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 13 **Report For 04-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 13	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue stimulation

Planned Operations: Continue injecting at current rate, and monitoring seismicity and injectivity improvement.

Wellsite Supervisors: Michael Moore, Marc Steffen **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	23:59	23.98		INJ	Stim pump 1 at 63 Hz, Stim pump 2 at 60 Hz, wellhead pressure at approximately 2800 psi with injection rates between 80-90 gpm. 18:30: Water well turned on to reduce inlet flow temperature (still running at the same Hz)	

Comments

Seismicity: 30 additional seismic events for a total of 180. See attachments for additional seismic event analysis.

Cumulative injected volume 1,306,700 gallons

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 36.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Light breeze, Hi 69	



NN24

500 m to shoe

55-29 ko

sh

td

NM22

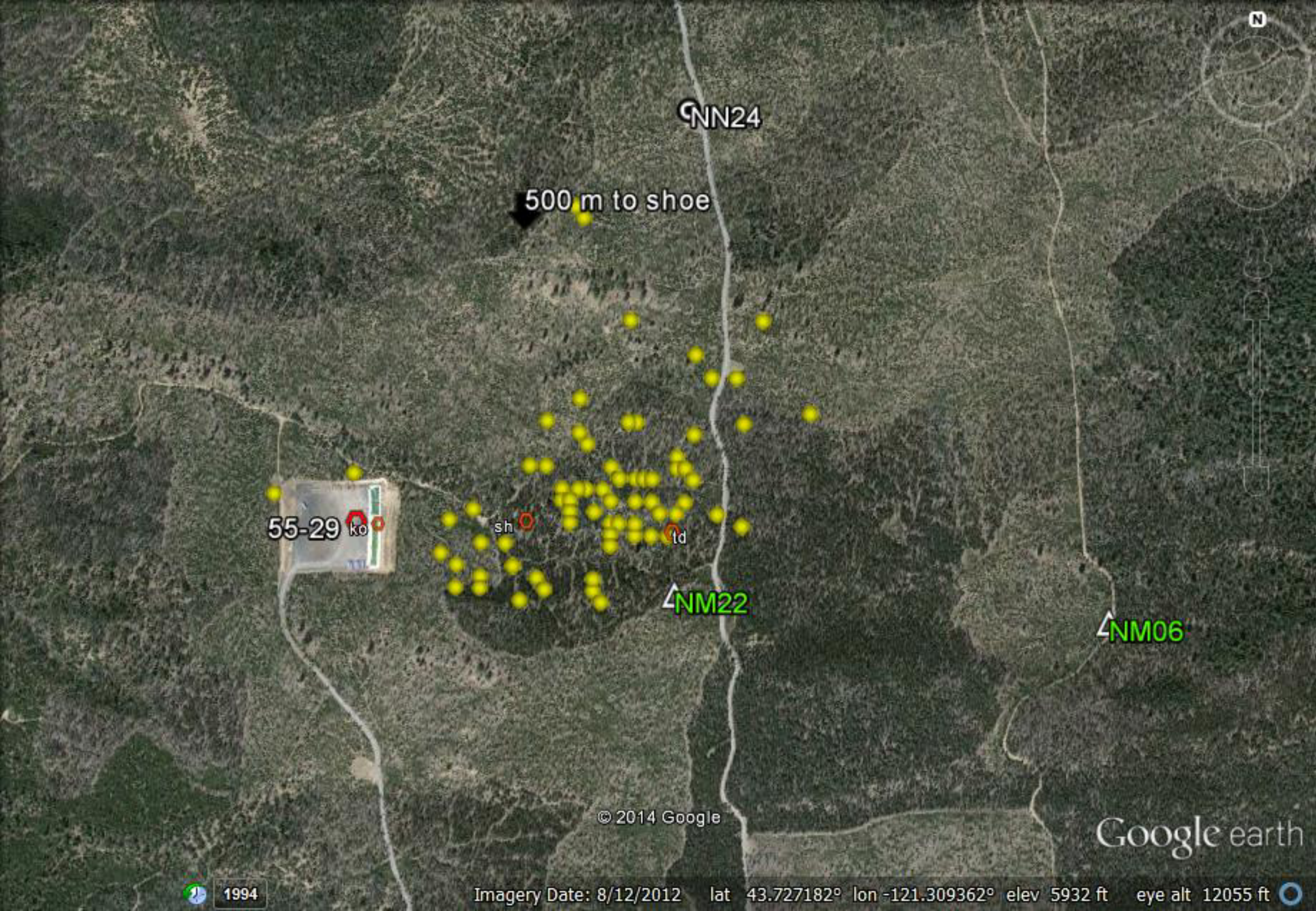
NM06

© 2014 Google

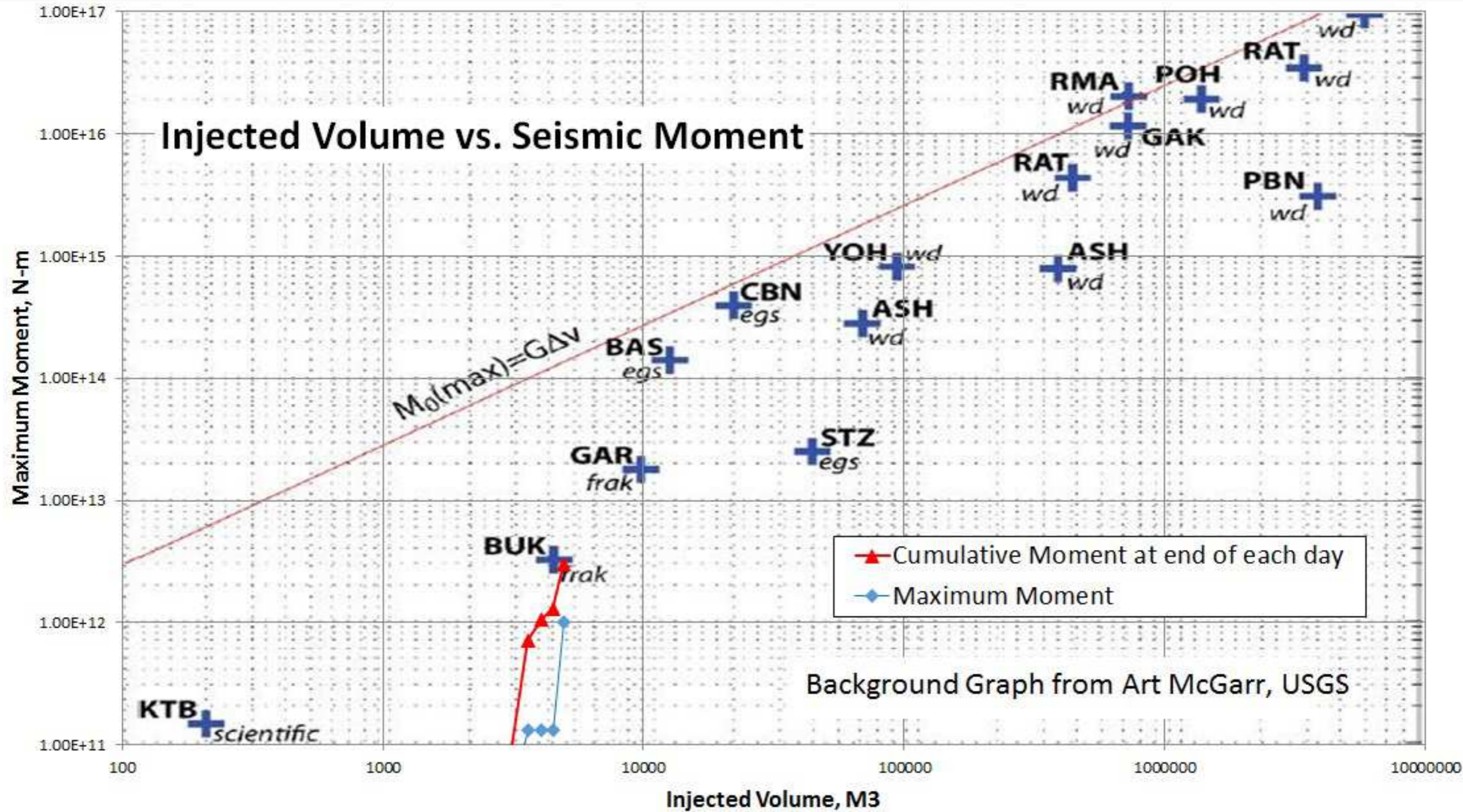
Google earth

1994

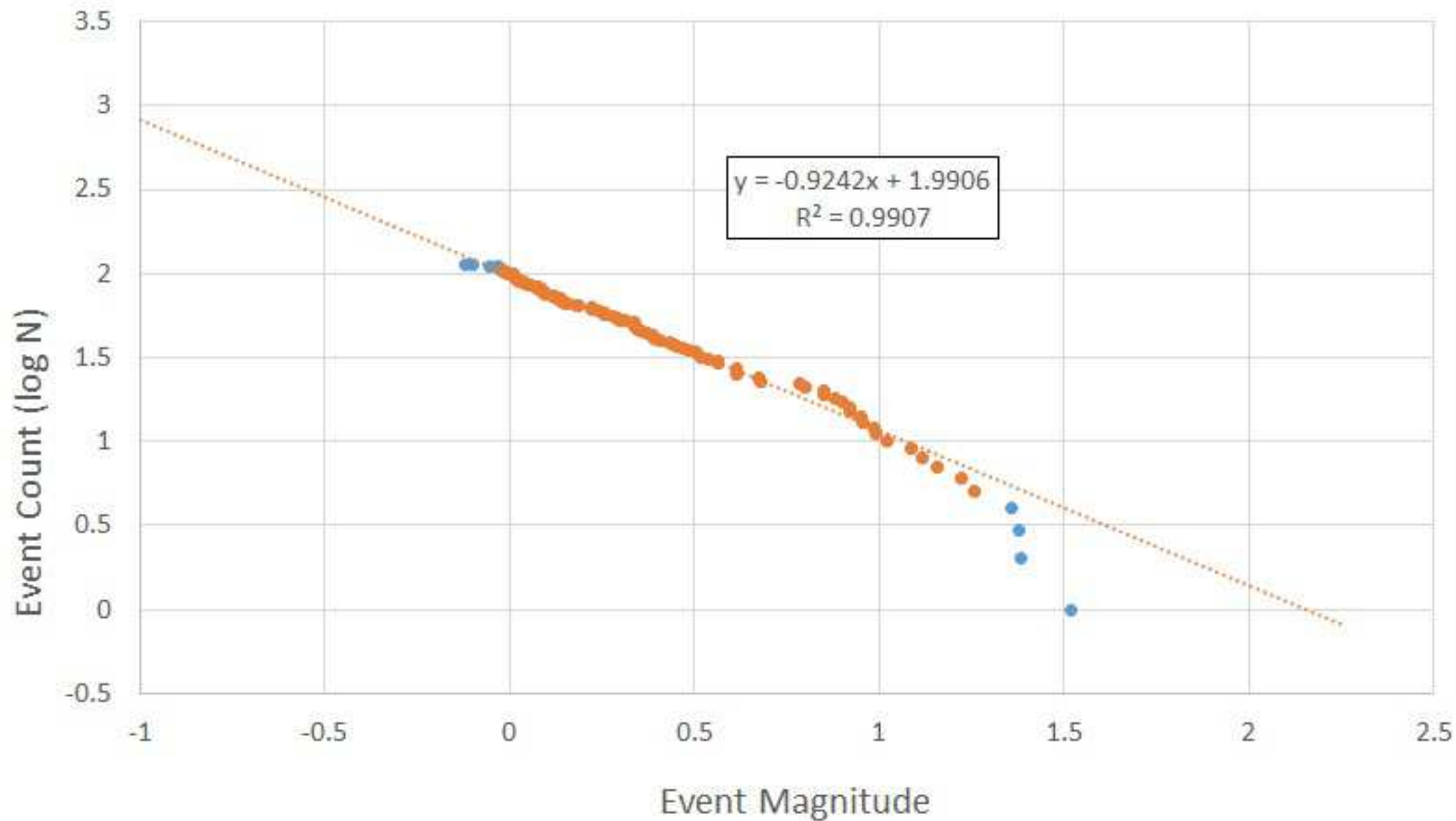
Imagery Date: 8/12/2012 lat 43.727182° lon -121.309362° elev 5932 ft eye alt 12055 ft



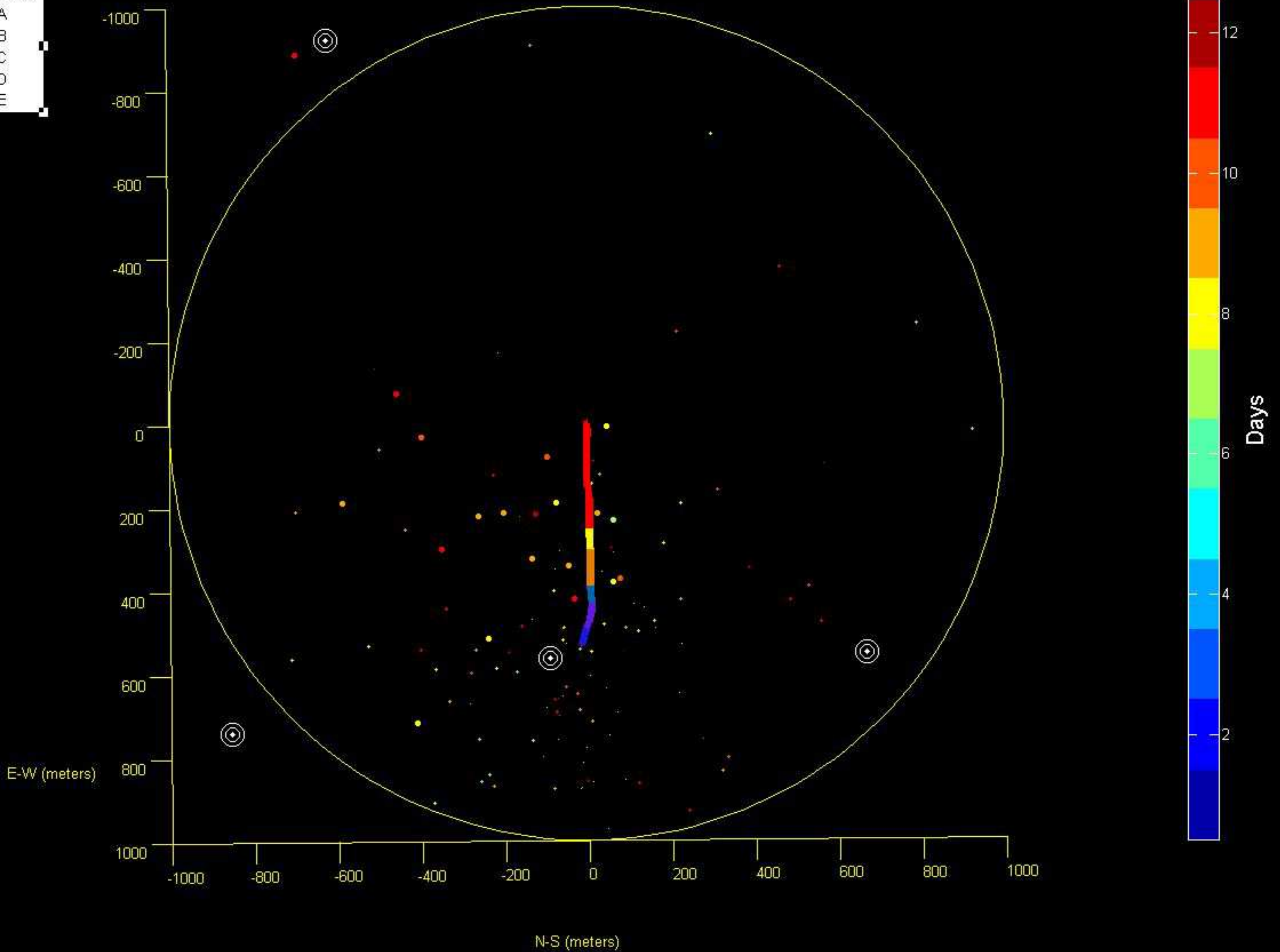
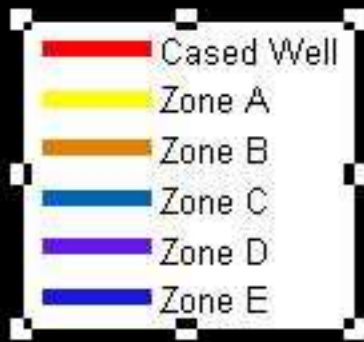
Injected Volume vs. Seismic Moment



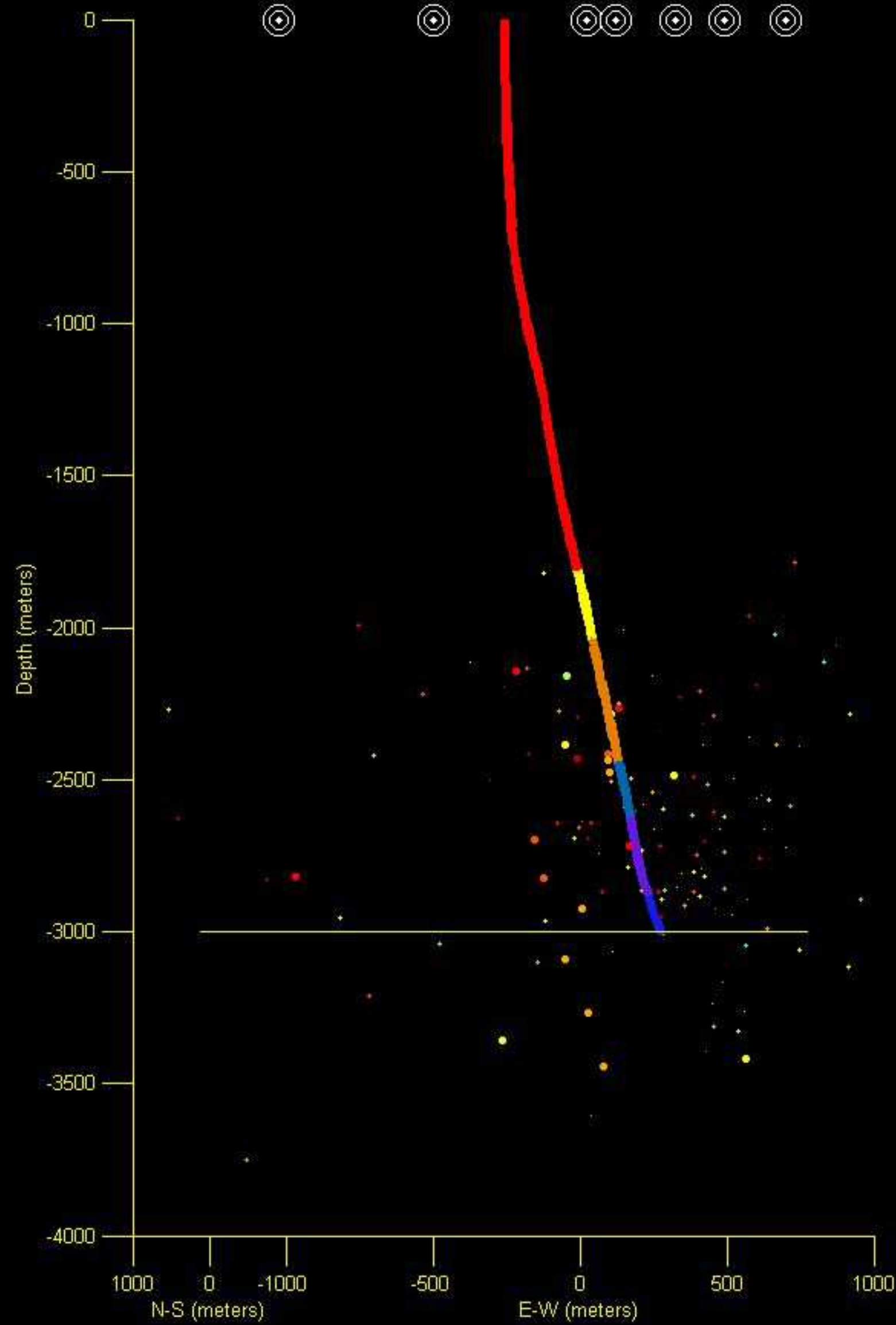
Background Graph from Art McGarr, USGS



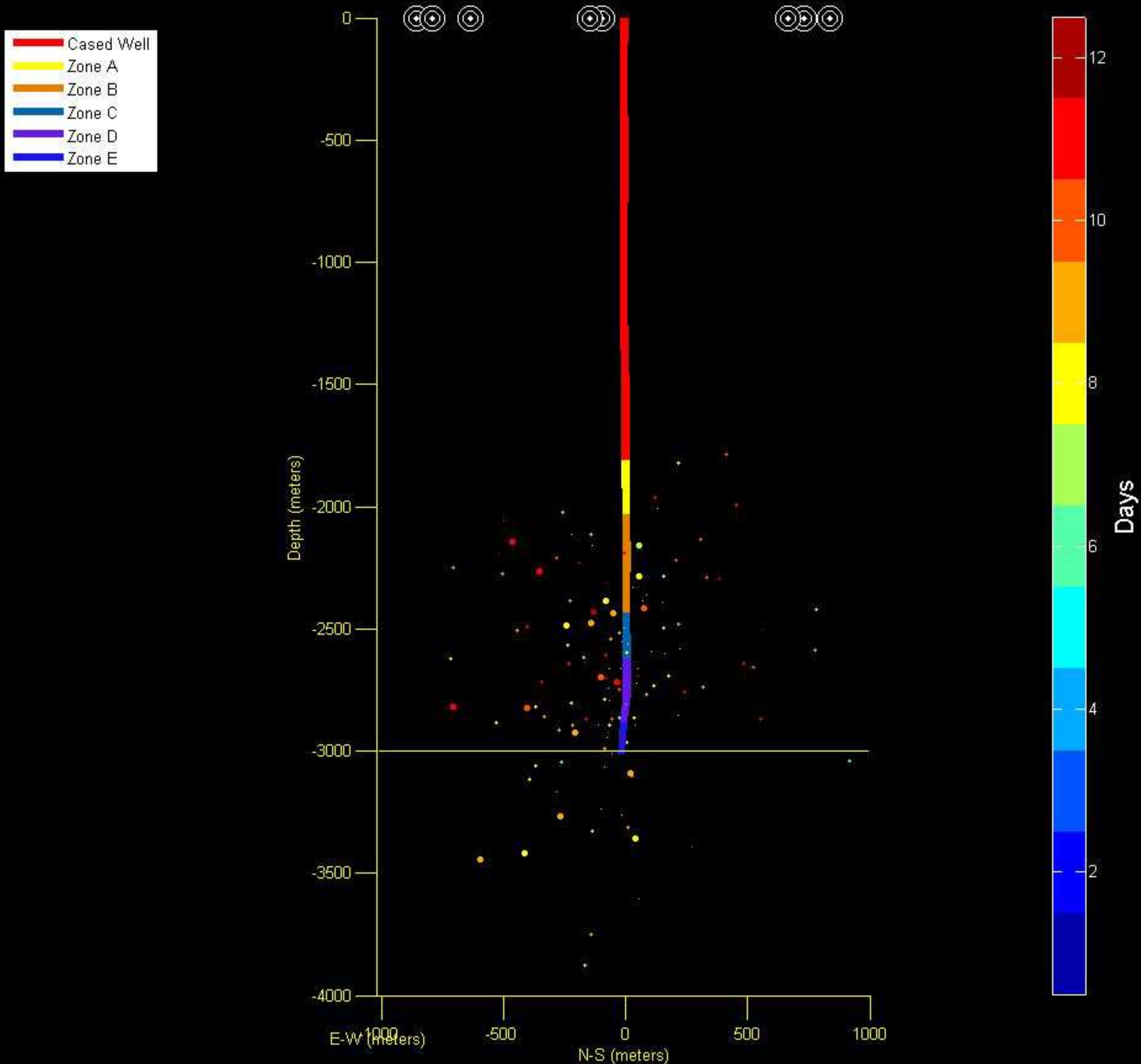
LBNL Seismic Locations 10-5-2014

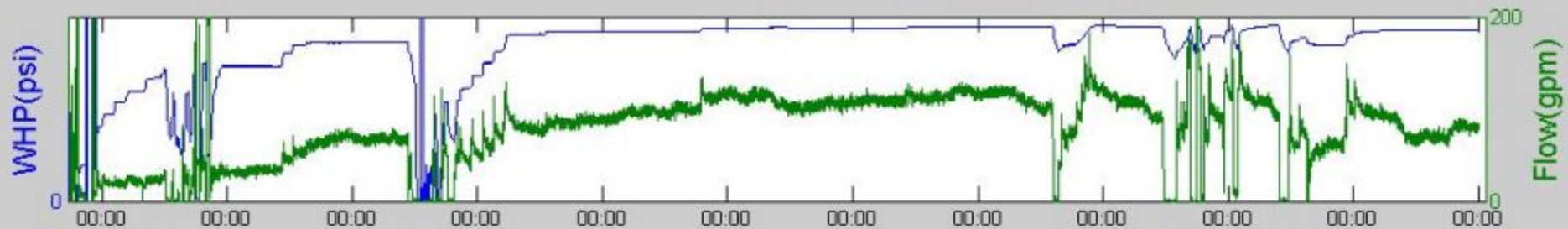
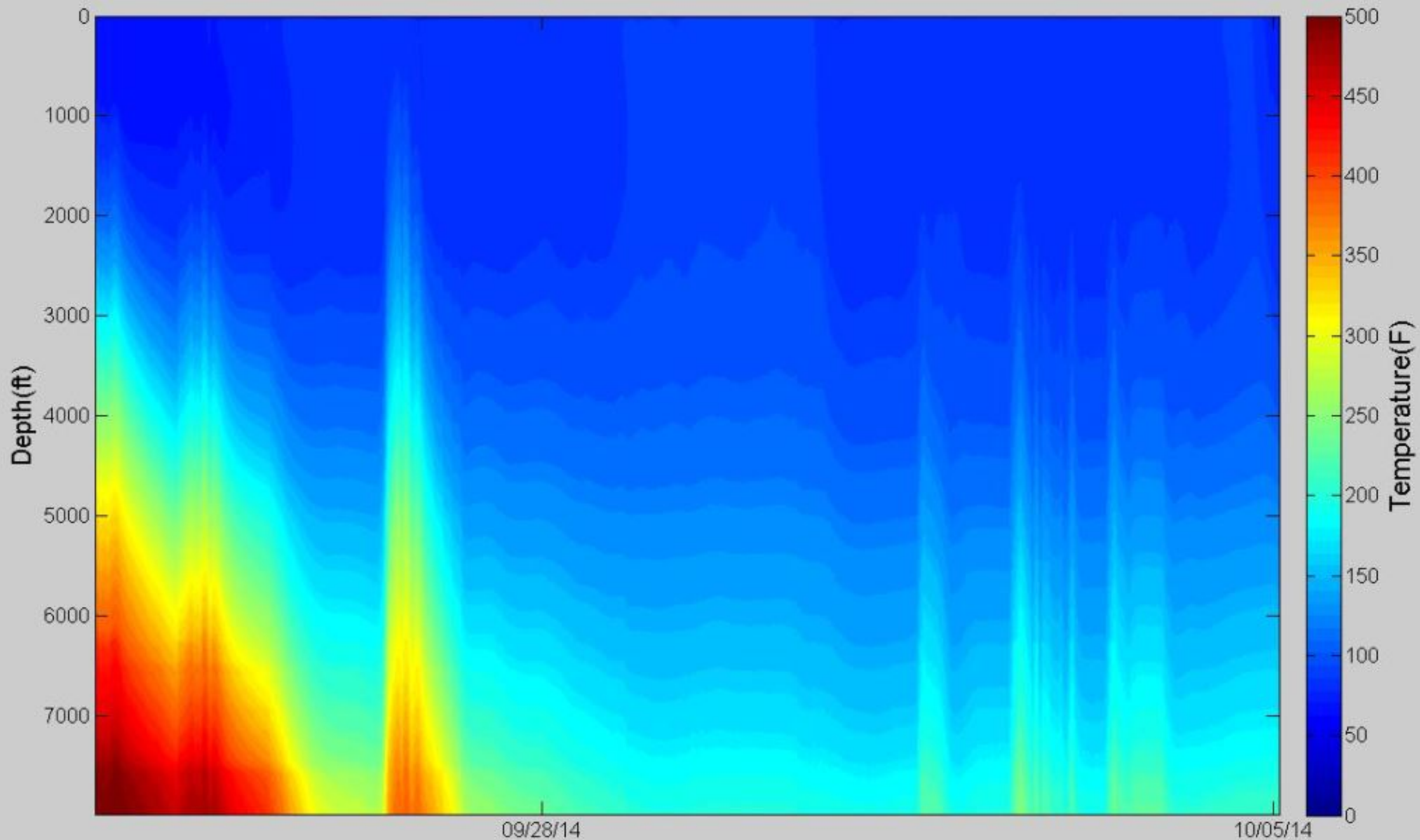


LBNL Seismic Locations 10-5-2014



LBNL Seismic Locations 10-5-2014





Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 14 **Report For 05-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 14	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue stimulation

Planned Operations: Continue injecting at current rate, and monitoring seismicity and injectivity improvement.

Wellsite Supervisors: Michael Moore, Marc Steffen **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	16:20	16.33		INJ	Injecting at WHP ranging 2750-2805psi. 13:00: add oil to stim pump 2 thrust box.	
16:20	19:15	2.92		REPR	Shutdown system to change out pump 2 leaking auto bypass valve; isolated inlet to pump 1.	X
19:15	23:59	4.73		INJ	Restarted pump 1 on 19:15. Started pump 2 on 20:40 after 4 attempts. Closed pump 2 manual bypass to 7 turns on final attempt. Increasing pump speeded. Reached 2600psi WHP and maintain current settings overnight.	

Comments

Seismicity: 19 additional seismic events for a total of 199. See attachments for additional seismic event analysis.

Cumulative injected volume 1,400,000 gallons

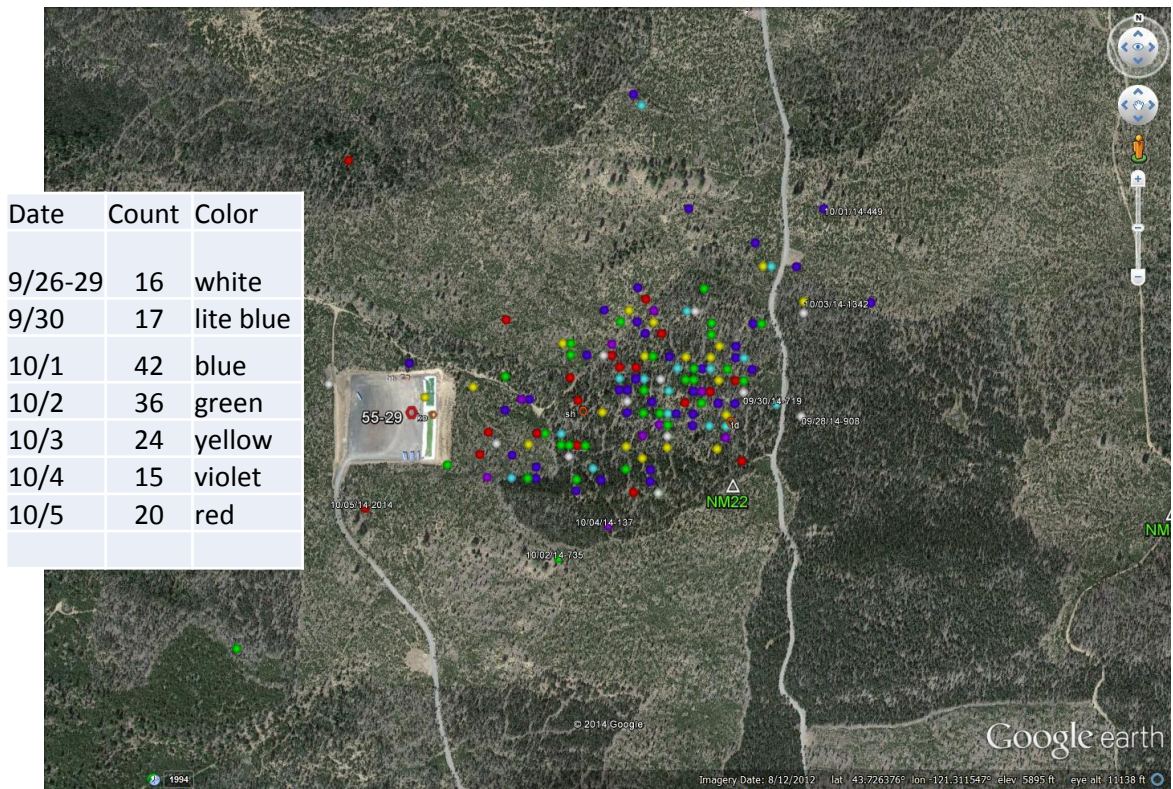
Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

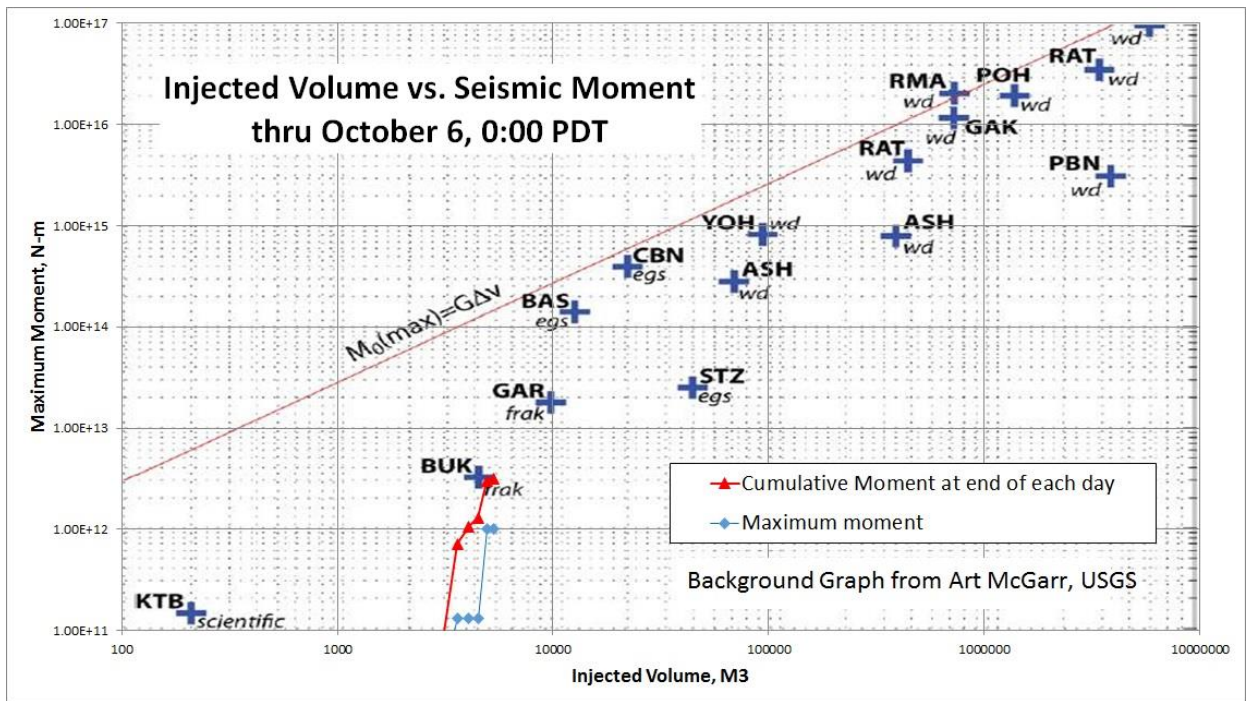
Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 30.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Hi 82	

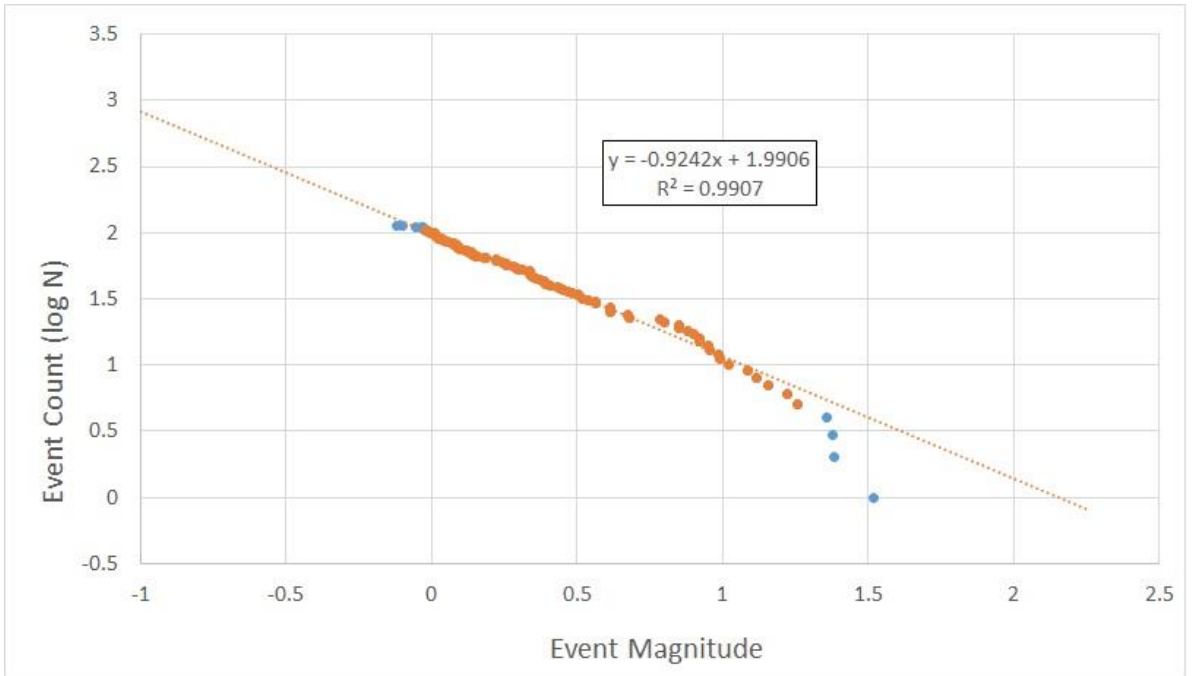
Seismic Addendum to Oct 6th daily report



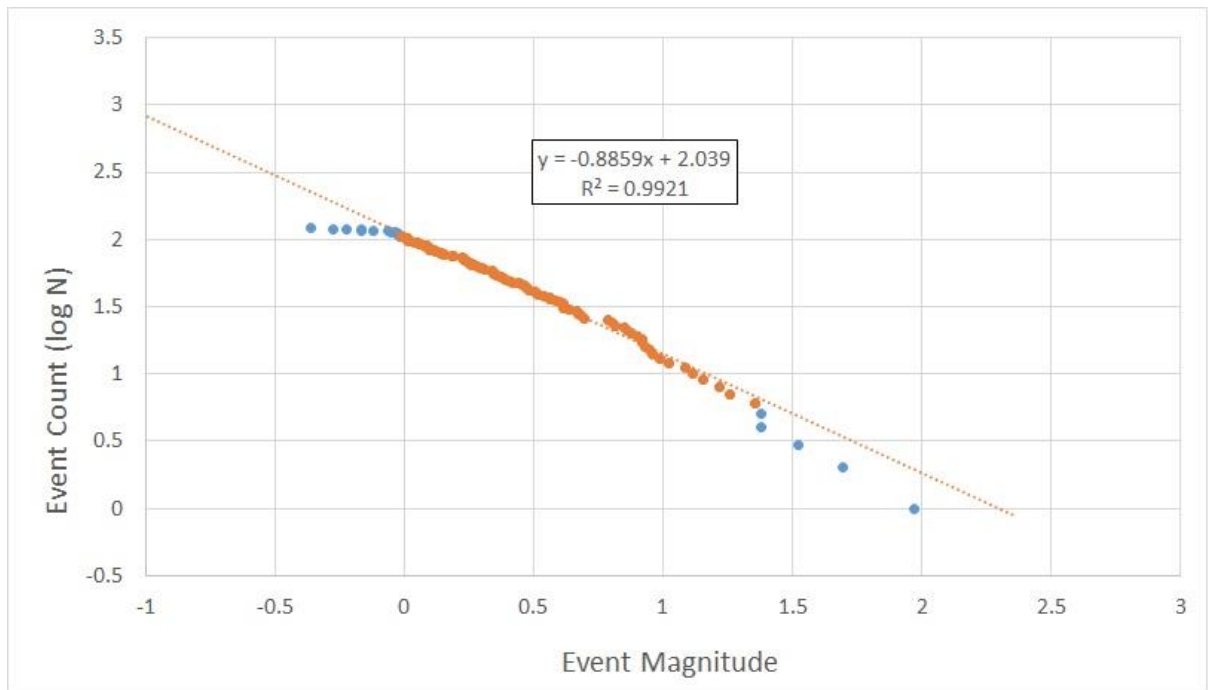
Google Earth image of ISTI hand-picked locations



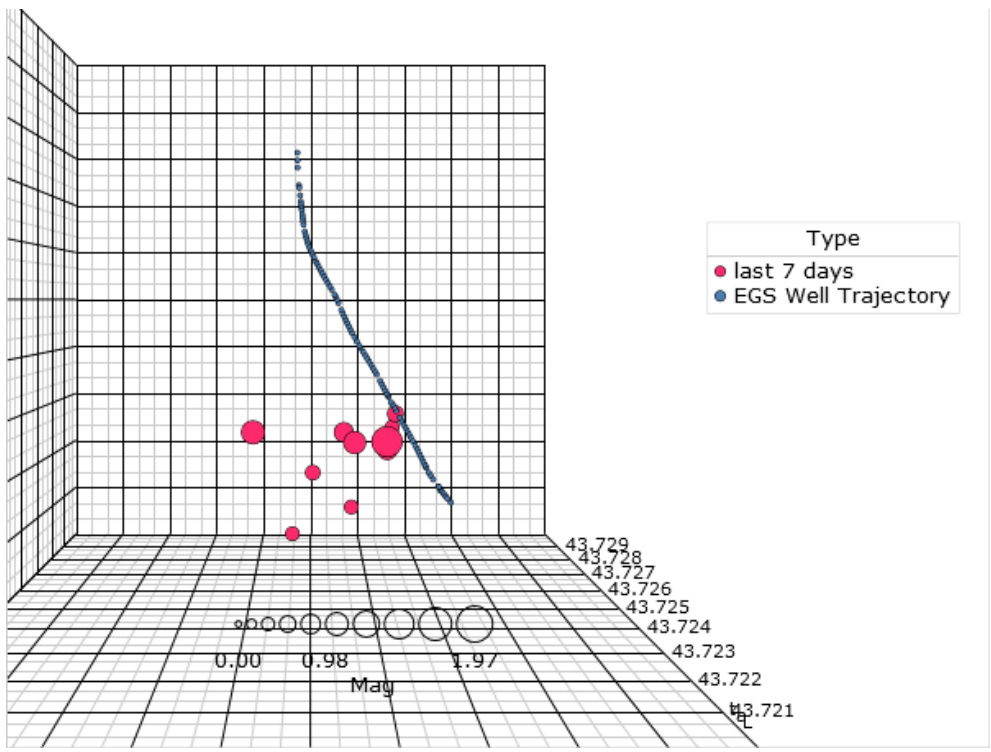
Injected Volume vs. Seismic moment from LBL locations



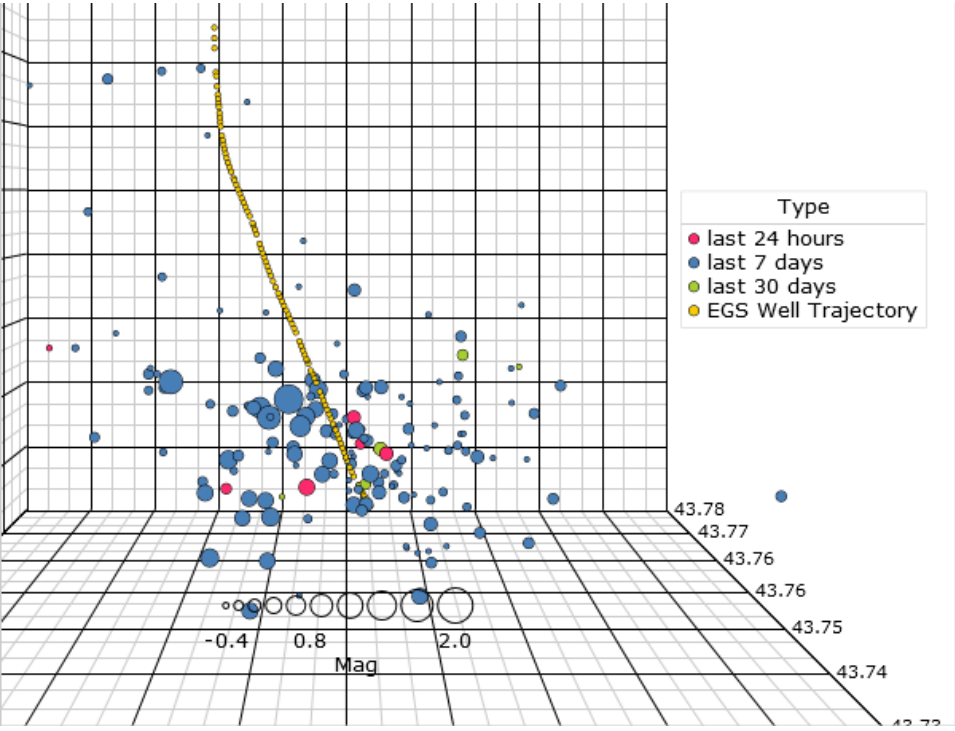
Size distribution: 9/30-10/4. 118 events. 100 in linear fit



Size distribution: 10/1-10/6. 121 events. 100 in linear fit



Cross section view of $M \geq 1$ events from LBL Site



Cross section view of all events from LBL Site. Scattered events with depths above sea level have $M < 0.65$ and average vertical error of 1,451 m, thus are considered poorly located.

Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 15 **Report For 06-Oct-14**

Operator:	AltaRock Energy	Rig:		Spud Date:	13-Apr-08	Daily Cost / Mud (\$):			---
Measured Depth (ft):		Drilling Days (act.):	0	Well Bore:	Original Well Bore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	10060	Drilling Days (plan):	68	RKB Elevation (ft):	0.00	---	---	---	
Proposed TD (ft):	10000	Days On Location:	15	Last BOP Test:		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Last Casing:	7.000 at 9,990			Totals	---	---	---
Average ROP (ft/hr):		Next Casing:		Working Interest:		Job/Well Cost (\$):	---	---	---
Personnel: Operator:		Contractor:		Service:		Other:		Total:	0

Current Operations: Continue stimulation

Planned Operations: Continue injecting at current rate, and monitoring seismicity and injectivity improvement.

Wellsite Supervisors: Michael Moore, Marc Steffen **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	10:05	10.08		INJ	WHP approximately 2600 psi and injection rate 60-70gpm.	
10:05	11:10	1.08		INJ	Pump 2 trip when bypass throttled to 30%. Opened bypass, ramped down pump 1, re-started pump 2 and ramped up both pumps.	
11:10	17:45	6.58		INJ	Throttled bypass to 40% and hold until WHP stabilized at 2400 psi.	
17:45	19:45	2.00		INJ	Stepped up WHP to 2600 psi.	
19:45	20:45	1.00		INJ	Stepped up WHP to 2700 psi.	
20:45	23:59	3.23		INJ	Stepped up WHP to 2800 psi. Hold pressure and inject overnight.	

Comments

Seismicity: 3 additional seismic events for a total of 201.

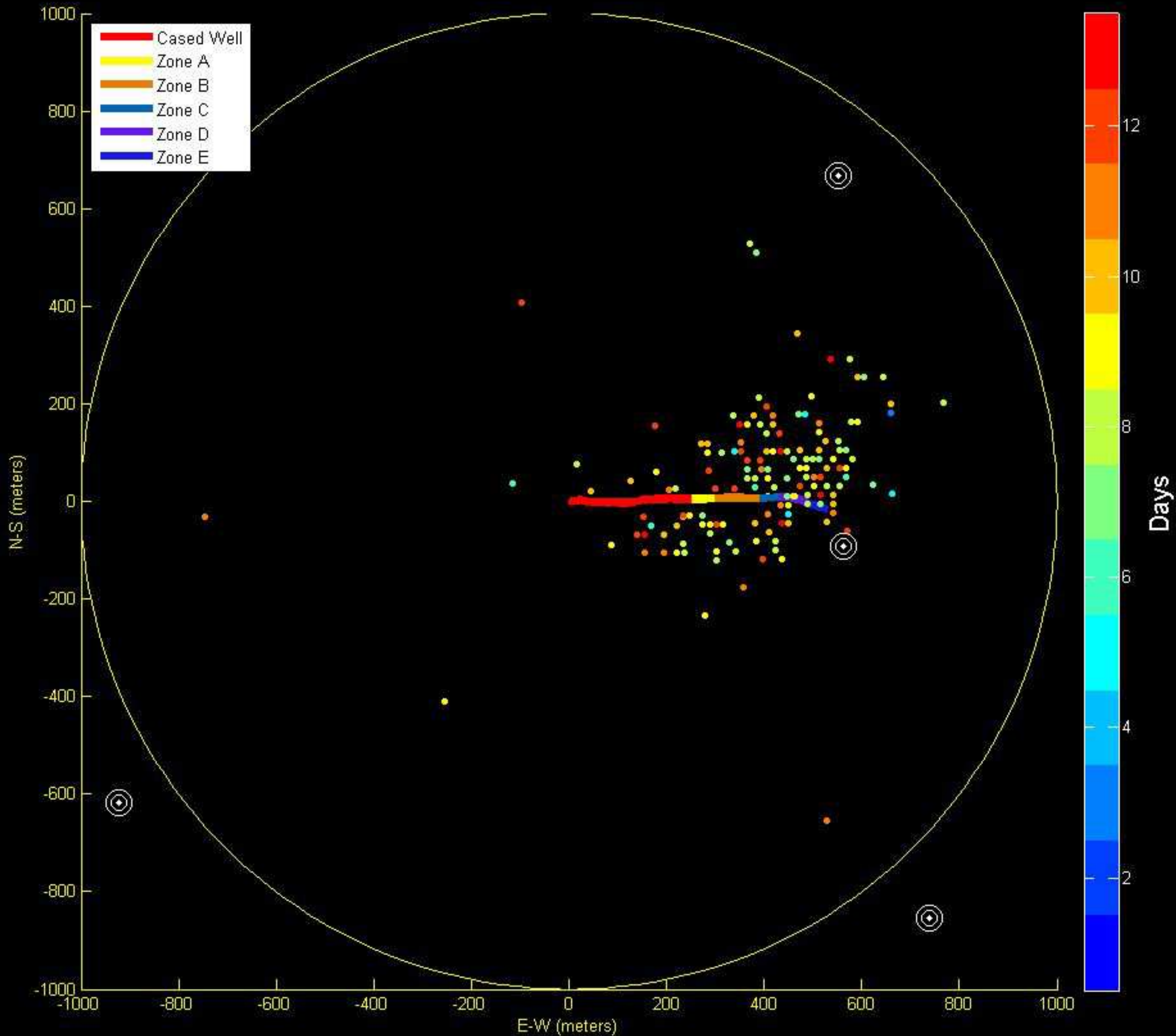
Cumulative injected volume 1,500,440 gallons

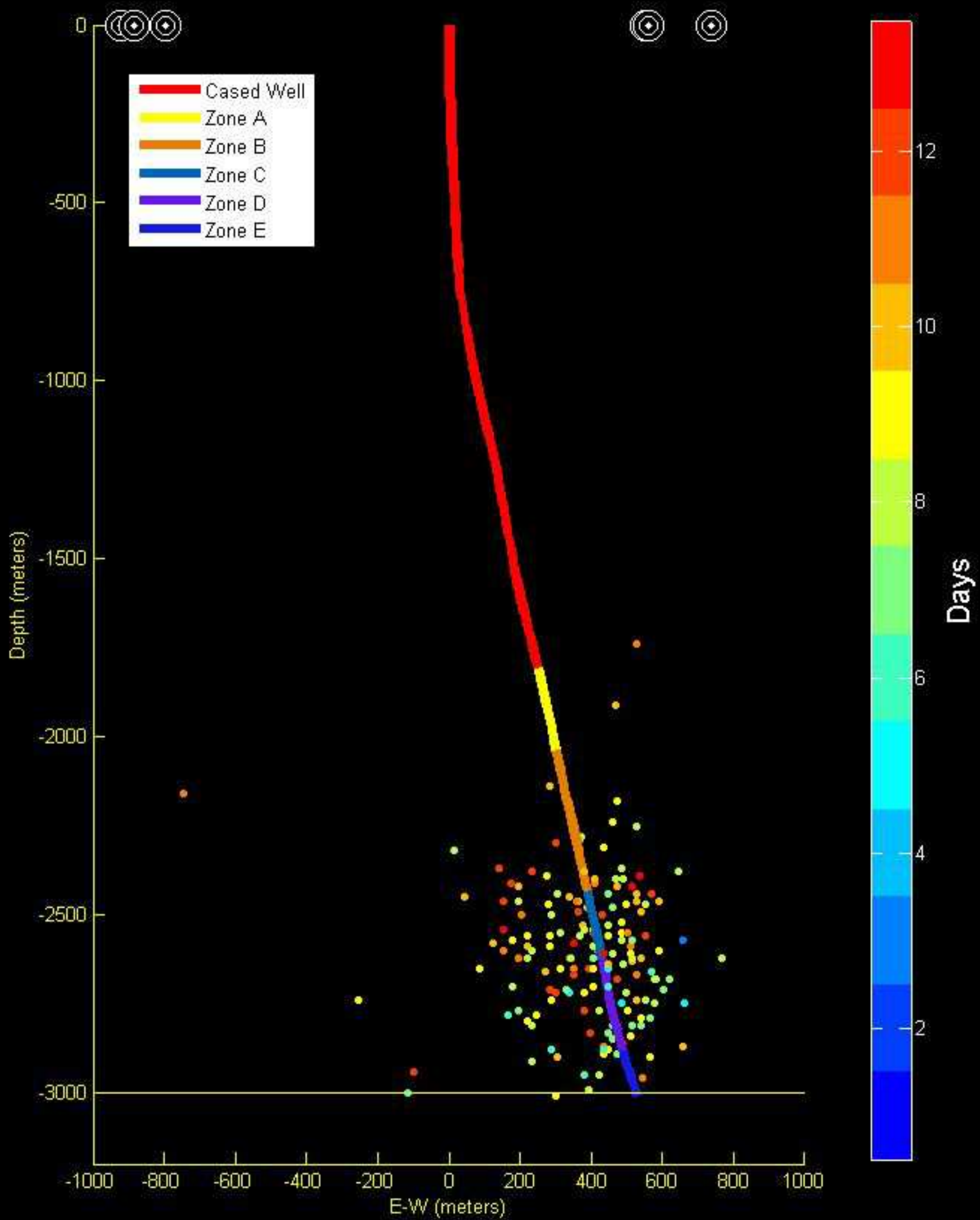
Casing/Tubular Information

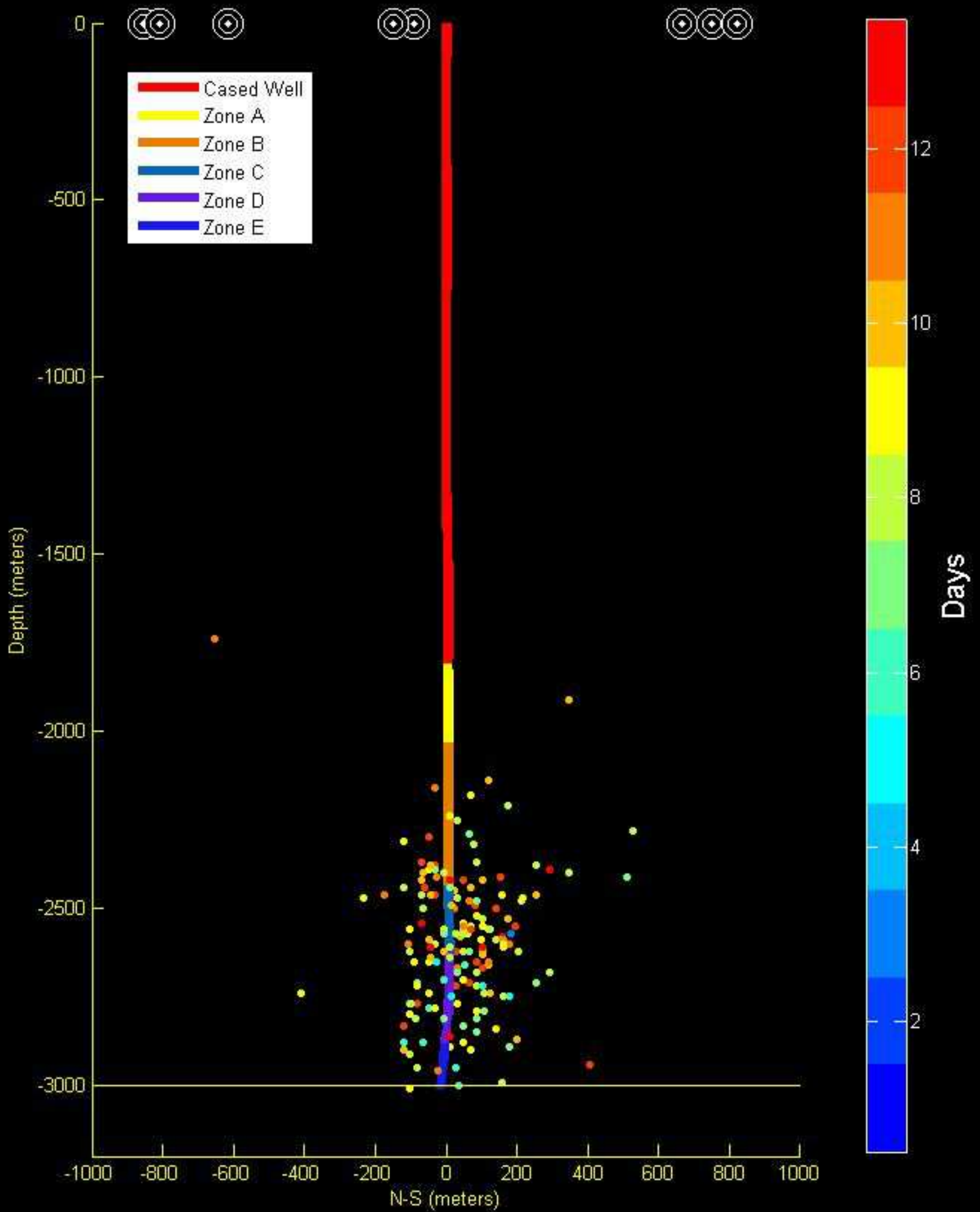
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

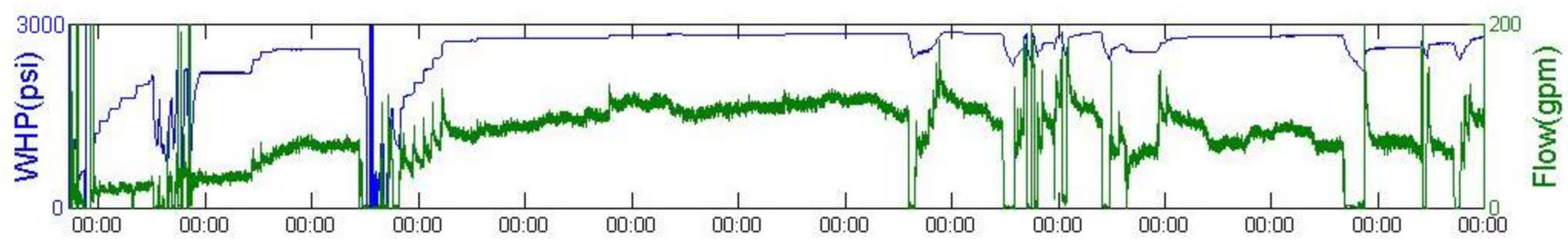
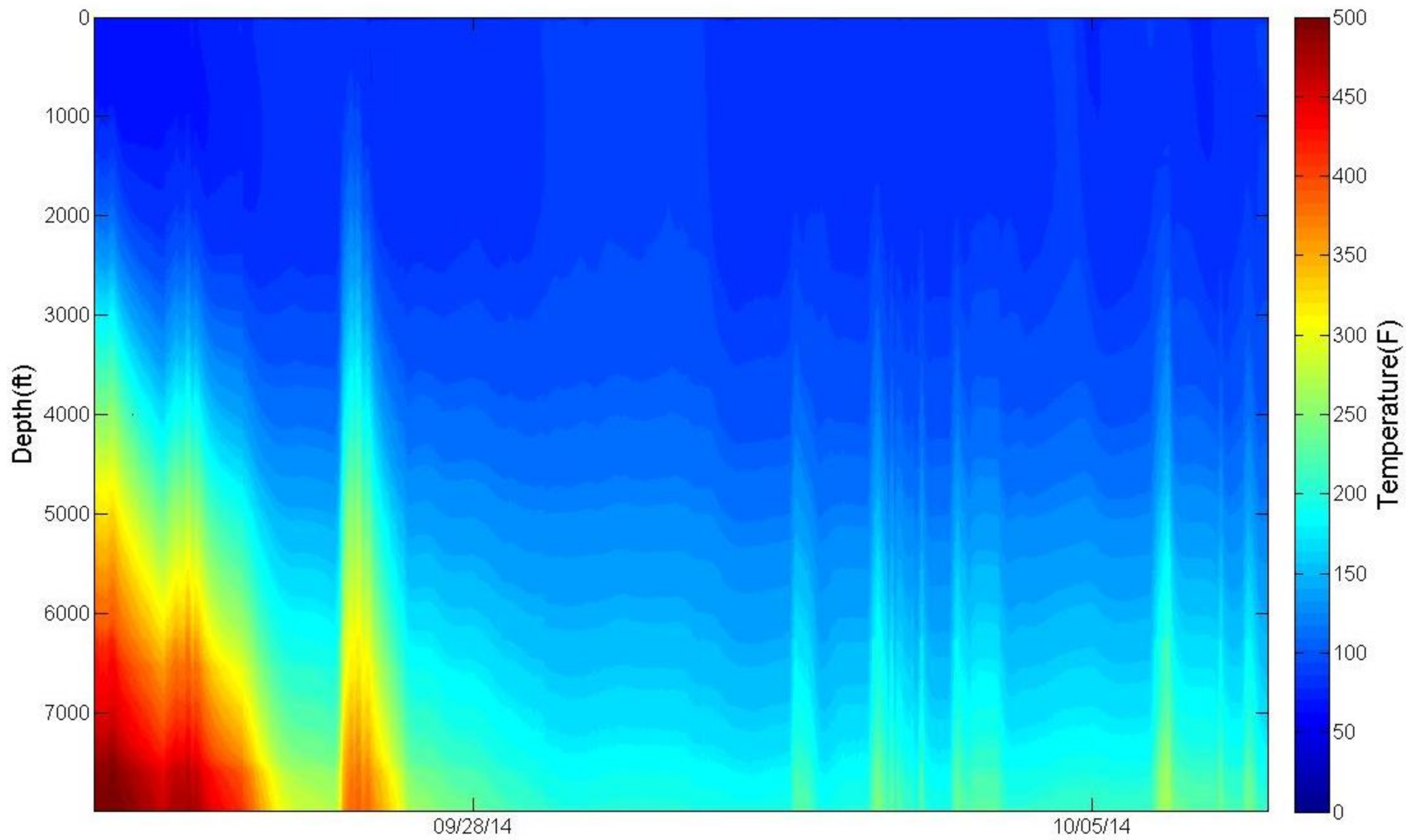
Weather Information

Sky Condition:	Clear	Visibility:	
Air Temperature:	41.0 degF	Bar. Pressure:	
Wind Speed/Dir:	/	Wind Gusts:	
Comments:	Light breeze, Hi 77		









Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 16 **Report For 07-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 16	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue stimulation

Planned Operations: Step up to 2800 psi and monitor seismicity and injectivity improvement.

Wellsite Supervisors: Michael Moore, Susan Petty **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	14:05	14.08		INJ	WHP~2800psi and downhole flow 80-90gpm.	
14:05	18:15	4.17		INJ	Ramp down stim pumps and sump pump turned off to relieve WHP for diverter injection.	
18:15	21:14	2.98		INJ	Sump pump turned on. Diverter added to well.	
21:14	23:59	2.75		INJ	Start up stim pumps and ramp up to 1st pressure step at 2500psi.	

Comments

Seismicity: 10 additional seismic events for a total of 211.

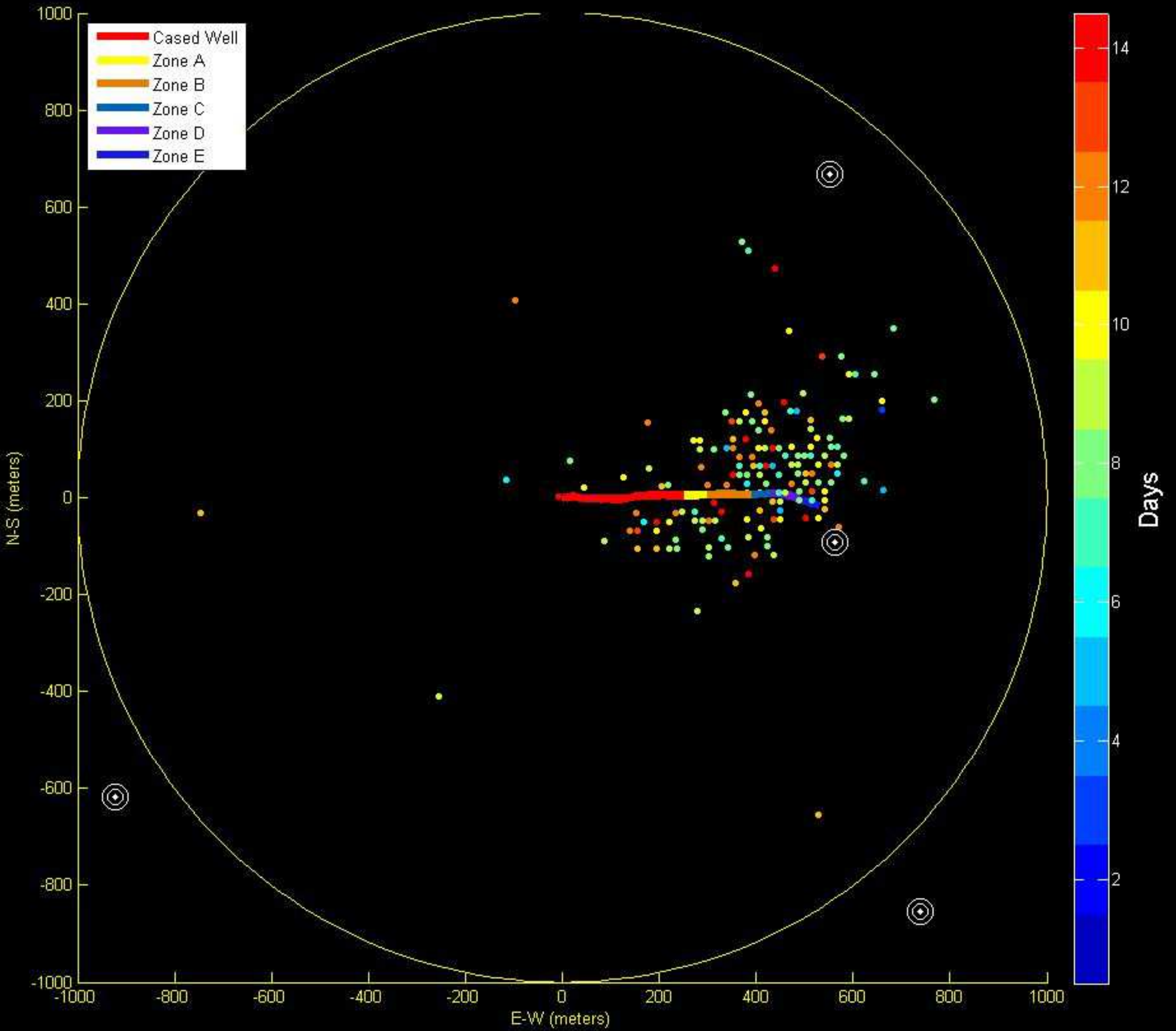
Cumulative injected volume 1,586,770 gallons

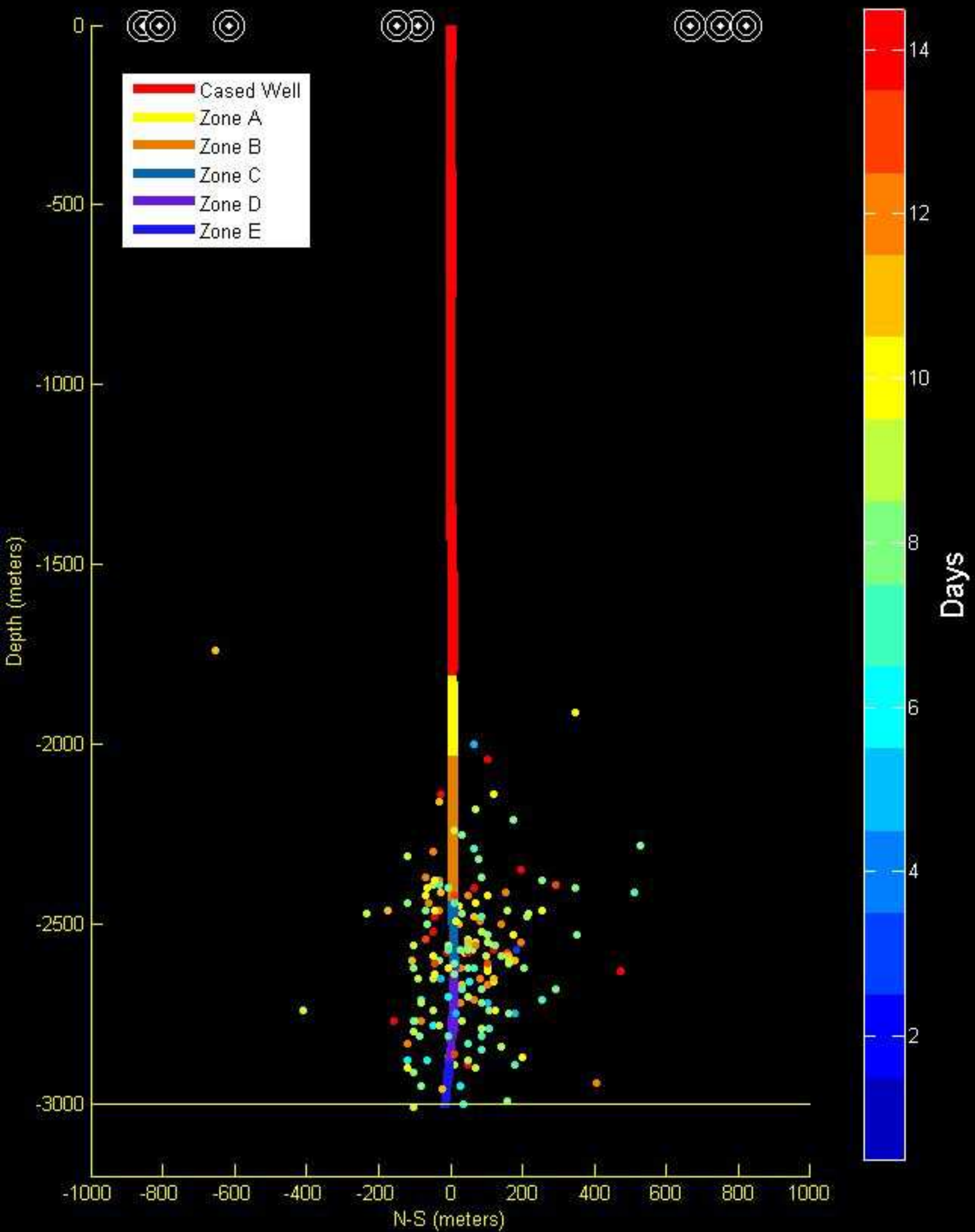
Casing/Tubular Information

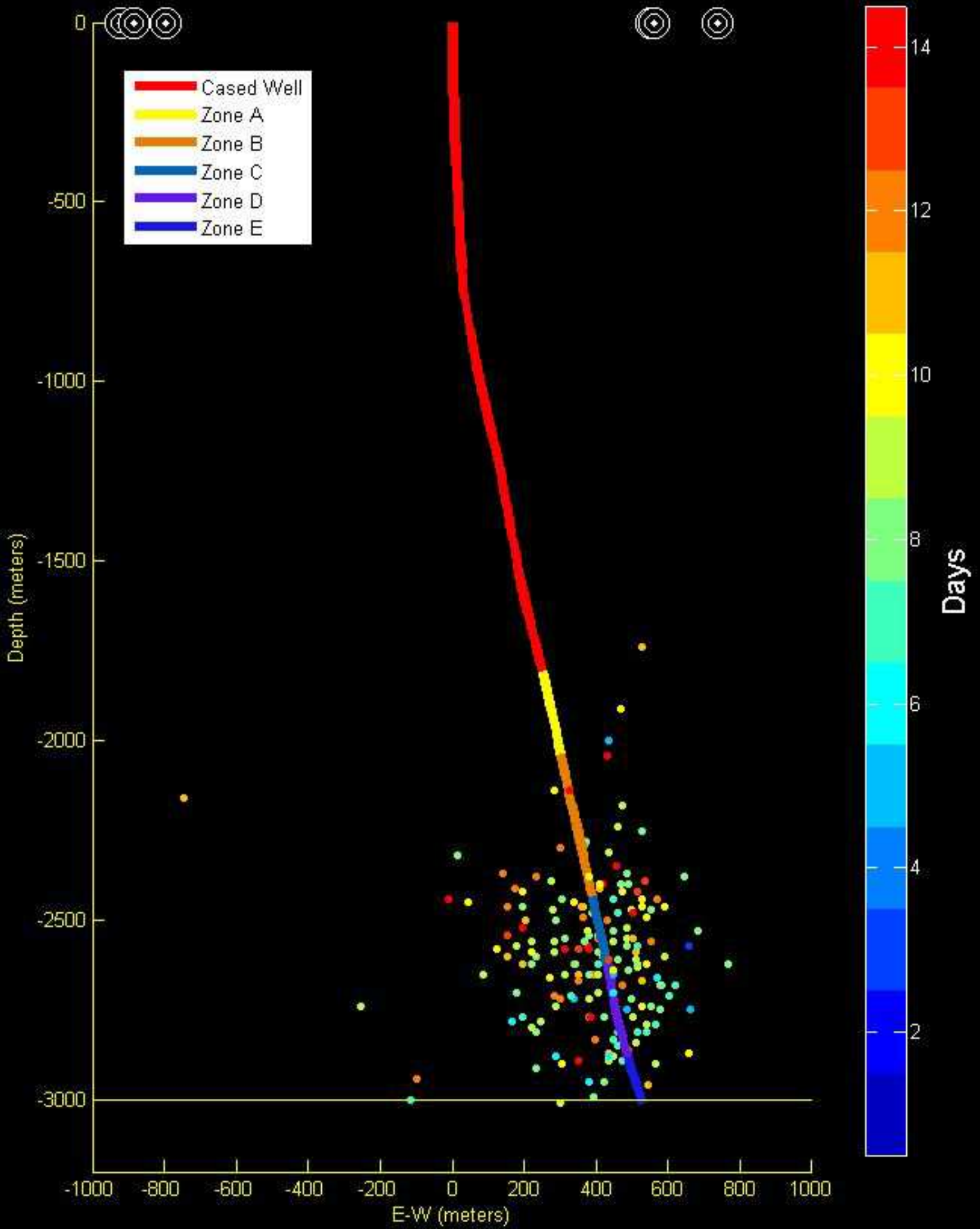
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

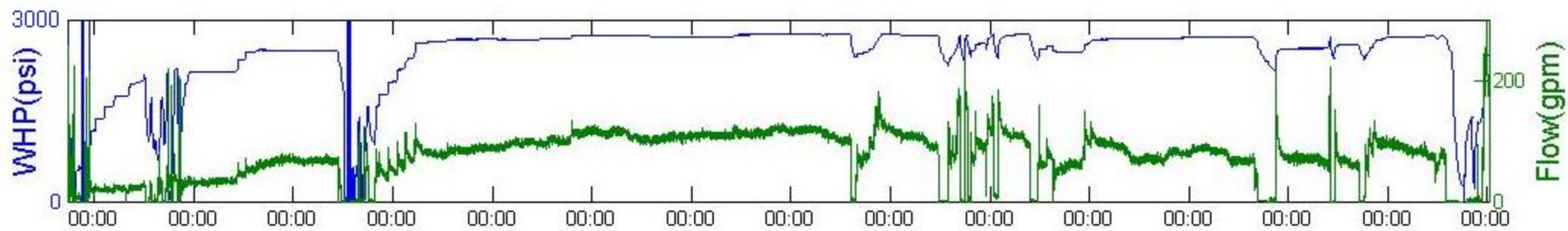
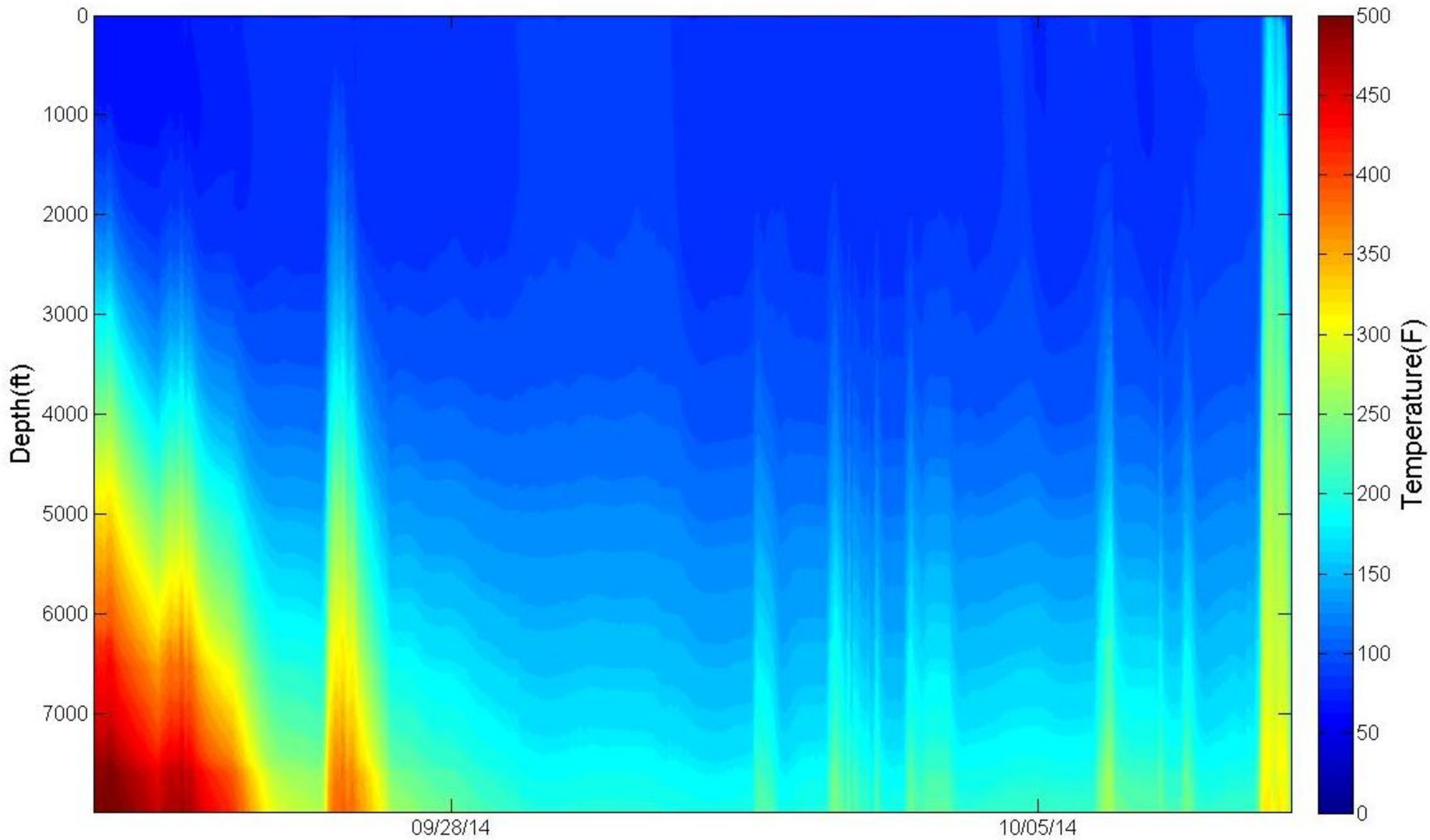
Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 42.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Light breeze, Hi 68	









Daily Report

Well ID: NWG 55-29
Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29
Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 17 **Report For 08-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 17	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals	---	---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total:	0

Current Operations: Continue stimulation

Planned Operations: Continue to monitor seismicity and injectivity improvement. Prepare to inject high temperature diverter on Friday or Monday.

Wellsite Supervisors: Michael Moore, Trenton Claduhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	2:02	2.03		INJ	First pressure step at 2550 psi WHP	
2:02	4:24	2.37		INJ	Second pressure step at 2760 psi WHP	
4:24	15:15	10.85		INJ	Third pressure step at 2820 psi WHP	
15:15	16:15	1.00		INJ	Ramped down stim pumps to injection 150lbs of low-temperature diverter.	
16:15	23:59	7.73		INJ	Slowly ramped up stim pumps to 2500 psi.	

Management Summary

After 16:00, the ultra sonic meter began reporting higher flows but is inconsistent compared to other system flow measurements. Will diagnose in the morning.

Comments

Seismicity: 13 additional seismic events for a total of 225.

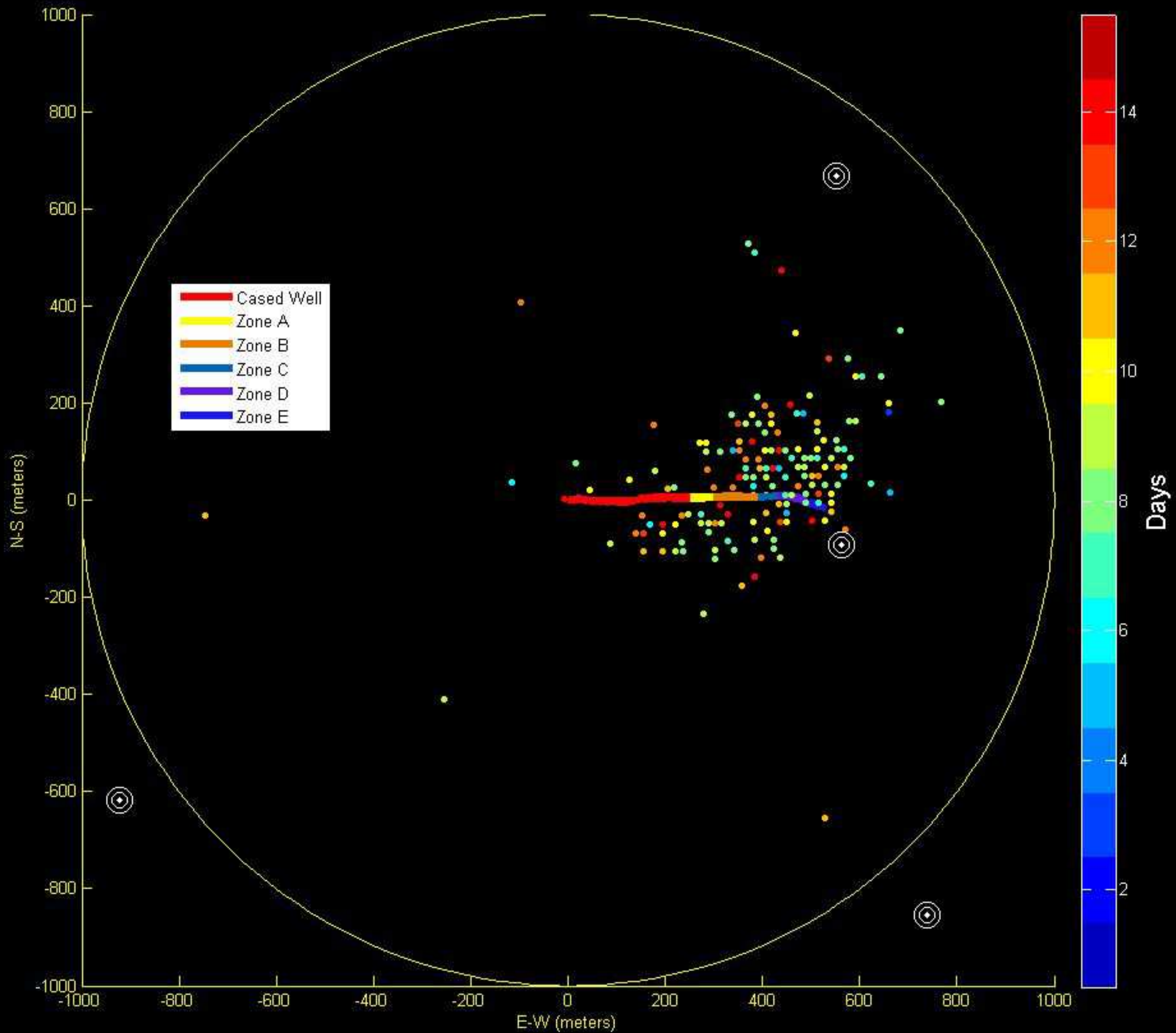
Cumulative injected volume 1,814,300 gallons*

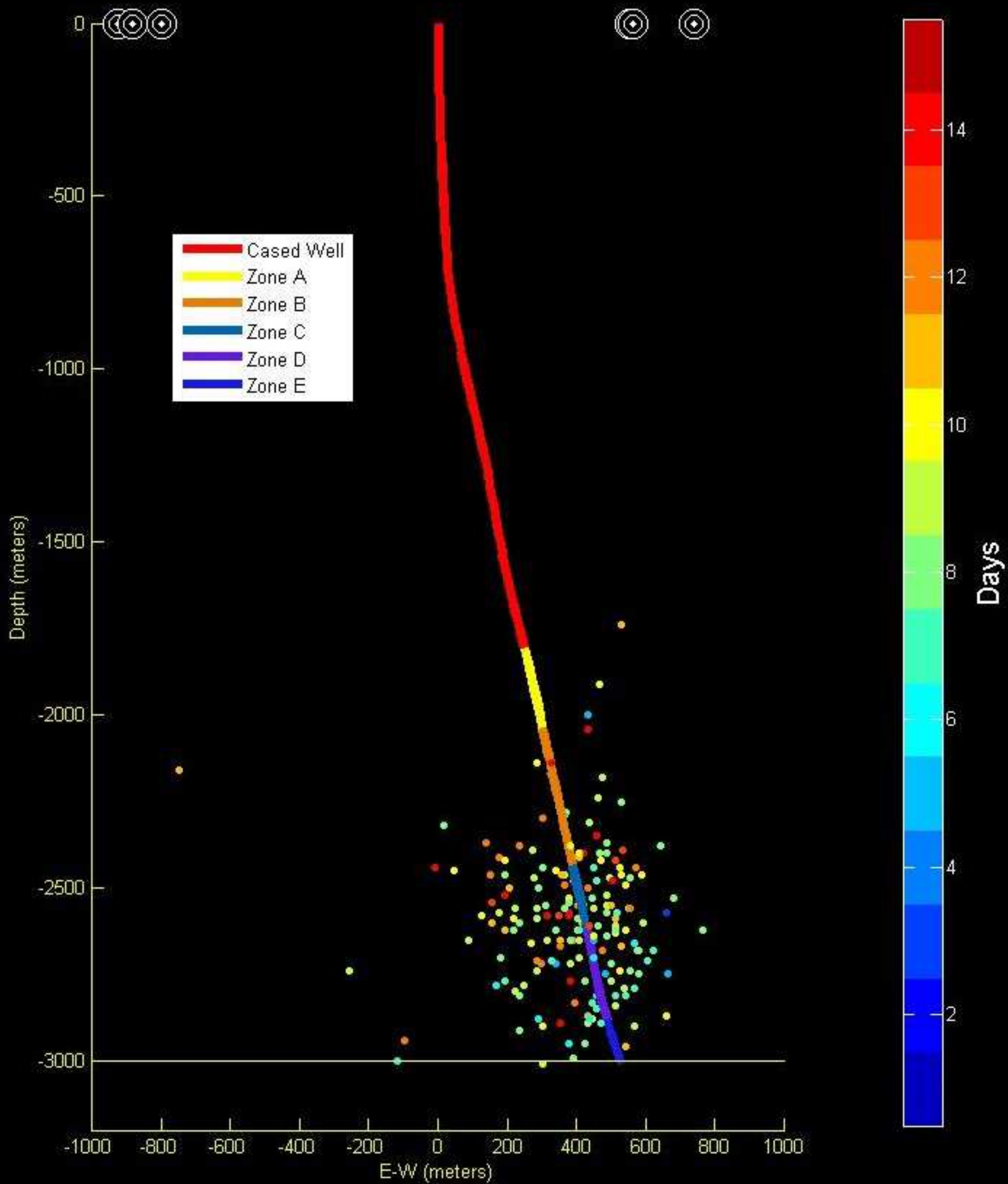
Casing/Tubular Information

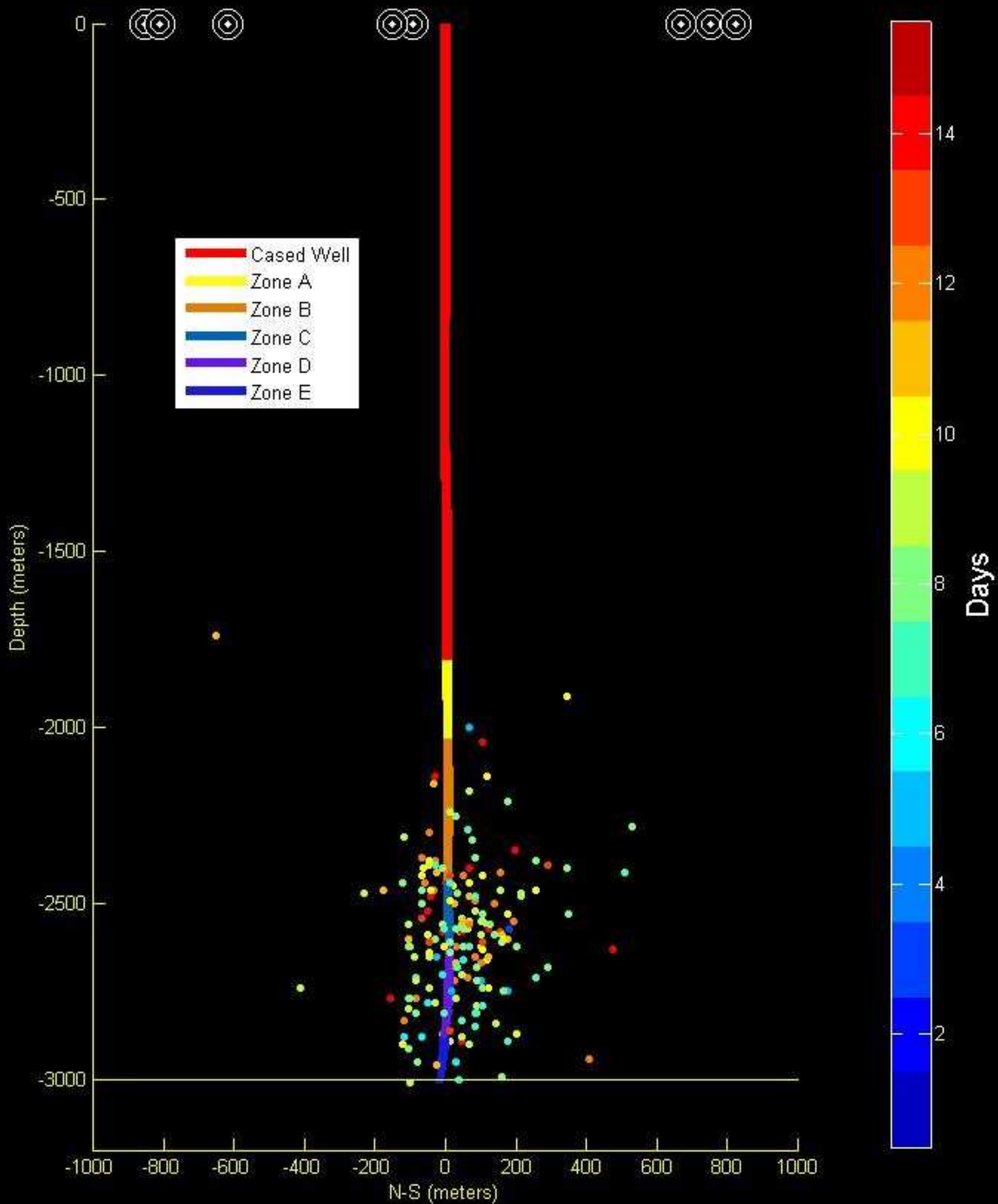
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

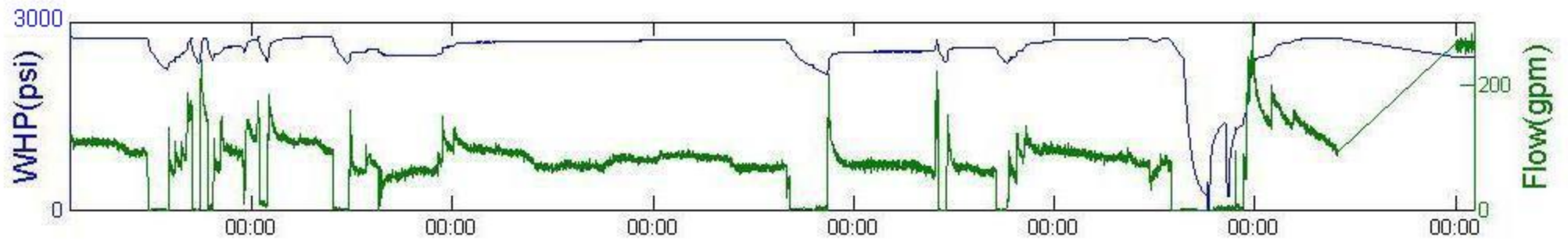
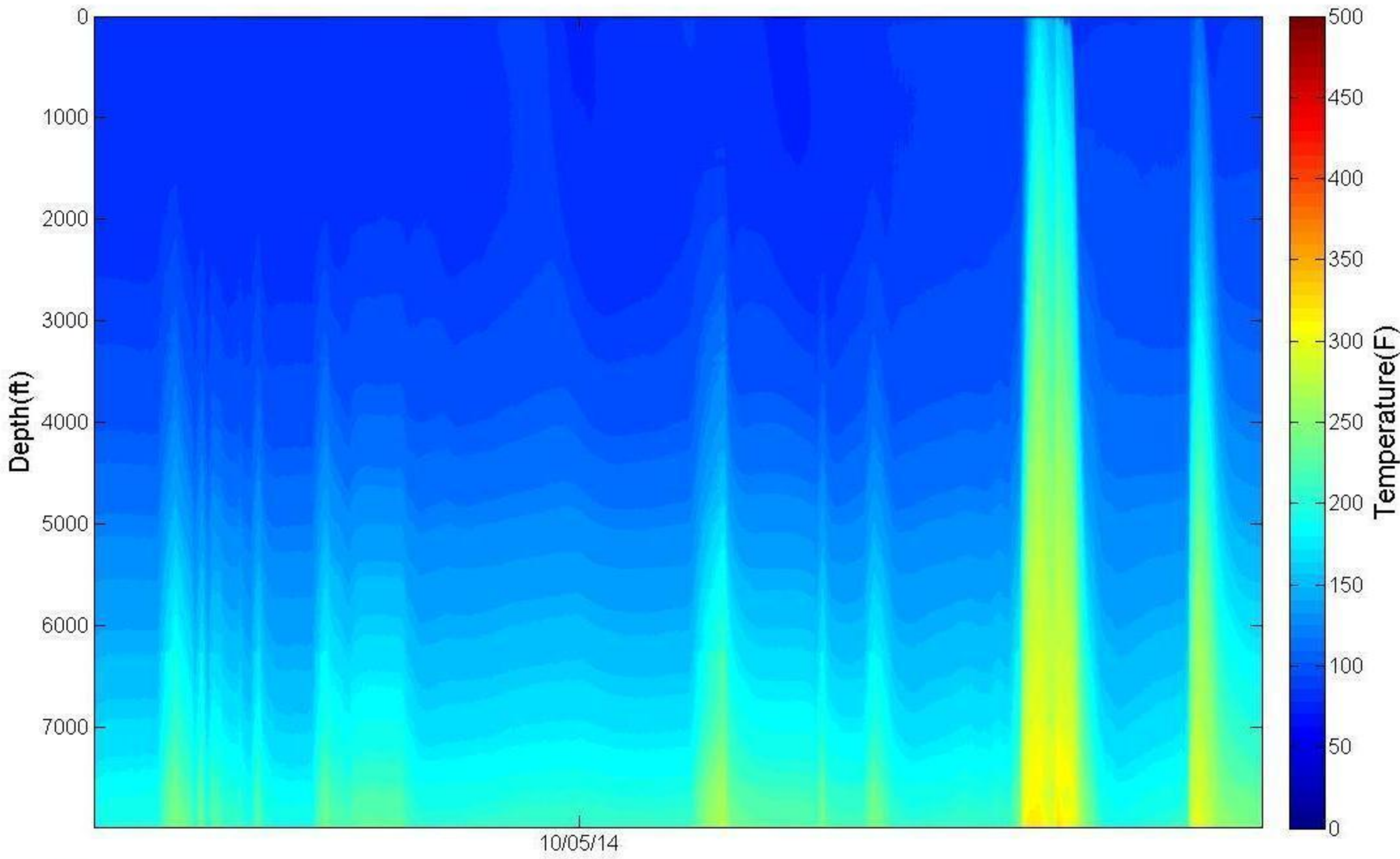
Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 35.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Light breeze, Hi 64	









Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 18 **Report For 09-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 18	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals	---	---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue stimulation.

Planned Operations: Continue to monitor seismicity and injectivity improvement. Prepare to inject high temperature diverter on Friday or Monday. Repair electrical issue with PLC in the AM.

Wellsite Supervisors: Michael Moore, Trenton Claduho **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	4:23	4.38		INJ	Pressure held at 2550psi, bypass valve closed to 22%.	
4:23	5:35	1.20		INJ	Pressure increased to 2600 psi by increasing pump speed.	
5:35	9:53	4.30		INJ	Pressure increased to 2650 psi by increasing pump speed.	
9:53	13:39	3.77		INJ	09:53 Opened bypass to 42% to increase flow through pumps and diagnose ultrasonic flow meter. Pressure dropped to 2600psi. 10:19 Ramped pumps up to full speed and closed bypass to 25%. WHP 2775 psi. 11:00 Open bypass to 34% to decrease pump 2 suction pressure and prevent pump trip.	
13:39	23:00	9.35		INJ	Pressure held at 2840 psi.	
23:00	0:00	1.00		REPR	Generator 1 trip. Started generator 2 in attempt to restart system, but outside PLC would not stay on. Generator 2 left on, and started submersible pump 1 manually to keep water moving through the system at 125 gpm to prevent freezing.	X

Management Summary

*Ultrasonic flow meter seems to be measuring ~200 gpm too high compared to other methods (water consumption and weir box measurements). We will continue to diagnose the next time that flow to the well is stopped.

Comments

Seismicity: 13 additional seismic events for a total of 238. (Based on Event ID 281 at 6:38 pm)

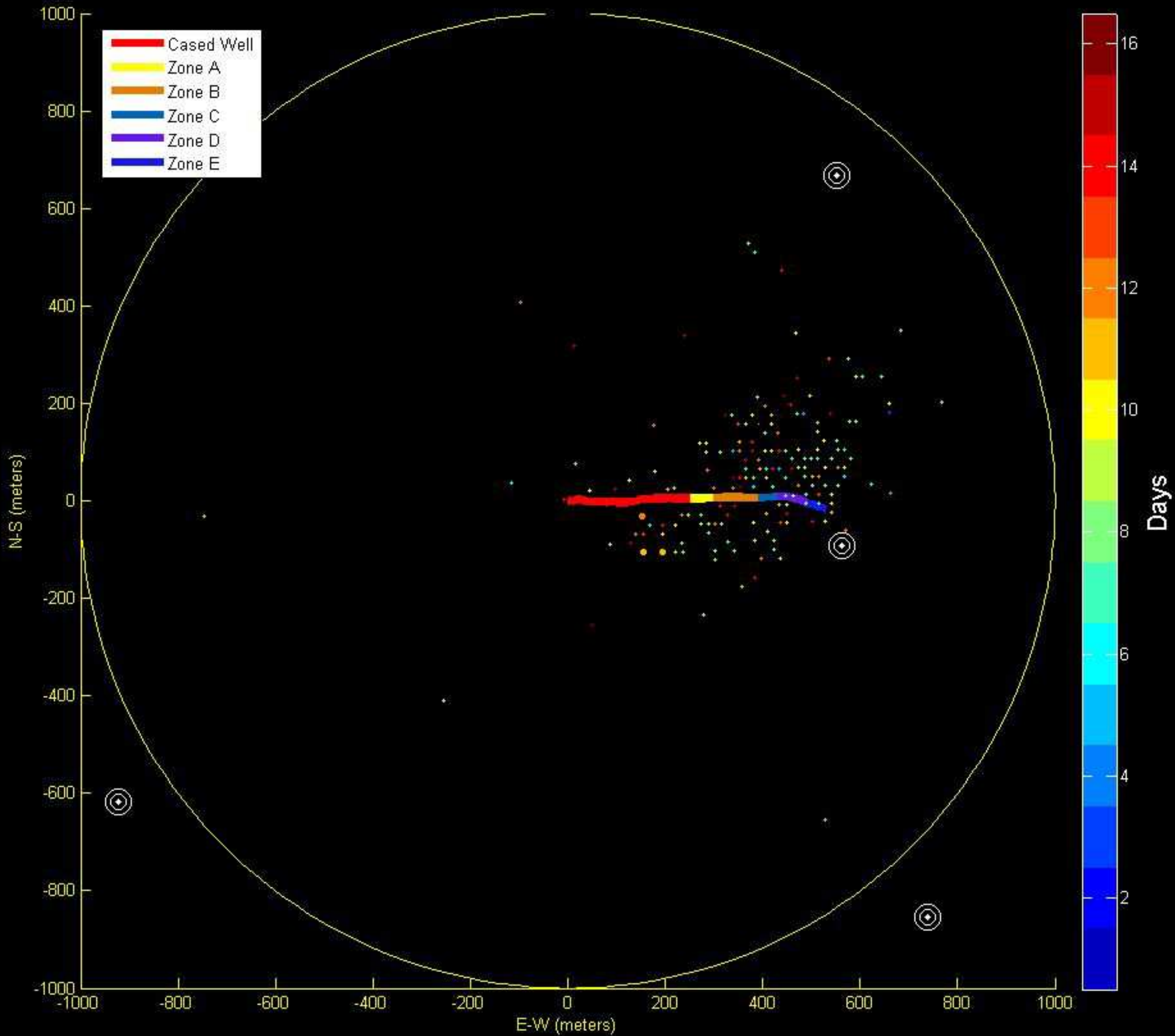
Cumulative injected volume 2,011,966 gallons* (Added 2,011,822 gallons to Ultrasonic cumulative reading because this was the value when it zeroed out)

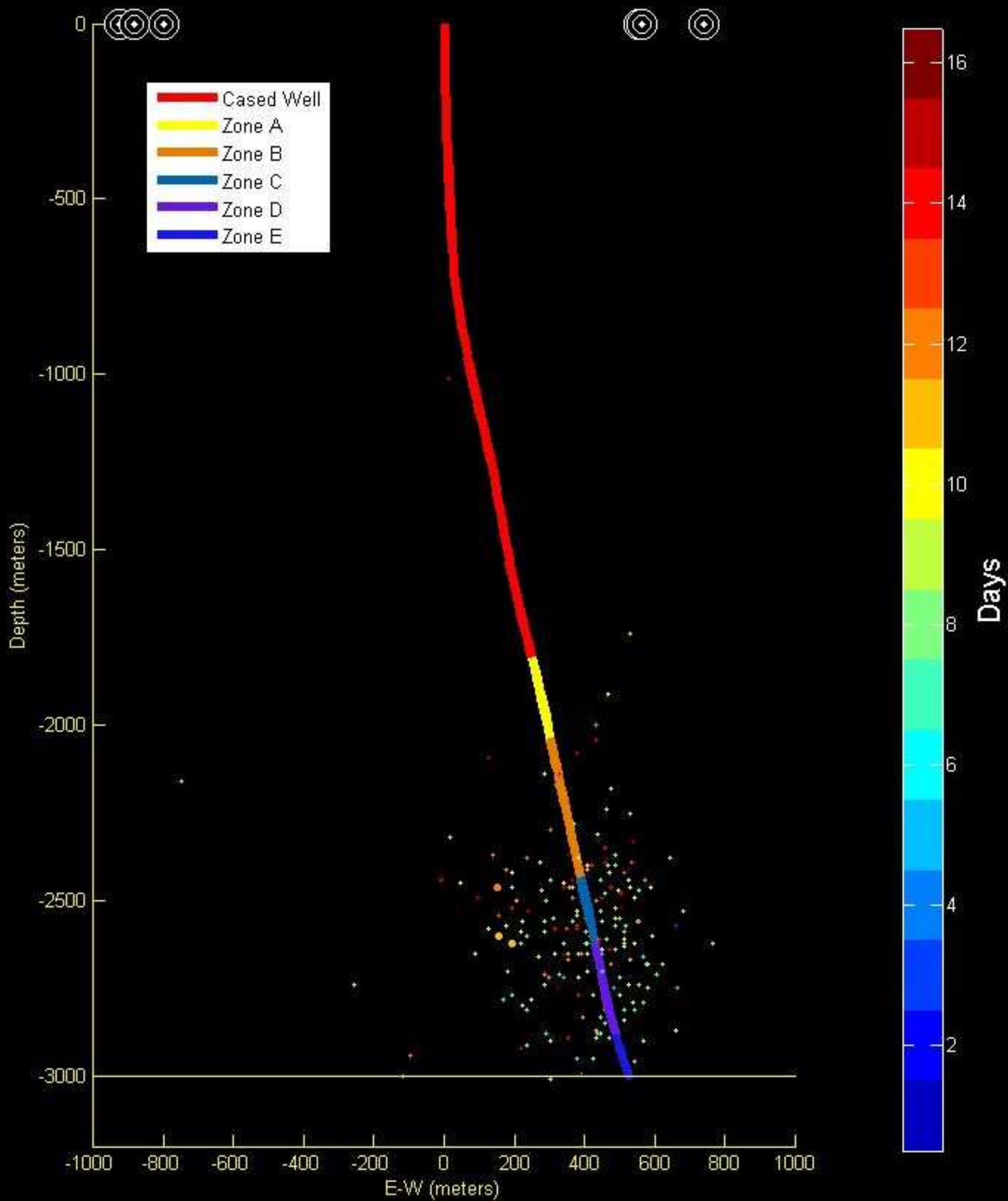
Casing/Tubular Information

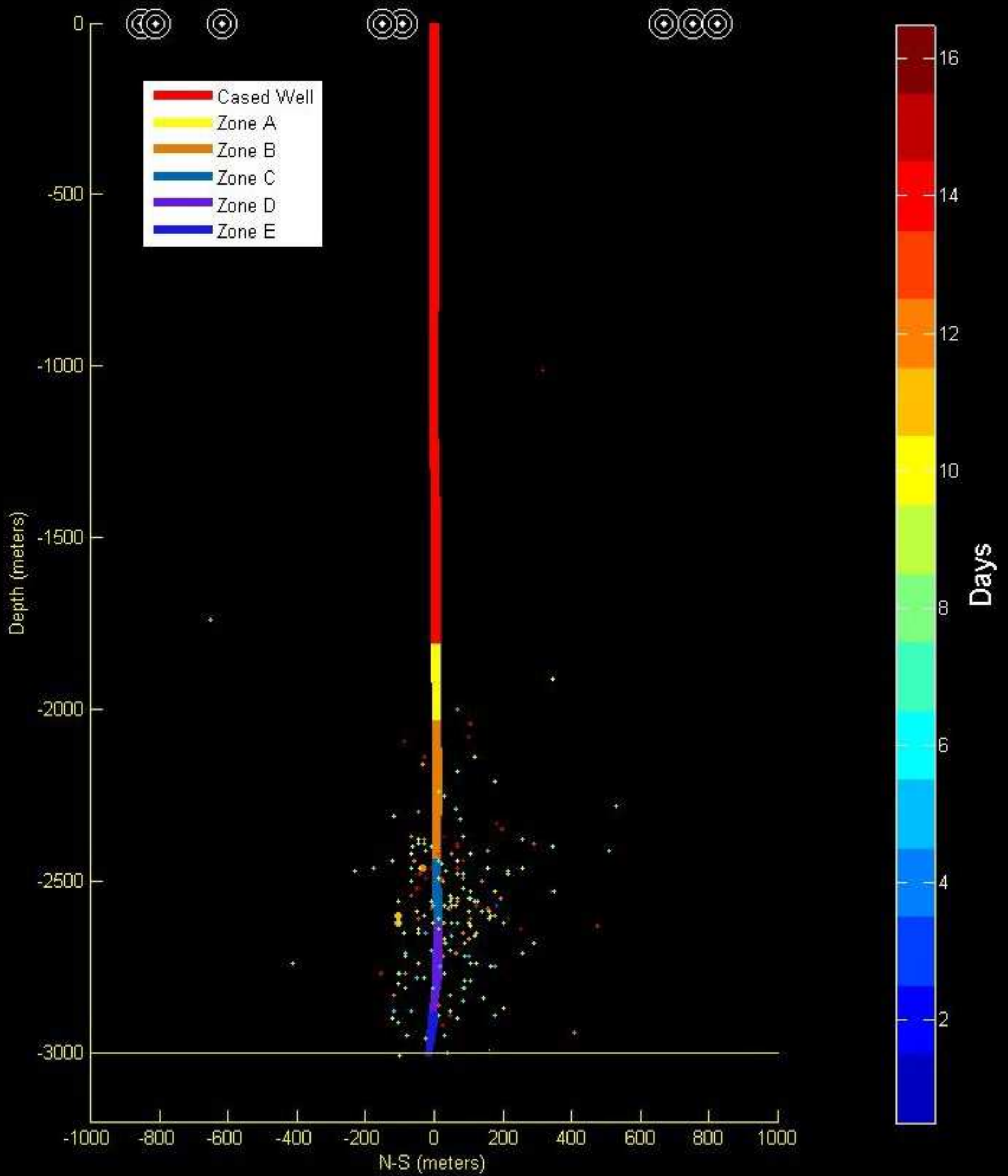
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

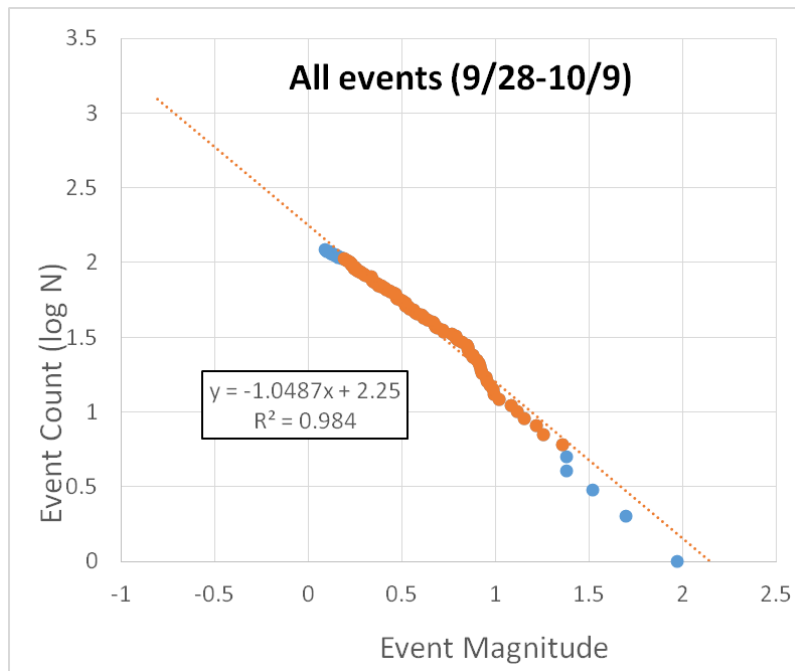
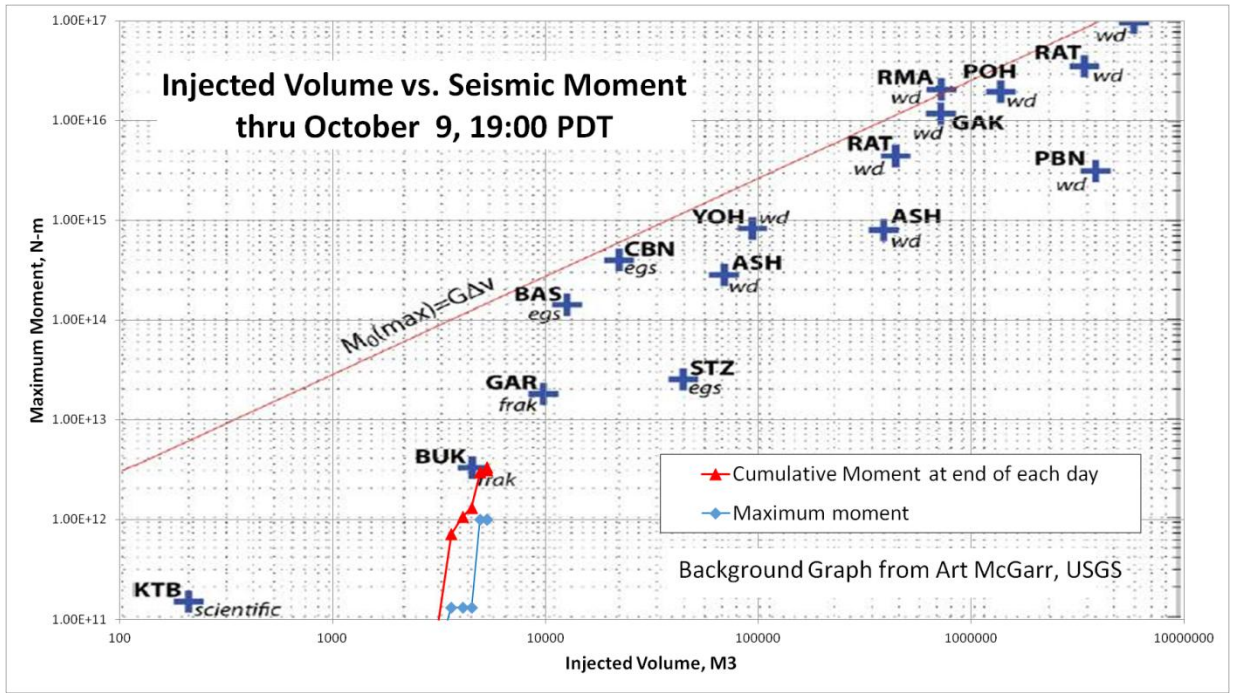
Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 32.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Light breeze, Hi 64	



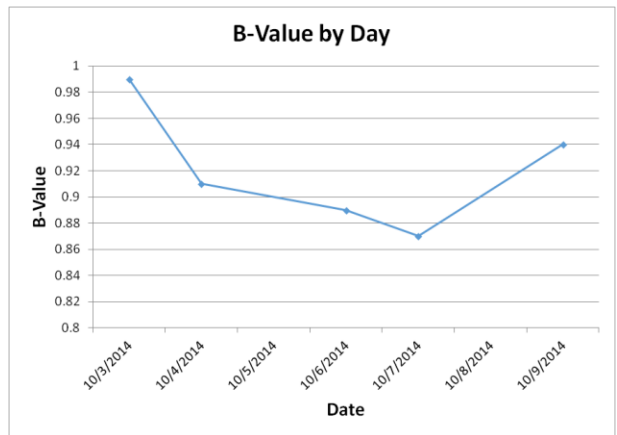
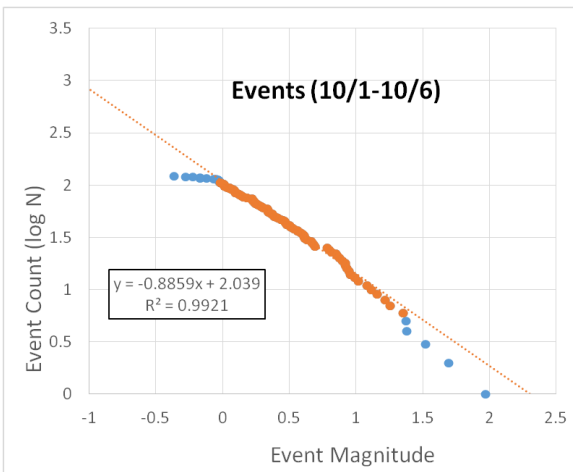
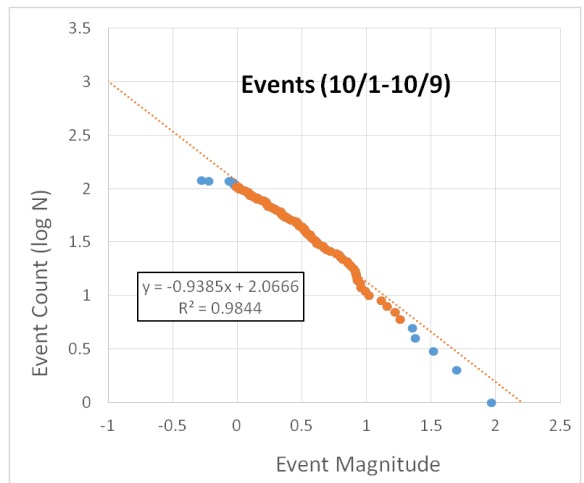
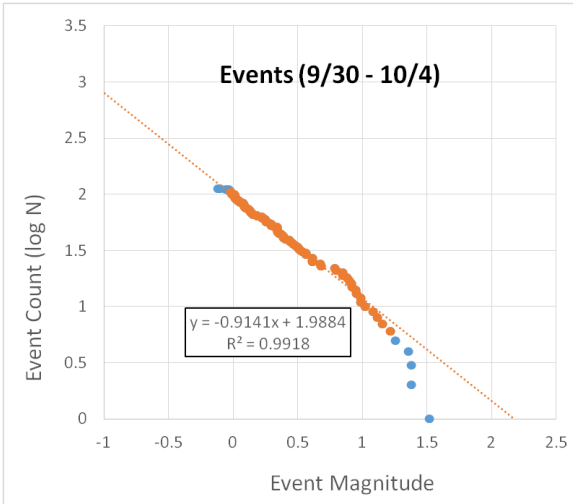
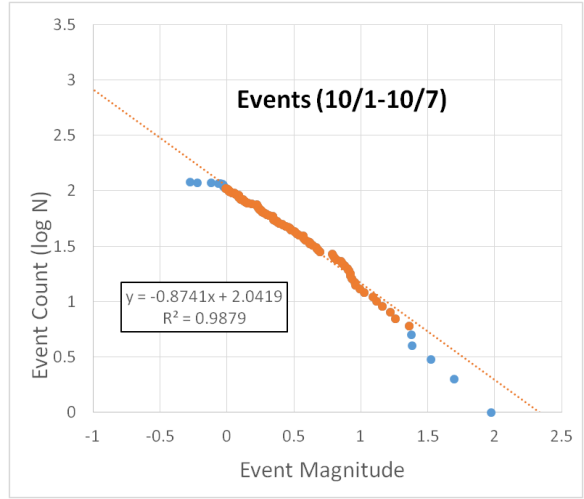
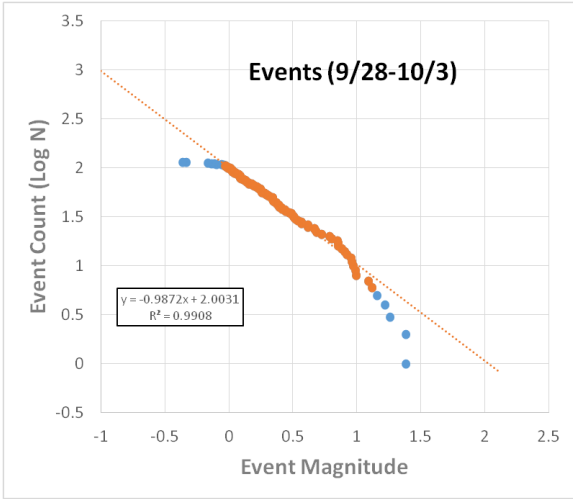


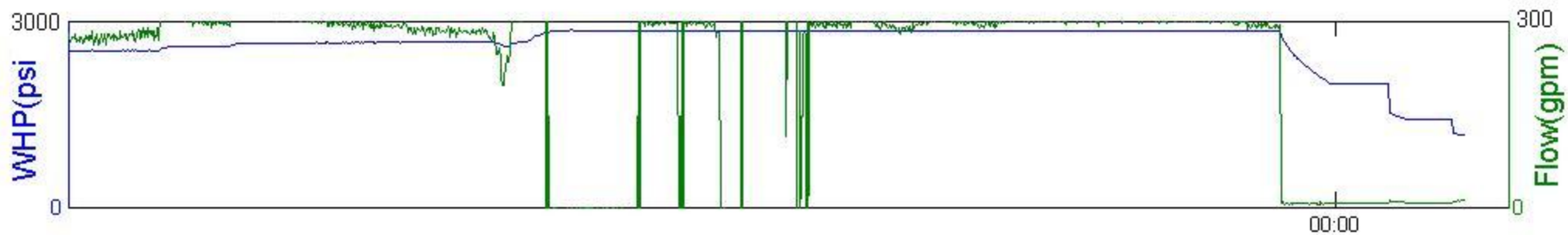
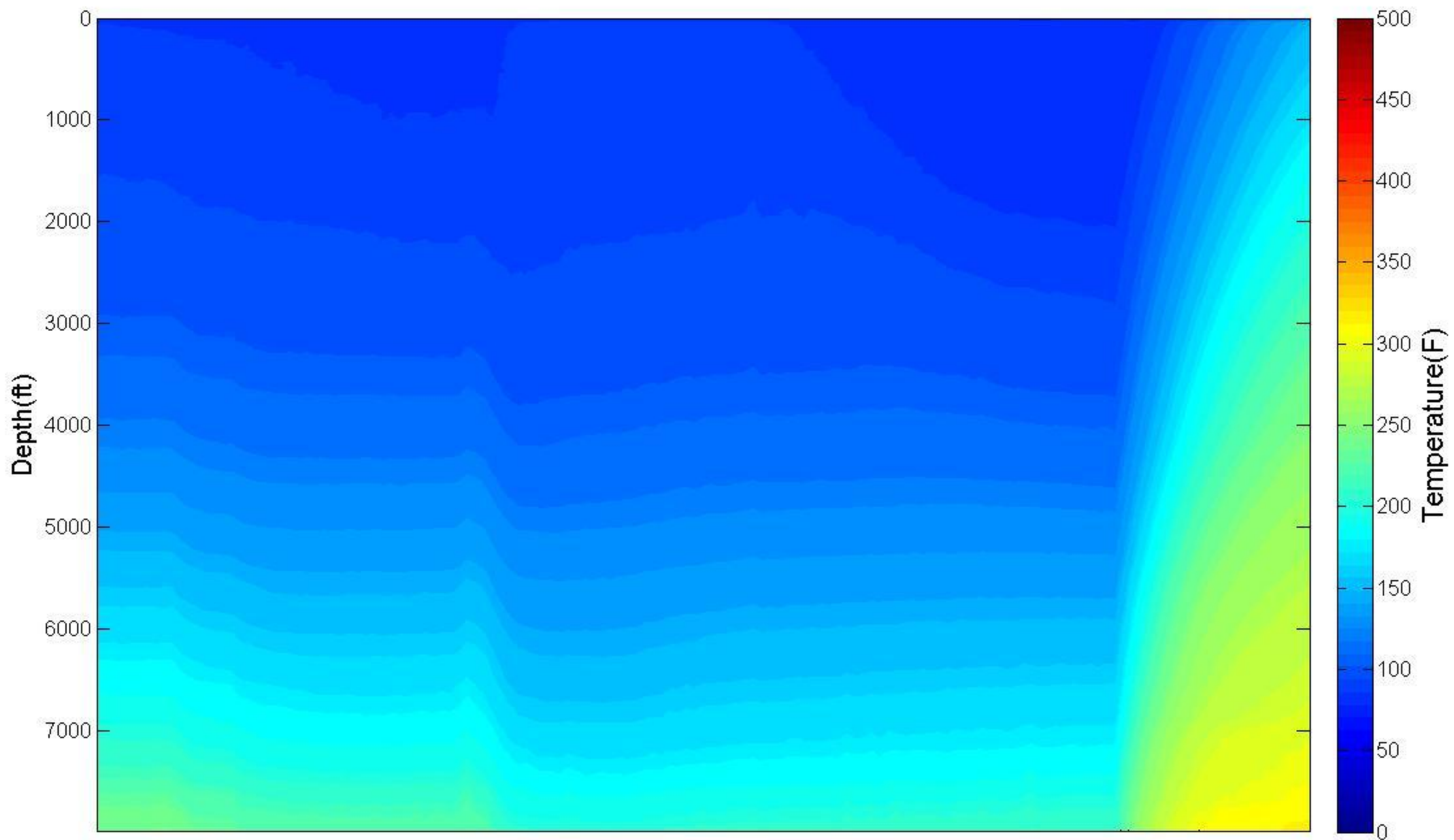




Microseismic Event Size Distribution (B-Value)

Temporal Evolution of B-Value





Report No: 19 **Report For 10-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 19	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals	---	---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue Stimulation.

Planned Operations: Continue to monitor seismicity and injectivity improvement. Prepare to inject high temperature diverter on Monday.

Wellsite Supervisors: Michael Moore, Trenton Claduhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	2:30	2.50		INJ	Submersible pump 1 running to keep water moving through the system at 125gpm to prevent freezing. Closed 8" valve at 1AM between pump 2and wellhead to shut in well. Measured flow through weir box and compared to inlet flow*.	
2:30	7:16	4.77		INJ	Started stim pump 1.	
7:16	8:16	1.00		INJ	Started stim pump 2.	
8:16	13:11	4.92		INJ	Ramped pumps up to full speed. Bypass throttled to 30%.	
13:11	19:17	6.10		INJ	Opened bypass to 35% and lowered pump 2 suction pressure.	
19:17	0:00	4.72		INJ	Held steady at WHP of 2790 psi.	

Management Summary

*Inlet flow meter was 100gpm less than weir box.

Comments

Seismicity: 8 additional seismic events for a total of 246. (Based on Event ID 289 at 10:47 pm)

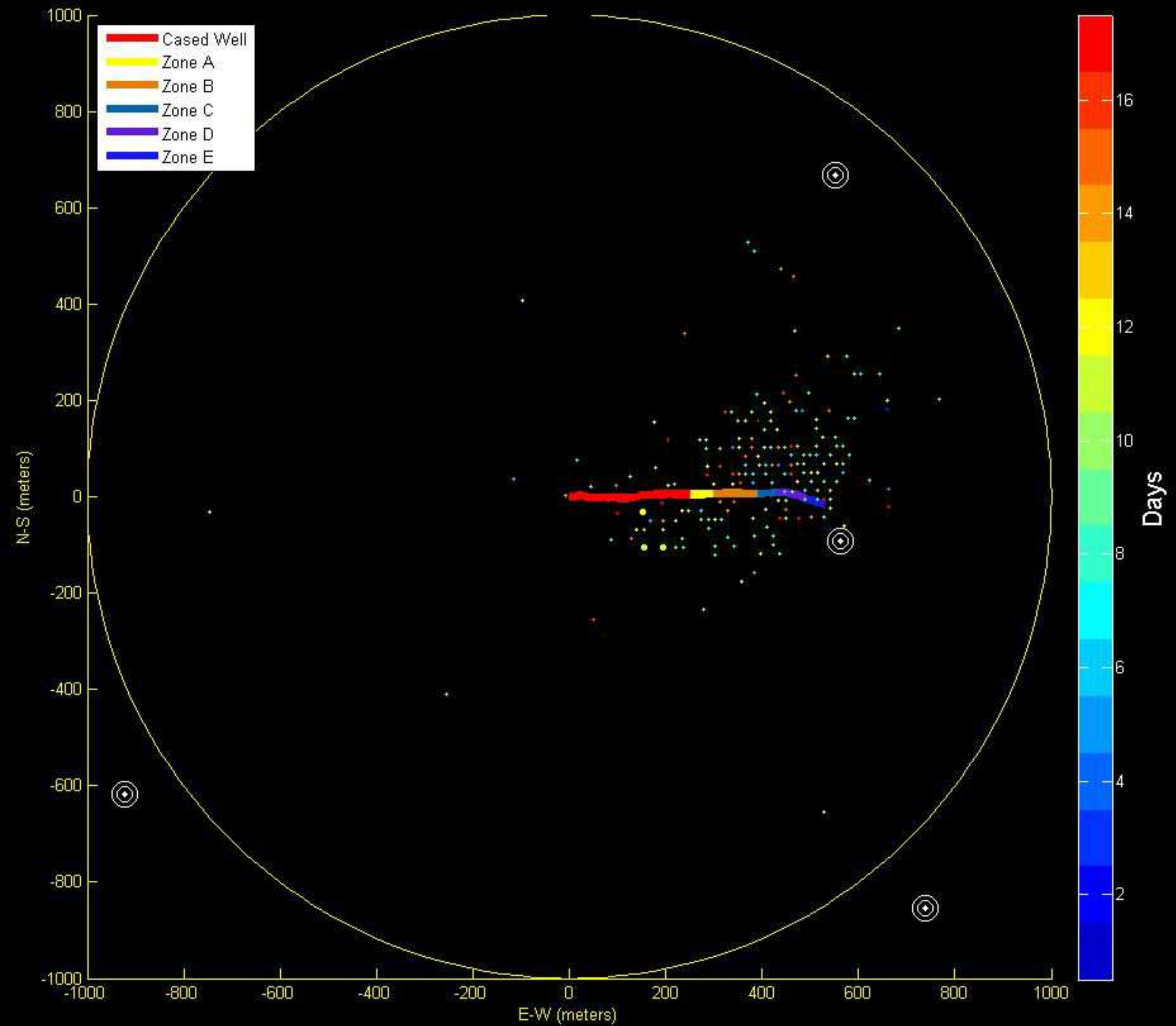
Cumulative injected volume 2,447,832 gallons* (Added 2,011,822 gallons to Ultrasonic cumulative reading because this was the value when it zeroed out)

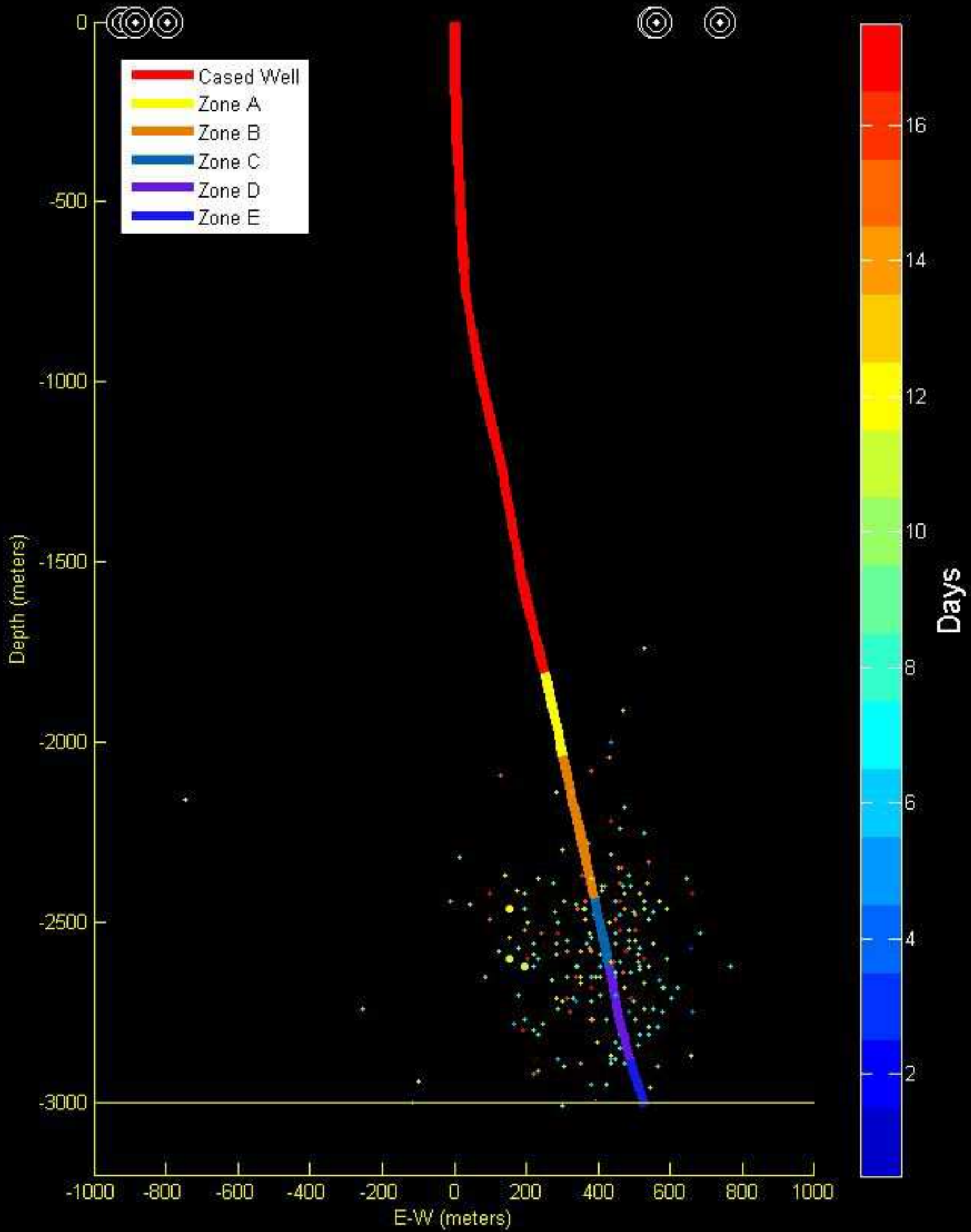
Casing/Tubular Information

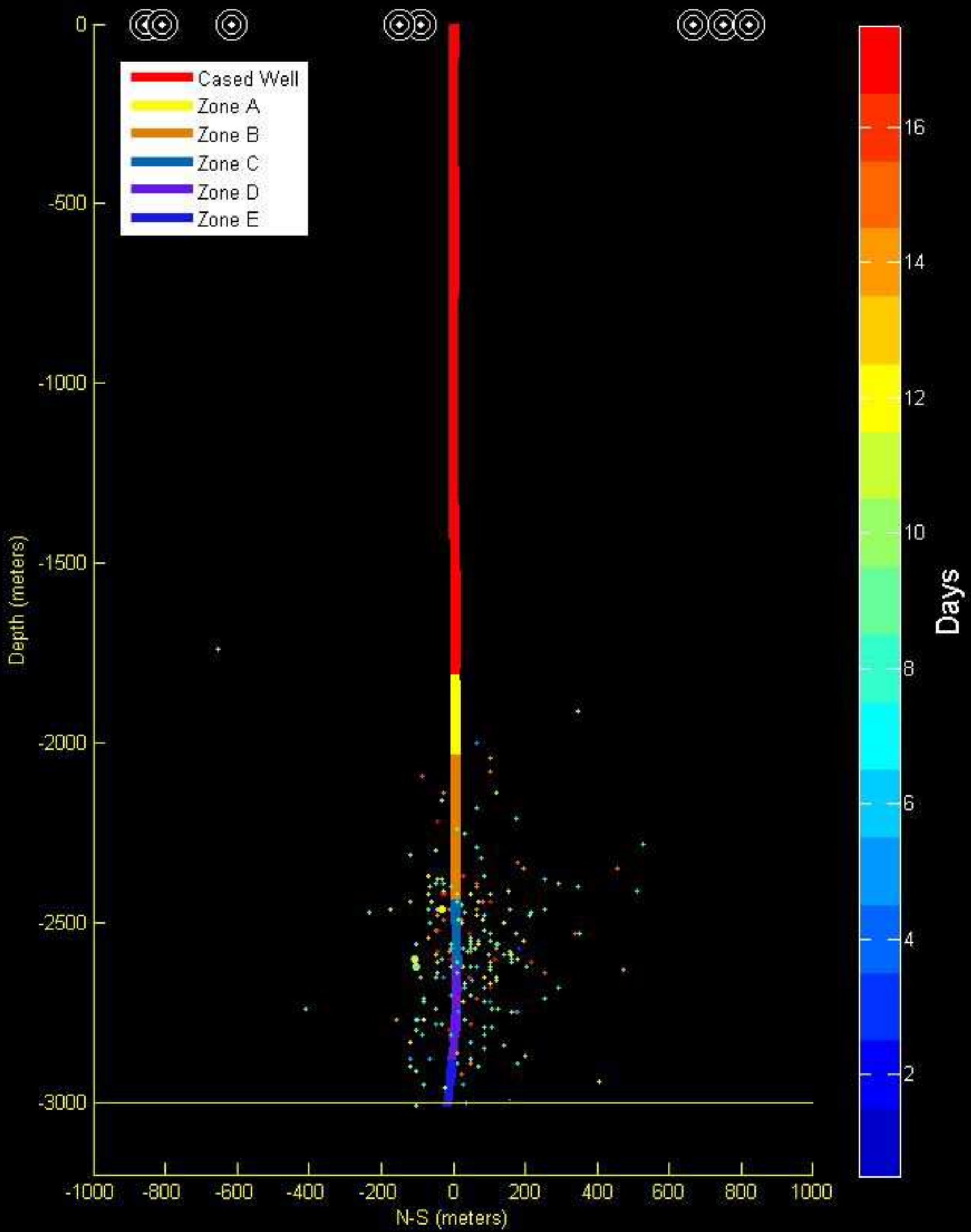
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

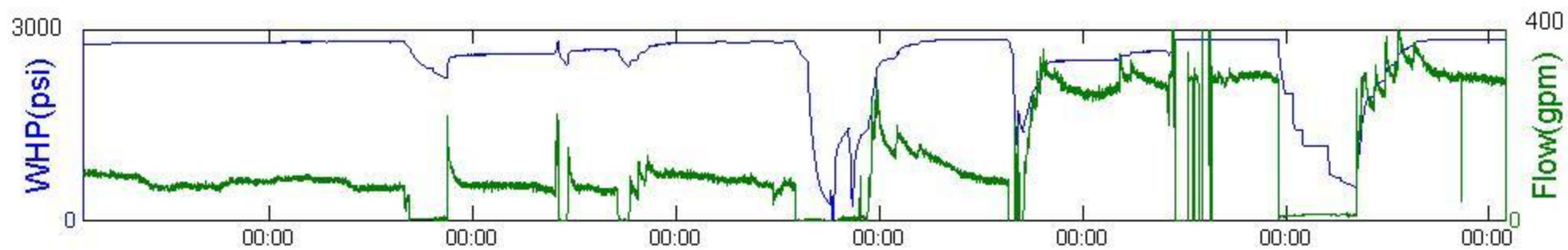
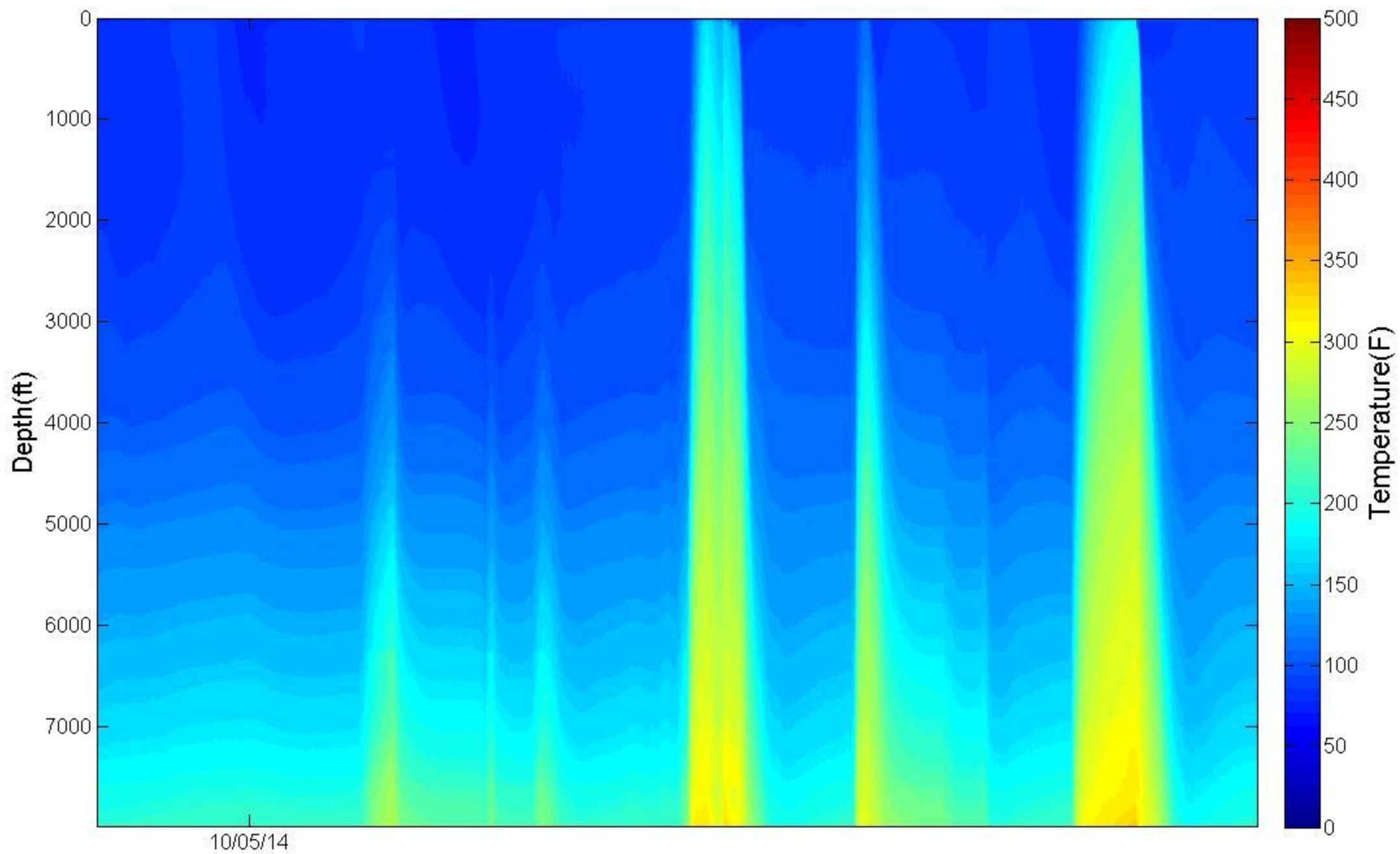
Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 33.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Light breeze, Hi 64.	









Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 20 **Report For 11-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 20	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue stimulation.

Planned Operations: Continue to monitor seismicity and injectivity improvement. Prepare to inject high temperature diverter on Monday.

Wellsite Supervisors: Michael Moore, Trenton Claduhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	12:04	12.07		INJ	Pumps and bypass held stead with WHP approximately 2840psi.	
12:04	17:45	5.68		INJ	Ramp down pump to WHP of 2000 psi and test DIVA.	
17:45	23:59	6.23		INJ	Ramp up pumps to 2520 psi WHP and maintain injection at this pressure overnight.	

Comments

Seismicity: 6 additional seismic events for a total of 252.

Cumulative injected volume 2,781,000 gallons

Note 1: Previous counts were based on Auto-picked seismic events. Manual review has determined 20 were either regional events or non-seismic.

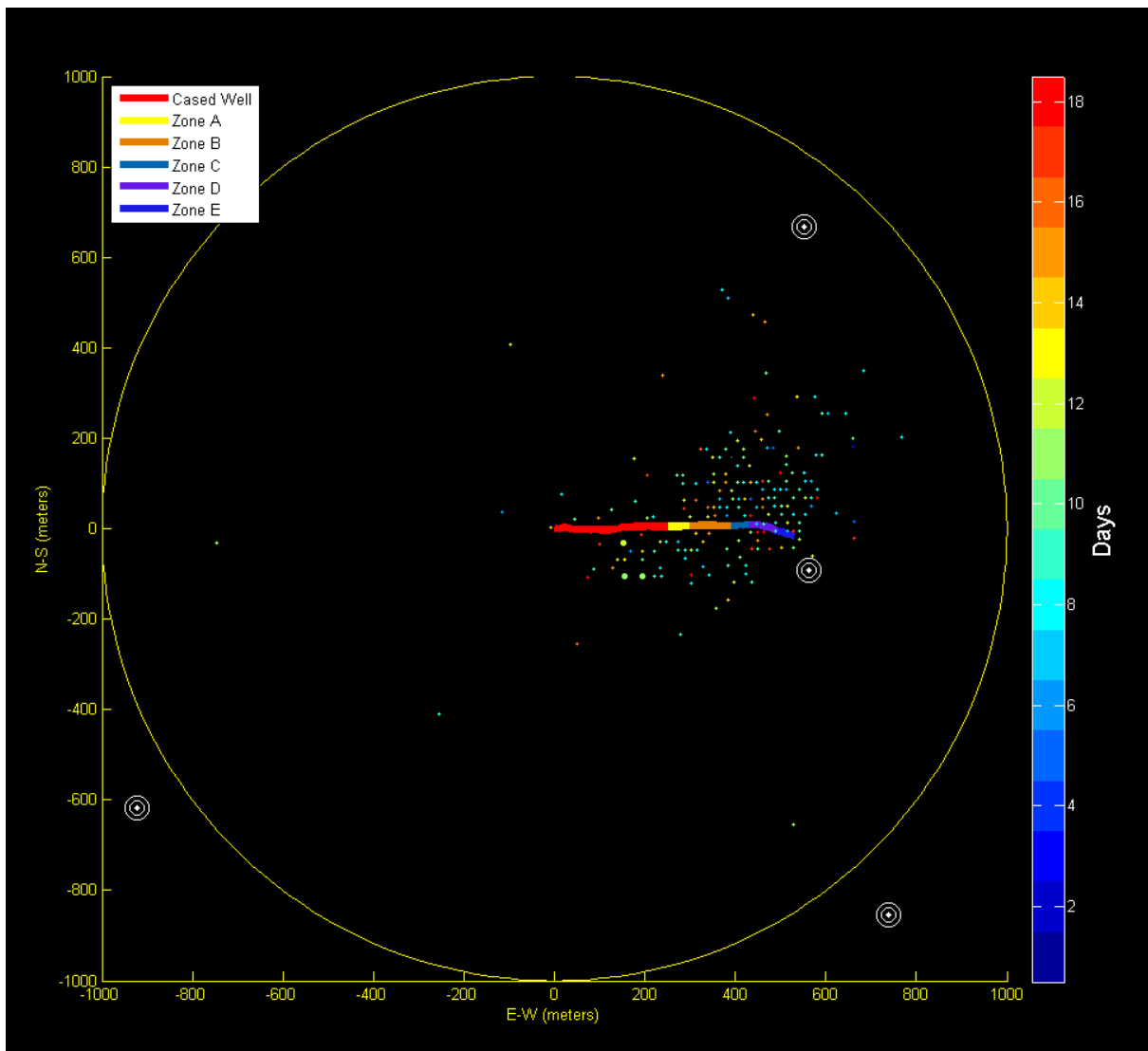
Note 2: Yesterday (October 10), during the work day a road grader and compactor were working 5 miles of the gravel access road from the pad down to the gate. The road goes past seismic stations NN19, NN24, and NM22. This surface noise prevented any microseismic detections during that time period

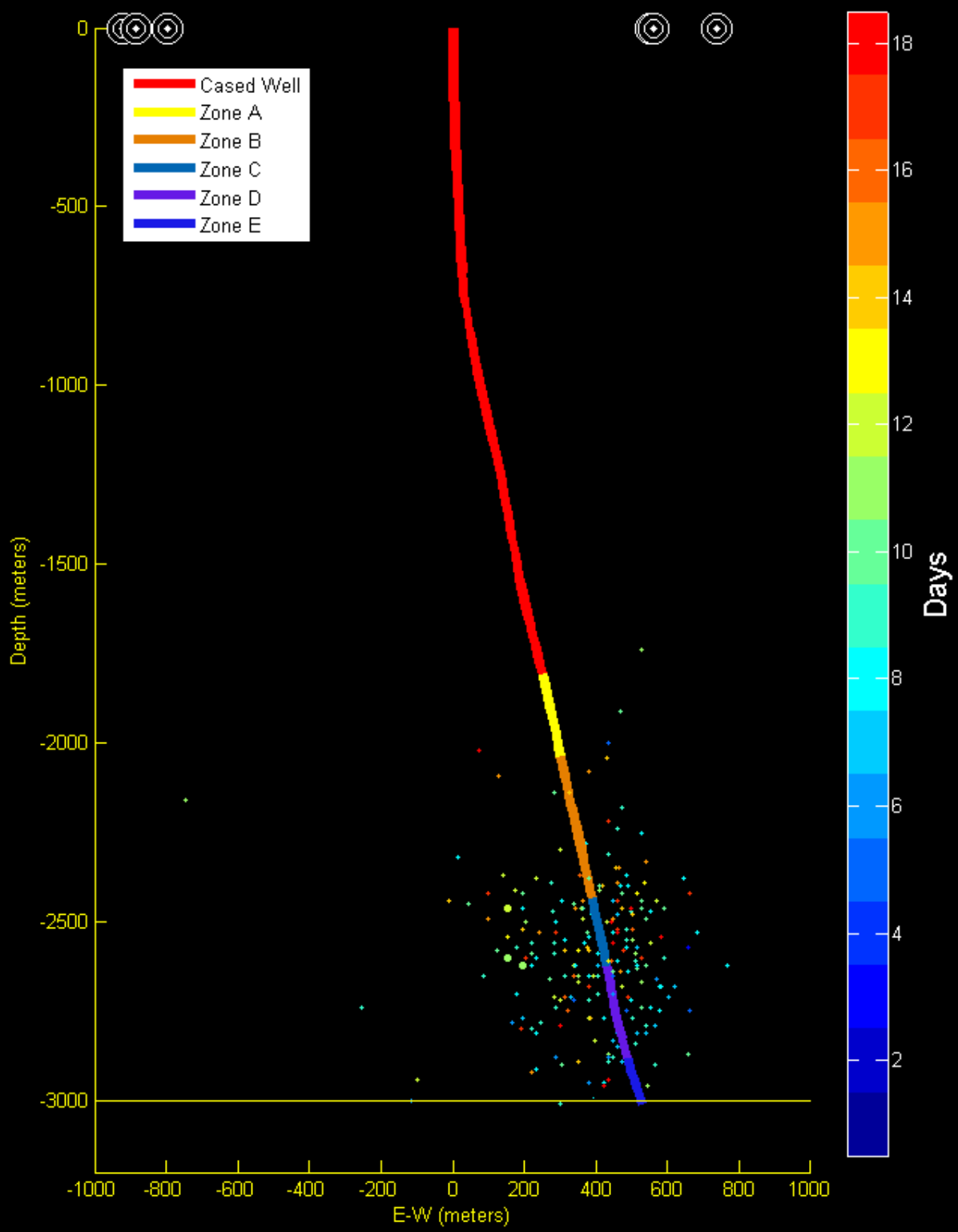
Casing/Tubular Information

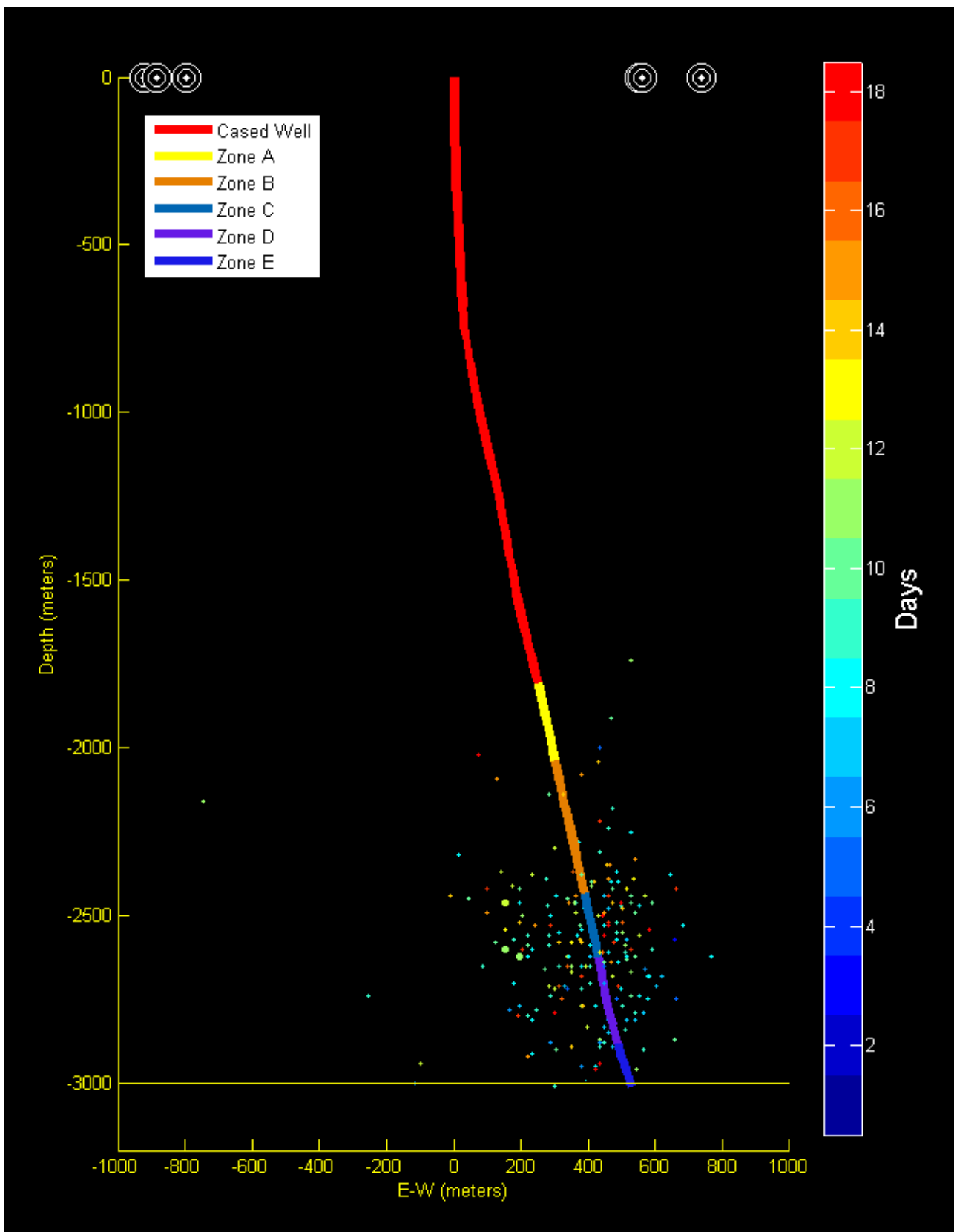
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

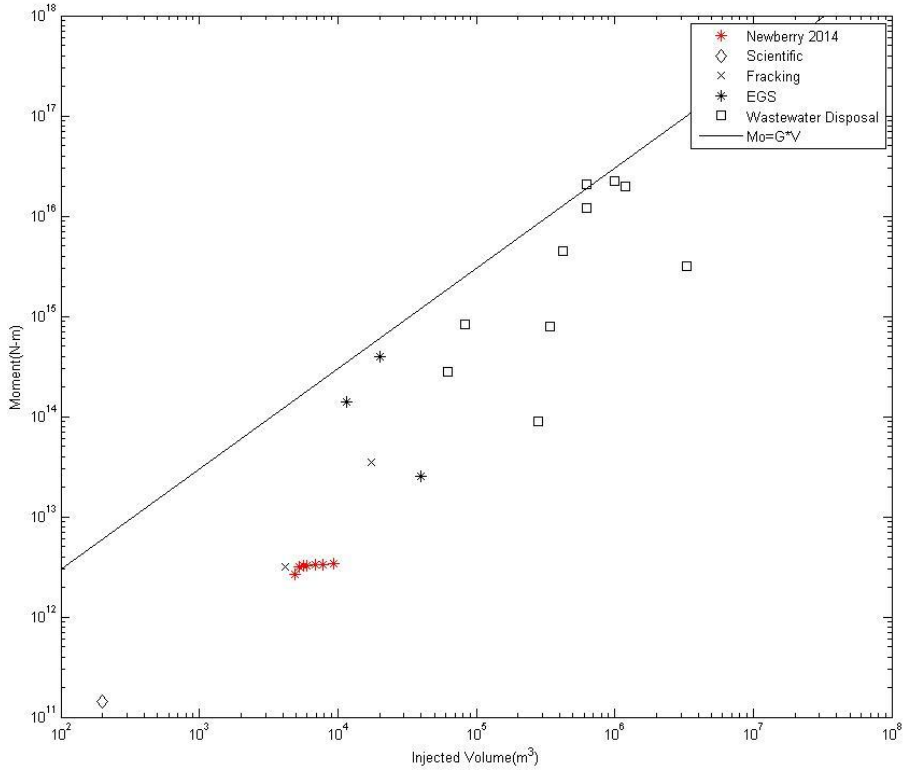
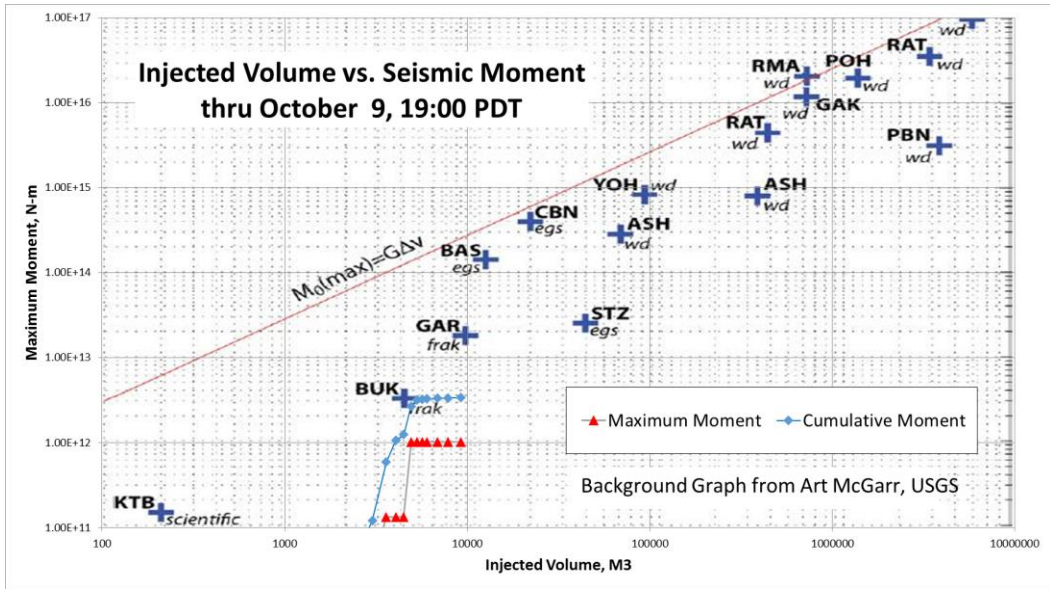
Weather Information

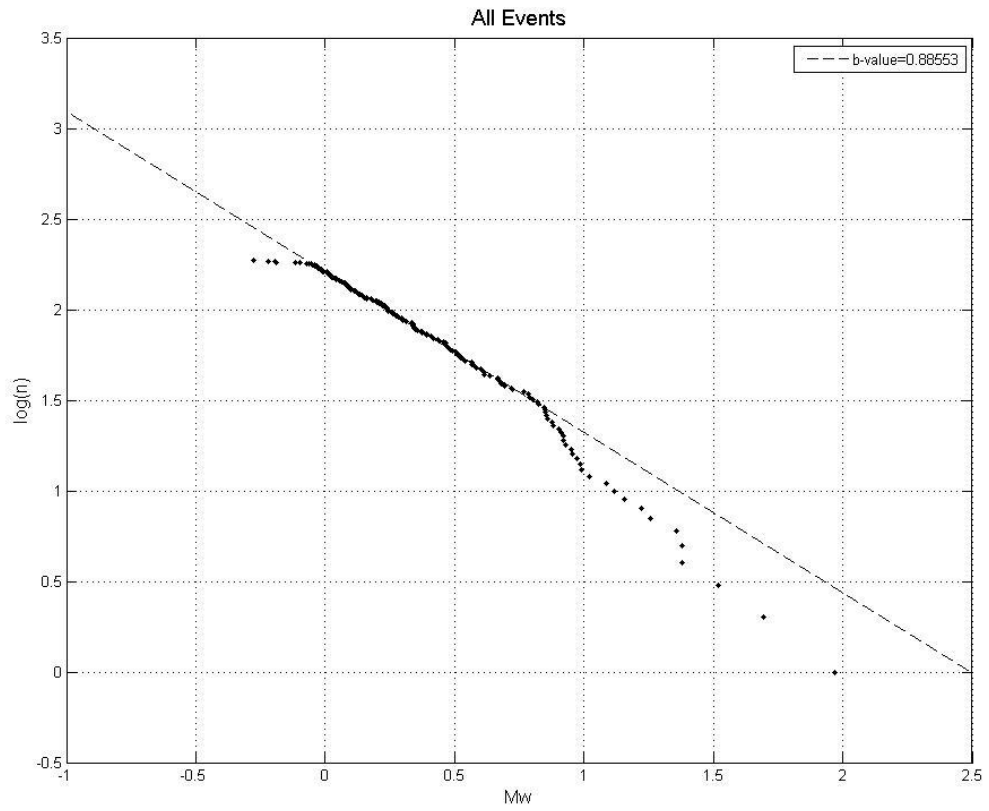
Sky Condition: Clear	Visibility:
Air Temperature: 38.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Hi 48	







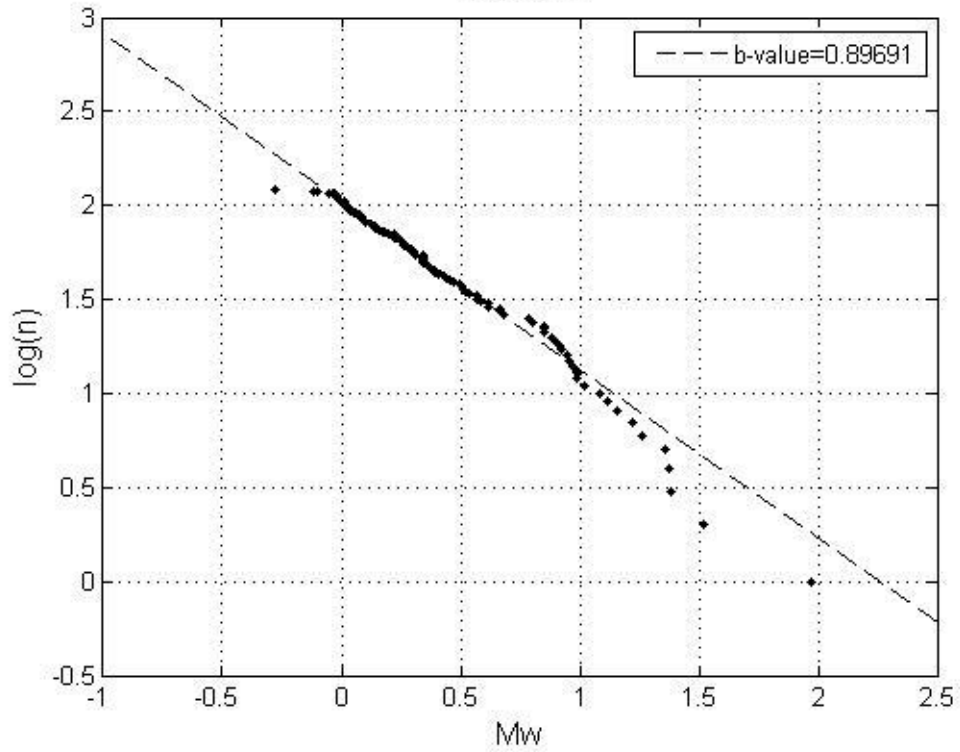




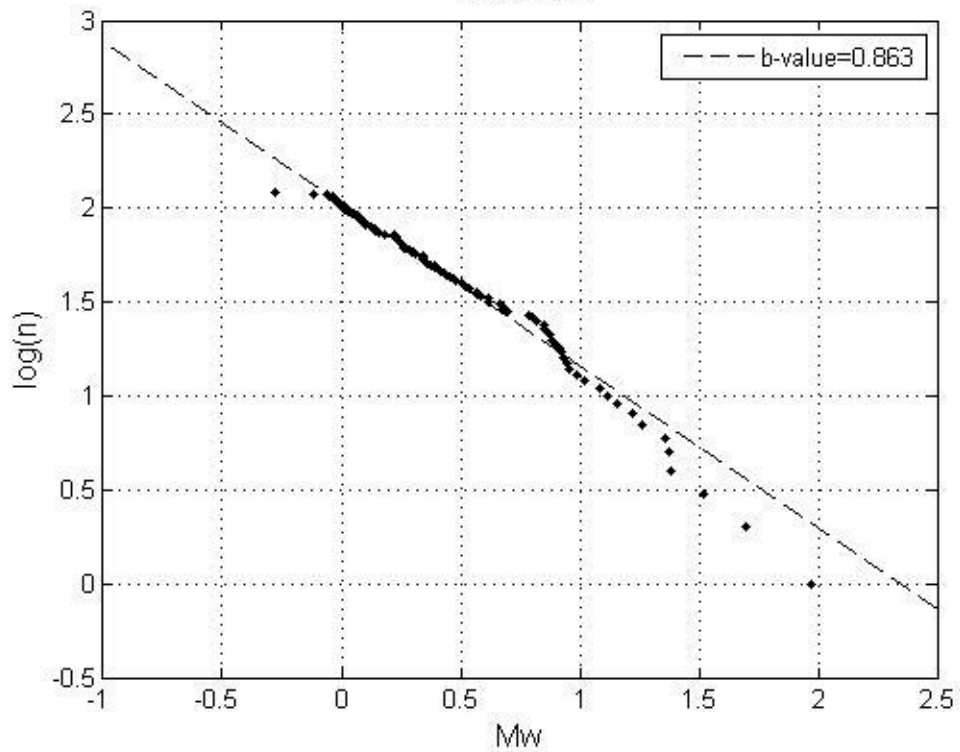
Microseismic Event Size Distribution (B-Value)

Temporal Evolution of B-Value

10/04/14

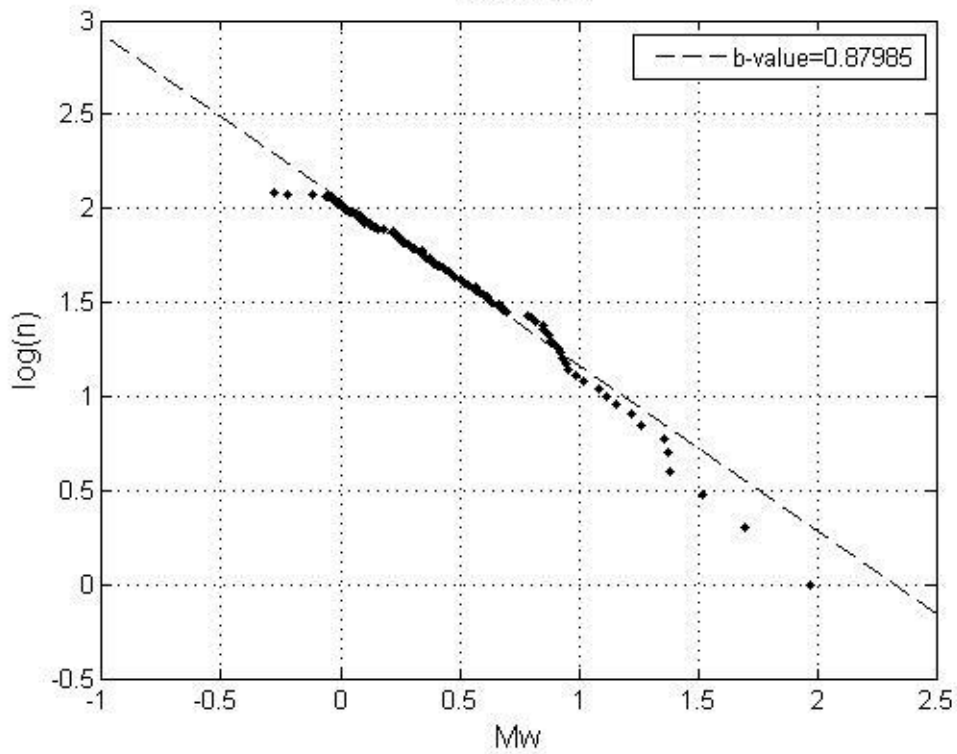


10/05/14

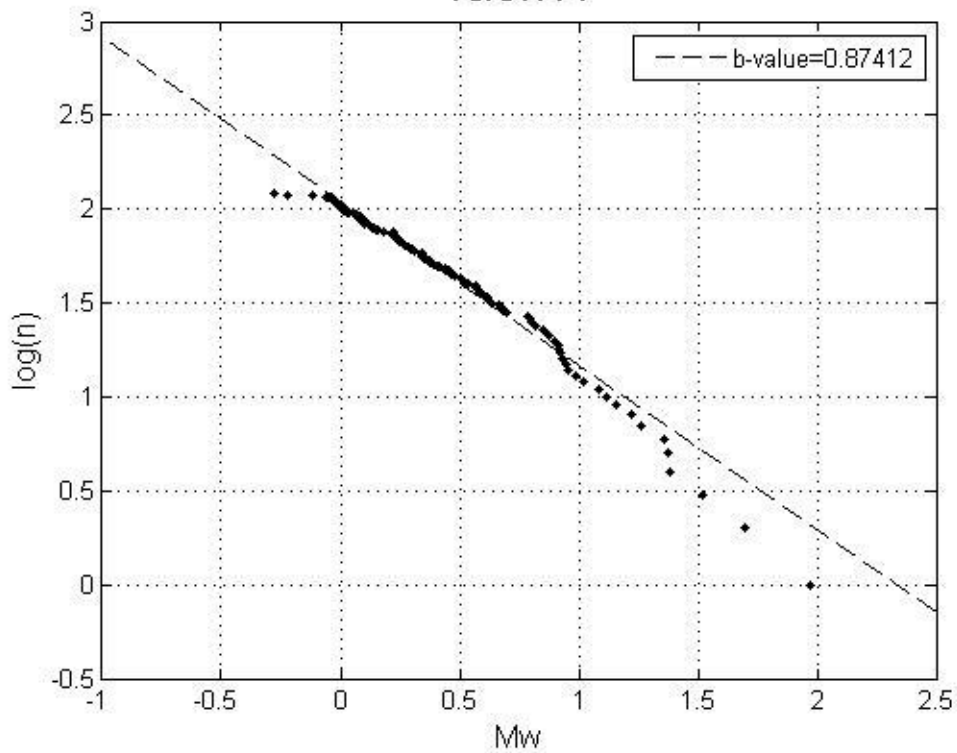


Temporal Evolution of B-Value

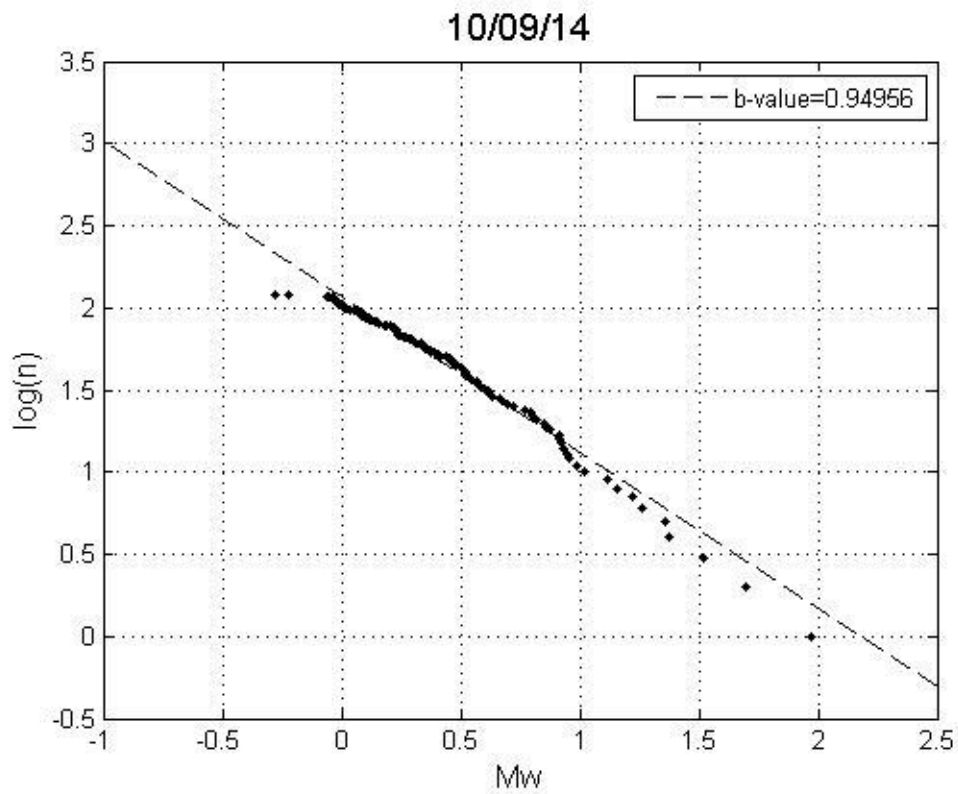
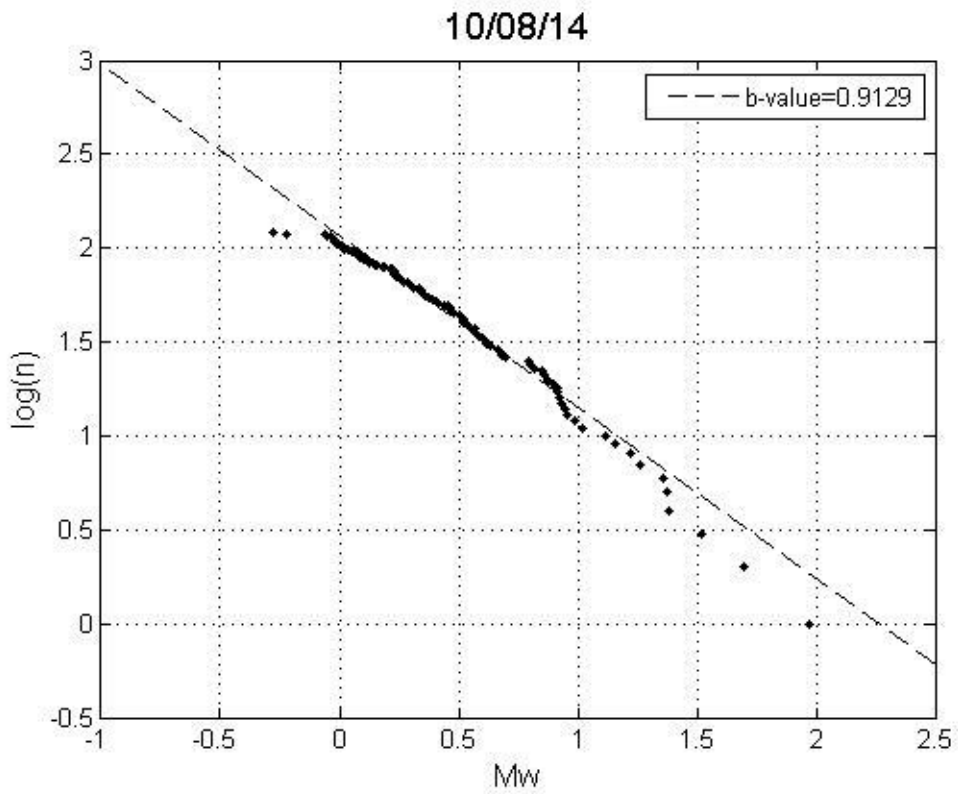
10/06/14



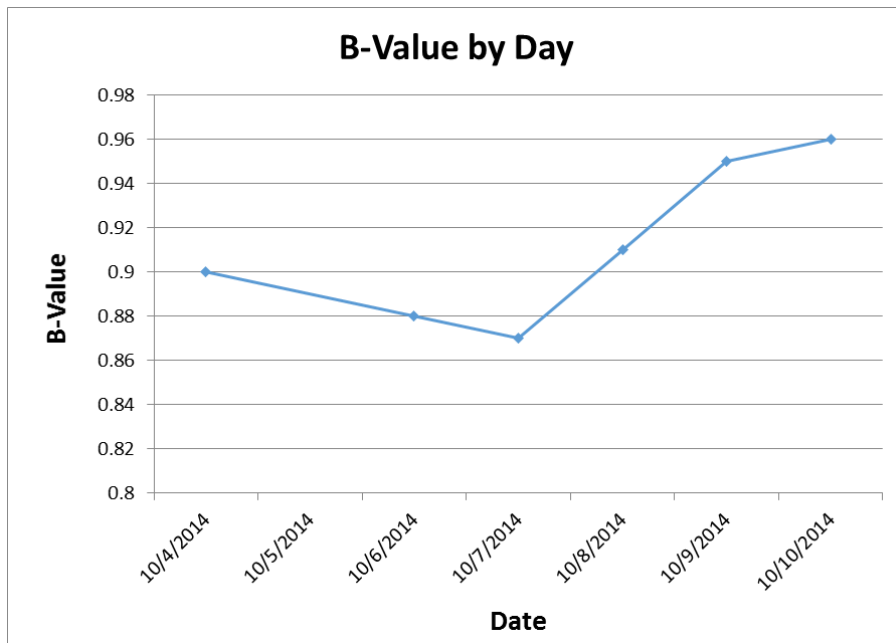
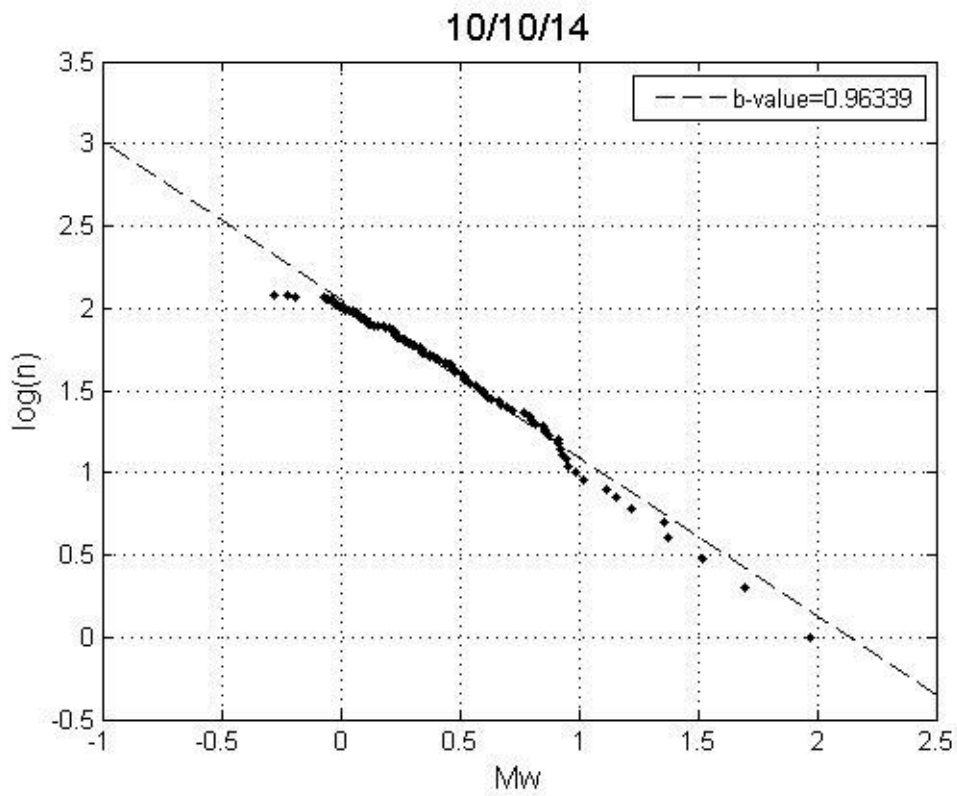
10/07/14

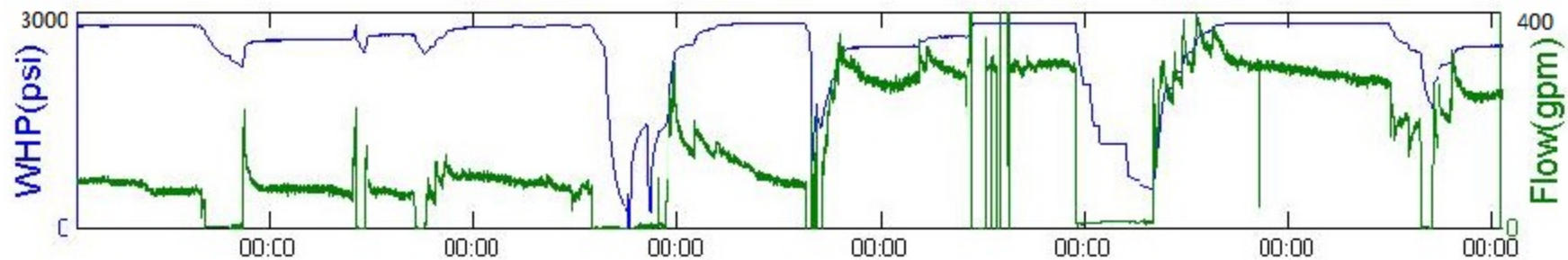
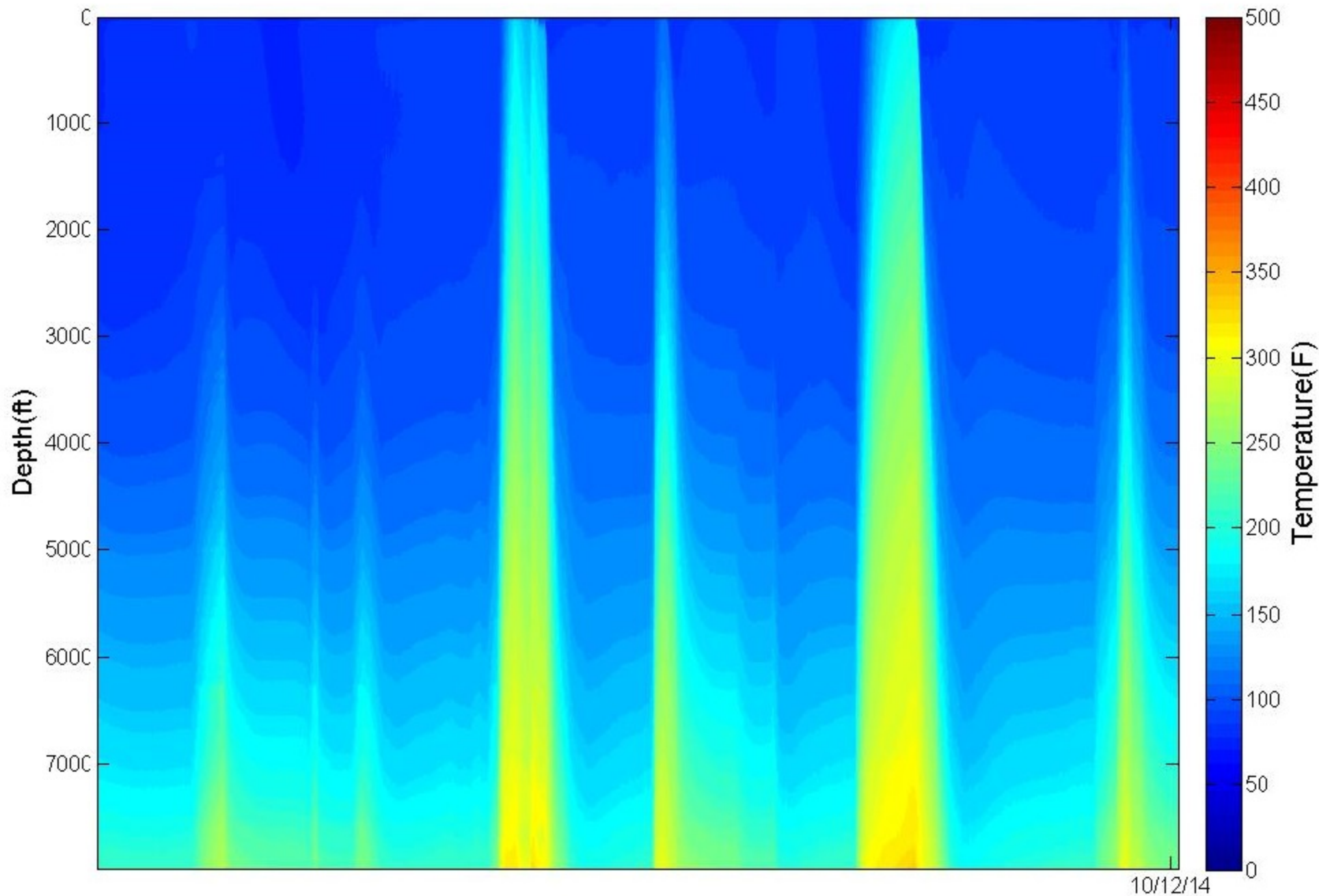


Temporal Evolution of B-Value



Temporal Evolution of B-Value





Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 21 **Report For 12-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 21	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals ---		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue Stimulation

Planned Operations: Inject high temperature diverter on Monday. Seismic goal has been reached. Current plan is to temporarily shut down for about 10 days to analyze data and wait for arrival of the replacement DTS (distributed temperature sensing system) that can be deployed to the bottom the well where the fluid is exiting the well. We will then restart for as long as funds and weather holds.

Wellsite Supervisors: Michael Moore, Trenton Claduhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	9:45	9.75		INJ	Pumps and bypass valve held stead with WHP near 2525 psi.	
9:45	15:25	5.67		INJ	Increase pump speed to reach 2610 psi WHP.	
15:25	16:19	0.90		INJ	Increase pump speed to reach 2714 psi WHP.	
16:19	18:40	2.35		INJ	Closing bypass valve to reach 2777 psi. WHP increased to 2829 prsi, re-open bypass valve to prevent high pressure condition between pumps.	
18:40	21:00	2.33		INJ	Injecting with WHP around 2842 psi.	
21:00	23:59	2.98		INJ	New leak found in bypass line, pressure reduced to 2766 psi.	

Management Summary

Over the past two days we have compared the flow between the ultrasonic meter on the high pressure line to the WH, the magnetic meter on the inlet flow, the pump curves of the submersible pumps, the magnetic meter on the bypass recirculation line, the magnetic meter on the water well, flow measured in the weir box, and water level in the sumps. All flow measurements are imprecise! We have concluded that the inlet magmeter reports about 100 gpm low and the ultrasonic flow meter reports about 100 gpm too high. This discrepancy seems to have begun on Oct 8 18:00. Over the past 5 days the ultra sonic meter has reported flow rates of 250-350 gpm down the well. Actual flow rates are likely in the range of 150-250 gpm. A correction will be developed soon.

Comments

Seismicity: 19 new events. Total of 248 (accounts for some removals from catalog). Today's events included a M1.7 and M 0.9 picked up by the USGS network. The USGS uses only four of our stations, so has a higher detection threshold. The USGS has detected 91 events during this year's stimulation.

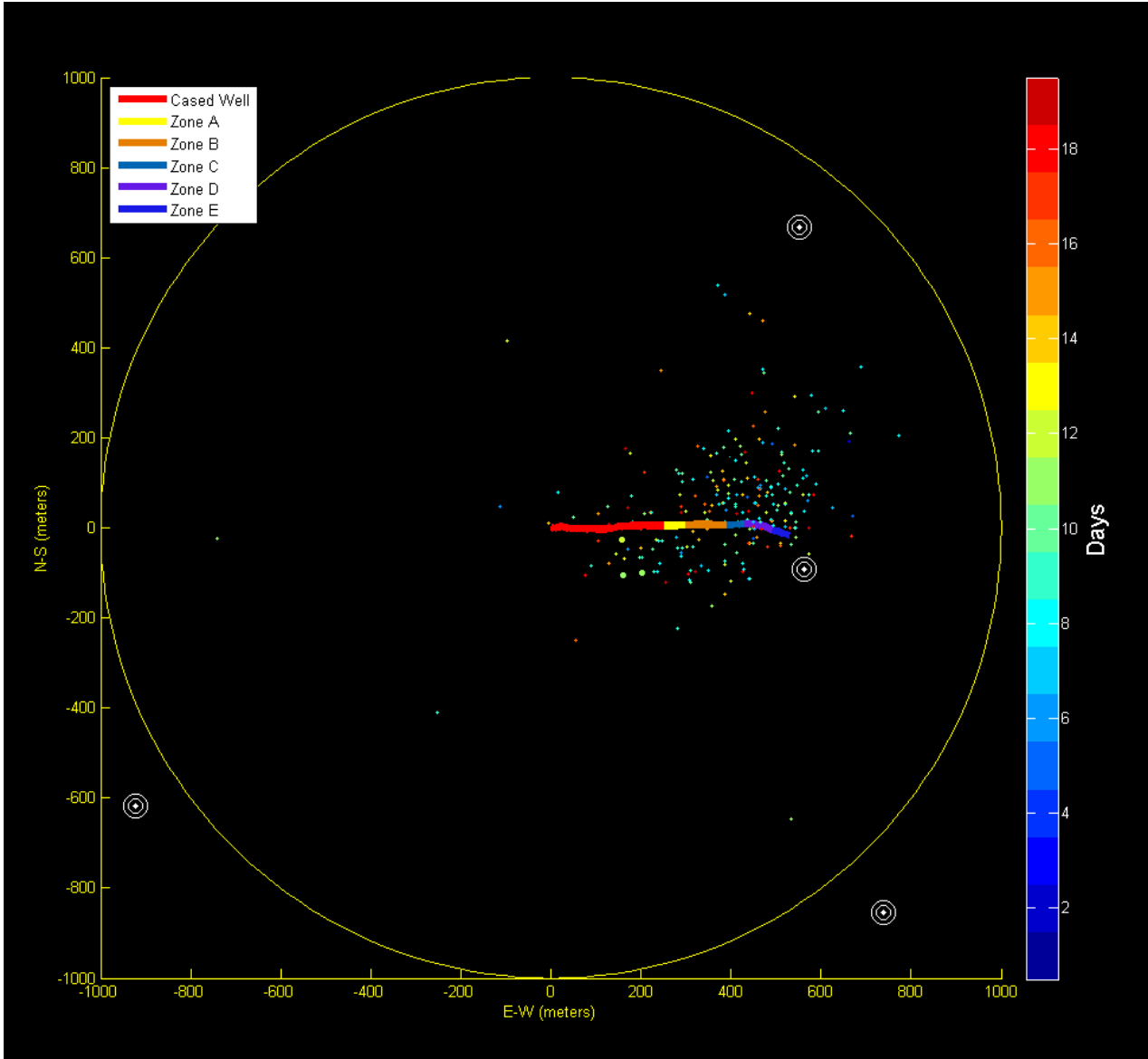
Cumulative injected volume 3,115,600 gallons (expect revision downward).

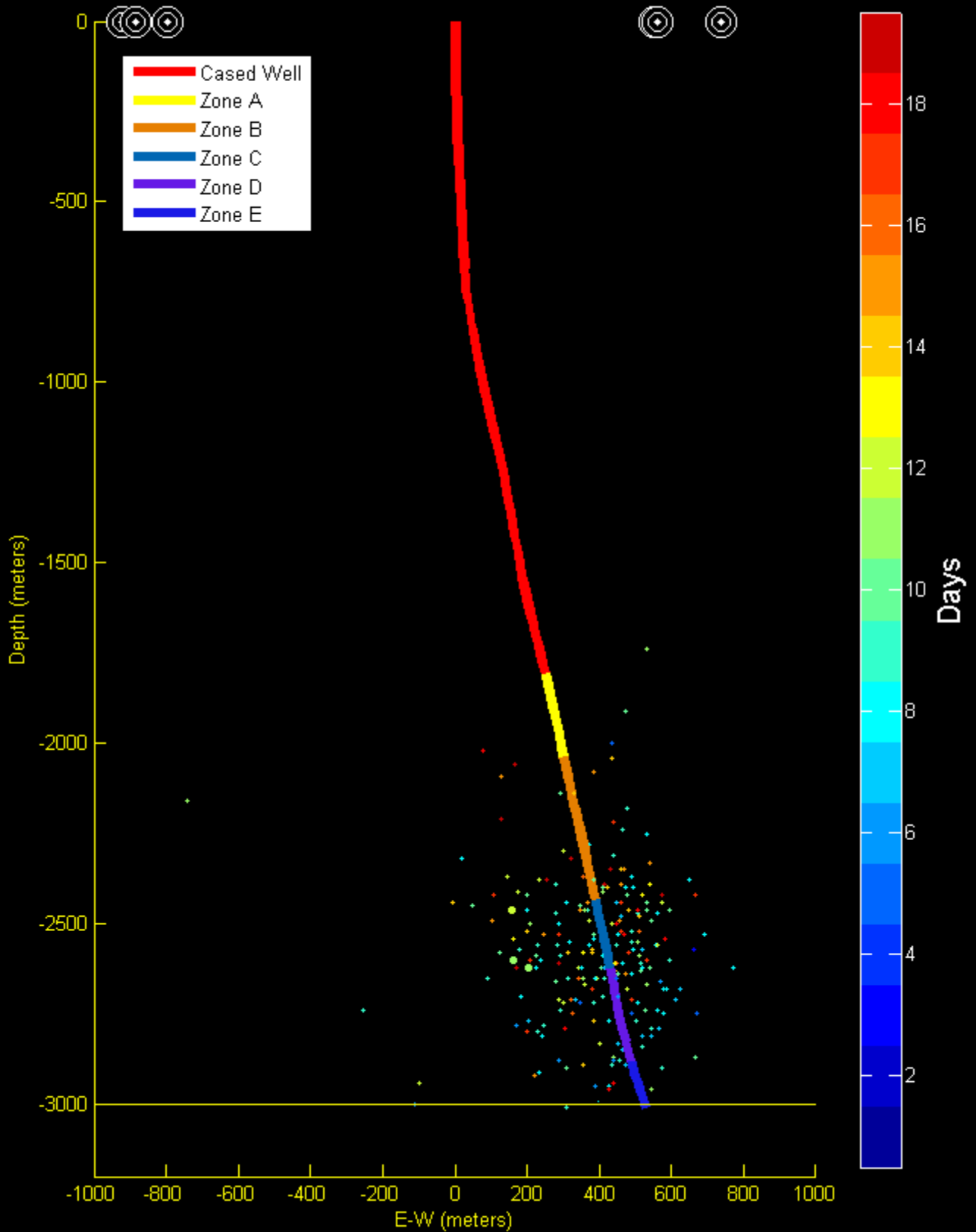
Casing/Tubular Information

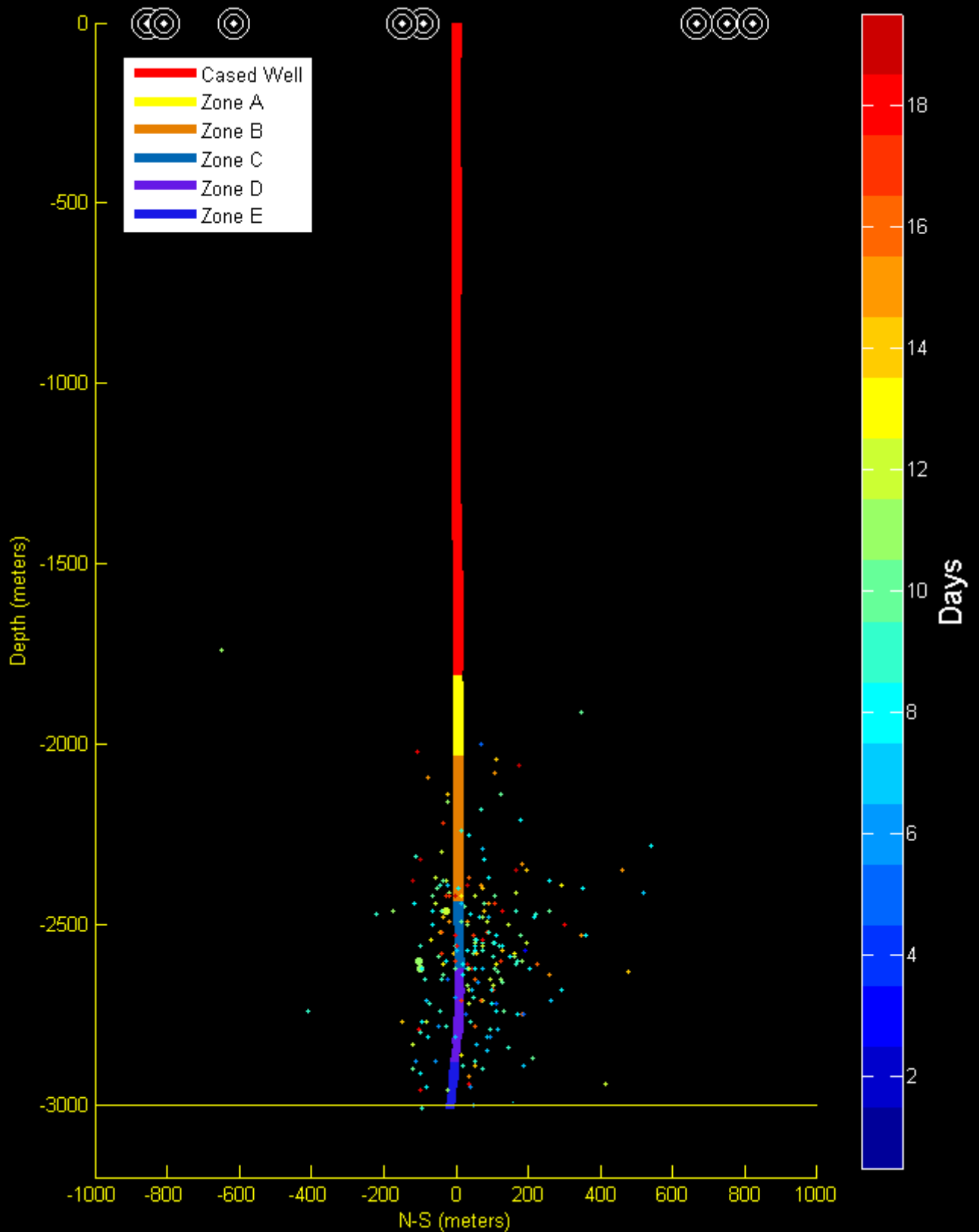
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

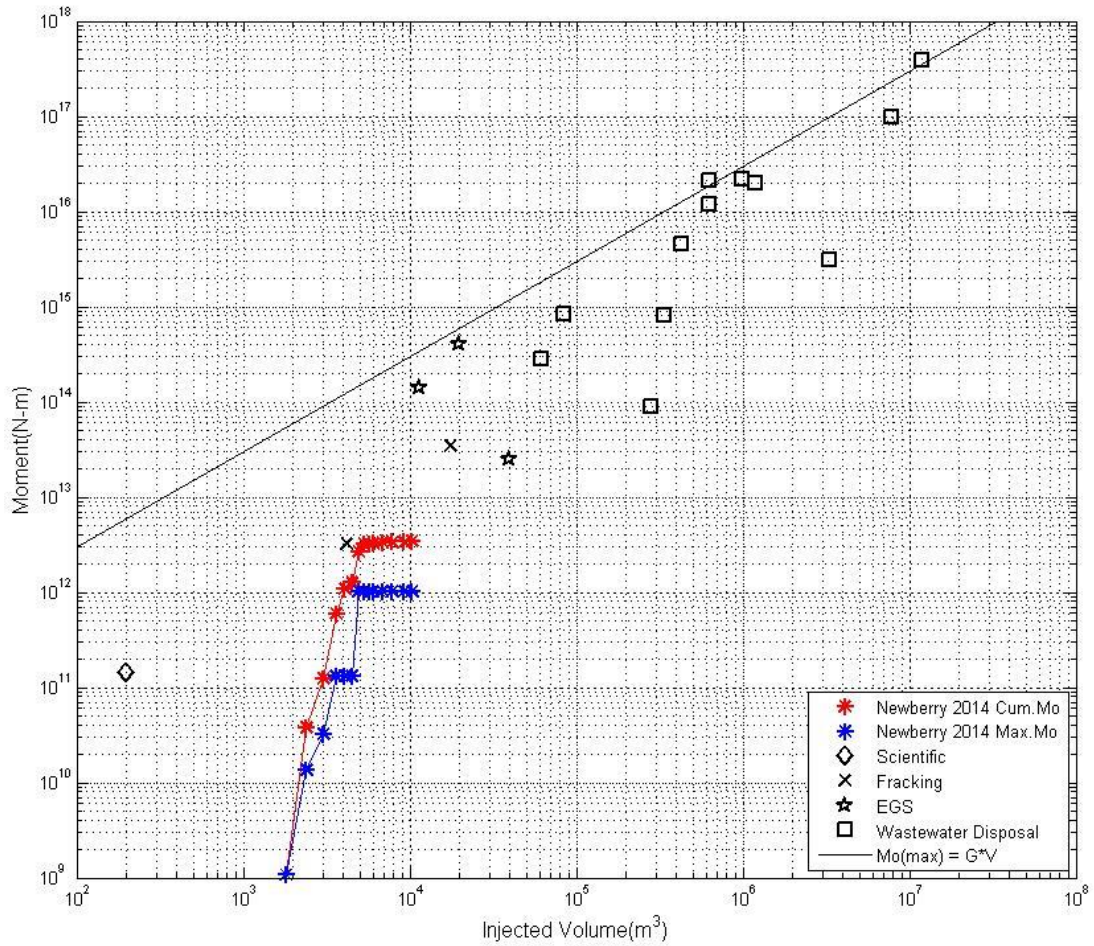
Sky Condition: Clear	Visibility:
Air Temperature: 27.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Hi 55	



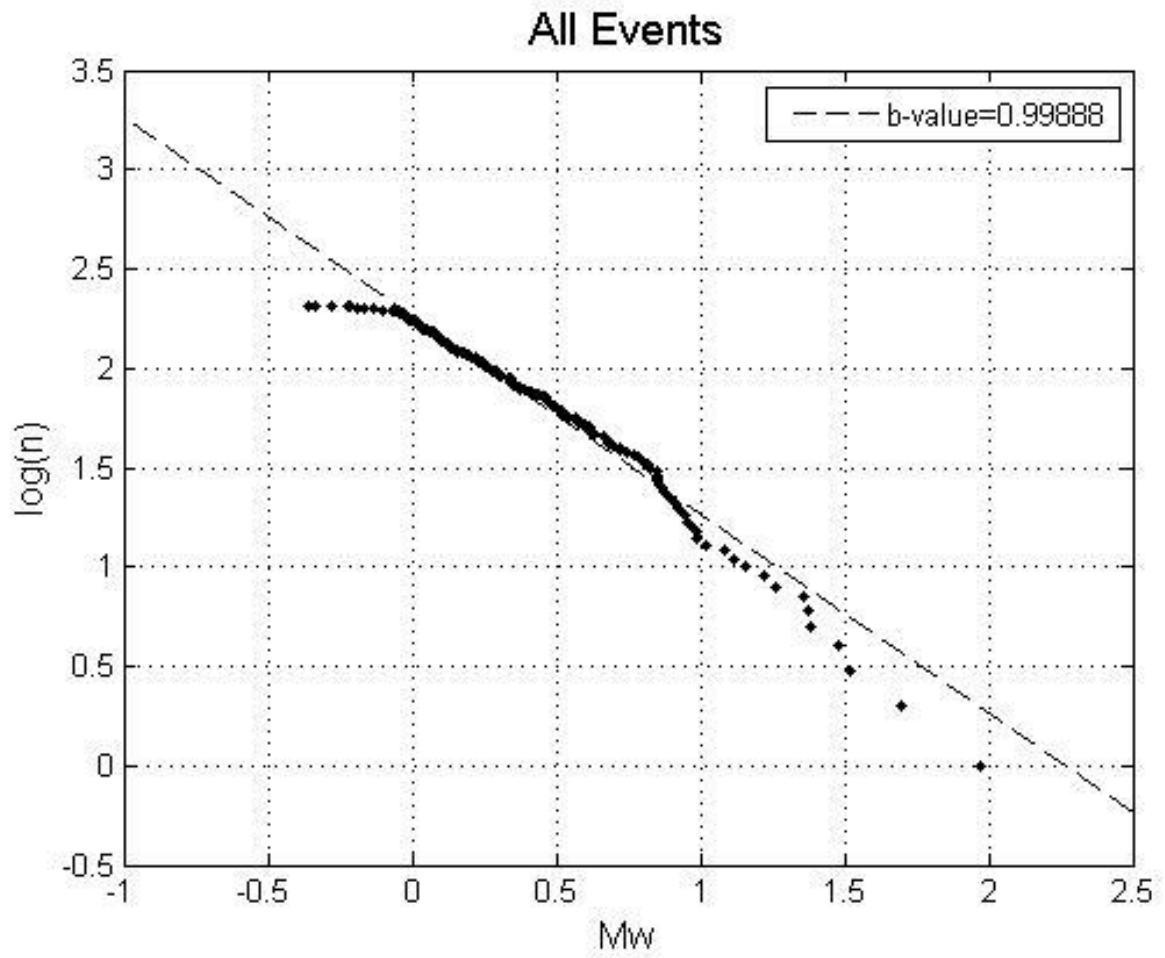




Cumulative and Maximum Moment vs. Injected Volume compared to other injection projects

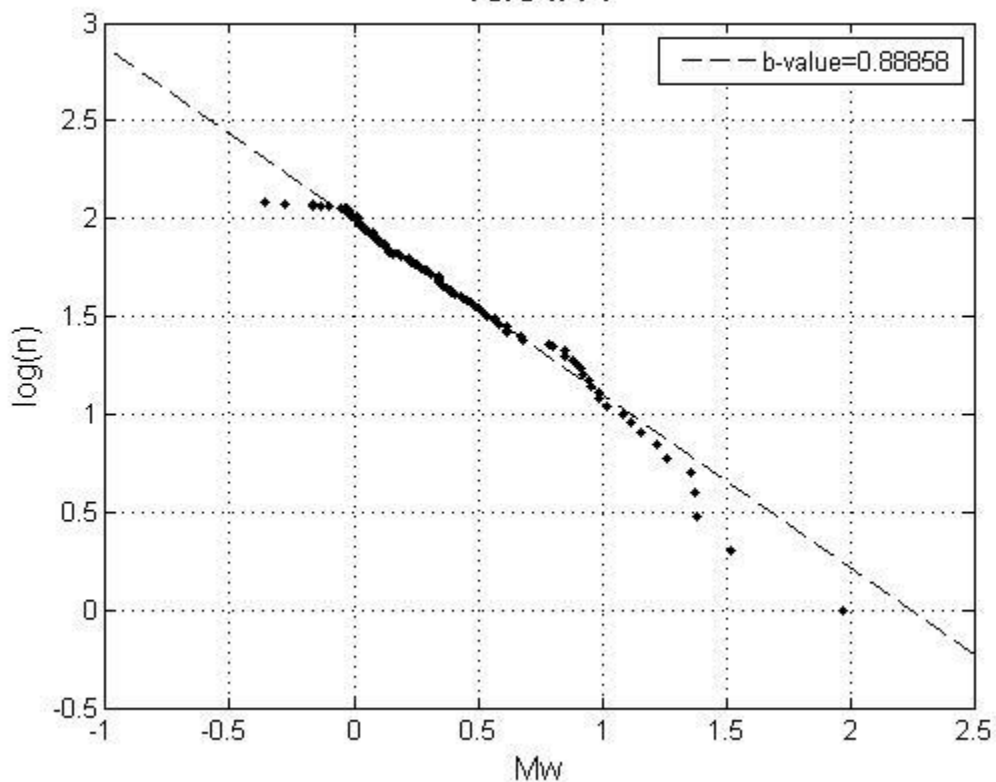


Microseismic Event Size Distribution (B-Value)

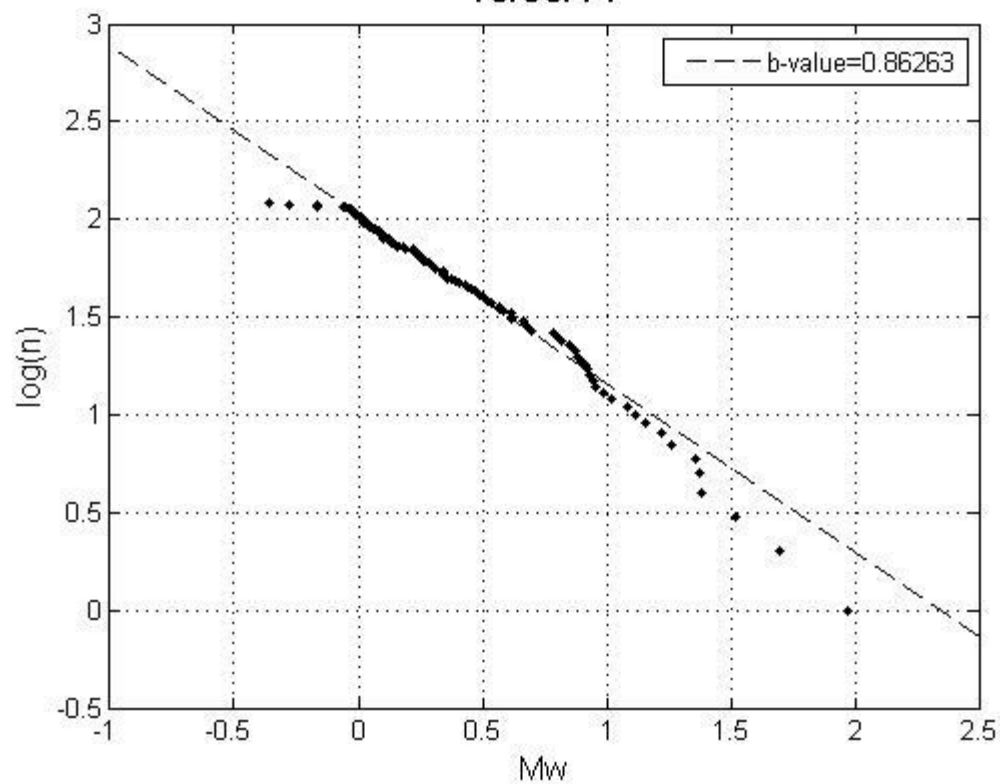


Temporal Evolution of B-Value

10/04/14

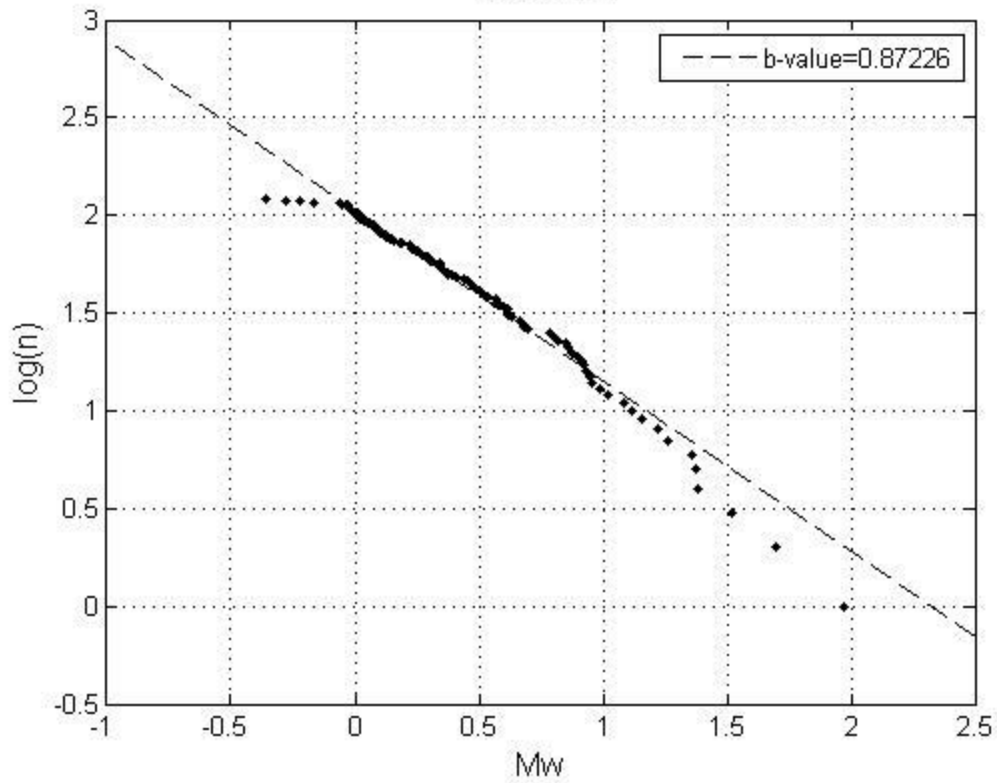


10/05/14

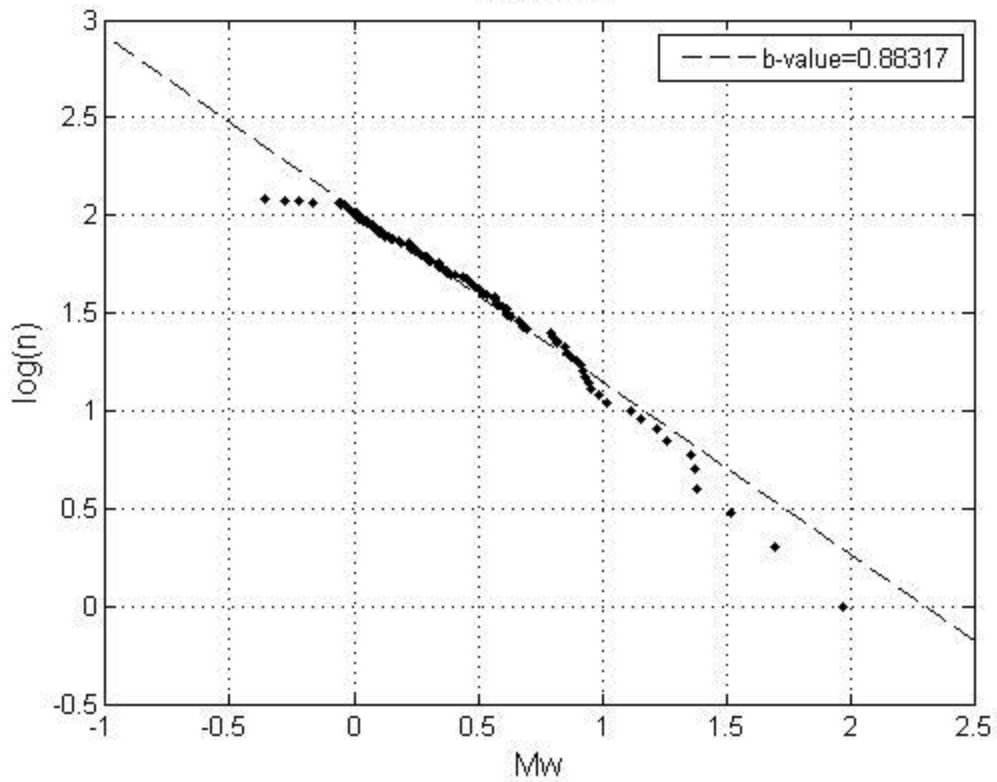


Temporal Evolution of B-Value

10/06/14

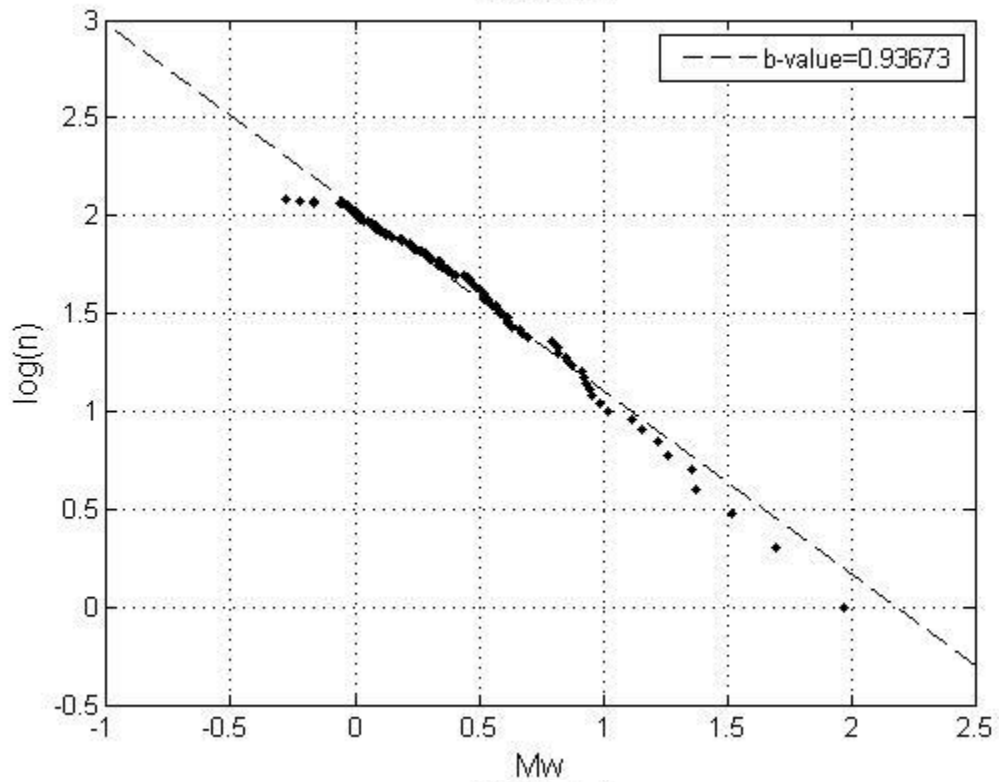


10/07/14

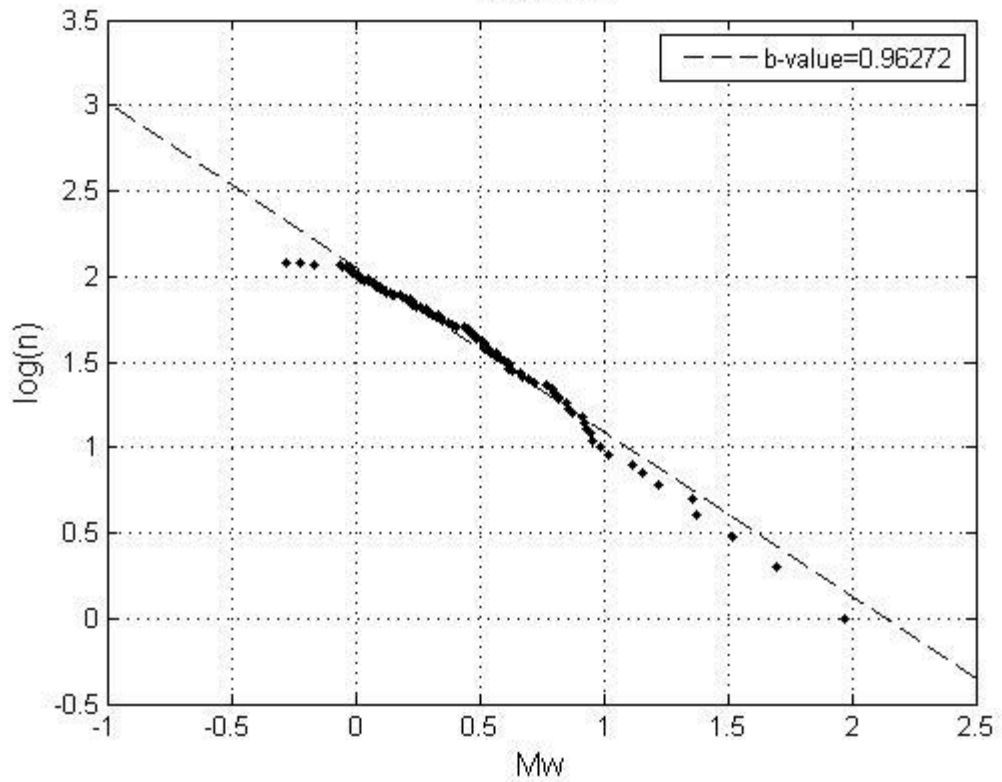


Temporal Evolution of B-Value

10/08/14

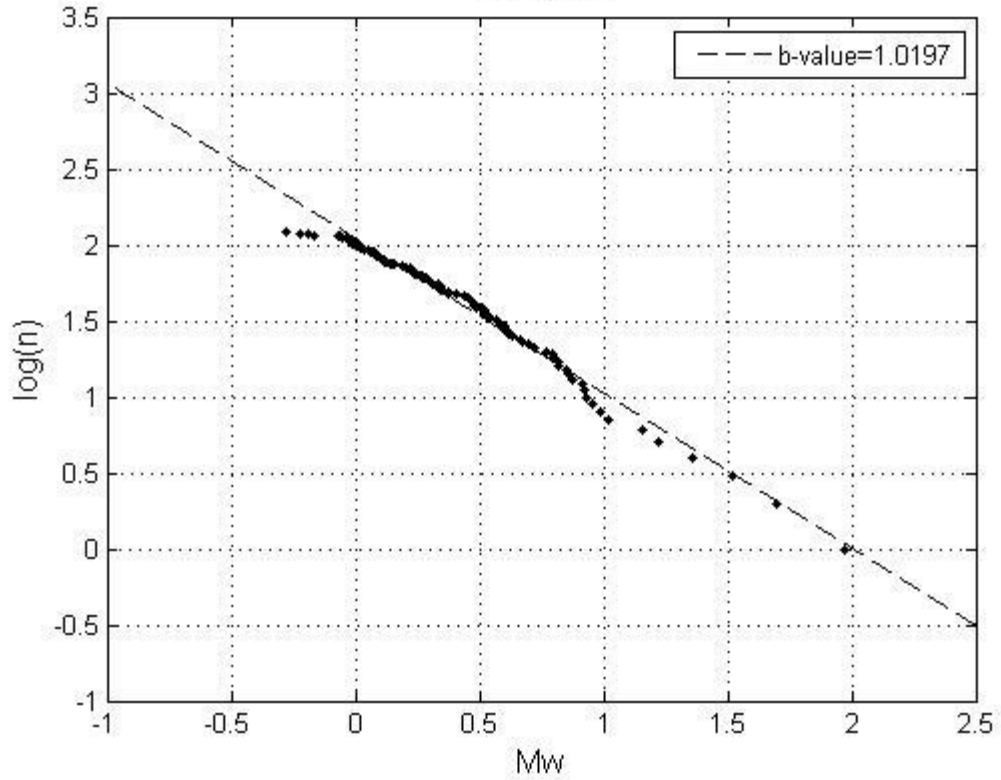


10/09/14

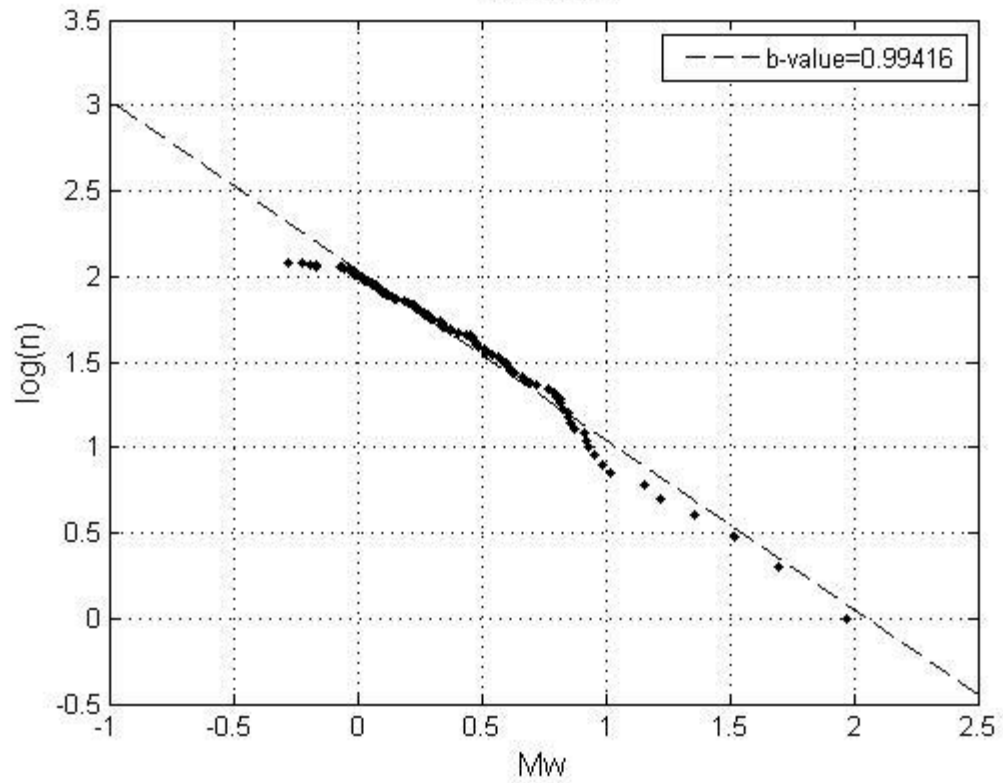


Temporal Evolution of B-Value

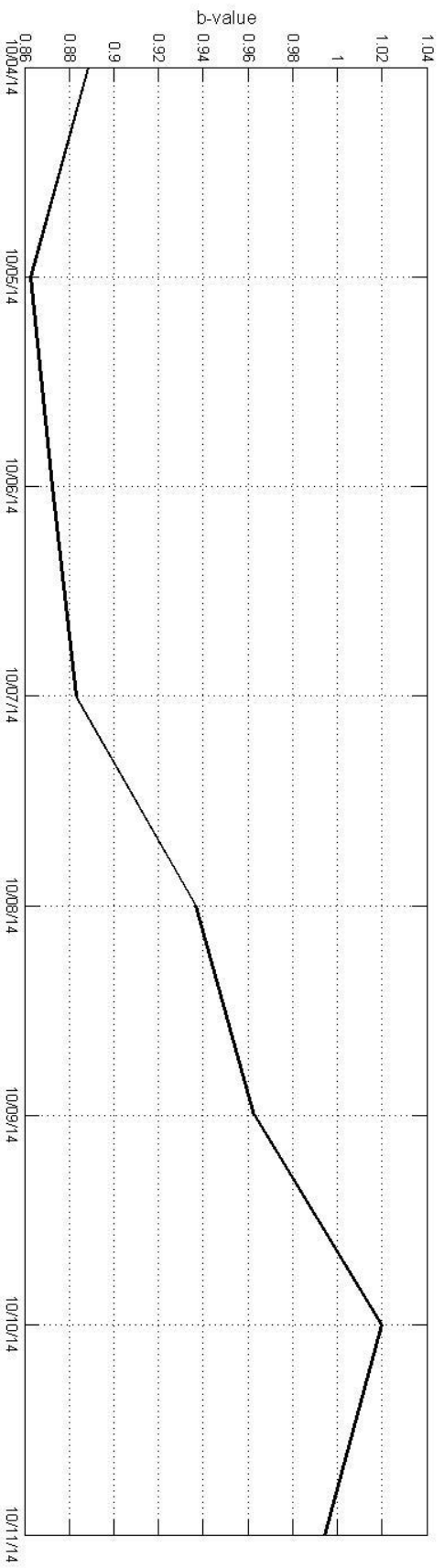
10/10/14

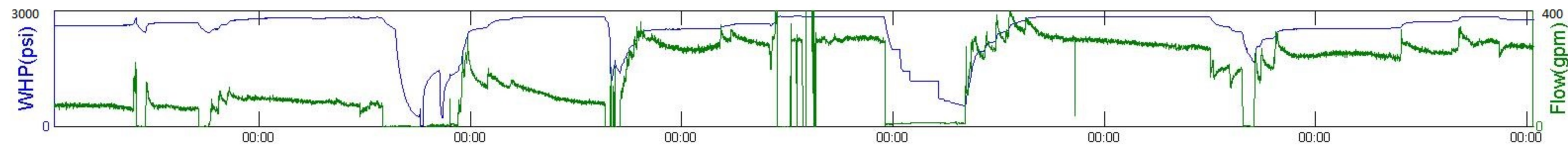
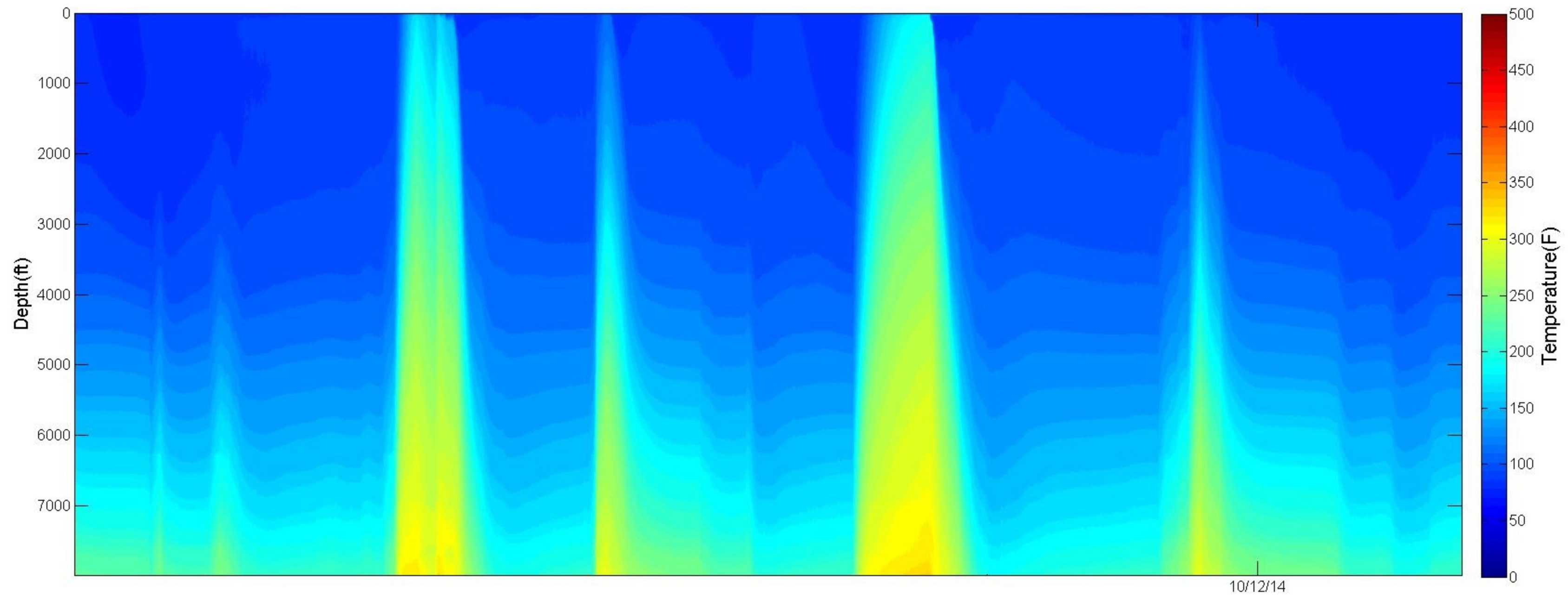


10/11/14



B-Value vs Time





Report No: 22 **Report For 13-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 22	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals ---		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Inject diverter, continue stimulation.

Planned Operations: Continue to monitor seismicity and injectivity improvement.

Wellsite Supervisors: Michael Moore, Trenton Claduhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	7:06	7.10		INJ	Maintain injection overnight, WHP held at 2765 psi.	
7:06	7:48	0.70		INJ	Ramp down pumps to try pressure cycling. Cycling wellhead pressure between 2467 psi and 2692 psi.	
7:48	10:30	2.70		REPR	Ramp down and turn off pumps for DIVA loading. Repair leaking on bypass valve #2.	X
10:30	16:21	5.85		INJ	Pump 1 back on at 10:31. Pump 2 back on at 10:42. WHP reached 2650 psi. Slow pumps down to 2200 psi at 13:50 to bleed off pressure for diverter injection.	
16:21	16:55	0.57		INJ	Load and pressurize DIVA. Inject pill #1, 150 lbs of AltaVert 251 at 16:21. Reload DIVA and inject pill #2, 150 lbs of AltaVert 251 at 16:55.	
16:55	21:10	4.25		INJ	Maintain 2404 psi WHP, 80 gpm injection.	
21:10	23:05	1.92		INJ	Step-up to and maintain WHP at 2500 psi.	
23:05	23:59	0.90		INJ	Step-up to and maintain WHP at 2600 psi.	

Management Summary

The outlet flow valve was discovered to be not fully closed, which was allowing approximately 95gpm to exit. After shutting in the valve completely, ultrasonic flow measurements reduced.

Comments

Successfully injected two, 150 lb pills of AltaVert 251 using DIVA system today. Pressure and flow response indicate successful diverter application.

Seismicity: 7 new events today.6 before diversion.

Cumulative injected volume 3,328,000 gallons

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 45.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Hi 59	

Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 23 **Report For 14-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 23	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals	---	---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Test AltaVert fiber. Continue stimulation.

Planned Operations: We will pull out the DTS cable and log the well with a pressure-temperature tool. Both injecting and flowing profiles will be collected. We learned this morning that the replacement DTS was damaged during final manufacture. The results of tomorrow's logging will determine the next steps.

Wellsite Supervisors: Michael Moore, Trenton Claduhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	1:15	1.25		INJ	Maintain 2635 psi WHP.	
1:15	8:28	7.22		INJ	Ramp up to 2829 psi WHP.	
8:28	11:30	3.03		REPR	Generator trip. Troubleshoot generator.	X
11:30	16:10	4.67		INJ	Re-start pumps and ramp-up injection. 15:00 generator trip while receiving maintenance from Peterson mechanic. Restart generator and pumps.	
16:10	17:50	1.67		INJ	Fill DIVA and pump diverter- one 15 lb pill of AltaVert fiber injected	
17:50	23:59	6.15		INJ	Ramp up to 2808 psi WHP; 90 gpm injection.	

Comments

Successfully injected one 15 lb pill of AltaVert Fiber using DIVA system today. Pressure and flow response is uncertain at this time – will require further analysis.

Two generator trips required Peterson CAT mechanical support on-site. Road repair work continued throughout the day.

A reporter and photographer from the Bend Bulletin visited in the morning. Members of the Sunriver and La Pine chambers of commerce and city council visited in the afternoon.

Seismicity: 4 new events.

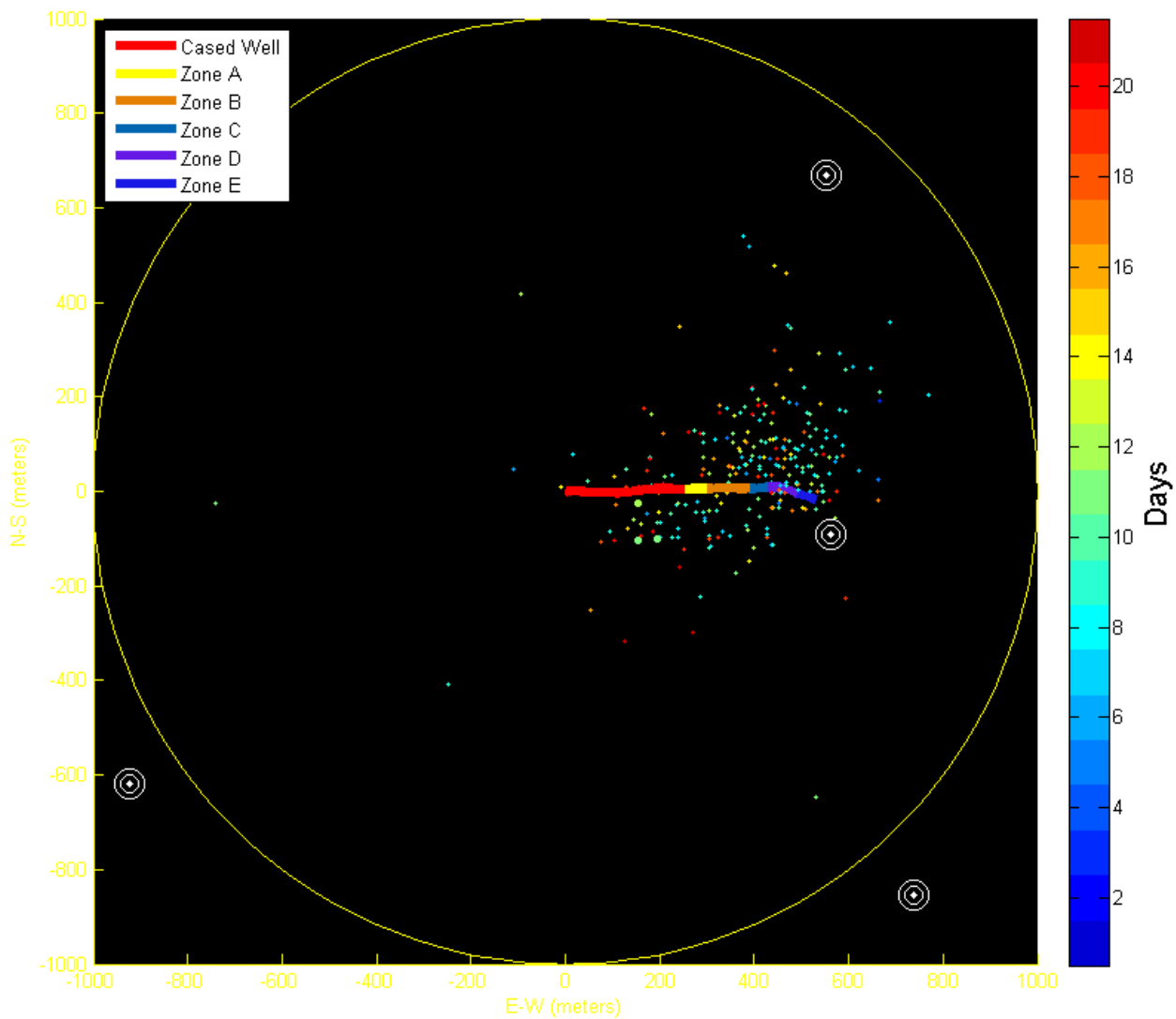
Cumulative injected volume 3,423,000 gallons

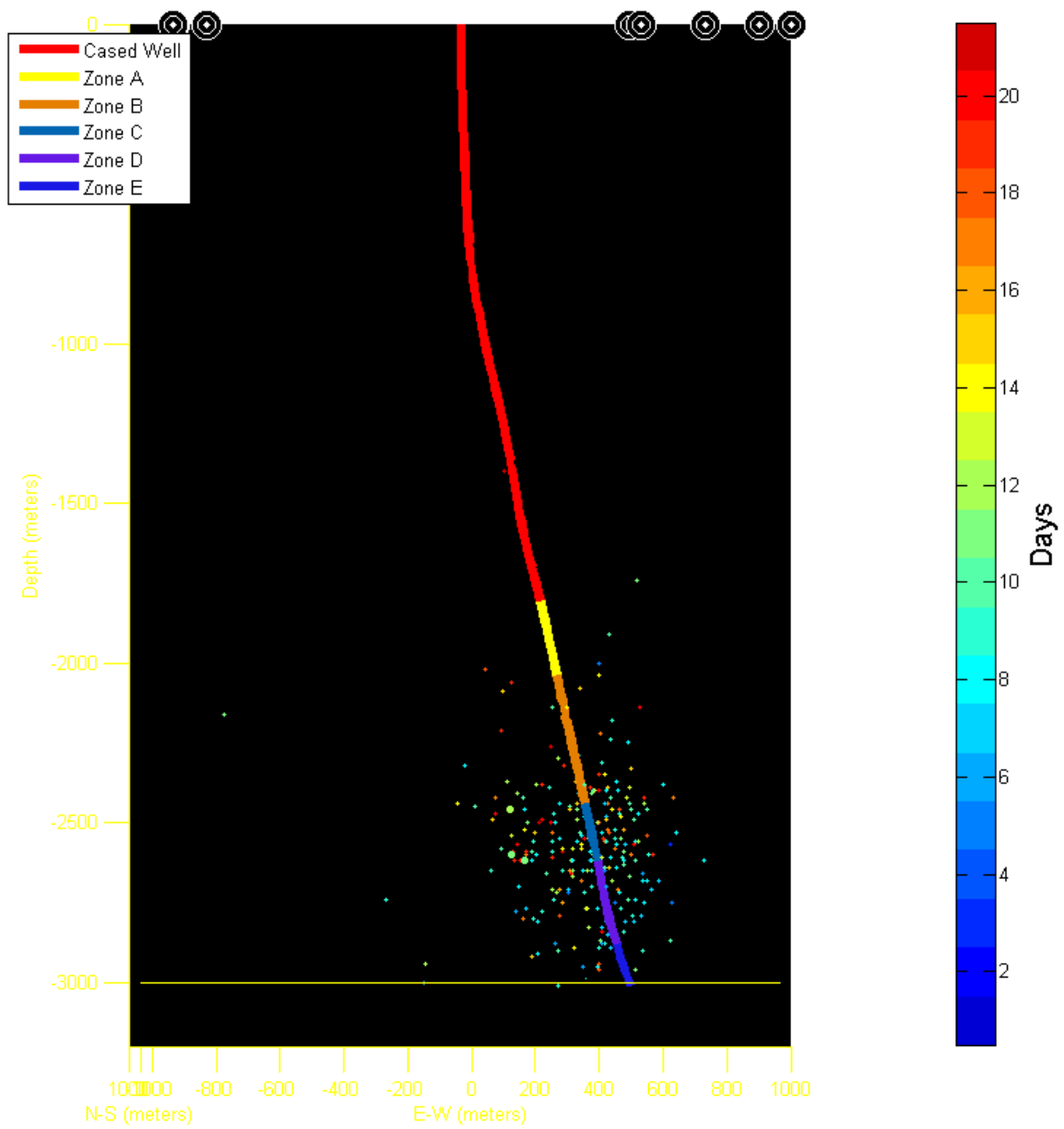
Casing/Tubular Information

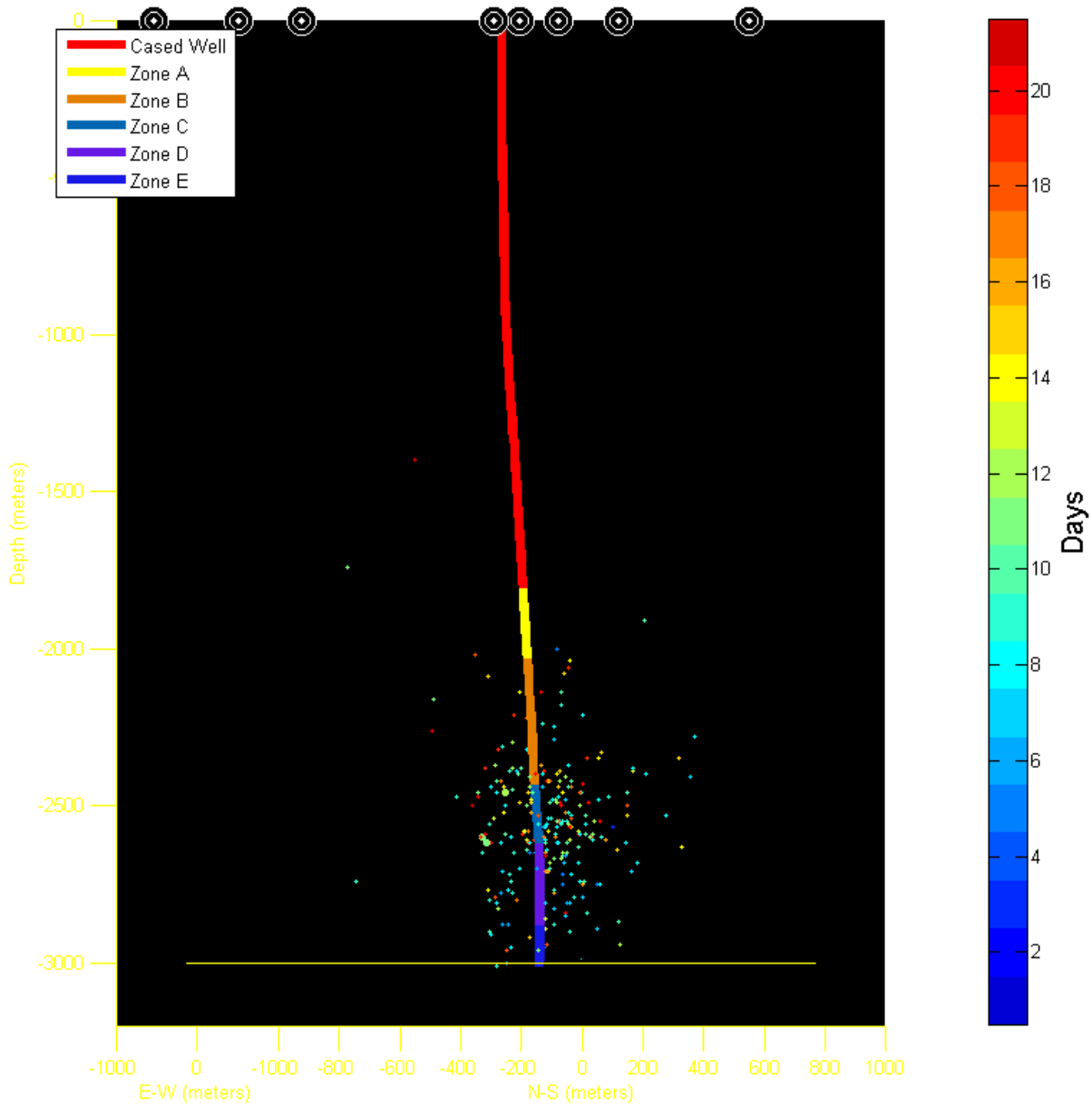
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

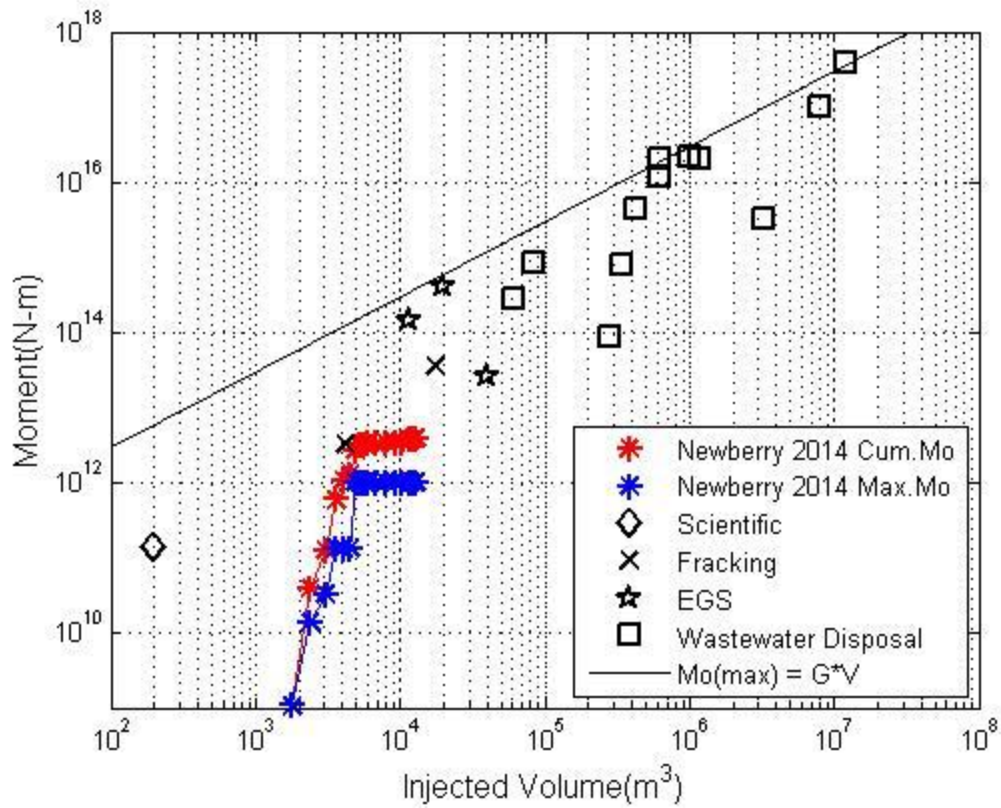
Sky Condition: Clear skies, turned to light rain in evening	Visibility:
Air Temperature: 39.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Hi 56	



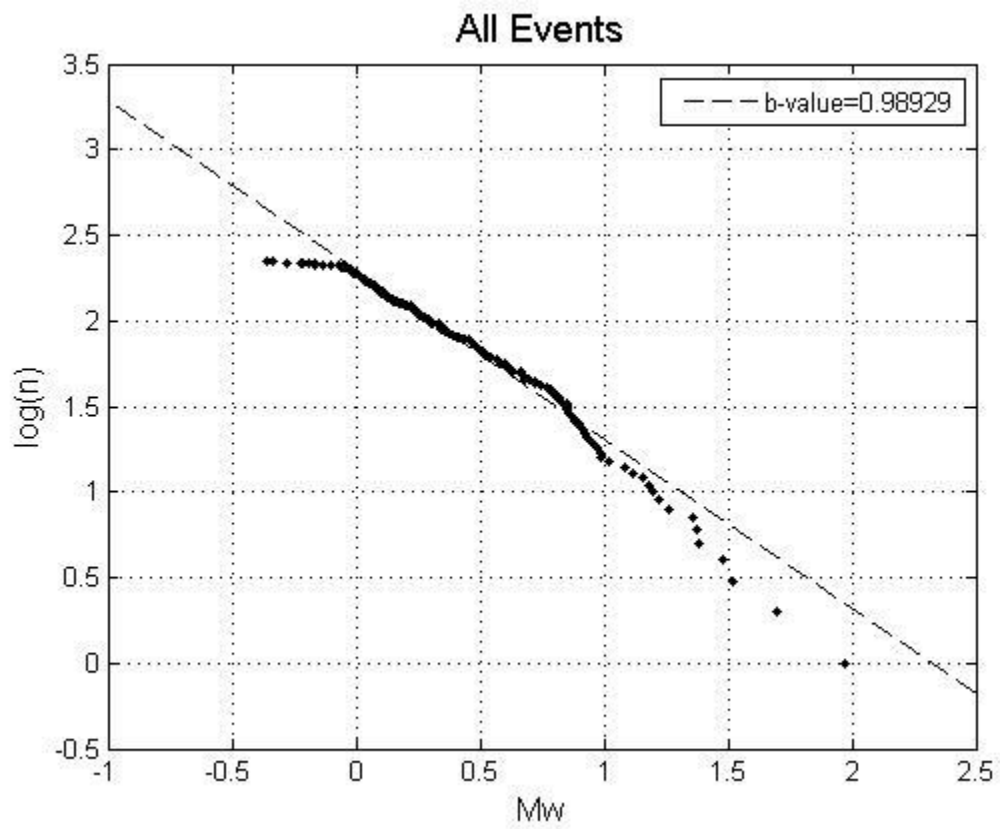




Cumulative and Maximum Moment vs. Injected Volume compared to other injection projects

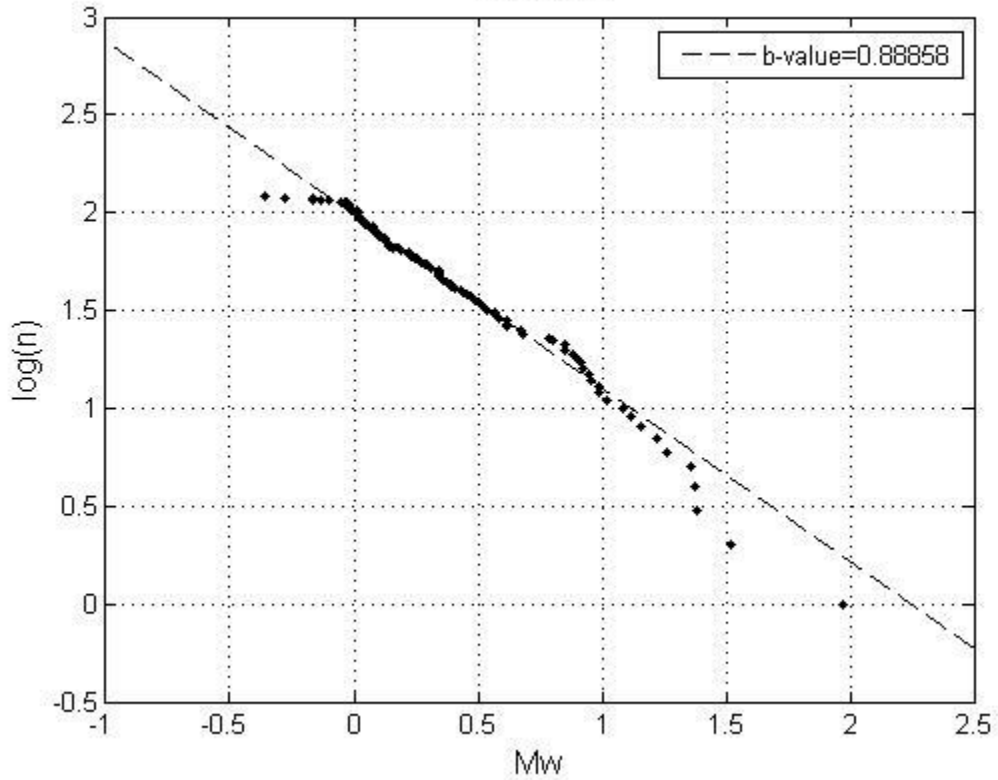


Microseismic Event Size Distribution (B-Value)

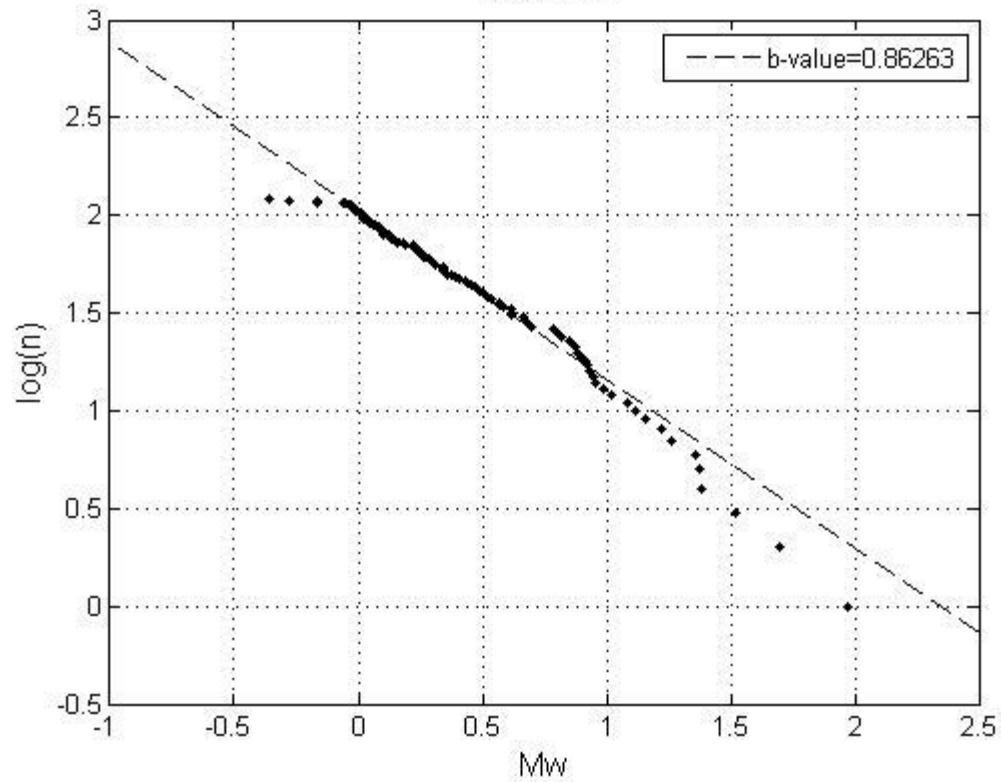


Temporal Evolution of B-Value

10/04/14

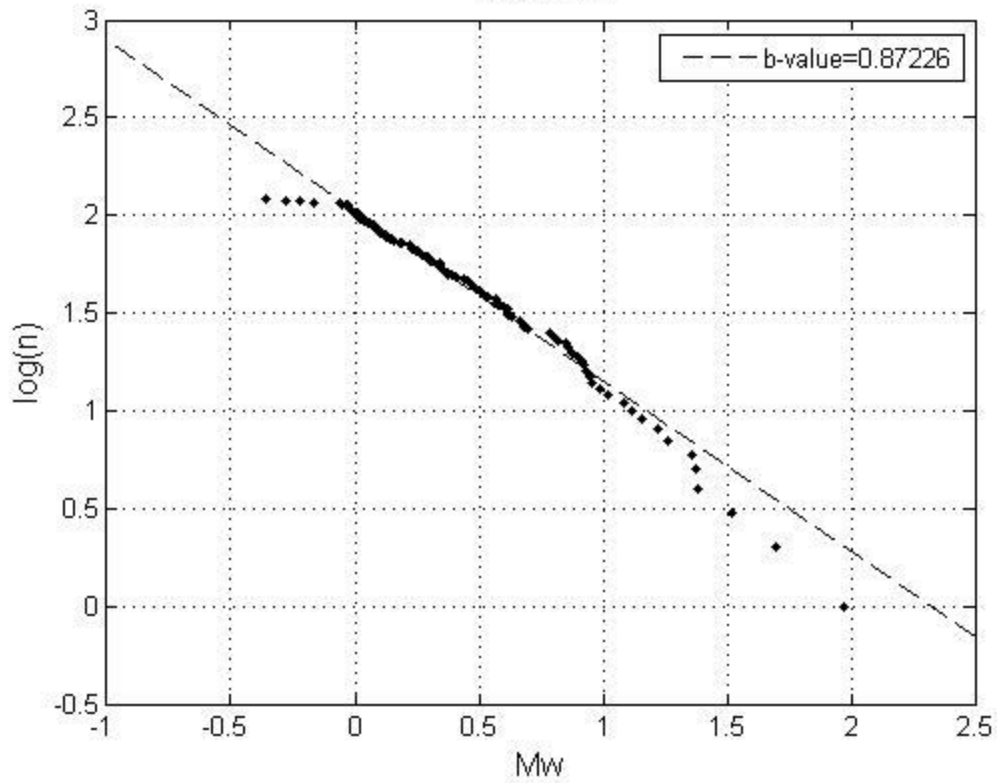


10/05/14

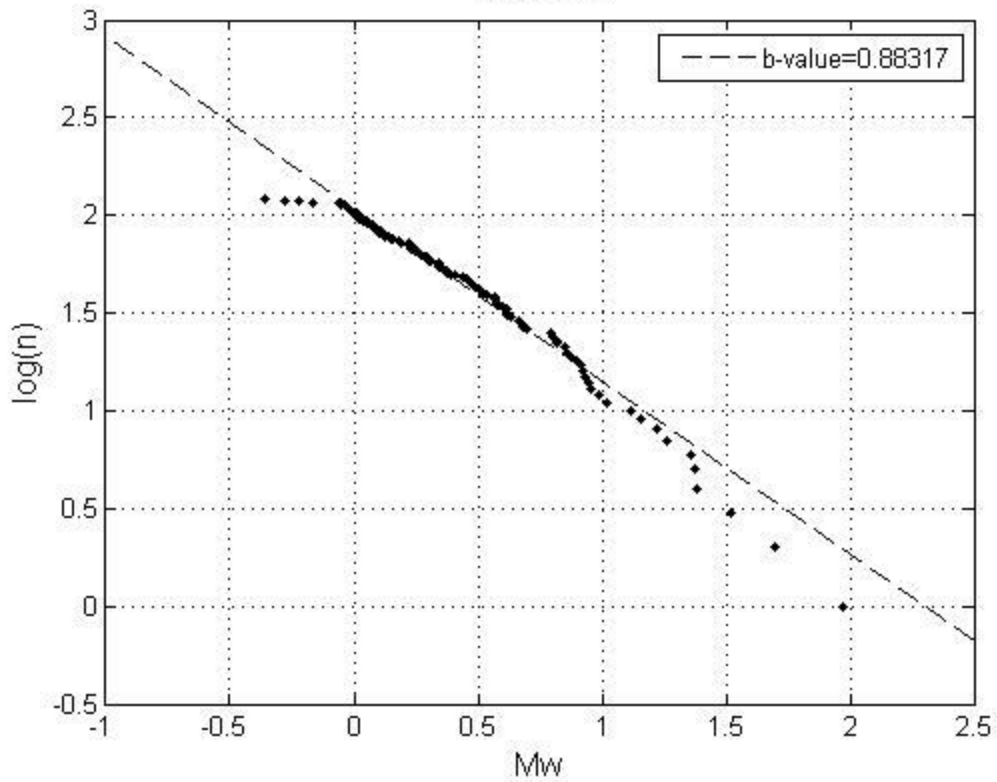


Temporal Evolution of B-Value

10/06/14

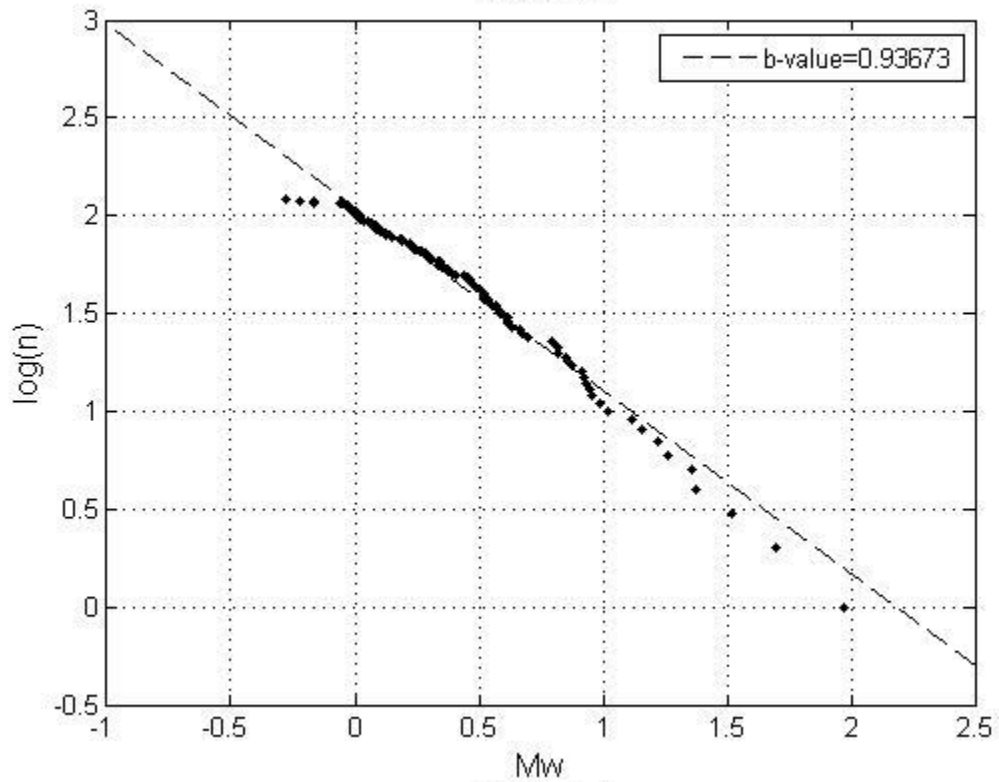


10/07/14

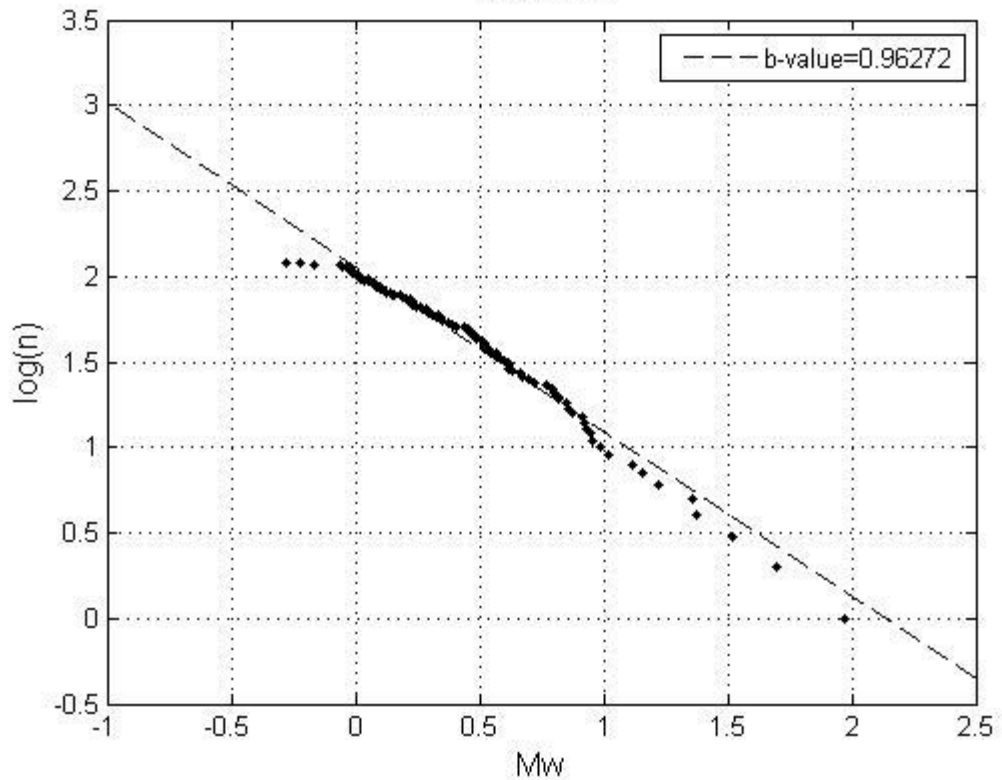


Temporal Evolution of B-Value

10/08/14

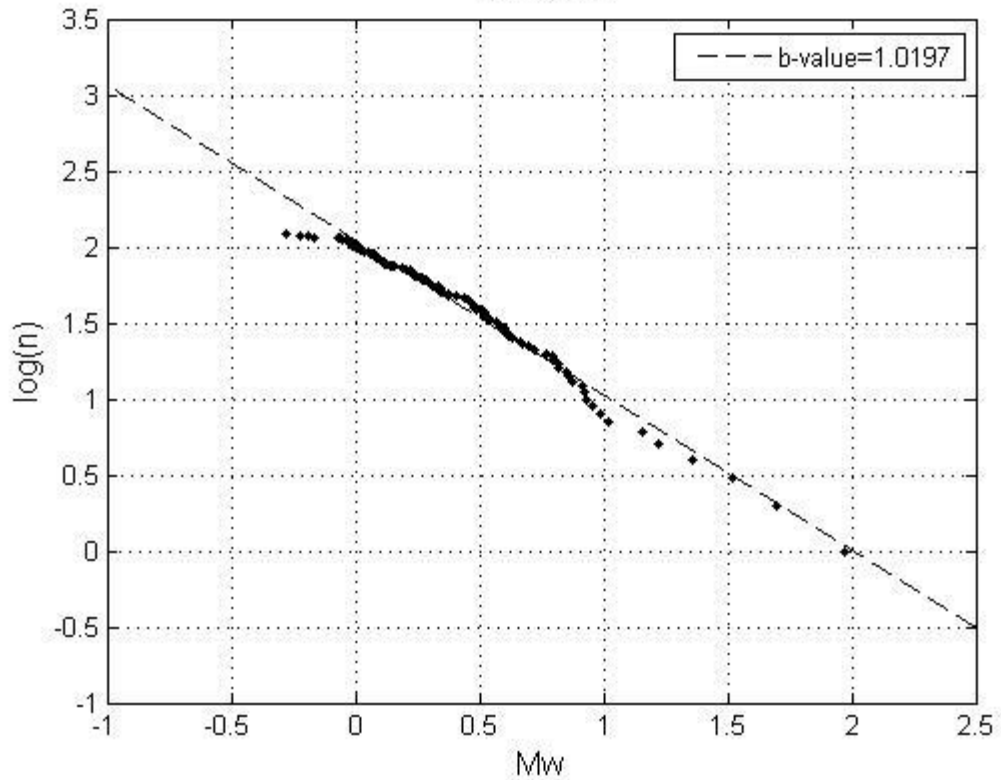


10/09/14

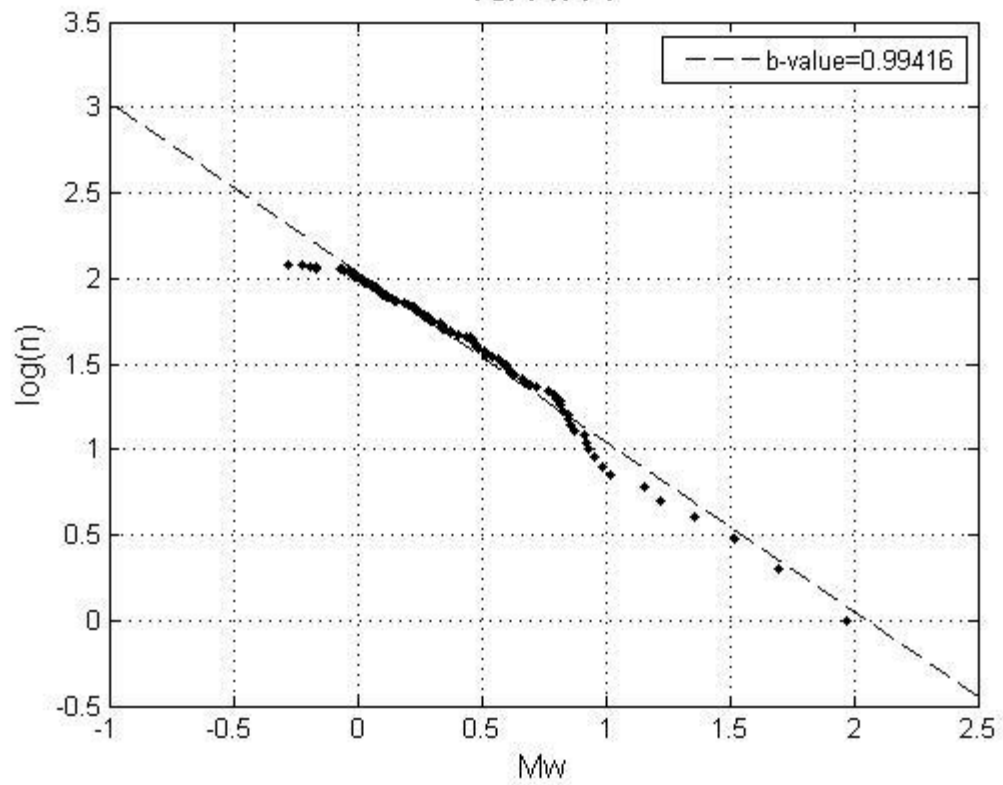


Temporal Evolution of B-Value

10/10/14

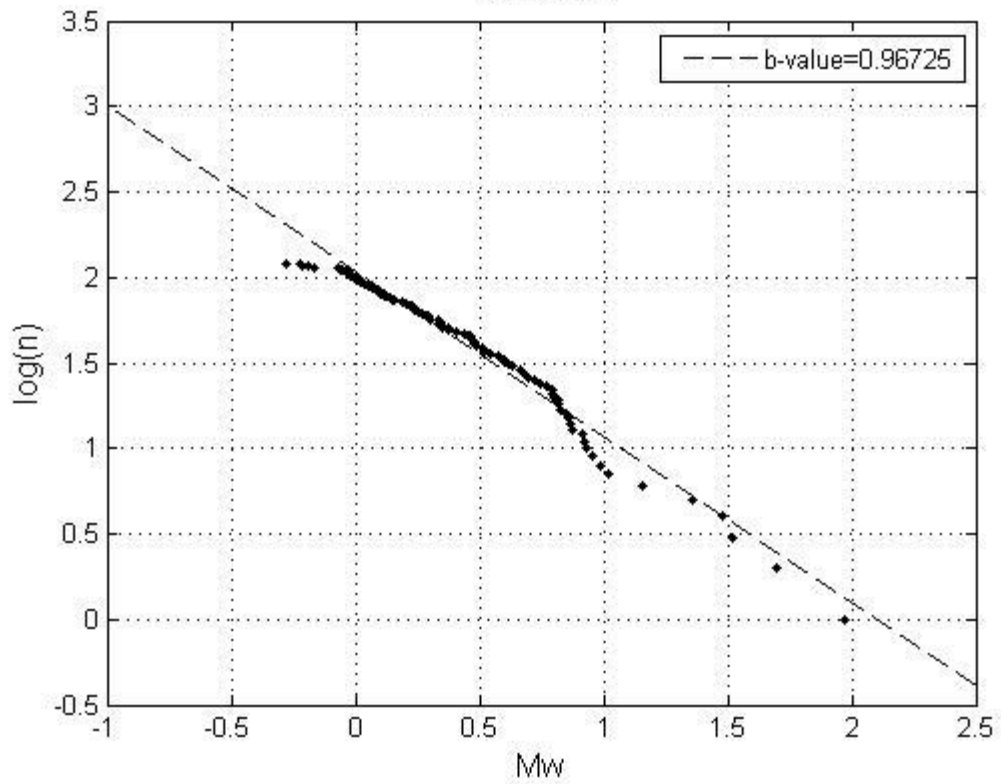


10/11/14

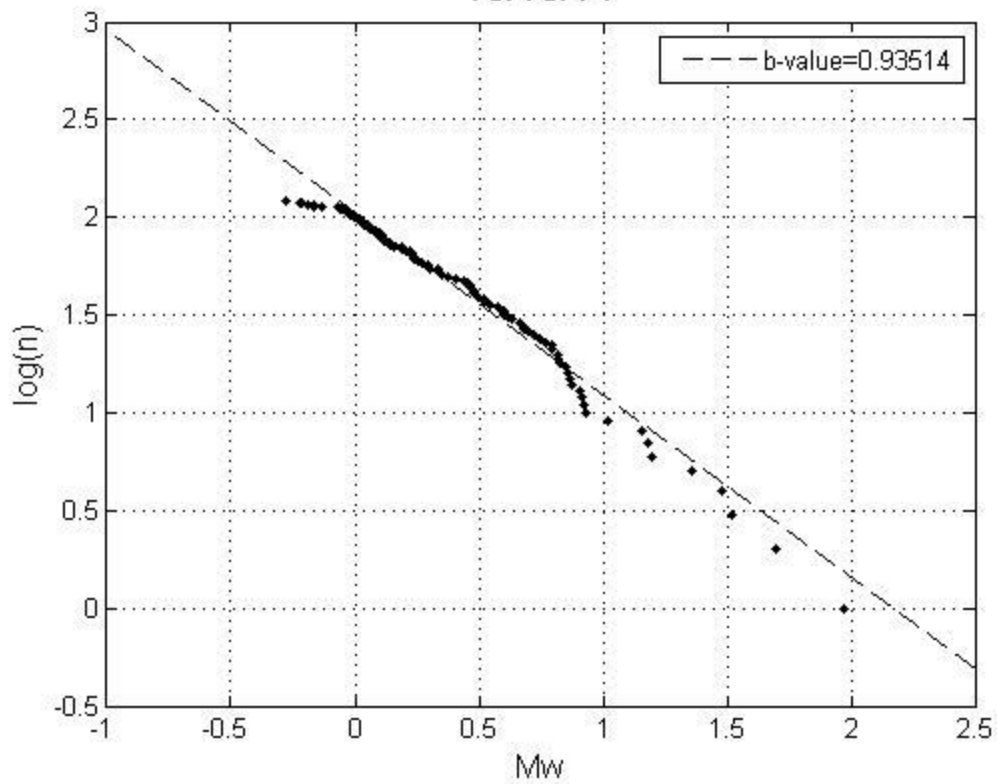


Temporal Evolution of B-Value

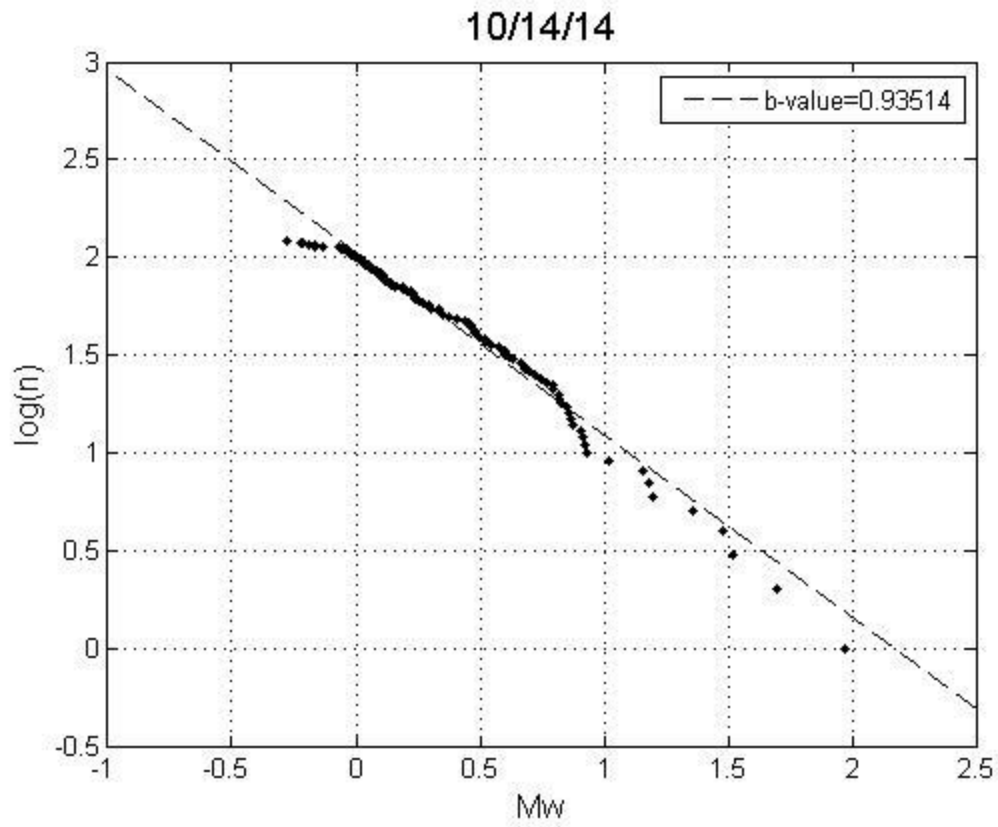
10/12/14



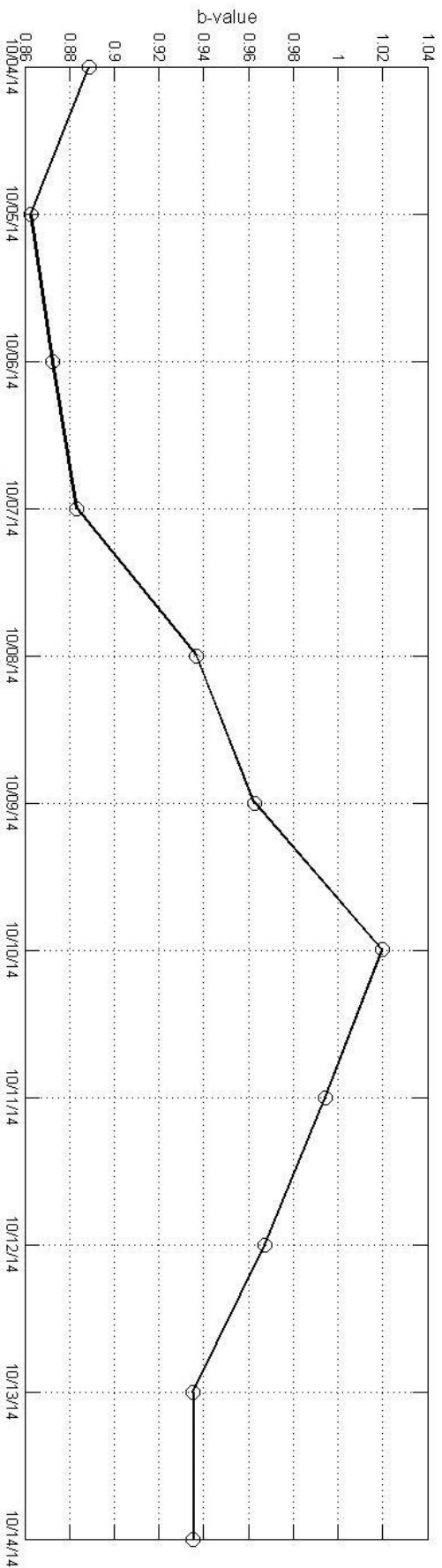
10/13/14



Temporal Evolution of B-Value



B-Value vs Time



Report No: 24 **Report For 15-Oct-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 24	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals ---		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Remove DTS. Run PT survey of entire wellbore, conduct step-rate injectivity test and pressure fall-off test.

Planned Operations: Go into hibernation mode, while data is analyzed, budget checked.

Wellsite Supervisors: Michael Moore, Trenton Claduhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	8:53	8.88		INJ	WHP dropped to 2567 psi (minor cycling test). Increases WHP to 2770 psi and held over night.	
8:53	11:36	2.72		POH	Wellaco on site. Shut down pumps at 8:53 and prepare for DTS removal. Well bled off from 2612-1533 psi through DIVA. DTS out of hole by 11:36. Partial tubing break observed at 847ft BGS. Multi-mode fibers still functional.	
11:36	14:22	2.77		WOE	Well-shut in while preparing to run PT survey. WHP builds from 1516 to 1920 psi. 13:45: put well on 200-300 gpm flowback to reduce WHP to 595 psi in order to run survey.	
14:22	15:23	1.02		RIH	Ran in hole with PT tool while well flowing back at ~100 gpm and pressure declined from 712 to 487 psi. Ran tool to 9800 ft.	
15:23	17:45	2.37		INJ	Started pumps and held PT tool at 9800ft. 16:30: POOH logging 9800ft to 4000ft interval with well under injection at 2200 psi WHP and 200 gpm.	
17:45	18:15	0.50		INJ	PT tool parked at 4000 ft (static temperature of 300F). Step-rate test with tool in hole. Finish 2200 psi step. Flow stabilized at 83 gpm.	
18:15	20:45	2.50		INJ	2500 psi step. Flow quasi-stable at 105 gpm.	
20:45	22:30	1.75		INJ	2800 psi step. Flow quasi-stable at 130 gpm	
22:30	23:49	1.32		TEST	Pumps and generators shut down. Begin 11 hour pressure fall-off test with PTS tool set at 4000ft.	

Comments

Seismicity: 3 events.

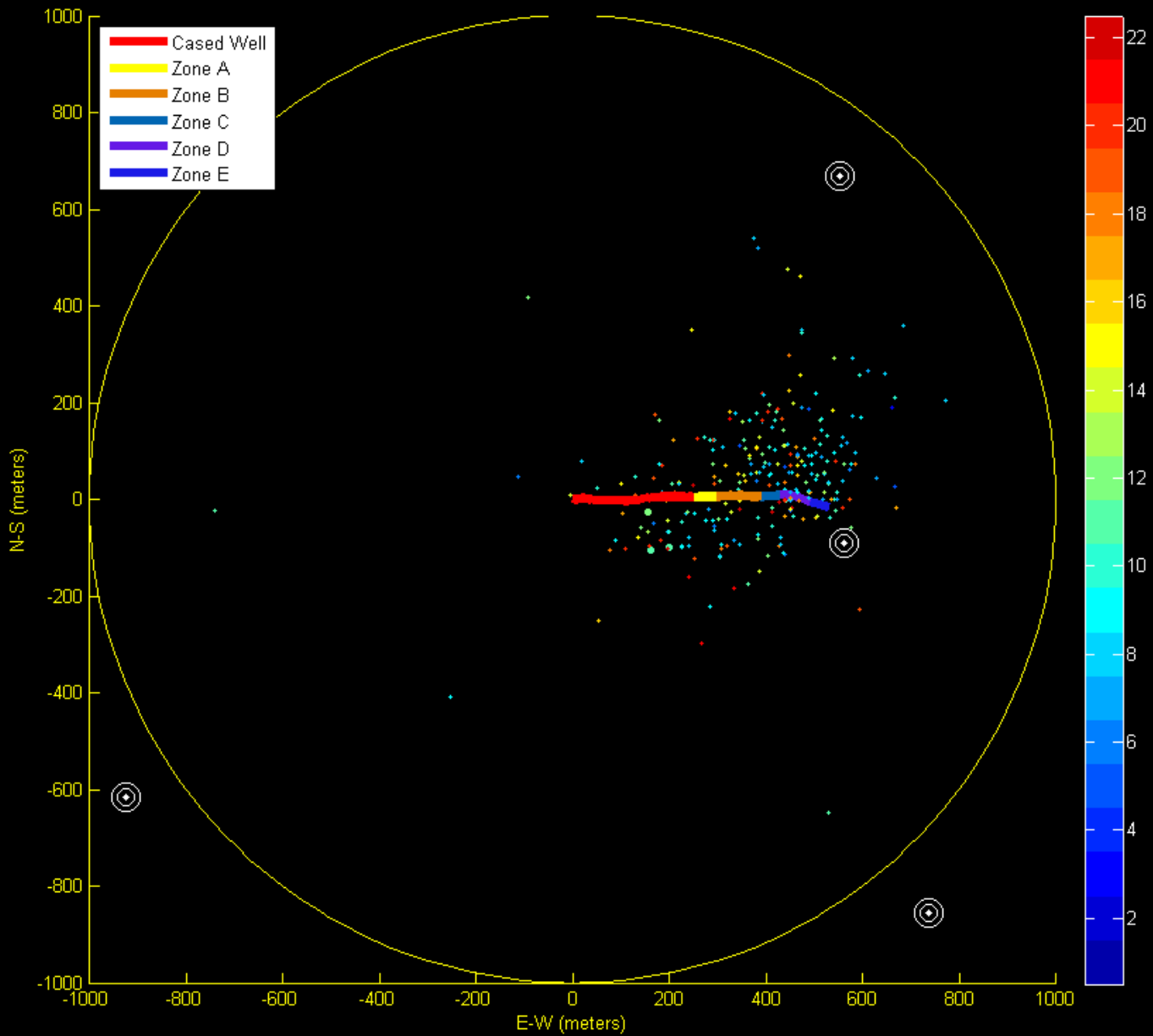
Cumulative injected volume ~3,500,000 gallons (expect revision)

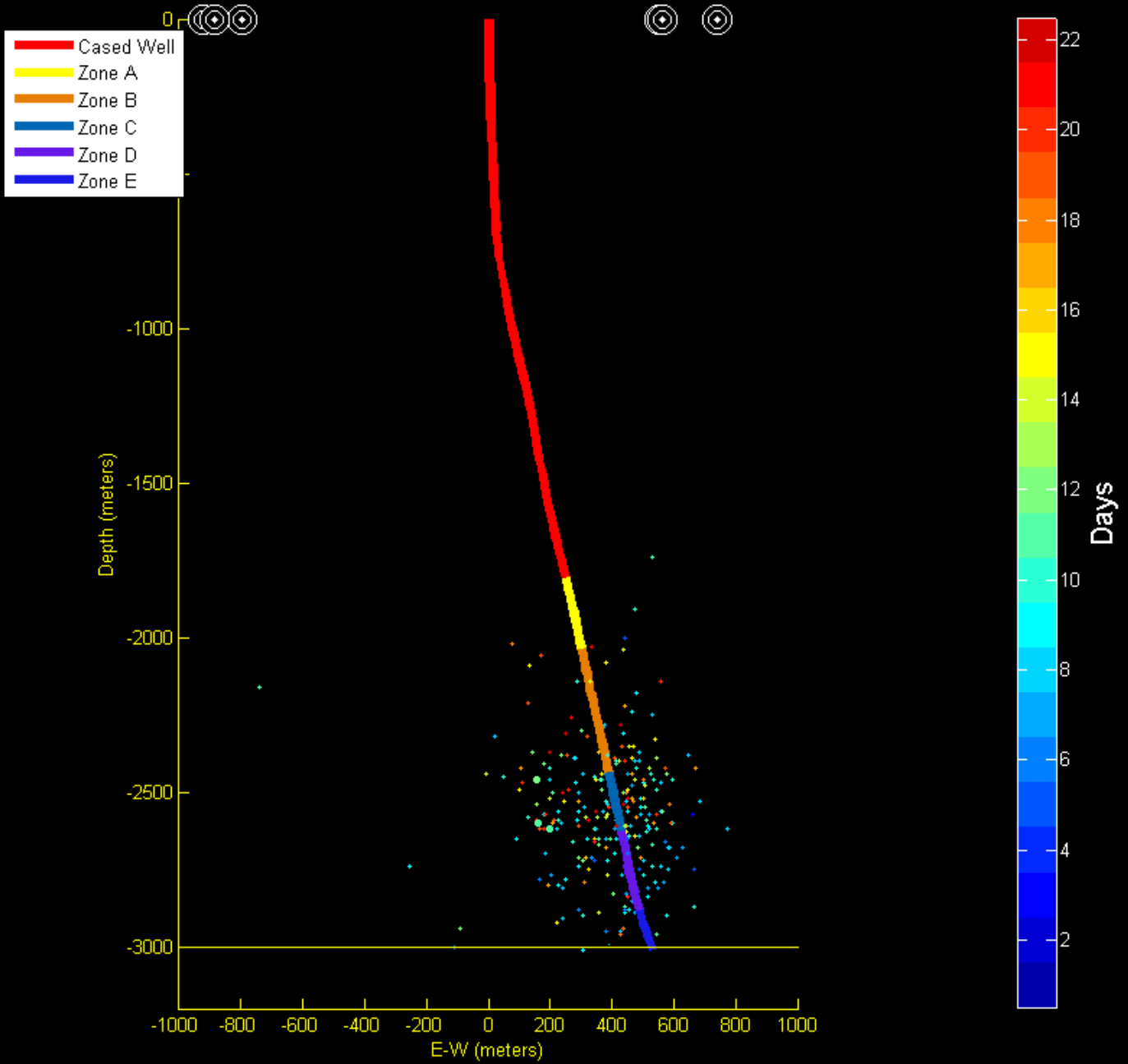
Casing/Tubular Information

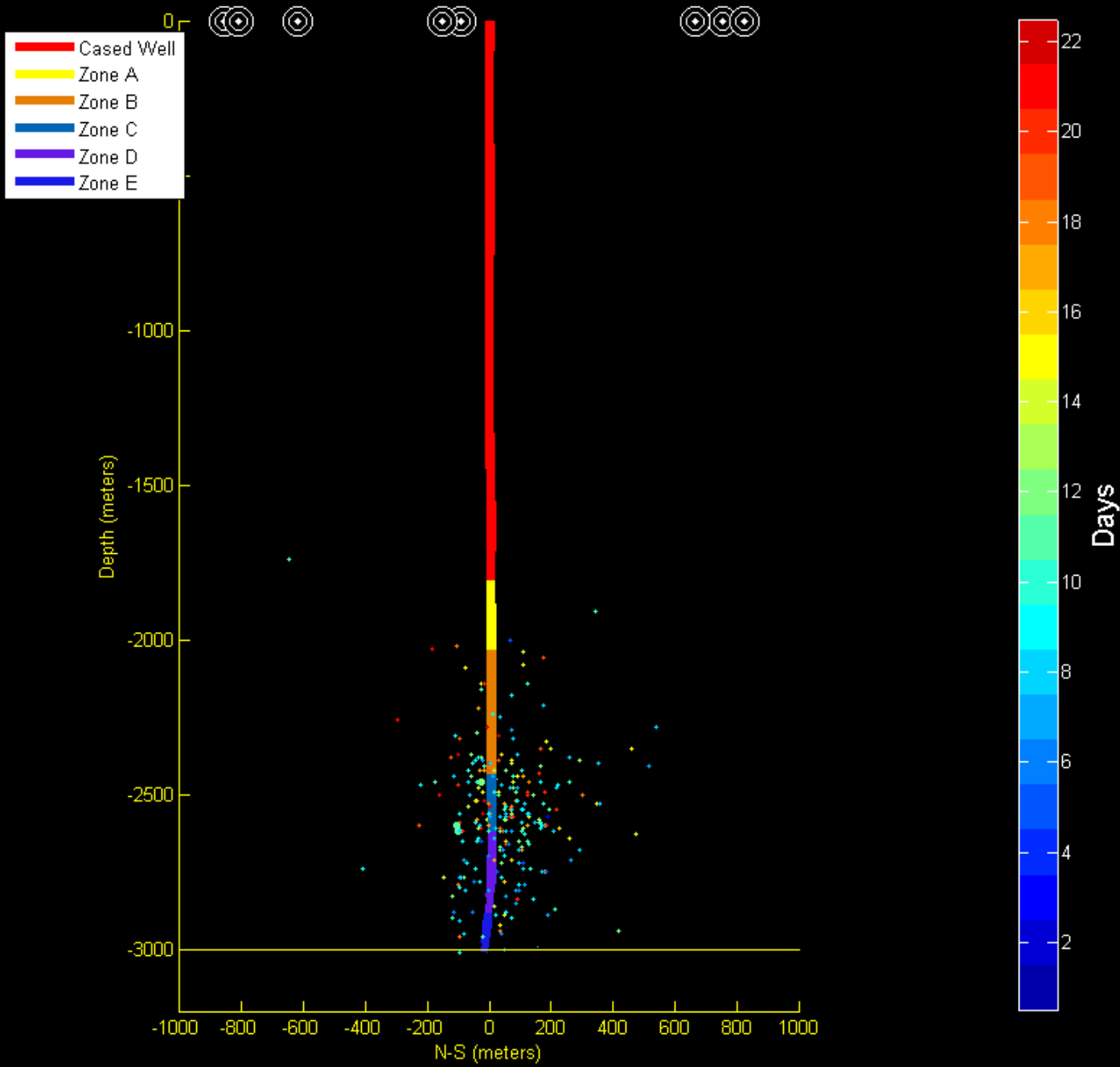
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

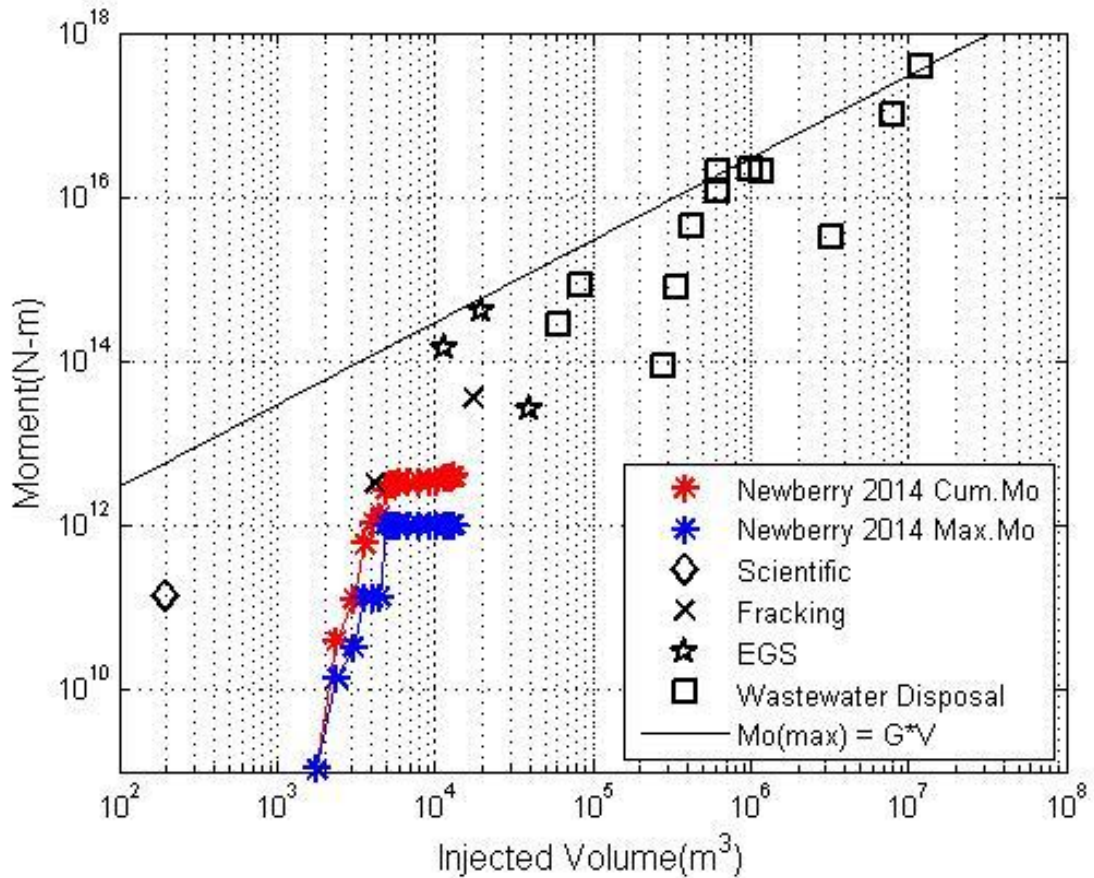
Sky Condition: Snow flurries and gusty wind at times	Visibility:
Air Temperature: 34.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Hi 51	



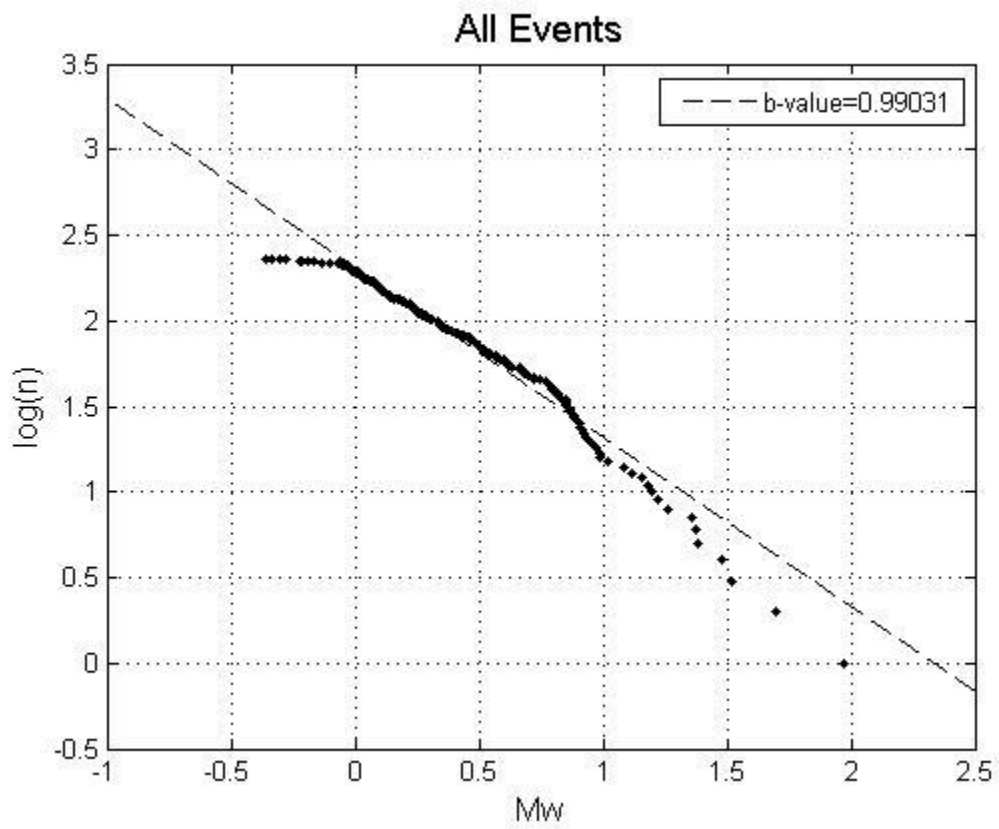




Cumulative and Maximum Moment vs. Injected Volume compared to other injection projects

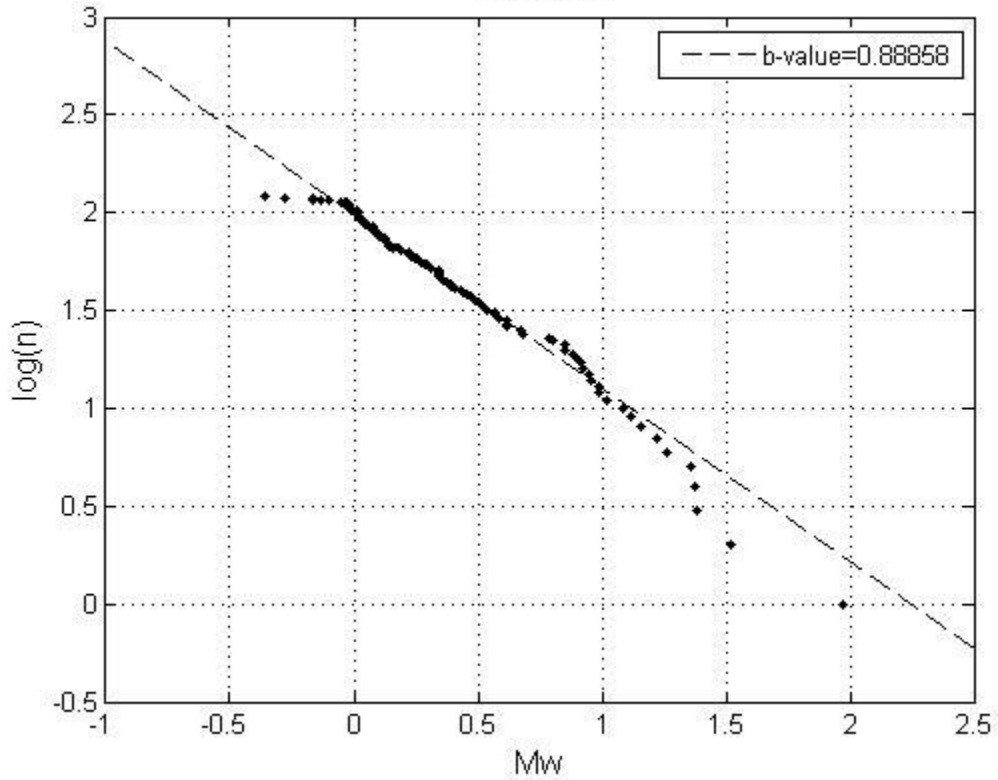


Microseismic Event Size Distribution (B-Value)

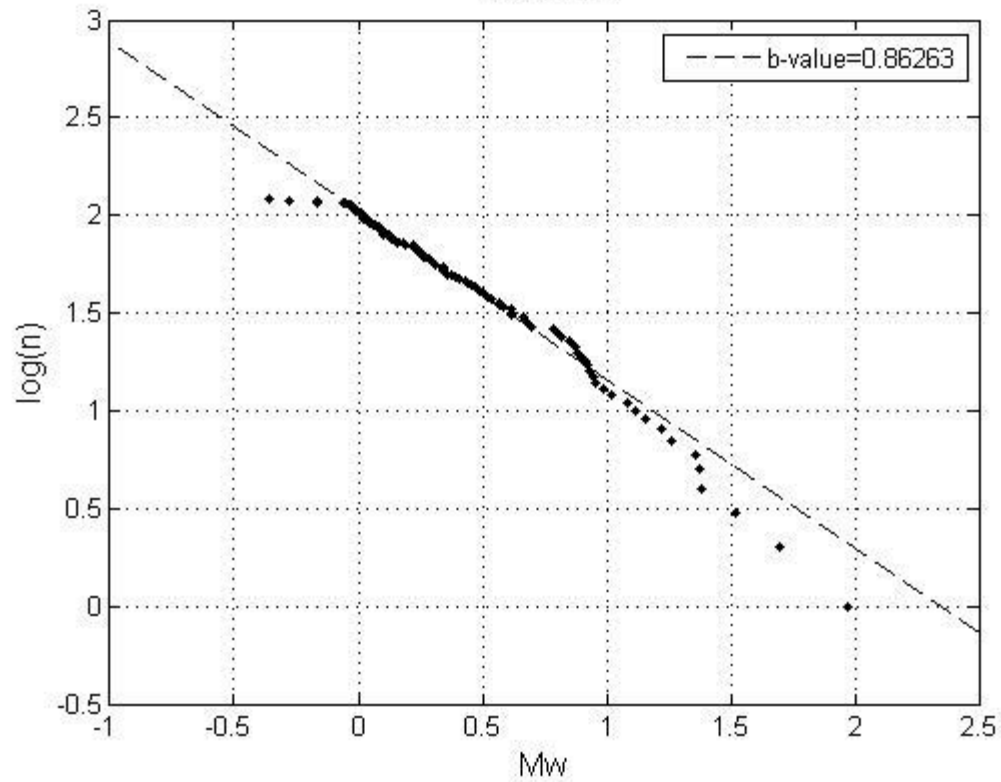


Temporal Evolution of B-Value

10/04/14

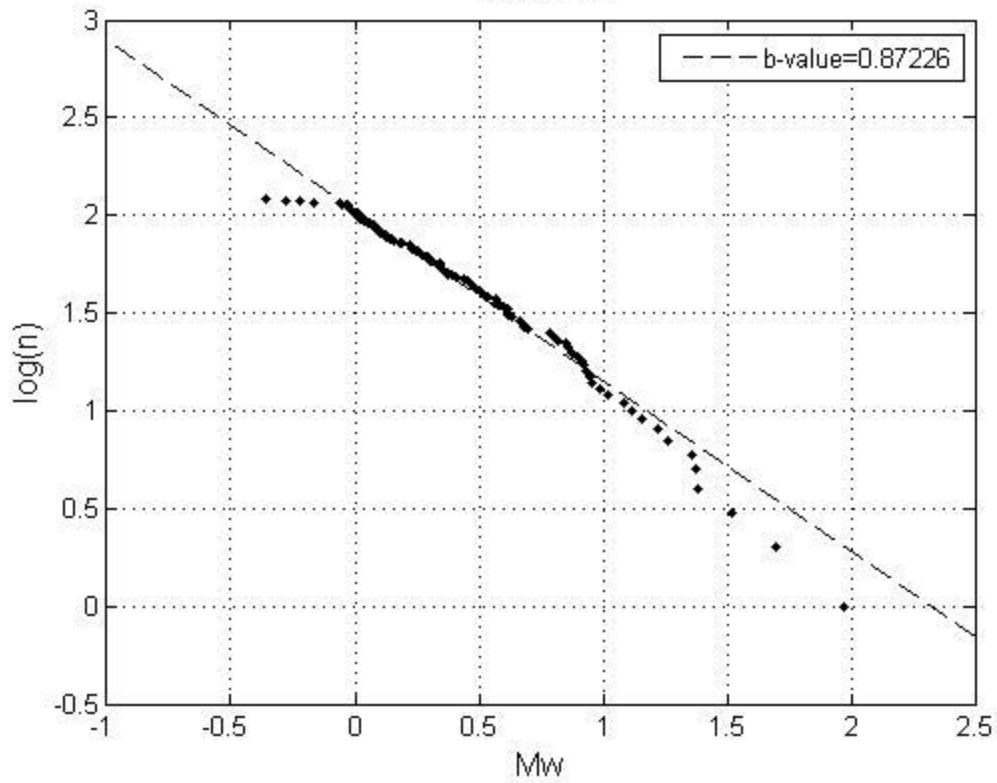


10/05/14

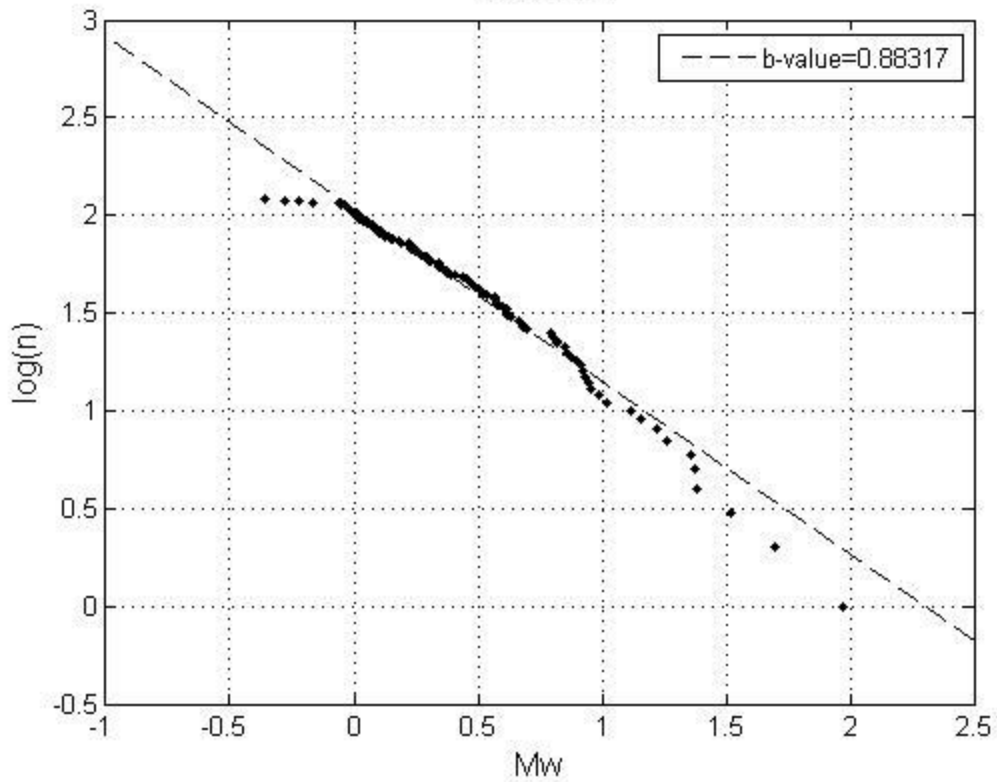


Temporal Evolution of B-Value

10/06/14

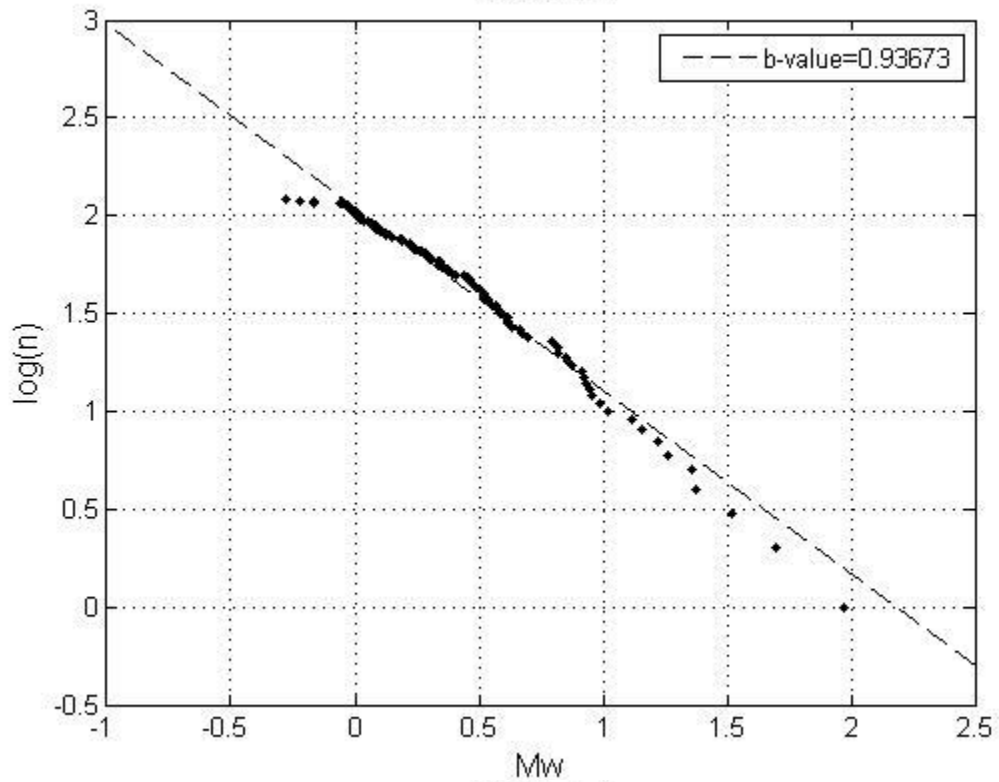


10/07/14

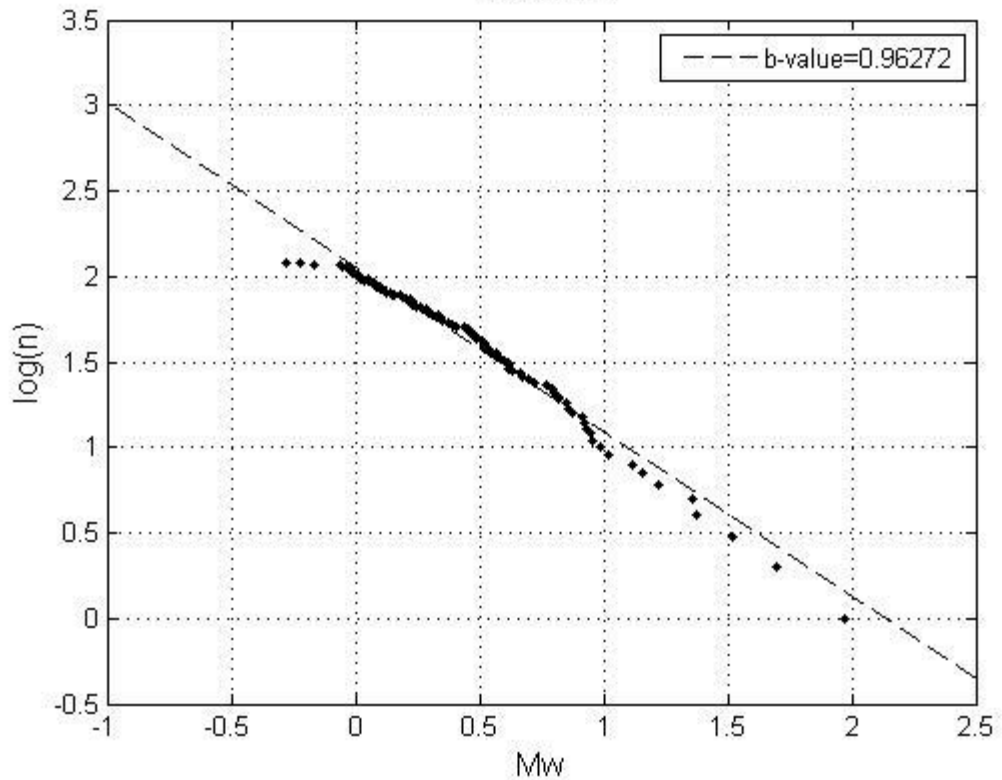


Temporal Evolution of B-Value

10/08/14

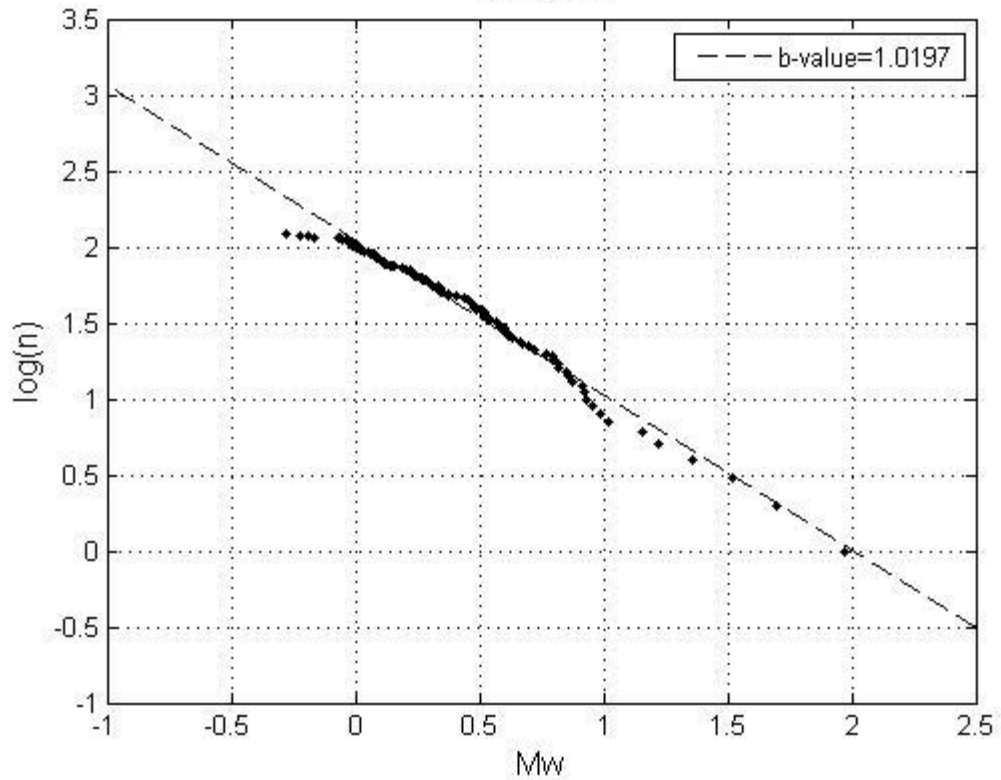


10/09/14

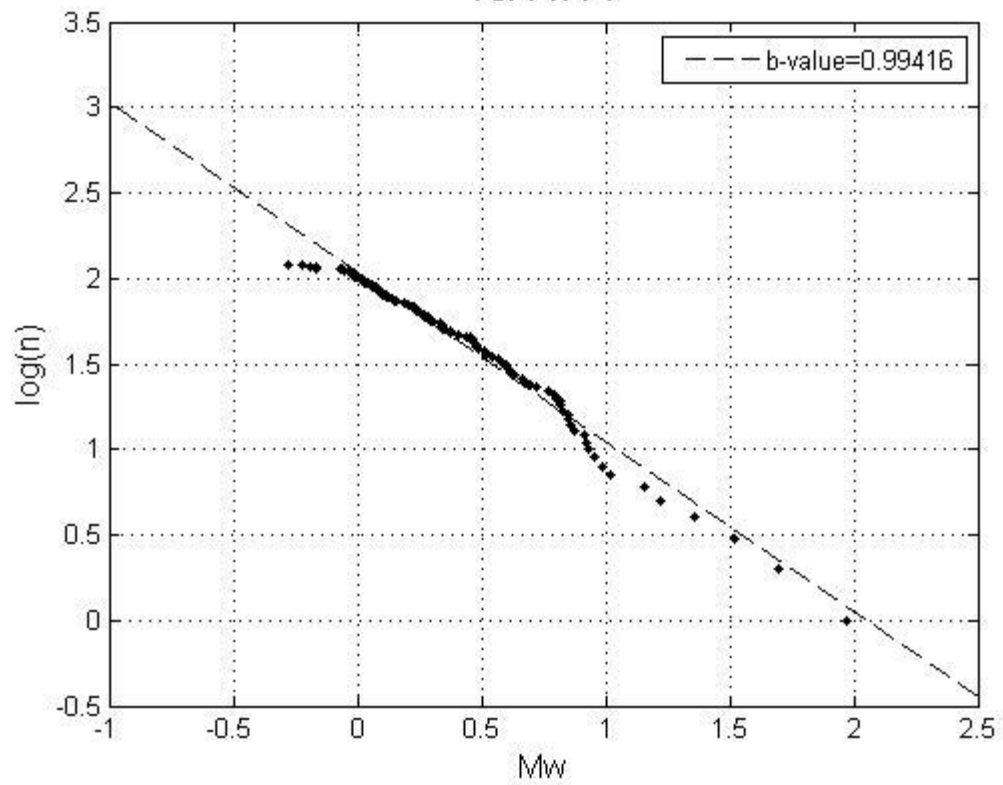


Temporal Evolution of B-Value

10/10/14

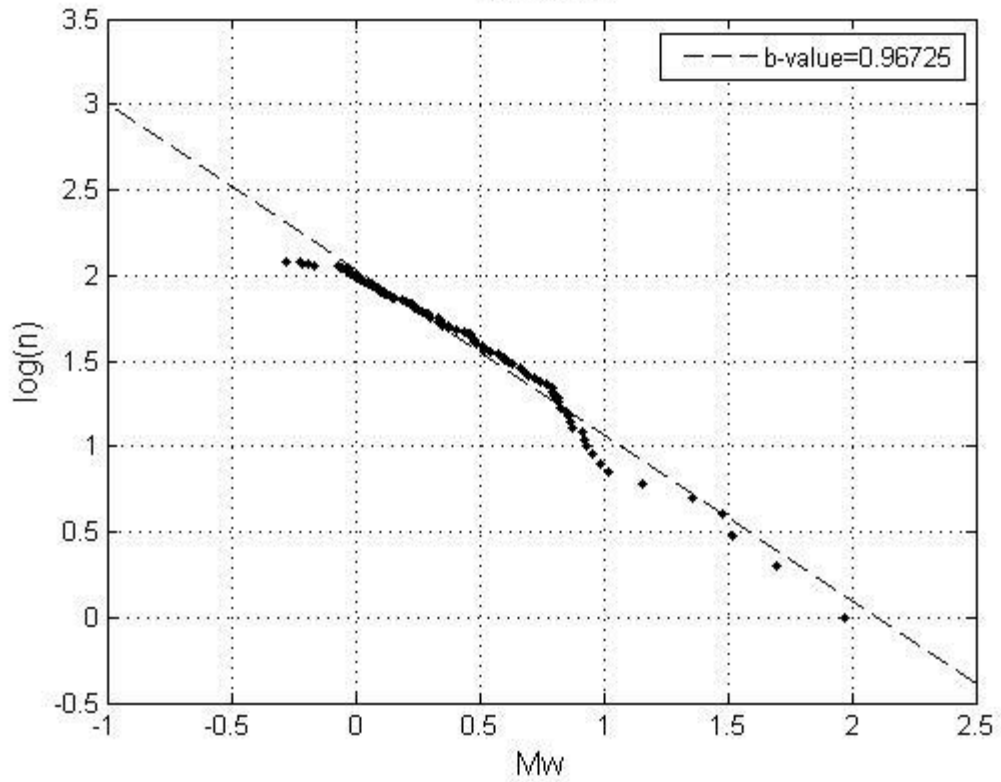


10/11/14

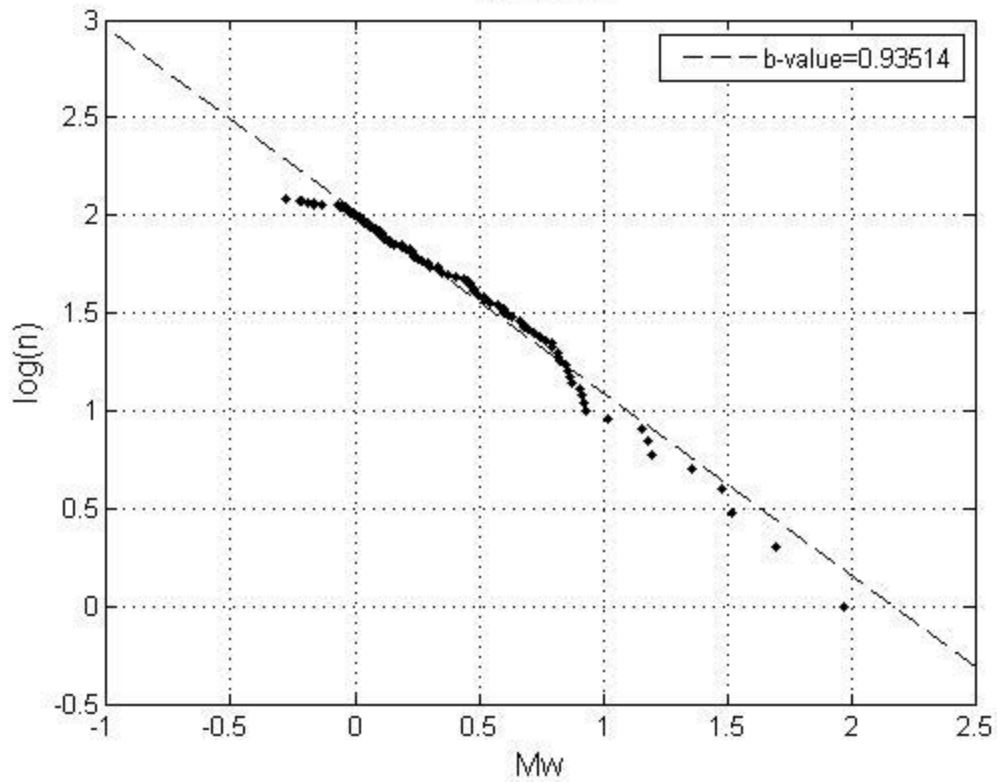


Temporal Evolution of B-Value

10/12/14

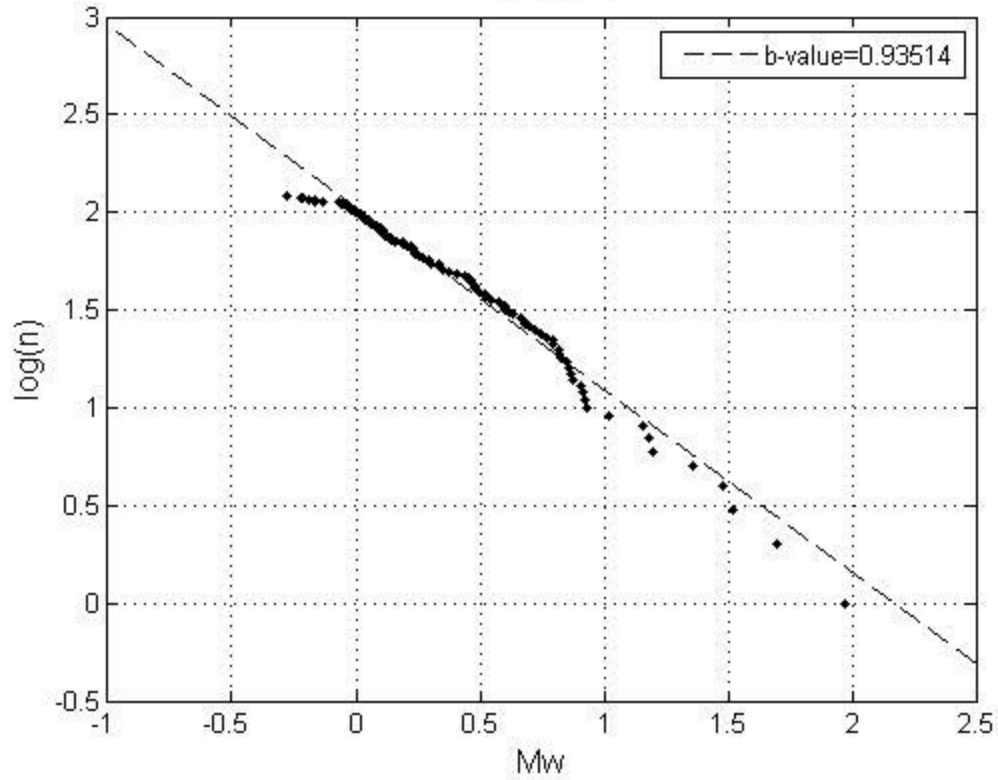


10/13/14

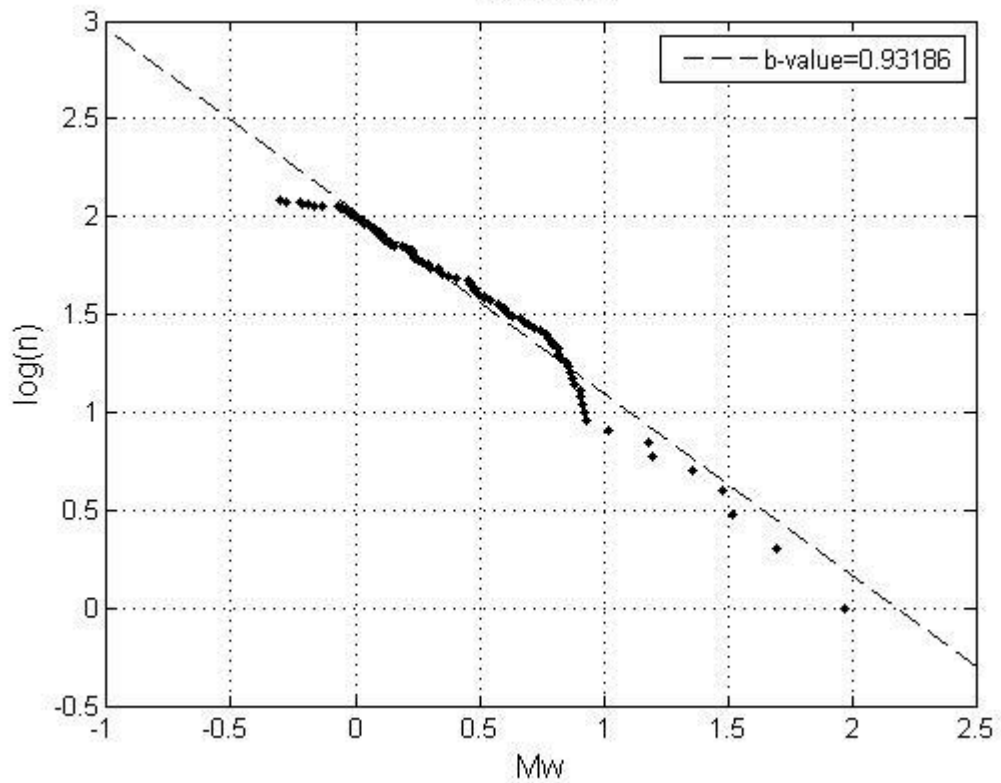


Temporal Evolution of B-Value

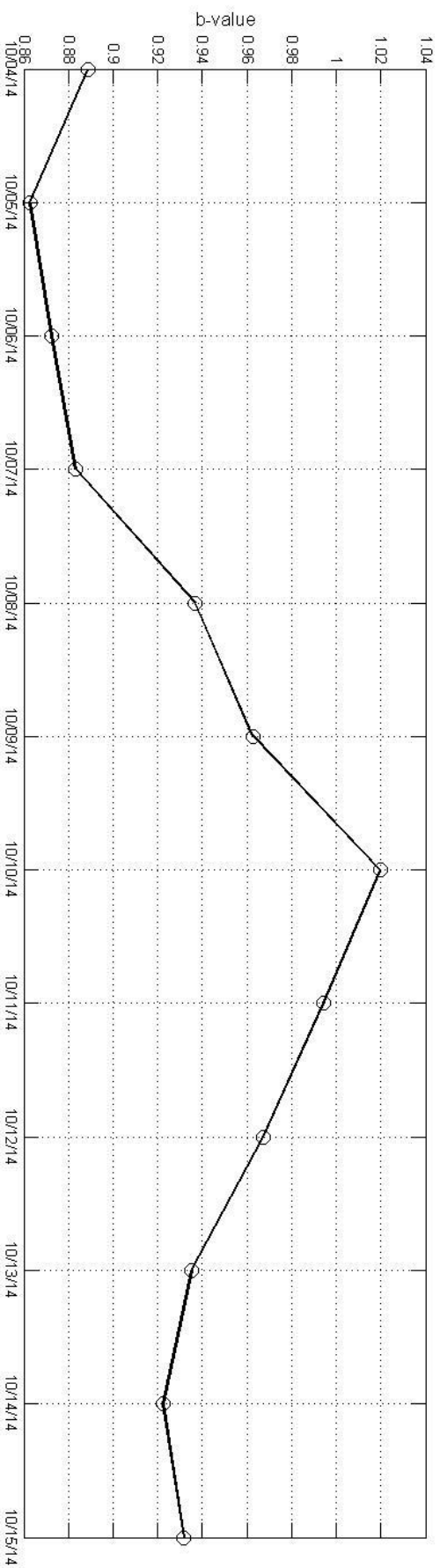
10/14/14



10/15/14



B-Value vs Time



Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 25 **Report For 11-Nov-14**

Operator:	AltaRock Energy	Rig:		Spud Date:	13-Apr-08	Daily Cost / Mud (\$):			---
Measured Depth (ft):		Drilling Days (act.):	0	Well Bore:	Original Well Bore	AFE No.	AFE (\$)	Actual (\$)	
Vertical Depth (ft):	10060	Drilling Days (plan):	68	RKB Elevation (ft):	0.00	---	---	---	
Proposed TD (ft):	10000	Days On Location:	25	Last BOP Test:		---	---	---	
Hole Made (ft) / Hrs:	0 / 0.0	Last Casing:	7.000 at 9,990			Totals	---	---	
Average ROP (ft/hr):		Next Casing:		Working Interest:		Job/Well Cost (\$):	---	---	
Personnel: Operator:		Contractor:		Service:		Other:		Total:	0

Current Operations: Restart generator and pumps. Conduct injectivity test

Planned Operations: Continue step rate test to 2200 psi. Re-calibrate WHP gauge tomorrow. Inject to cool wellbore in preparation for perf shots

Wellsite Supervisors: Michael Moore, Ted De Rocher **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	10:30	10.50		IDLE		
10:30	14:51	4.35		WOE	10:30 Started generator, turned on heaters, removed ice from pumps/pipes etc. Circulated oil through stim pumps to prep for startup in cold weather. 14:40 Re calibrated stim pump 1 inlet pressure gauge.	X
14:51	16:15	1.40		INJ	Stim pump 1 start, closed bypass valve 1 and ramped up to 41 Hz. 8" crown valve started leaking, cycled valve open/closed to remove potential debris. Closed valve but still has small leak.	
16:15	17:17	1.03		INJ	Starting stim pump 2. Stim pump 2 trip. Opened bypass valve 1 by 50% and ramp down pump 1 to 38 Hz. 16:48: restarted stim pump. Ramping up pumps and injecting into well. Begin step-wise injectivity test.	
17:17	19:39	2.37		INJ	1st pressure step at 1250 psi WHP.	
19:39	21:38	1.98		INJ	2nd pressure step at 1450 psi WHP.	
21:38	23:35	1.95		INJ	3rd pressure step at 1650 psi WHP.	
23:35	23:59	0.40		INJ	4th pressure step at 1850 psi WHP.	

Comments

Comments: WHP not recording, use pump 2 discharge pressure until WHP gauge re-calibrated.

Seismicity: no new seismicity

Cumulative injected volume: 29,594 gallons

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 26 **Report For 12-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 26	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Inject to cool
Planned Operations: Continue to hold 2200 psi. Run perforation shots in the morning. Re-calibrate flow meter while flow stopped for lubricator install.

Wellsite Supervisors: Michael Moore, Ted De Rocher **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	2:31	2.52		INJ	4th pressure step at 1850 psi.	
2:31	2:59	0.47		WOE	Both pumps tripped during 5th step up. Restart pumps.	X
2:59	4:30	1.52		INJ	Ramping up to resume step-rate test.	
4:30	6:46	2.27		INJ	5th pressure step at 1950 psi.	
6:46	10:30	3.73		INJ	6th pressure step at 2200 psi.	
10:30	23:59	13.48		INJ	Continue injecting at 2200 psi to cool well overnight. 10:30 LBNL onsite to install geophone and digitizer. 14:46 COGCO onsite to drop off lubricator/rig and perforation guns.	

Comments

WHP not recording, use pump 2 discharge pressure. WHP sensor malfunctioning – not sending signal to PLC. Continue to use pump 2 discharge pressure and read gauge at wellhead. Flow meter may be reading 15-20 gpm too high due to non-zero flow during pump trip. The step-rate test shows that injectivity improvement (about 4x) achieved 9/23-10/15 has been maintained. Injectivity at WH pressures below 2200 psi is now 0.04 gpm/psi.

Seismicity: no new seismicity.
 Alex Morales of LBNL installed a Geophone on the exposed casing and connected a RefTek digitizer, in order to precisely record the timing of the perforation shots.

Cumulative injected volume: 122,762 gallons.

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Snow	Visibility:
Air Temperature: 15.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:

Comments: Hi 25. Snow through the night with 2" accumulation on site; expected to continue through tomorrow.

Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 27 **Report For 13-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 27	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: COGCO onsite conducting perf shots

Planned Operations: Prepare wellhead for high pressure injection. Run booster pump overnight to prevent freezing.

Wellsite Supervisors: Michael Moore, Ted De Rocher **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	8:00	8.00		INJ	Injecting at 2200 psi.	
8:00	10:17	2.28		INJ	COGCO onsite, installing lubricator for temperature survey.	
10:17	14:21	4.07		INJ	Ramp down pumps slowly to lower pressure while maintaining injection. Ran in hole 4 times unsuccessfully.	
14:21	15:25	1.07		SURV	Open flowback valve to lower WHP. Run temperature survey.	
15:25	17:58	2.55		PERF	Ramp up pumps to initiate flow into well. Run in hole 1st perforation shot. Top of gun: 8402'. Bottom of gun: 8412'. Shot fired @ 17:09:15.	
17:58	19:01	1.05		REPR	Ramping down pumps to stop flow due to crown valve leak. Pumps shut down at 8:39. Open flowback valve to lower WHP.	X
19:01	20:26	1.42		PERF	Run in hole 2nd perforation shot. Top of gun: 8229'. Bottom of gun: 8239'. Shot fired @ 19:33:30.	
20:26	23:59	3.55		INJ	Master valve would not close all the way. 3rd shot cancelled. Rig down Cogco. Run booster pump overnight for freeze prevention.	

Comments

WHP not recording, use pump 2 discharge pressure. WHP sensor malfunctioning – not sending signal to PLC. Continue to use pump 2 discharge pressure and read gauge at wellhead. Flow meter may be reading 15-20 gpm too high due to non-zero flow during pump trip.

Seismicity: no new seismicity

Cumulative injected volume: 209,451 gallons

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Snow/rain	Visibility:
Air Temperature: 15.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:

Comments: high 25, low 15 F. Snow stopped. Rain in the evening.

Report No: 28 **Report For 14-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 28	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals	---	---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Reconfigure wellhead for high pressure injection. Re-start pumps.

Planned Operations: Ramp up to 2800 psi and hold until Diverter is injected on Tuesday.

Wellsite Supervisors: Michael Moore, Ted De Rocher **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	8:30	8.50		INJ	Run booster pump overnight for freeze prevention.	
8:30	13:57	5.45		WOE	COGCO onsite to de-mob equipment. Removing 8" crown valve. PNSN onsite to collect GPS/Digitizer, Geophone left on wellhead during crown valve removal to be collected later. Re-install 3" valve	X
13:57	16:11	2.23		FLOW	Flowback initiated at 1009 psi. Well flowing at 130 gpm initially. Reduced to 72 gpm around 14:19.	
16:11	17:00	0.82		WOE	Stopped flowback. Setting up for injection.	X
17:00	18:54	1.90		INJ	Stim pumps started up. Ramp up to 1200 psi. Repair 3" valve leak.	
18:54	20:19	1.42		INJ	Ramp up pumps to 1400 psi.	
20:19	21:30	1.18		INJ	Ramp up pumps to 1600 psi.	
21:30	22:50	1.33		INJ	Ramp up pumps to 1800 psi.	
22:50	23:59	1.15		INJ	Ramp up pumps to 2000 psi. Step up pressure to 2200 psi at 23:50.	

Comments

WHP not recording, use pump 2 discharge pressure. WHP sensor malfunctioning – not sending signal to PLC. Continue to use pump 2 discharge pressure and read gauge at wellhead. Flow meter calibrated today at 11:05.

The 800 g total perforation shots fired on 11/13/2014 were detected on at least 3 BH geophones and 2 surface geophones. Arrival times will be used to improve the velocity model, resulting in better seismic locations.

Seismicity: No events located with

Cumulative injected volume: 259,782 gallons

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Snow	Visibility:
Air Temperature:	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:

Comments: high 35, low 0 F. Snow stopped. Heavy snow in the morning and during the day. Clear and cold overnight.

Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 29 **Report For 15-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 29	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals	---	---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Inject at high pressure. Continue to monitor seismicity and injectivity improvement.

Planned Operations: Inject at high pressure. Continue to monitor seismicity and injectivity improvement.

Wellsite Supervisors: Michael Moore, Ted De Rocher **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	11:30	11.50		INJ	Injecting at 2300 psi.	
11:30	16:52	5.37		INJ	Ramp pumps to full speed. Throttled bypass to 28% open and globe valve to 32% open.	
16:52	18:09	1.28		INJ	Ramped down pumps to prevent trip.	
18:09	23:59	5.83		INJ	Hold pump speed. WHP at 2700 psi.	

Comments

WHP not recording, use pump 2 discharge pressure. WHP sensor malfunctioning – not sending signal to PLC. Continue to use pump 2 discharge pressure and read gauge at wellhead. Geophone removed from wellhead, indent pointing ESE. Flow data log now recording pump 2 discharge pressure starting at 12:12.

Seismicity: 8 seismic event

Cumulative injected volume: 439,215 gallons

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Partly cloudy	Visibility:
Air Temperature:	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:

Comments: high 36, low 0° F. Cloudy in the morning, clear in the afternoon and evening.

Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 30 **Report For 16-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 30	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals	---	---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Inject at high pressure. Continue to monitor seismicity and injectivity improvement.

Planned Operations: PTS log with surface read-out to bottom while injecting at 2700 psi WHP. A flowing profile may also be performed depending on result of injecting profile. Diverter injection currently schedule for 11/18/14.

Wellsite Supervisors: Michael Moore, Ted De Rocher **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	13:00	13.00		INJ	Injecting at 2700 psi WHP	
13:00	23:59	10.98		INJ	WAC onsite from 13:00-16:30 to prep PTS tool and lubricator. Continue injection at 2700 psi WHP.	

Comments

Seismicity: 29 microseismic events since 11/15/2014. On 11/16/2014 at 8:41 PM (local time), a Moment Magnitude 2.2 event (magnitude reported by LBNL) occurred. The ISMP requires notification and no flow increase for events with M>2.0. Since the WHP is already at a maximum, no further pressure increases are planned. In addition, some events were initially located as shallow (depth =1.5 km above sea level). AltaRock requested that these outliers be confirmed. After checking, LBNL seismologists determined that the events were below sea level

Cumulative injected volume: 577,678 gallons

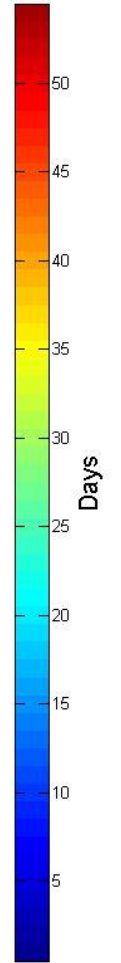
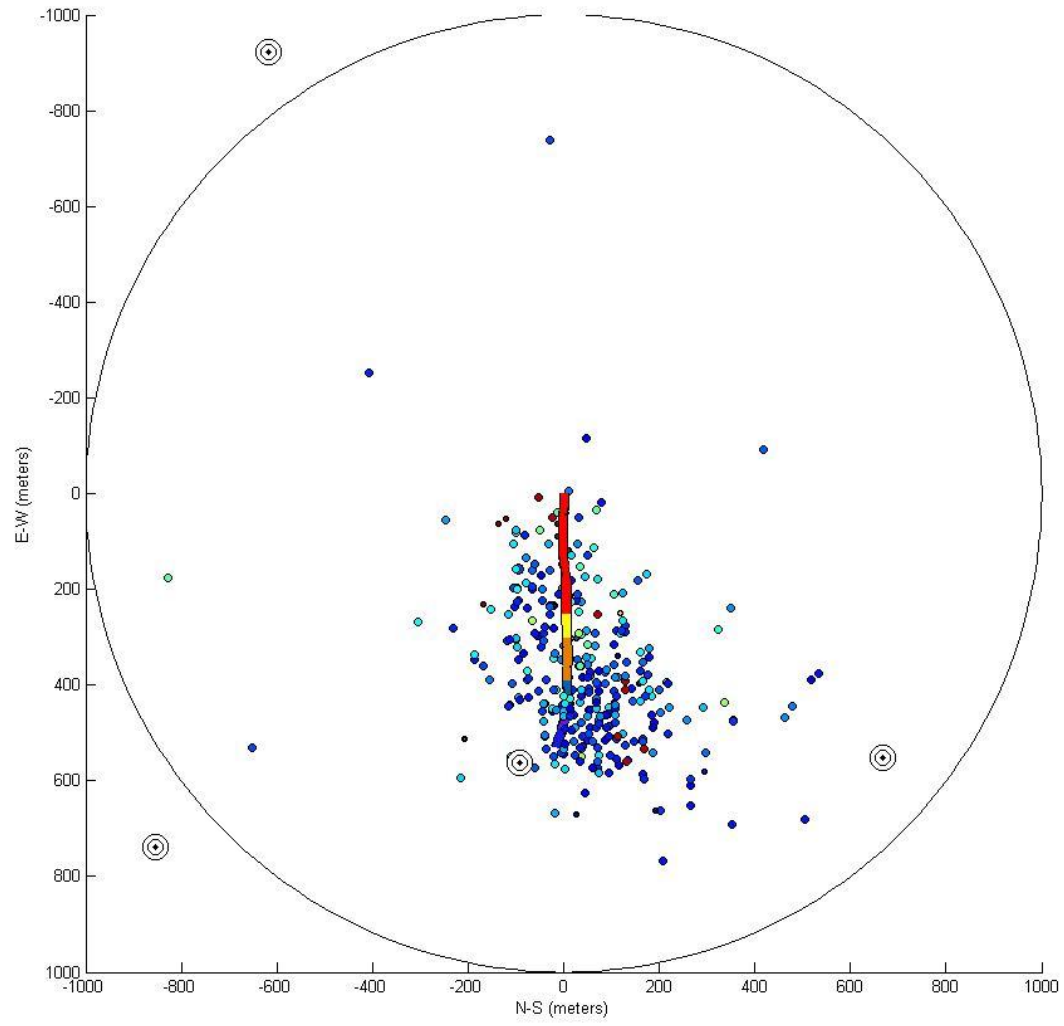
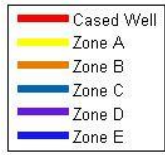
Casing/Tubular Information

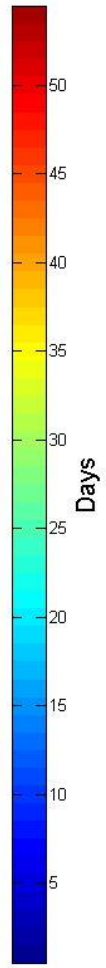
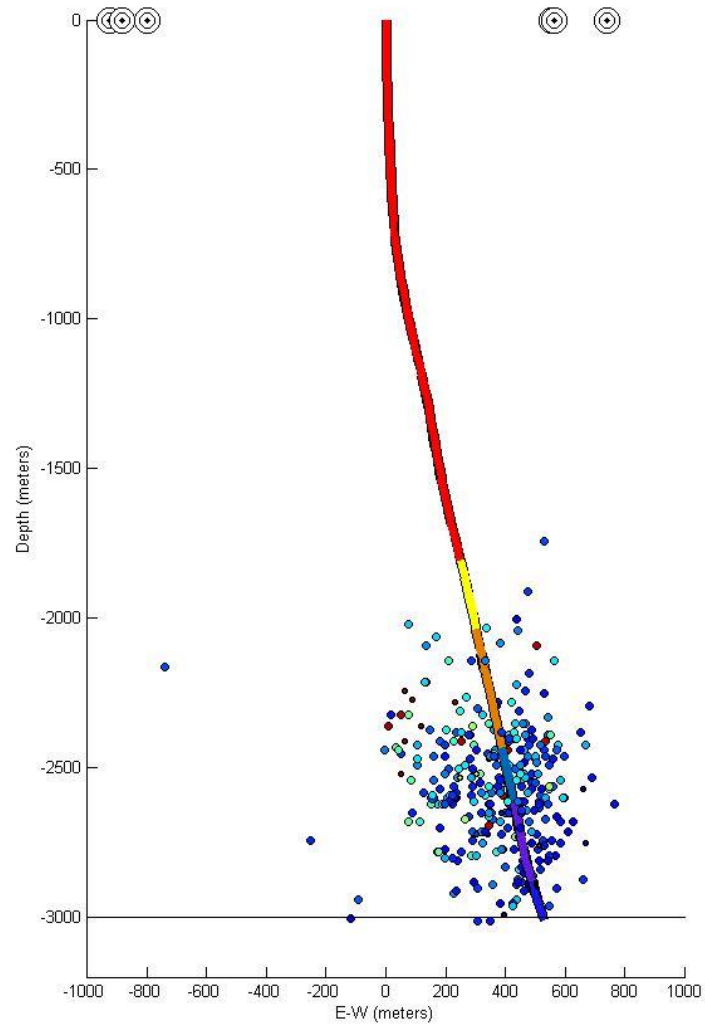
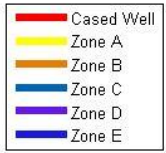
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

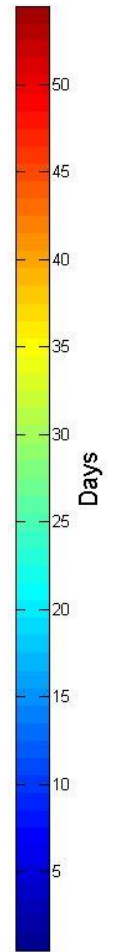
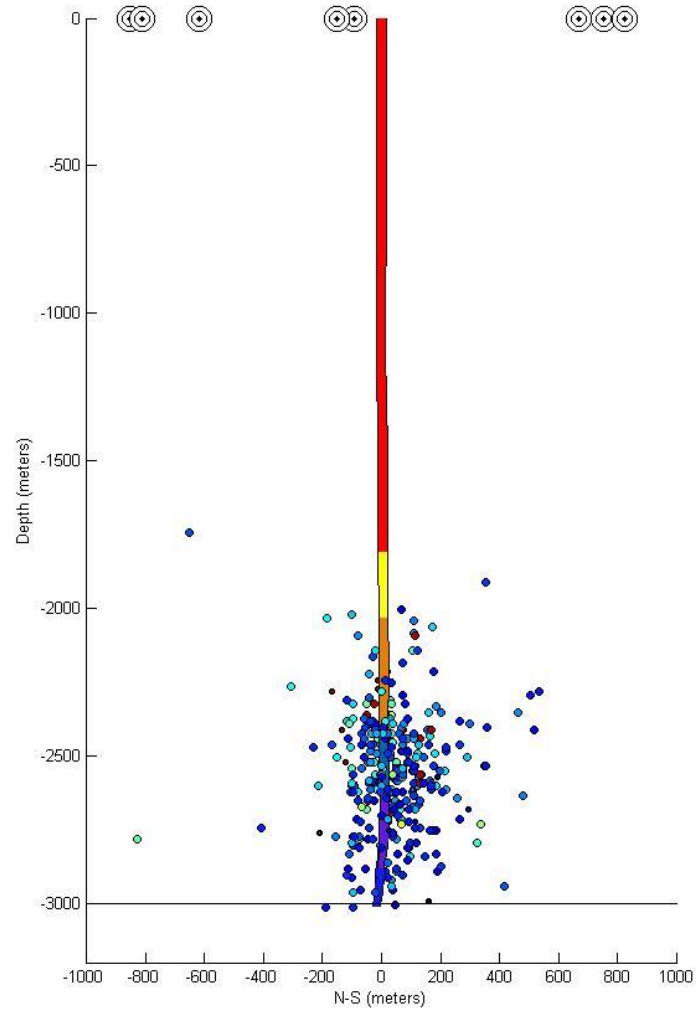
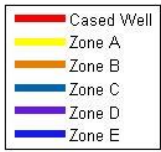
Weather Information

Sky Condition: Partly cloudy	Visibility:
Air Temperature:	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:

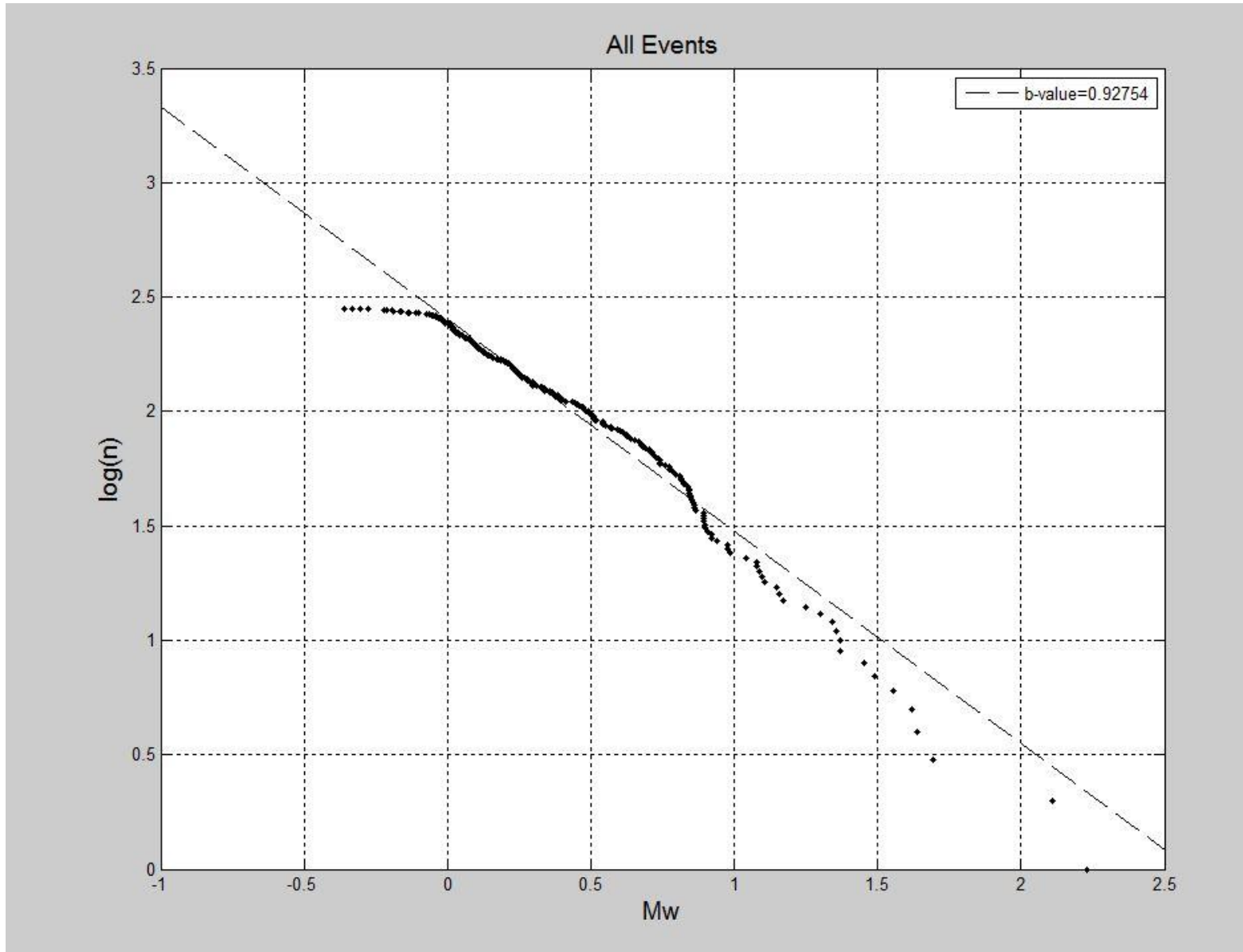
Comments: Weather: high 40, low 0° F. Cloudy in the morning, clear in the afternoon and evening.



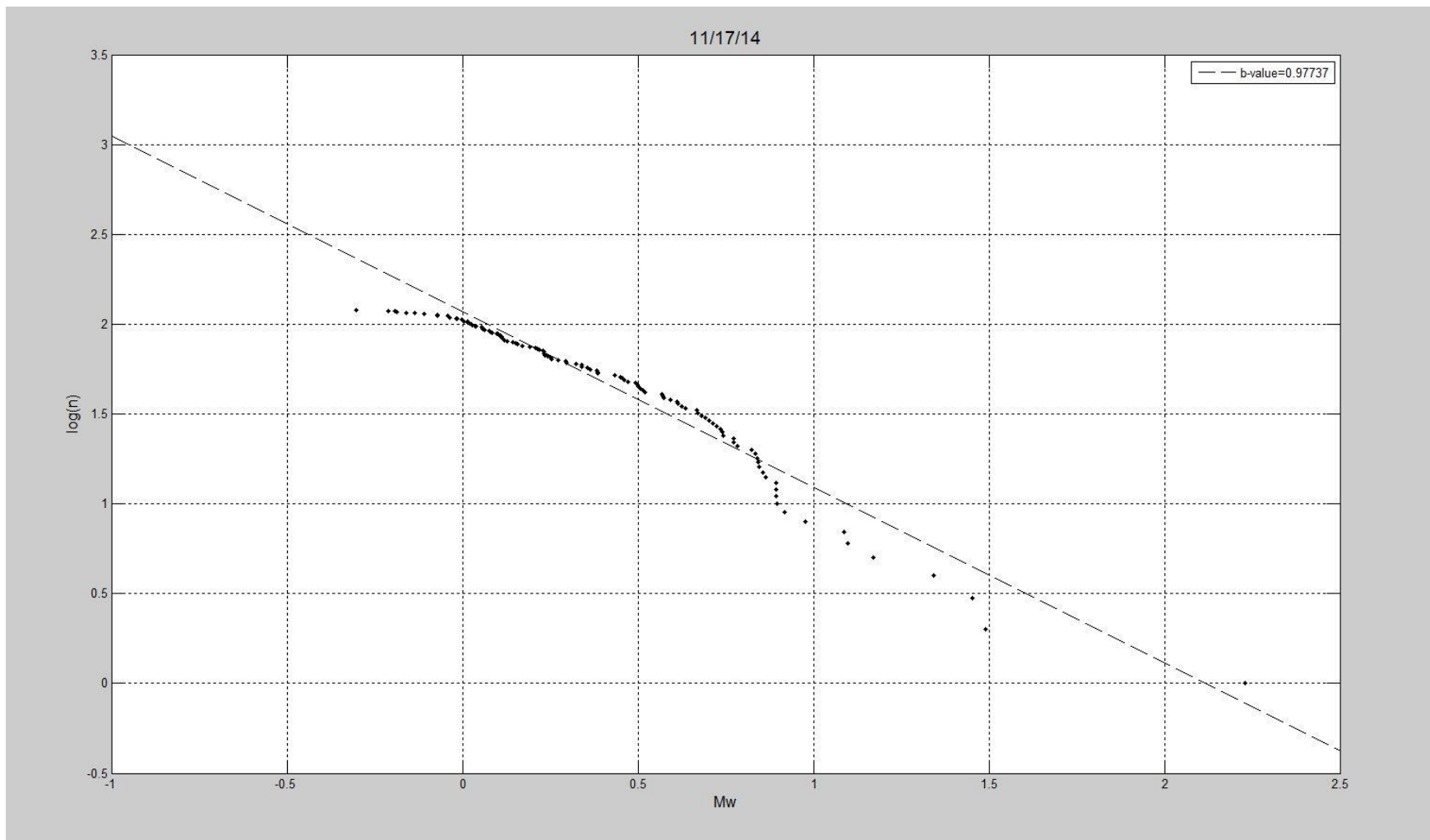




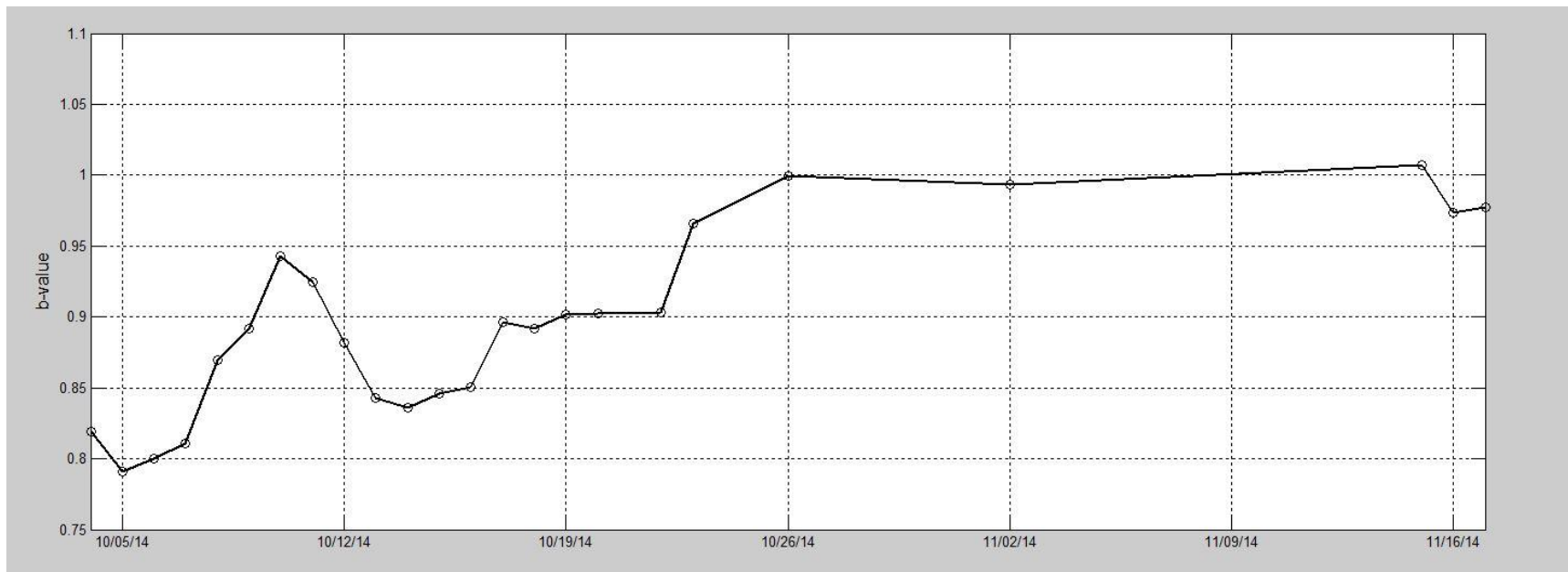
Microseismic Event Size Distribution (B-Value)



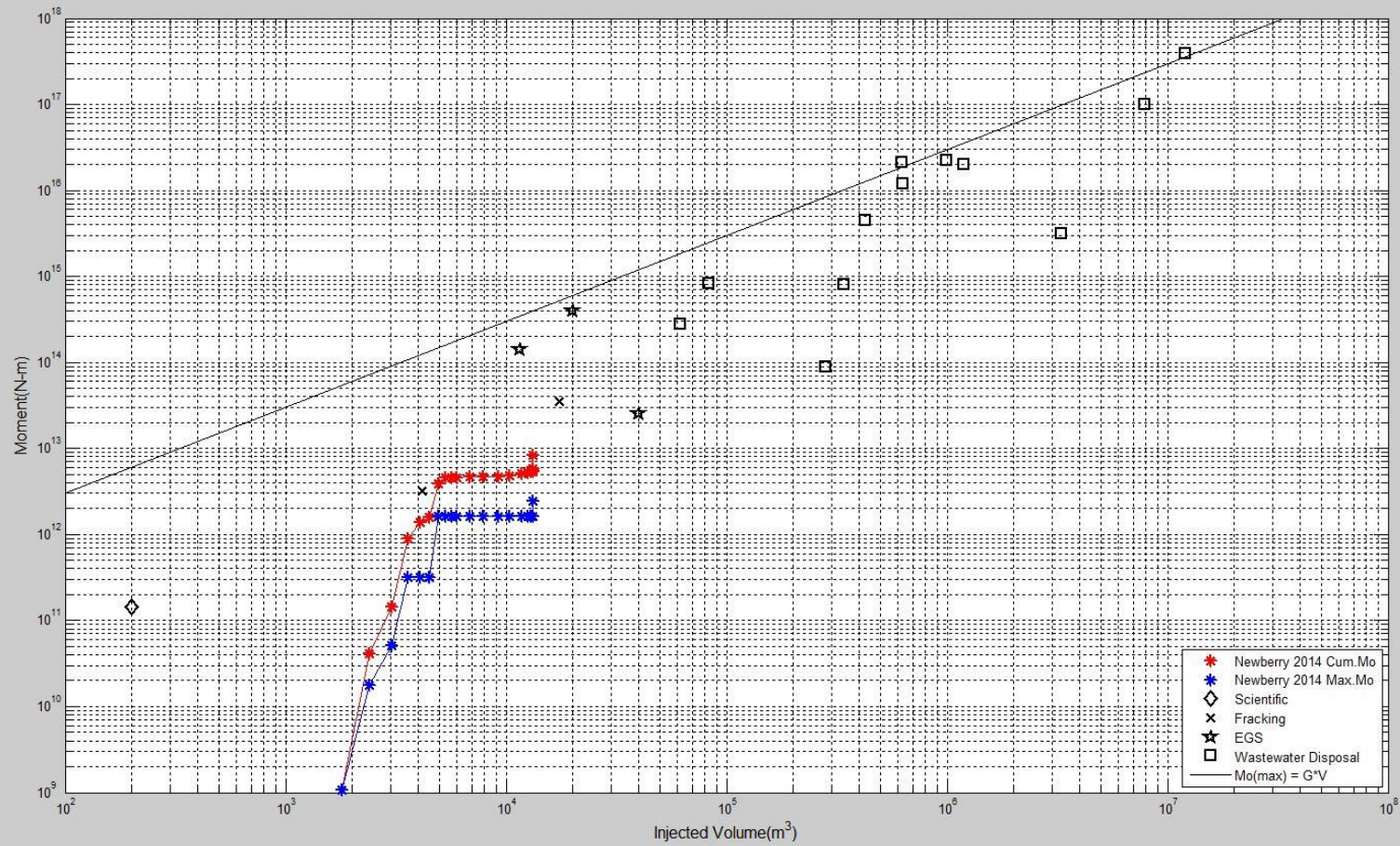
Microseismic Event Size Distribution (B-Value on 11/17/14)



B-Value vs. Time



Cumulative and Maximum Moment vs. Injected Volume compared to other injection projects.



Report No: 31 **Report For 17-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 31	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals ---		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Continue to inject at high pressure while monitoring seismicity and injectivity improvements. Conduct PTS log under injecting and flowing conditions.

Planned Operations: Continue injection. Inject TZIM while monitoring temperature/pressure with PTS tool downhole.

Wellsite Supervisors: Michael Moore, Trenton Cladouhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	9:10	9.17		INJ	Injecting at 2646 psi WHP.	
9:10	13:40	4.50		INJ	Injecting at 2700 psi WHP. 11:22-13:10, WAC ran PTS log to TD while injecting (some extra logging at flow zones).	
13:40	15:51	2.18		FLOW	Shut off pumps. 14:30-15:51, flow back started. Initial estimated flow rate ~400 gpm at 2800 psi. Final estimated flow rate 180 gpm at 965 psi. WAC ran PTS log to shoe while flowing.	
15:51	16:40	0.82		WOE	Restarted north generator (was previously running on south generator). Start stim pumps.	X
16:40	17:42	1.03		INJ	Flow re-established down hole at 1800 psi WHP.	
17:42	19:25	1.72		INJ	Injecting at 2130-2159 psi WHP.	
19:25	20:22	0.95		INJ	Ramp up pumps. Injecting at 2340-2260 psi WHP.	
20:22	22:49	2.45		INJ	Ramping up pumps to 2500 psi.	
22:49	23:59	1.17		INJ	Ramping up pumps to 2700 psi.	

Comments

Seismicity: 12 new seismic events for total of 39 since restart
Cumulative injected volume: 692,274 gallons

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Clear	Visibility:
Air Temperature: 20.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: high 42, low 20° F. Clear.	

Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 32 **Report For 18-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 32	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Inject tracer and TZIM. Run PTS survey to TD to document diversion.

Planned Operations: Maintain small amount of flow over night to prevent freezing. Inject fibrous TZIM.

Wellsite Supervisors: Michael Moore, Trenton Cladouhos

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	4:44	4.73		INJ	Injecting at 2629 psi WHP.	
4:44	9:48	5.07		INJ	Ramped down to 2400 psi to prepare for TZIM injection.	
9:48	10:54	1.10		INJ	Well bled off to 1743 psi WHP.	
10:54	12:38	1.73		INJ	11:06: Tracer (NDS 1,3,6) injected. 11:15: 450lbs of AltaVert 251 mixed in 10 bbl water (250 lbs A, 150 lbs AB, 50 lb B). 11:24 Pill 1 injected at WHP 1923 psi. 11:45 Pill 2 injected at WHP ~2000 psi. 12:02 Pill 3 injected at WHP 2118 psi. 12:20 Pill 4 injected at WHP 2198 psi. 12:38 Pill 5 injected at WHP 2212 psi.	
12:38	19:34	6.93		INJ	Inject starting at 2360 psi ending at 2545 psi to maintain constant flow of 100 gpm while diverter chased down hole. 17:15-18:19: WAC run PTS to TD while injecting to document diversion. 18:20-19:20 WAC POOH PTS logging while injecting to document diversion.	
19:34	23:59	4.42		INJ	Ramped down to WHP 2194 psi to prepare for TZIM.	

Comments

Total injected volume: 781,984 gallons

Seismicity: 3 new seismic events.

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Partly Cloudy	Visibility:
Air Temperature:	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: high 45, low 18° F. Partly cloudy	

Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 33 **Report For 19-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 33	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals ---		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Injecting tracers and fibrous diverter using ThermaSource mixing truck.

Planned Operations: Continue stimulation and monitor seismicity.

Wellsite Supervisors: Michael Moore, Trenton Cladouhos

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	6:30	6.50		INJ	Ramping down from 2200 to 1962 to prepare for TZIM injection.	
6:30	10:00	3.50		INJ	WHP head at 1962 psi.	
10:00	12:16	2.27		INJ	10:25: Tracer (NTS 2,7) injected. 11:07: Pill 1 of AltaVert 251 Fiber injected (10 lbs in 150 gallons) at WHP 2019 psi 12:07: Pill 2 injected at WHP 2150 psi 12:25: Pill 3 injected at WHP 2150 psi 12:55: Pill 4 injected at WHP 2216 psi 13:15: Pill 5 injected at WHP 2257 psi	
12:16	20:00	7.73		SURV	Inject starting at 2317 psi ending at 2539 psi WHP to maintain constant flow of 100 gpm while diverter chased down hole. 17:15-20:00 WAC ran PTS to TD and back while injecting to document diversion	
20:00	20:40	0.67		INJ	WHP increased to 2660 psi.	
20:40	21:45	1.08		INJ	WHP increased to 2772 psi.	
21:45	23:59	2.23		INJ	WHP increased to 2795 psi. Maintain 100 gpm downhole flow.	

Comments

Seismicity: 10 new seismic events.

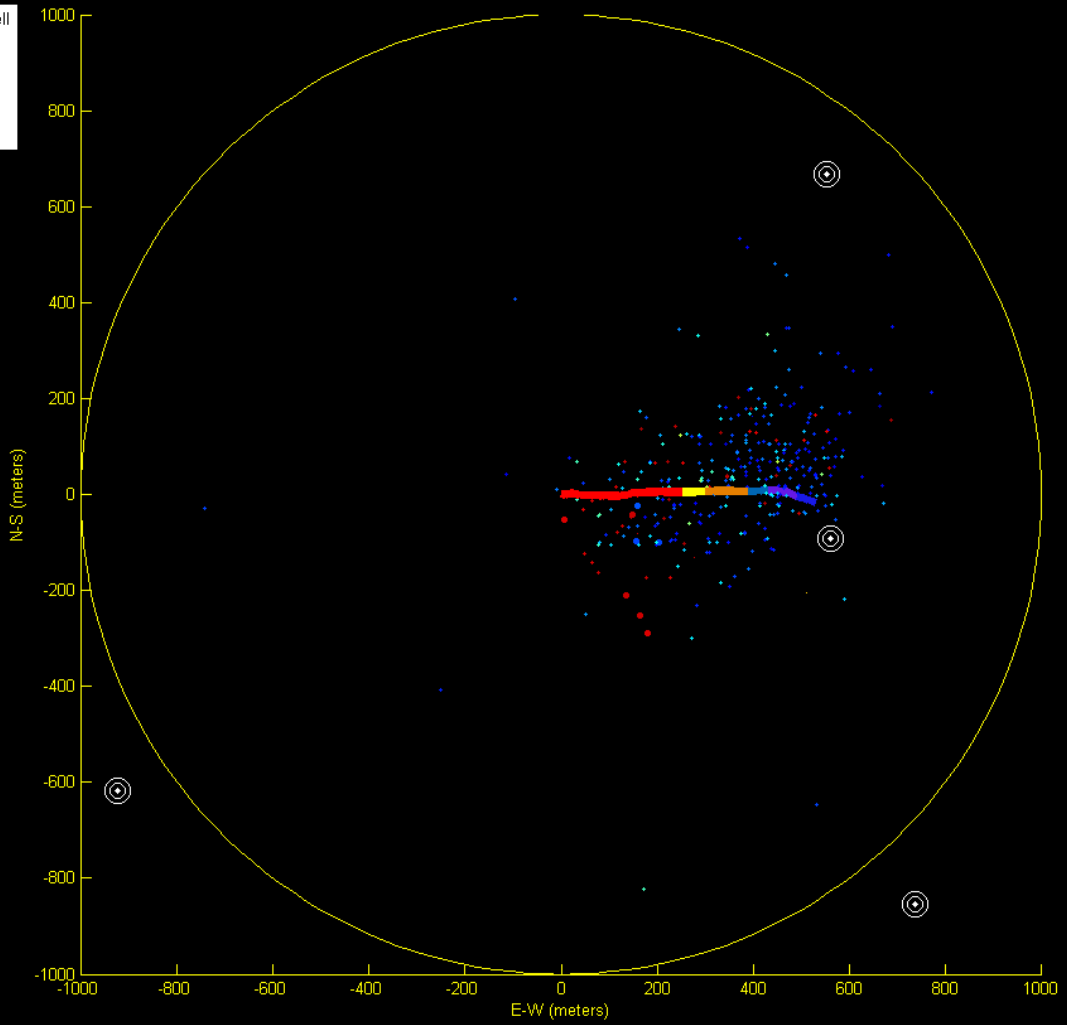
Injected volume: 855,384 gallons

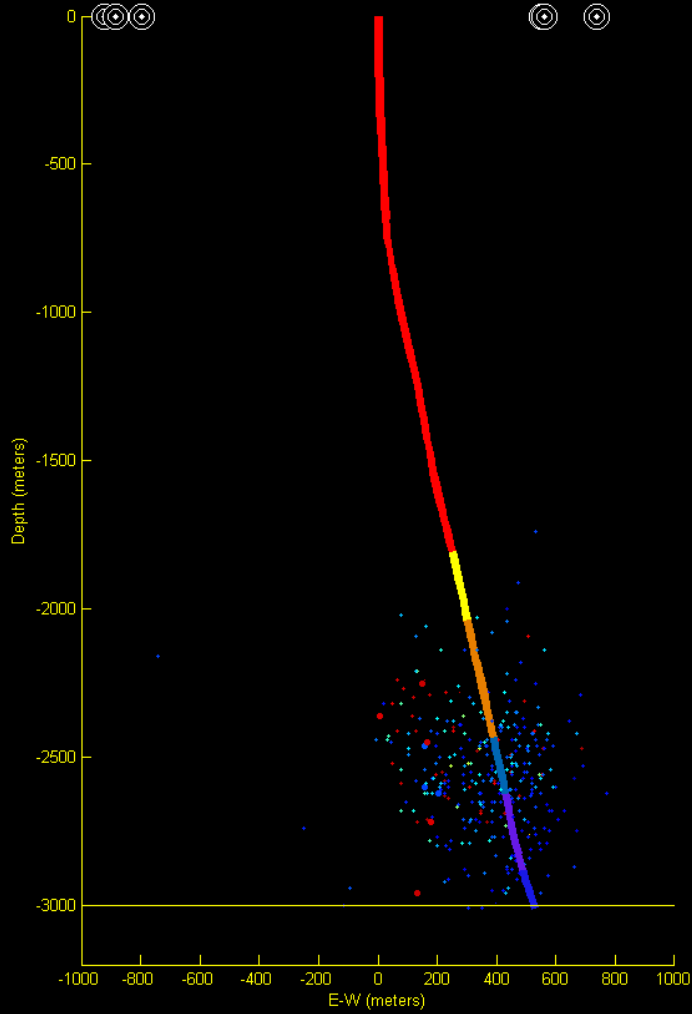
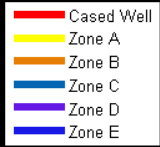
Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

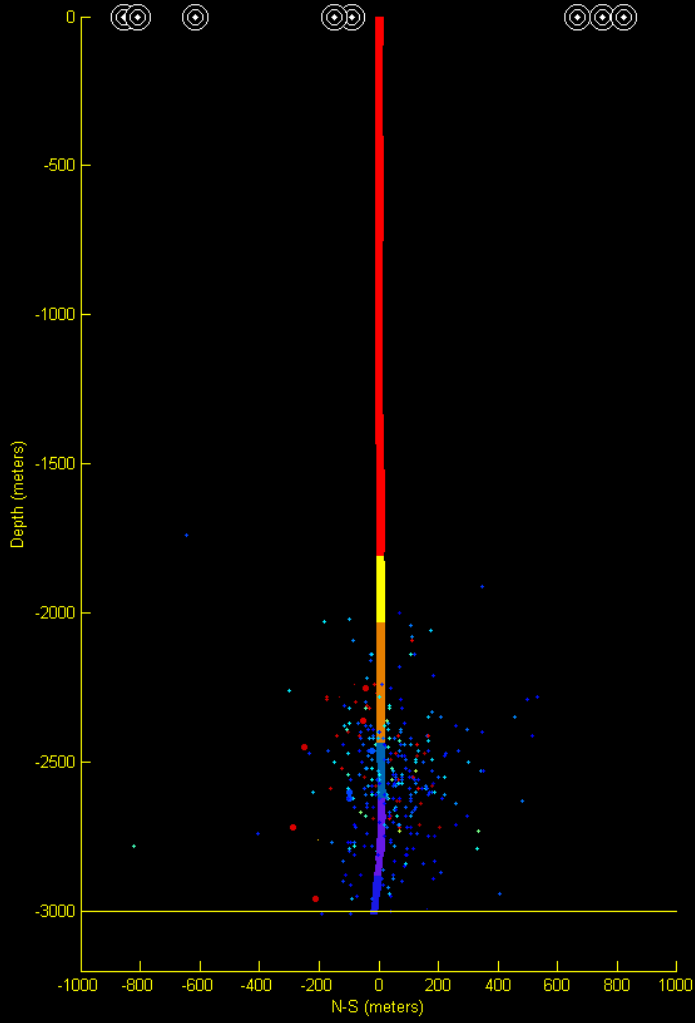
Weather Information

Sky Condition: Overcast	Visibility:
Air Temperature:	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: high 41, low 31° F. Overcast. Small snow showers throughout the night.	





- Cased Well
- Zone A
- Zone B
- Zone C
- Zone D
- Zone E



Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 34 **Report For 20-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 34	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Run final PTS survey while injecting. Shut down pumps and monitoring WHP falloff

Planned Operations: Disassemble pumps and plumbing. Prepare for flow back test on Monday- Tuesday. Complete demobilization after Thanksgiving.

Wellsite Supervisors: Michael Moore, Trenton Cladouhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	15:30	15.50		INJ	WHP held at around 2725 psi. 10:00-12:00 WAC ran final PTS log to TD and back. New flow zones observed at depth.	
15:30	18:30	3.00		INJ	Pumps shutdown and restarted on Generator 2 to lower diesel tank to <20%. 18:30: pumps shut down and master valve shut	
18:30	23:59	5.48		RIGD	Lines drained. Recording WHP decline.	

Comments

Seismicity: 22 new seismic events.

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Overcast	Visibility:
Air Temperature:	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:

Comments: high 40, low 31° F. Overcast. Some snow showers throughout the day.

Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 35 **Report For 24-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 34	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals	---	---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Flow test well and collect water samples.

Planned Operations: Flow until ~10:00 am 11/26, To a cumulative flow of >225,000 gallons. Then complete demobilization.

Wellsite Supervisors: Michael Moore, Trenton Cladouhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	10:10	10.17		WOO	Well shut-in since 11/21	X
10:10	13:00	2.83		TEST	Flow test started. Initial WHP 1300 psi. Initial flow 200 gpm. Flow gradually declined to 100 gpm by 13:00. Flow temp: 162 deg. F	
13:00	17:30	4.50		TEST	Temperature reaches ~200 deg. F at wellhead. Geysering begins. 200 gpm surges, every 90 seconds.	
17:30	23:59	6.48		TEST	Spacing between surges reach 6 minutes. Average flow ~40 gpm. Cumulative flow of 124,000 gallons.	

Comments

Water samples for tracer, geochemistry and isotopes taken every 2 hours.

Seismicity: No seismic events.

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Overcast	Visibility:
Air Temperature:	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: high 50, low 29° F. Overcast. Clear in morning, cloudy in afternoon, drizzly in evening	

Daily Report

Well ID: NWG 55-29

Field: Newberry

Job ID: Stim 2014

Well Name: Northwest Geothermal 55-29

Sect: 29 Town: 21S Rng: 12E County: Deschutes State: OR

Report No: 36 **Report For 25-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---		
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No.	AFE (\$)	Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	---	---	---
Proposed TD (ft): 10000	Days On Location: 35	Last BOP Test:	---	---	---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals		
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---		
Personnel: Operator:	Contractor:	Service:	Other:	Total: 0	

Current Operations: Flow test well and collect water samples.

Planned Operations: Flow until ~10 am 11/26. Then complete demobilization.

Wellsite Supervisors: Michael Moore, Trenton Cladouhos **Tel No.:**

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	12:00	12.00		TEST	Flow test continued. Steam lifted surges of 400-500 gpm every 10-20 minutes. Average flow of 36 gpm in first half of day.	
12:00	23:59	11.98		TEST	Average flow of 30 gpm in second half of day.	

Comments

Water samples for tracer, geochemistry and isotopes taken every 2-3 hours. Total of 14 samples starting at 11/24 13:00. Infra-red thermometer shows 190 F on casing. Cumulative volume flowed 116,500 gallons (note: an error was made in reporting yesterday's total).

Seismicity: 1 seismic event.

Casing/Tubular Information

Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

Sky Condition: Overcast	Visibility:
Air Temperature: 30.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:
Comments: Hi 40. Low 30.	

Report No: 37 **Report For 26-Nov-14**

Operator: AltaRock Energy	Rig:	Spud Date: 13-Apr-08	Daily Cost / Mud (\$): ---
Measured Depth (ft):	Drilling Days (act.): 0	Well Bore: Original Well Bore	AFE No. AFE (\$) Actual (\$)
Vertical Depth (ft): 10060	Drilling Days (plan): 68	RKB Elevation (ft): 0.00	--- --- ---
Proposed TD (ft): 10000	Days On Location: 36	Last BOP Test:	--- --- ---
Hole Made (ft) / Hrs: 0 / 0.0	Last Casing: 7.000 at 9,990		Totals --- --- ---
Average ROP (ft/hr):	Next Casing:	Working Interest:	Job/Well Cost (\$): ---
Personnel: Operator:	Contractor:	Service:	Other: Total: 0

Current Operations: Complete flow testing. Demob equipment.

Planned Operations: Have a Happy Thanksgiving!

Wellsite Supervisors: Michael Moore, Trenton Cladouhos

Tel No.:

Operations Summary

From	To	Elapsed	End MD(ft)	Code	Operations Description	Non-Prod
0:00	10:00	10:00		TEST	Flow test continued. Steam lifted surges of 300-400 gpm every 10-20 minutes. Average flow 26 gpm.	
10:00	12:00	2:00		RIGD	Well shut in at 10:00 am. WHP 320 psi at 11:30 am. Demob site.	

Comments

Water samples for tracer, geochemistry and isotopes taken every 2-3 hours. Total of 19 samples collected. Infra-red thermometer shows 190 F on casing. Cumulative volume flowed 130,000 gallons

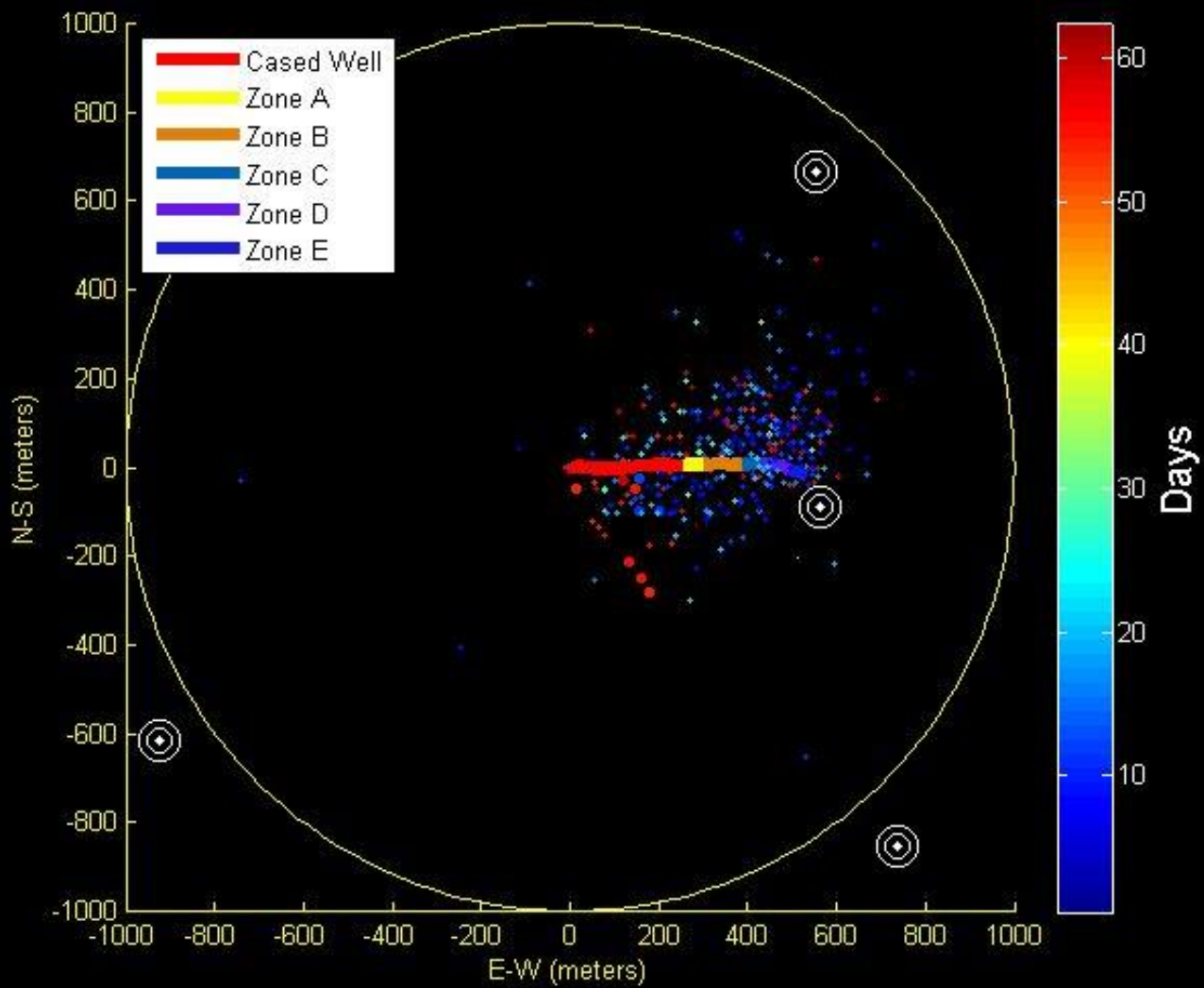
Seismicity: one seismic event.

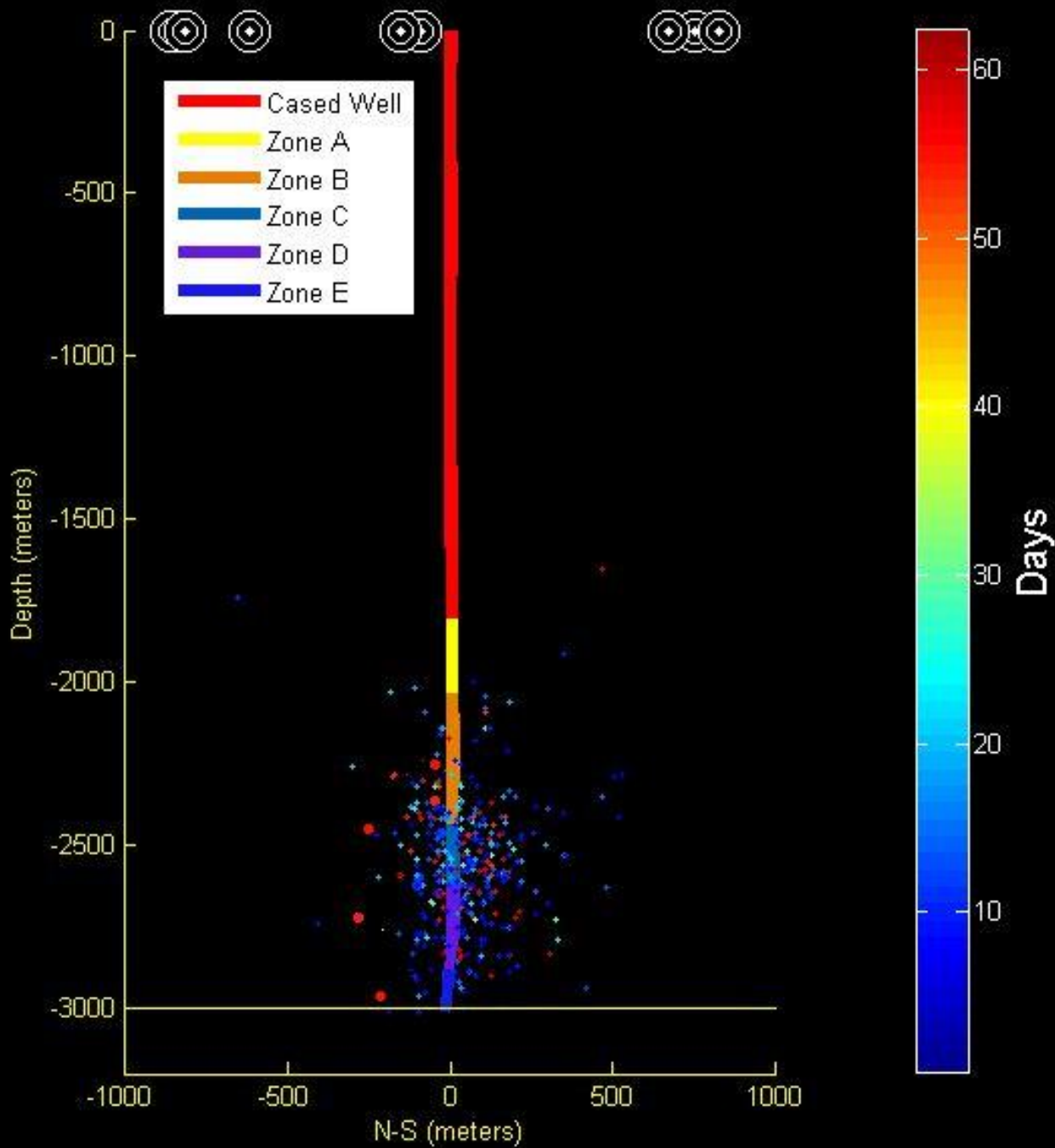
Casing/Tubular Information

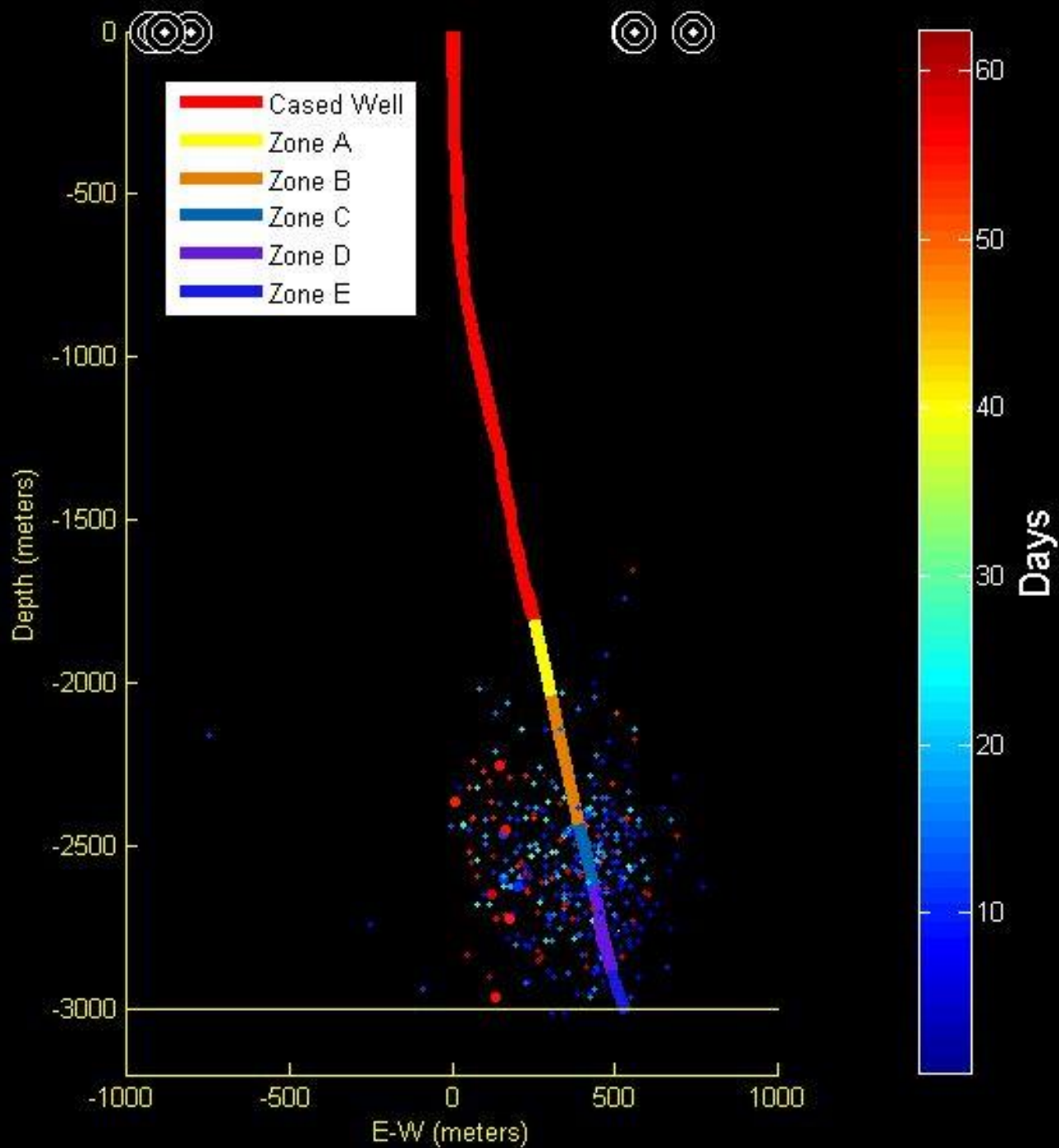
Type	Size	Top MD	Top TVD	Bottom MD	Bottom TVD	Hole Section	Avg OH Diam	LOT
FULL	30.000	30		134		COND		
FULL	20.000	0	0	1109	1109	SURF	26.000	
FULL	13.375	-4		4391	4349	INT1	17.500	11.50
TIEBCK	9.625	0		4212				
LINER	9.625	4199		6462		INT2		13.40
LINER	7.000	6222		9990		PROD	8.500	

Weather Information

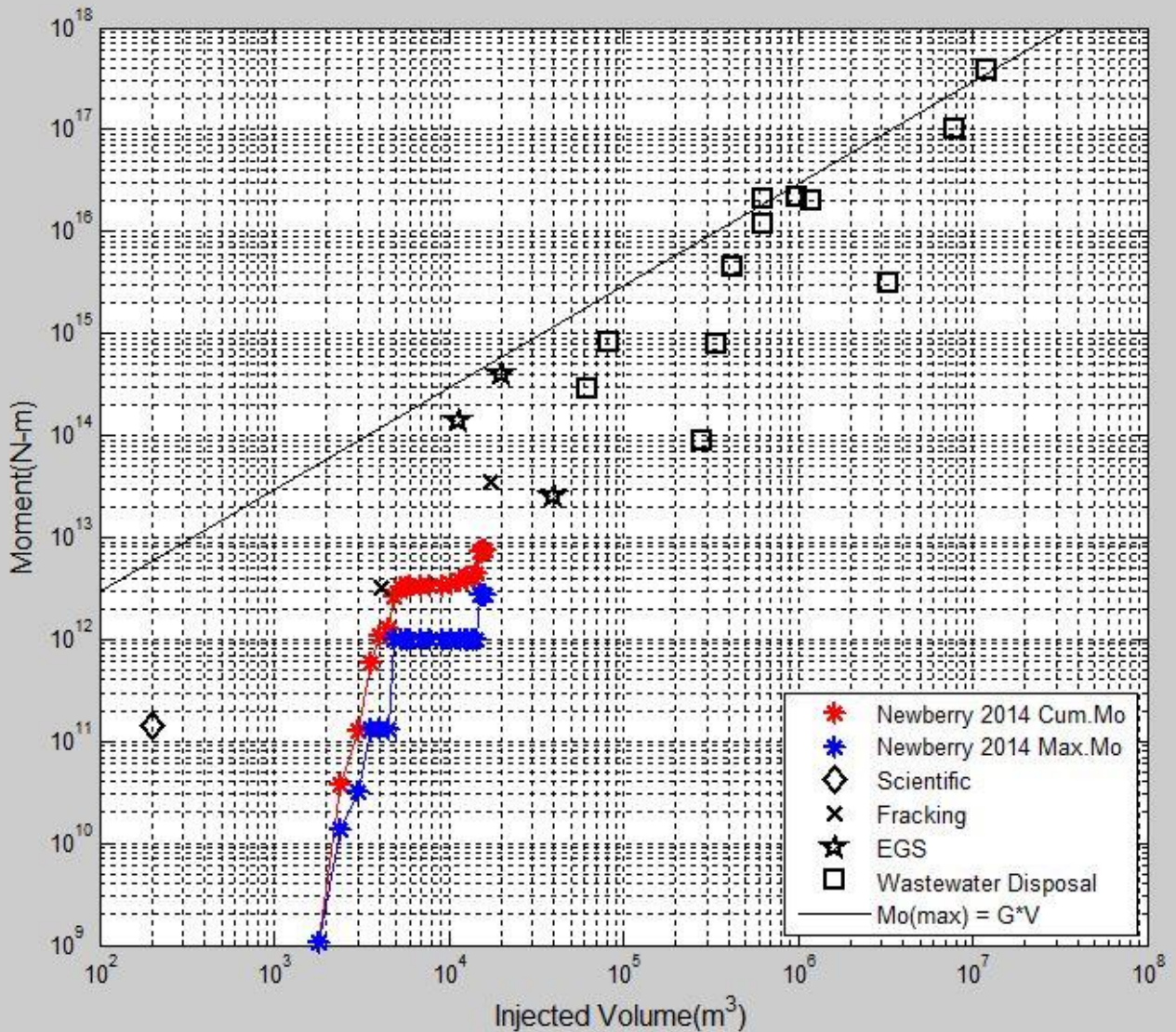
Sky Condition: Clear	Visibility:
Air Temperature: 40.0 degF	Bar. Pressure:
Wind Speed/Dir: /	Wind Gusts:



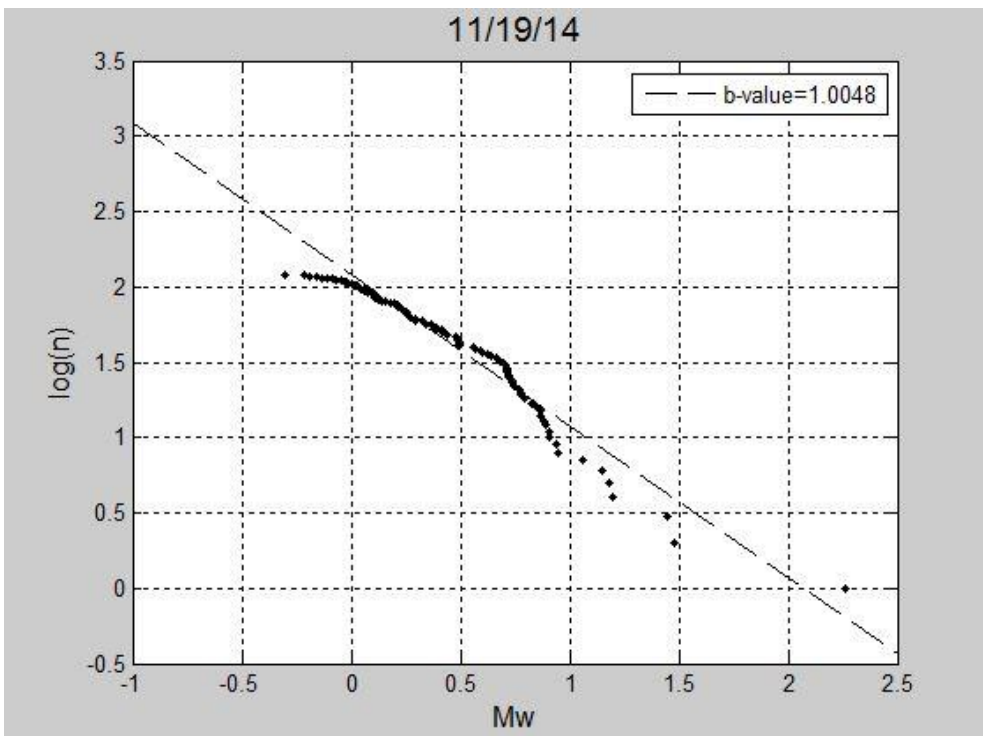
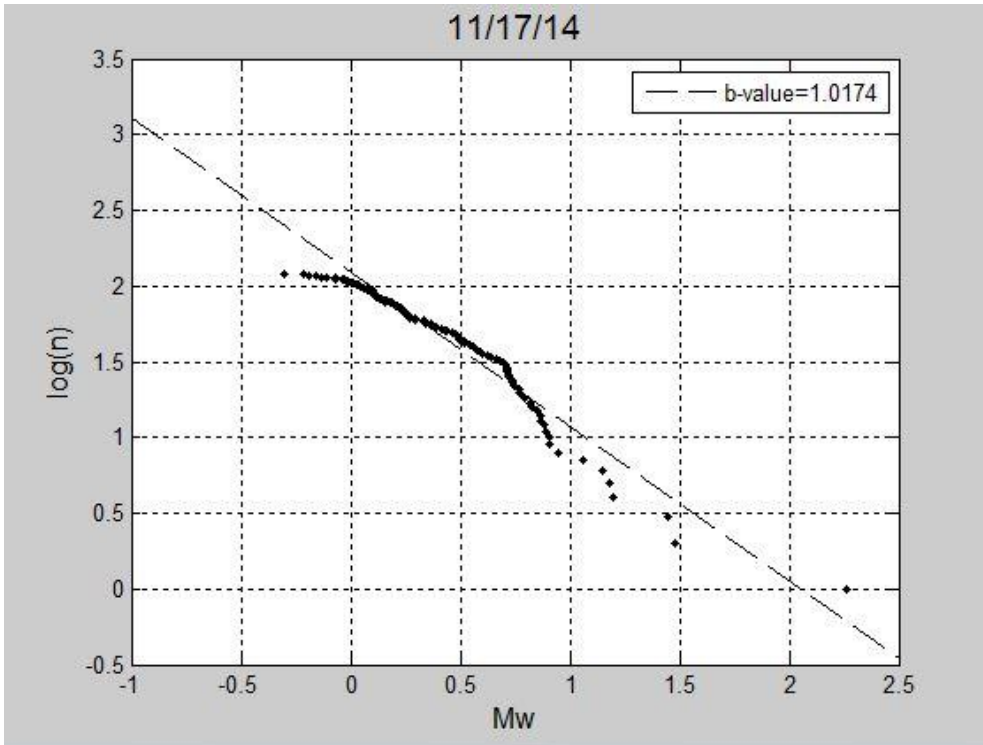




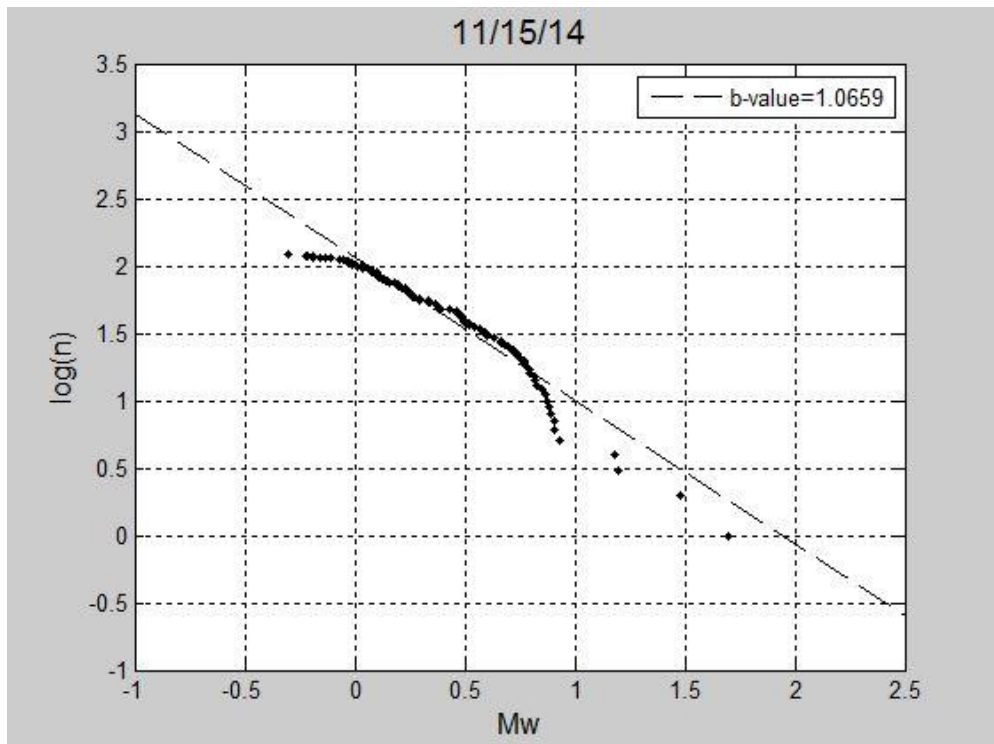
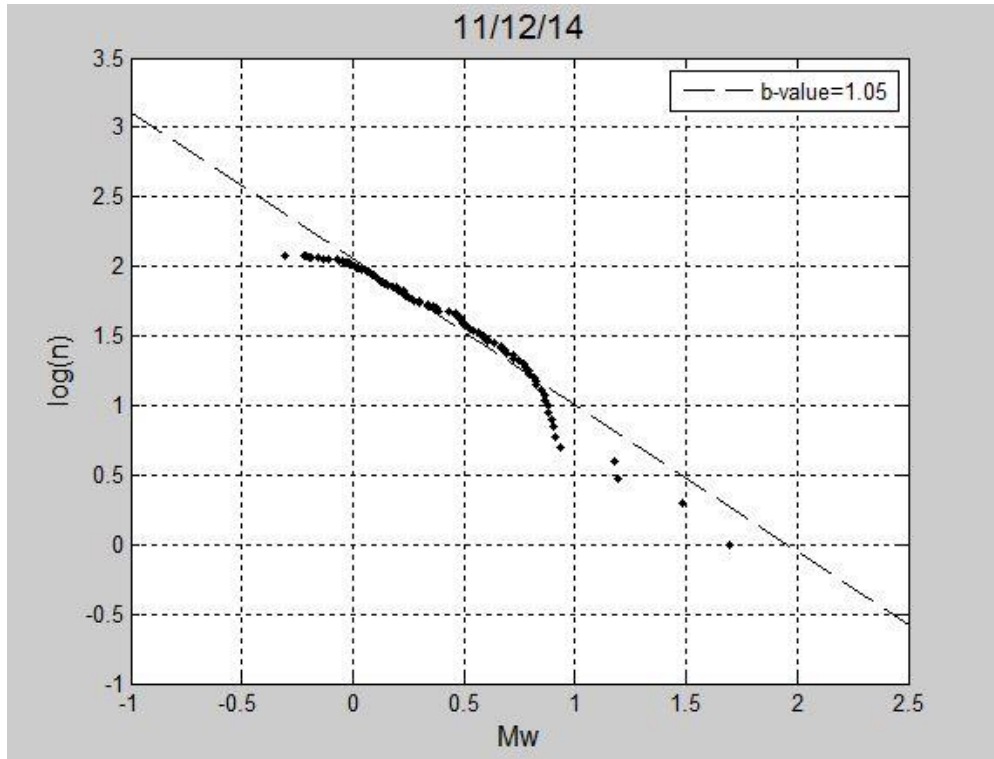
Cumulative and Maximum Moment vs. Injected Volume compared to other injection projects



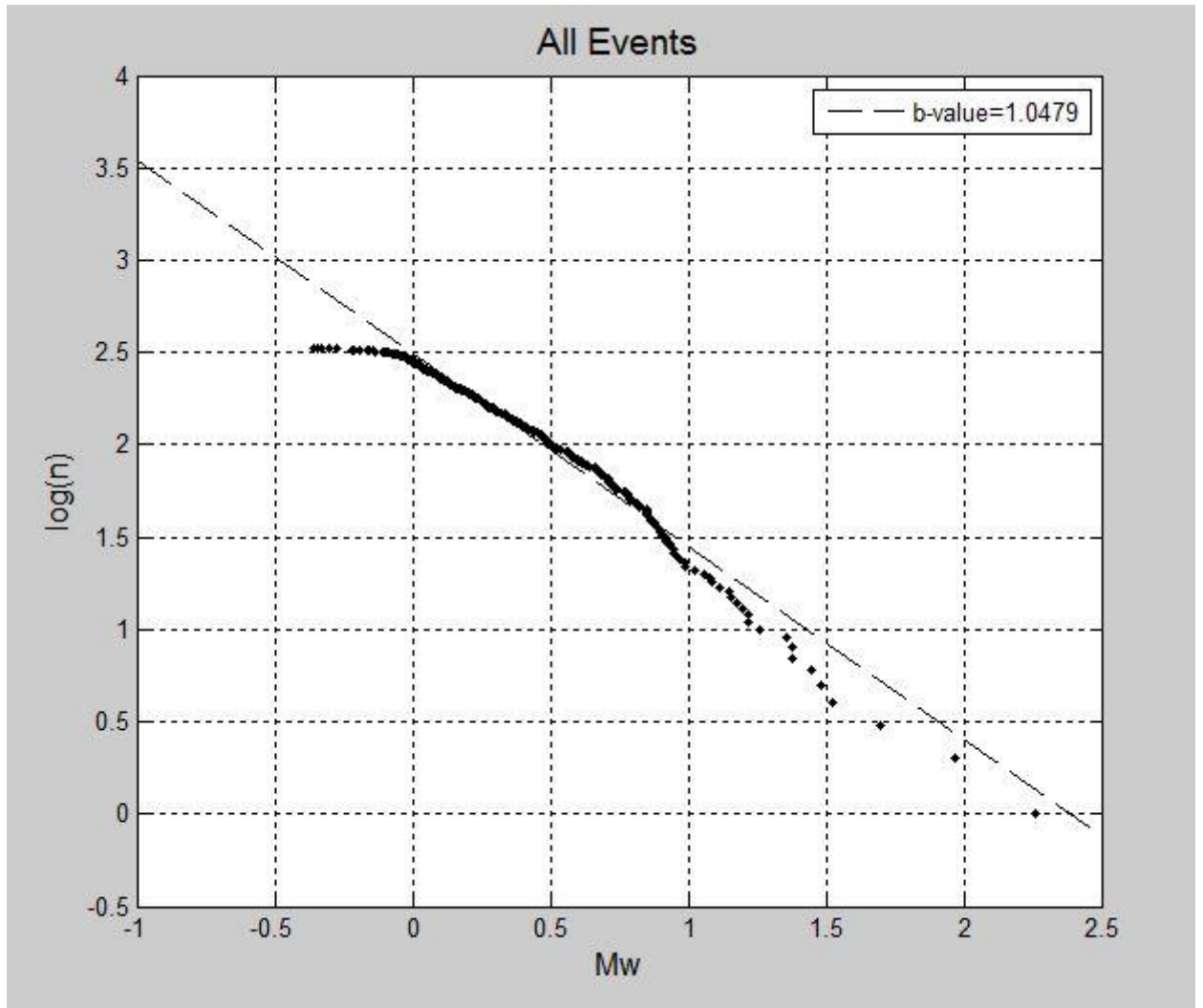
Microseismic Event Size Distribution (B-Value)



Temporal Evolution of B-Value



Temporal Evolution of B-Value



B-Value vs Time

