

ROP Rate of Penetration  
 DDS Drillstring Dynamics  
 PWD Pressure While Drilling

**PROPRIETARY**

8.50" Pilot Hole PWD DDS Time Log

Country : USA																																																																									
Field : Posey 6912																																																																									
Location : Lat: 71° 10' 24.06" North Long: 163° 28' 18.67" West																																																																									
Well : OCS-Y-2321 BJ001 ST00BP00																																																																									
Company : Shell Gulf of Mexico Inc.																																																																									
Rig : Polar Pioneer																																																																									
LOCATION	Latitude : 71° 10' 24.06" North																																																																								
	Longitude : 163° 28' 18.67" West																																																																								
Final UTM Easting = 555,034.550 m																																																																									
Final UTM Northing = 7,897,425.308 m																																																																									
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Field	: Posey 6912																																																																								
Country	: USA																																																																								
API Number	: 55-352-00004-00																																																																								
Permanent Datum	: Mean Sea Level Elevation : 0.00 ft																																																																								
Log Measured From	: Drill Floor 76.00 ft Above Permanent Datum																																																																								
Drilling Measured From	: Drill Floor																																																																								
Depth Logged	: 222.00 ft To 1,512.00 ft																																																																								
Date Logged	: 30-Jul-15 To 01-Aug-15																																																																								
Total Depth MD	: 1,512.00 ft TVD : 1,511.97 ft																																																																								
Spud Date	: 30-Jul-15 Plot Type : Final Plot Date : 31-Oct-15																																																																								
Unit No.	: 1 Job No. : AK-XX-0901604700																																																																								
<table border="1"> <thead> <tr> <th colspan="2">Borehole Record (MD)</th> <th colspan="2">Casing Record (MD)</th> </tr> <tr> <th>Run No.</th> <th>Size From To</th> <th>Size From To</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>8.500 in 222.00 ft 1,512.00 ft</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Borehole Record (MD)		Casing Record (MD)		Run No.	Size From To	Size From To	Weight	1	8.500 in 222.00 ft 1,512.00 ft																																																														
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<b>TIME LOG</b>																																																																									
Other Services	ADR, DGR, EWR ALD, CTN, XBAT MRL-WD																																																																								
Elev.	N/A																																																																								
DF	76.00 ft																																																																								
GL	N/A																																																																								
WD	146.00 ft																																																																								

**WELL INFORMATION**

MWD Run Number	100			
Date run completed	01-Aug-15			
Rig Bit Number	1			
Bit Size (in)	8.500			
Tool Nominal OD (in)	6.75			
Log Start Depth (MD, ft)	222.00			
Log End Depth (MD, ft)	1,512.00			
Drill or Wipe	Drill			
Drill/Wipe Start Date and Time	30-Jul-15 17:05			
Drill/Wipe End Date and Time	01-Aug-15 11:21			
Min Inc (deg) @ Depth (MD, ft)	0.00 @ 0.00			
Max Inc (deg) @ Depth (MD, ft)	0.51 @ 320.88			
Bit TFA(in2) / Bit Type	0.71 / Tricone			
Flow Rate (gpm)	449.40			
Max AV (fpm) / CV (fpm) @ MWD	774.0 / 984.0			
Fluid Type	Sea Water			
Density (ppg) / Viscosity (spqt)	8.55 / 27.00			
Filtrate CL (ppm)	35,000.00			
pH / Fluid Loss (mptm)	8.50 / 0			
PV (cP) / YP (lhf2)	17 / 31.00			
% Solids / % Sand	.01 / .01			
% Oil / Oil:Water Ratio	0 / 0:100			
Rm @ Measured Temp (degF)	0.350 @ 35.60			
Rmf @ Measured Temp (degF)	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A			
Max Tool Temp (degF) / Source	42.60 / HCIM			

Rm @ Max Tool Temp (degF)	0.3004 @ 42.60			
Lead MWD Engineer	Nick Weeks			
Customer Representative	Doug Sloan			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	HCIM			
Software Version	88.58			
Sub Serial Number	12272466			
Insert Serial Number	14776659			
Date and Time Initialized	30-Jul-15 10:14			
Date and Time Read	01-Aug-15 18:48			
ECMB SW Version	N/A			

### Directional Sensor Information

Tool Type	PCDC			
Distance From Bit (ft)	16.80			
Software Version	6.33			
Sub Serial Number	12510194			
Sonde Serial Number	12059421			
Sensor ID Number	N/A			
Toolface Offset (deg)	0.00			

### Pressure Sensor Information

Tool Type	PWD			
Distance From Bit (ft)	9.49			
Recorded Sample Period (sec)	2			
Software Version	4.13			
Collar Serial Number	11468873			
Insert Serial Number	11850156			

### DDSr-DGR Sensor Information

Tool Type	DDSr-DGR			
Distance From Bit (ft)	6.78			
Recorded Sample Period (sec)	12			
Software Version	10.88			
Sub Serial Number	12519619			
Insert Serial Number	12528703			
Sensor ID Number	11660			

## REMARKS

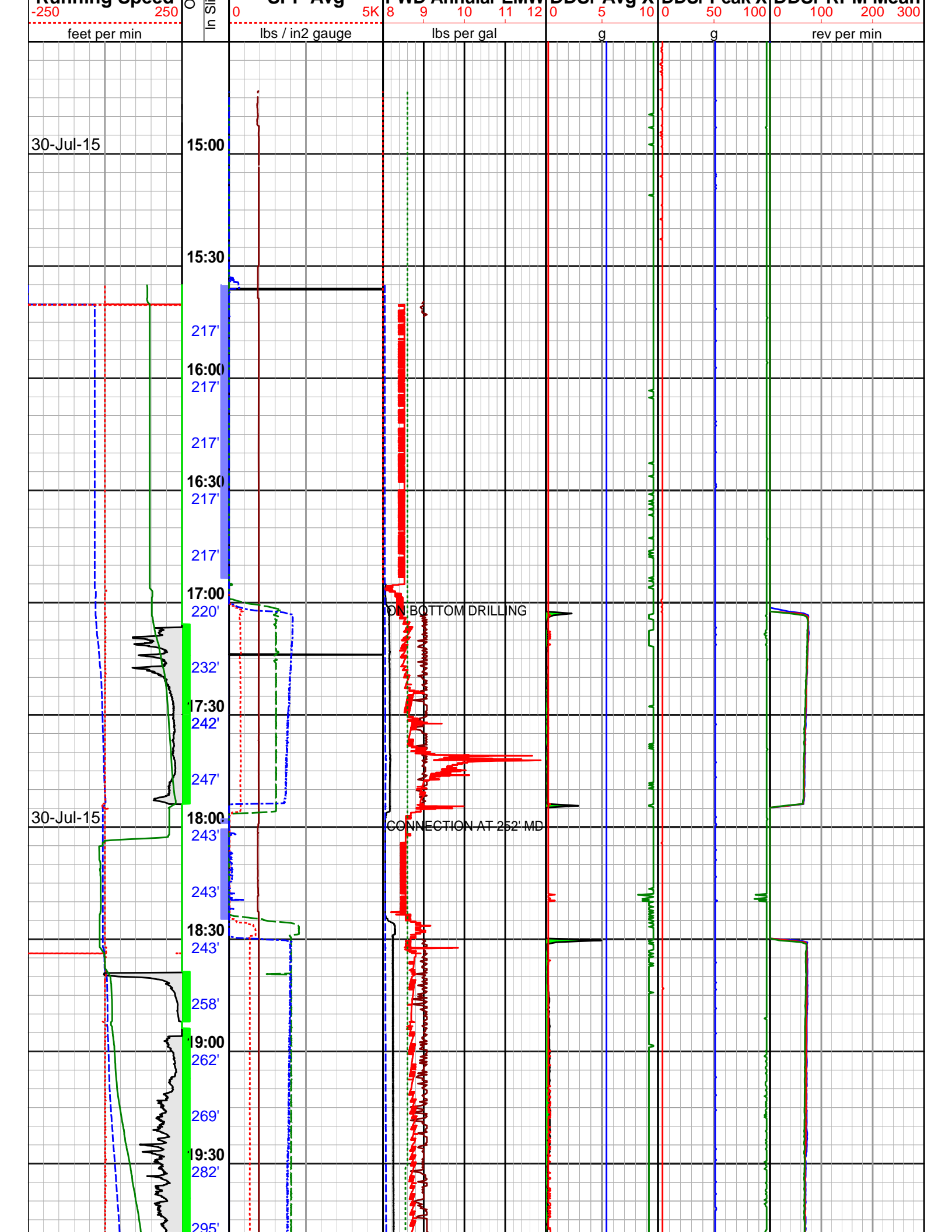
1. ALL DEPTHS ARE MEASURED DEPTHS (MD), UNLESS OTHERWISE NOTED. THESE DEPTHS ARE BIT DEPTHS AND ARE CALLIBRATED TO THE DRILLERS PIPE TALLY. NO DEPTH CORRECTIONS HAVE BEEN MADE FOR PIPE STRETCH OR COMPRESSION.
2. ALL VERTICAL DEPTHS ARE TRUE VERTICAL DEPTHS (TVD), UNLESS OTHERWISE NOTED. ONLY INVERTED / REVERTED SECTIONS GREATER THAN 30' TVD ARE PRESENTED
3. ALL DATA PRESENTED IS RECORDED DATA UNLESS OTHERWISE STATED.
4. LWD RUN 1 WAS COMPRISED OF DIRECTIONAL, DUAL GAMMA RAY (DGR) UTILIZING GEIGER-MUELLER TUBE TYPE DETECTORS, AZIMUTHAL DEEP ELECTROMAGNETIC WAVE RESISTIVITY (ADR), PRESSURE WHILE DRILLING (PWD) DRILLSTRING DYNAMICS SENSOR (DDSr), AZIMUTHAL LITHODENSITY (ALD), COMPENSATED THERMAL NEUTRON (CTN), MAGNETIC RESONANCE WHILE DRILLING (MRIL-WD), AZIMUTHAL BIMODAL ACOUSTIC TOOL (XBAT), AND THE AZIMUTHAL ACOUSTIC CALIPER TOOL (XCAL).

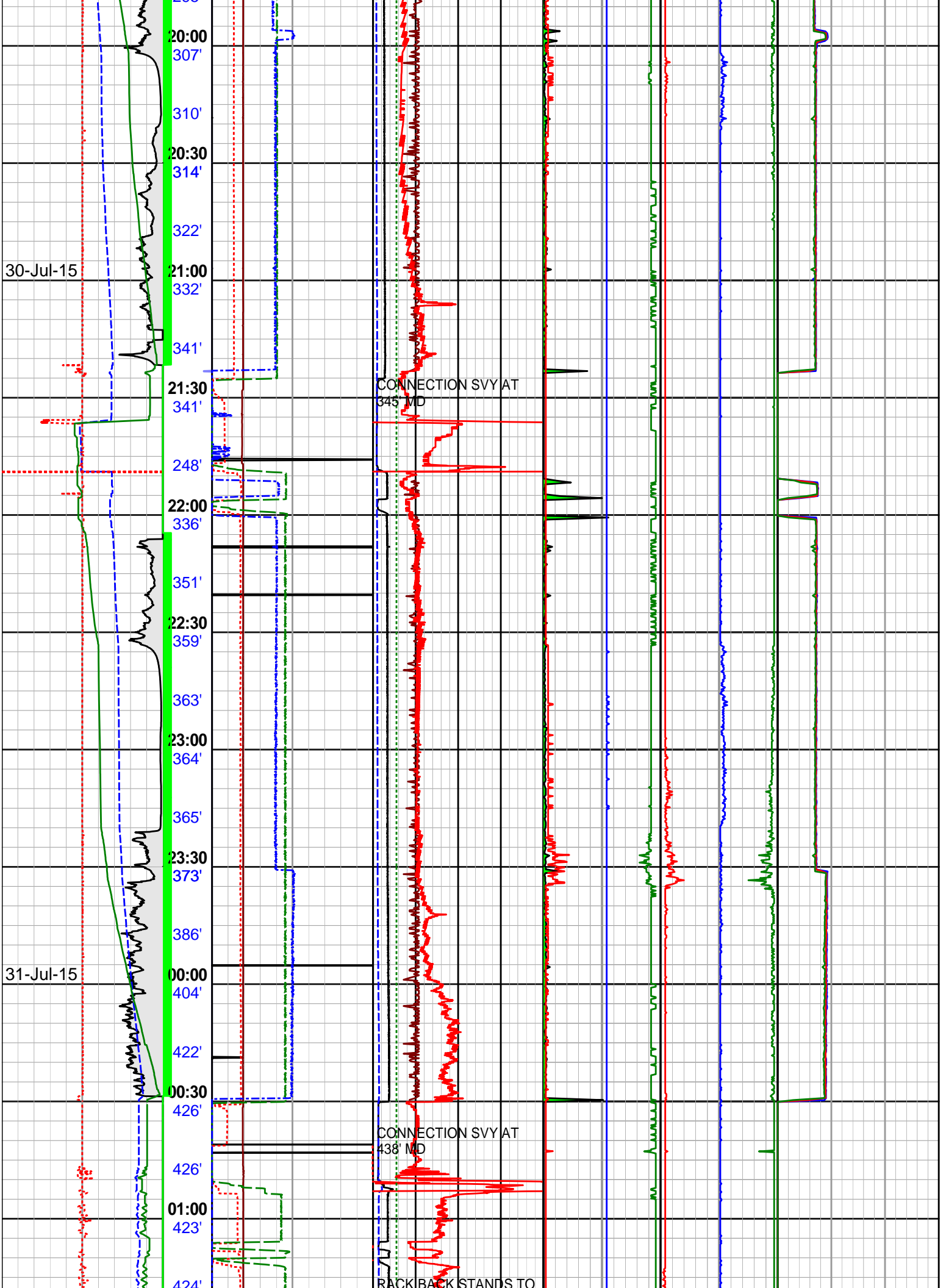
5. RUN 200 WAS A 36" HOLE OPENING RUN, NO MWD TOOLS WERE PRESENT THEREFOR IT IS NOT PRESENTED.
6. RUN 300 WAS A 42" HOLE OPENING RUN, NO MWD TOOLS WERE PRESENT THEREFOR IT IS NOT PRESENTED.
7. RUN 400 WAS A CLEANOUT RUN TO DRILL OUT THE SHOE TRACK AND 30' OF NEW FORMATION, NO MWD TOOLS WERE PRESENT THEREFOR IT IS NOT PRESENTED.
8. RUN 401 WAS A 26" HOLE OPENING RUN UTILIZING DIRECTIONAL, DRILL STRING DYNAMICS SENSOR AND PRESSURE WHILE DRILLING. NO LOGGING SENSORS WERE PRESENT.
9. MWD RUN 500 WAS A 17.5" DRILLING RUN UTILIZING DIRECTIONAL, DRILL STRING DYNAMICS SENSOR AND PRESSURE WHILE DRILLING. NO LOGGING SENSORS WERE PRESENT.
10. LWD RUN 6 WAS COMPRISED OF DIRECTIONAL, DUAL GAMMA RAY (DGR) UTILIZING GEIGER-MUELLER TUBE TYPE DETECTORS, ELECTROMAGNETIC WAVE RESISTIVITY PHASE 4 (EWR-P4), PRESSURE WHILE DRILLING (PWD) DRILLSTRING DYNAMICS SENSOR (DDSr), AZIMUTHAL LITHODENSITY (ALD), COMPENSATED THERMAL NEUTRON (CTN), AZIMUTHAL BIMODAL ACOUSTIC TOOL (XBAT), AND THE AZIMUTHAL ACOUSTIC CALIPER TOOL (XCAL).
11. LWD RUN 7 WAS COMPRISED OF DIRECTIONAL, DUAL GAMMA RAY (DGR) UTILIZING GEIGER-MUELLER TUBE TYPE DETECTORS, AZIMUTHAL DEEP ELECTROMAGNETIC WAVE RESISTIVITY (ADR), PRESSURE WHILE DRILLING (PWD) DRILLSTRING DYNAMICS SENSOR (DDSr), AZIMUTHAL LITHODENSITY (ALD), COMPENSATED THERMAL NEUTRON (CTN), MAGNETIC RESONANCE WHILE DRILLING (MRIL-WD), AZIMUTHAL BIMODAL ACOUSTIC TOOL (XBAT), AND THE AZIMUTHAL ACOUSTIC CALIPER TOOL (XCAL).
12. OVER THE COURSE OF THE 12.25" HOLE SECTION THERE ARE SEVERAL INSTANCES WHERE THE BOREHOLE RUGOSITY HAS CREATED "SPIKES" IN THE RESISTIVITY DATA. THIS IS DUE TO ONE RECIEVER READING THE HIGH SALINITY BOREHOLE FLUID (WASHOUT) AND THE OTHER READING THE FORMATION. THERE ARE ALSO AREAS ACROSS THE LOGGED INTERVAL THAT SHOW AN UNDERGAUGE HOLE.
13. RUNS 1- 7 REPRESENT THE OCS-Y-2321 BJ001 ST00BP00 WELL WITH AN API# OF 55-352-00004-00. THIS WELL REACHED A TOTAL DEPTH OF 6,800'MD / 6,795'TVD

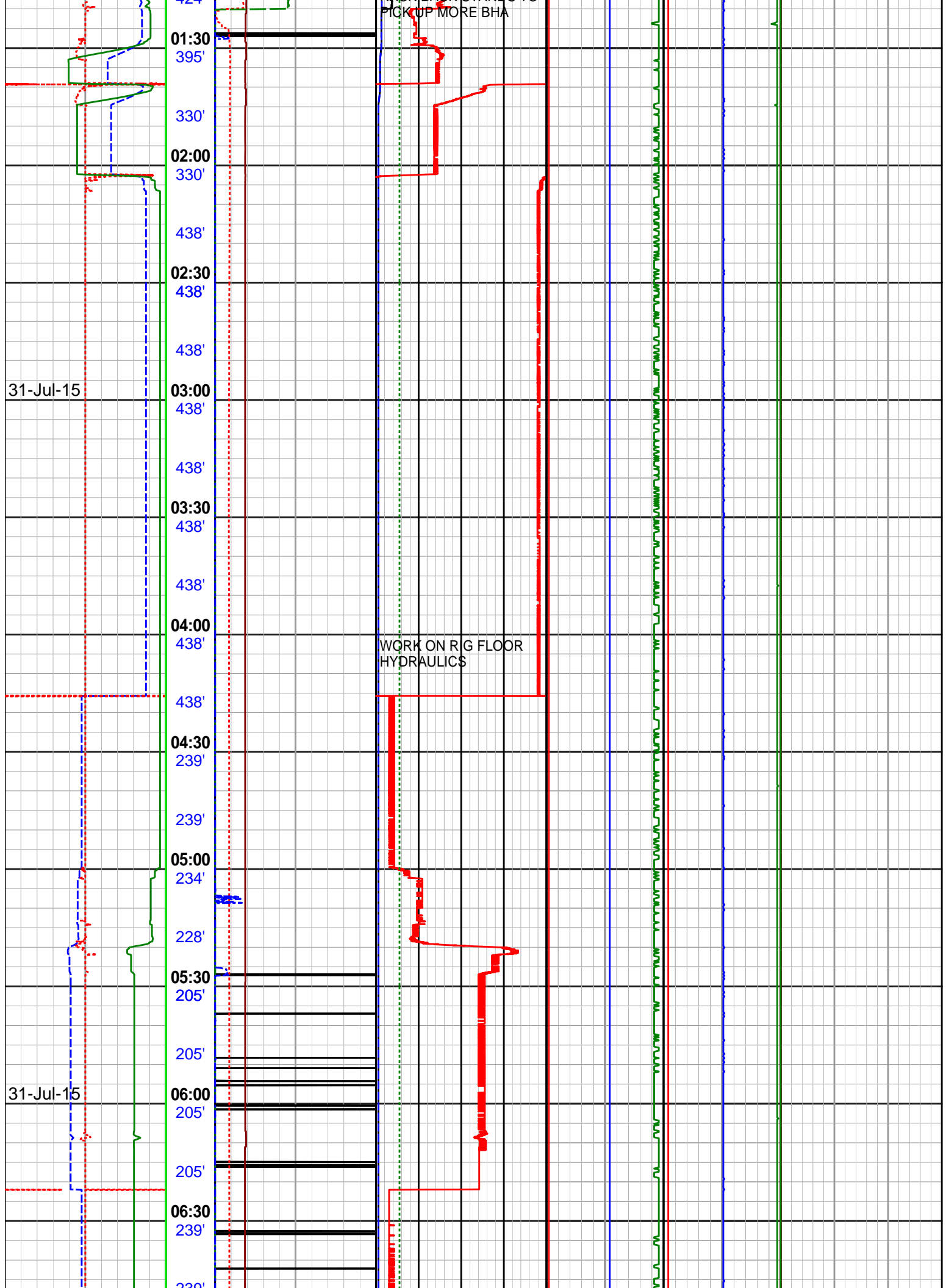
## WARRANTY

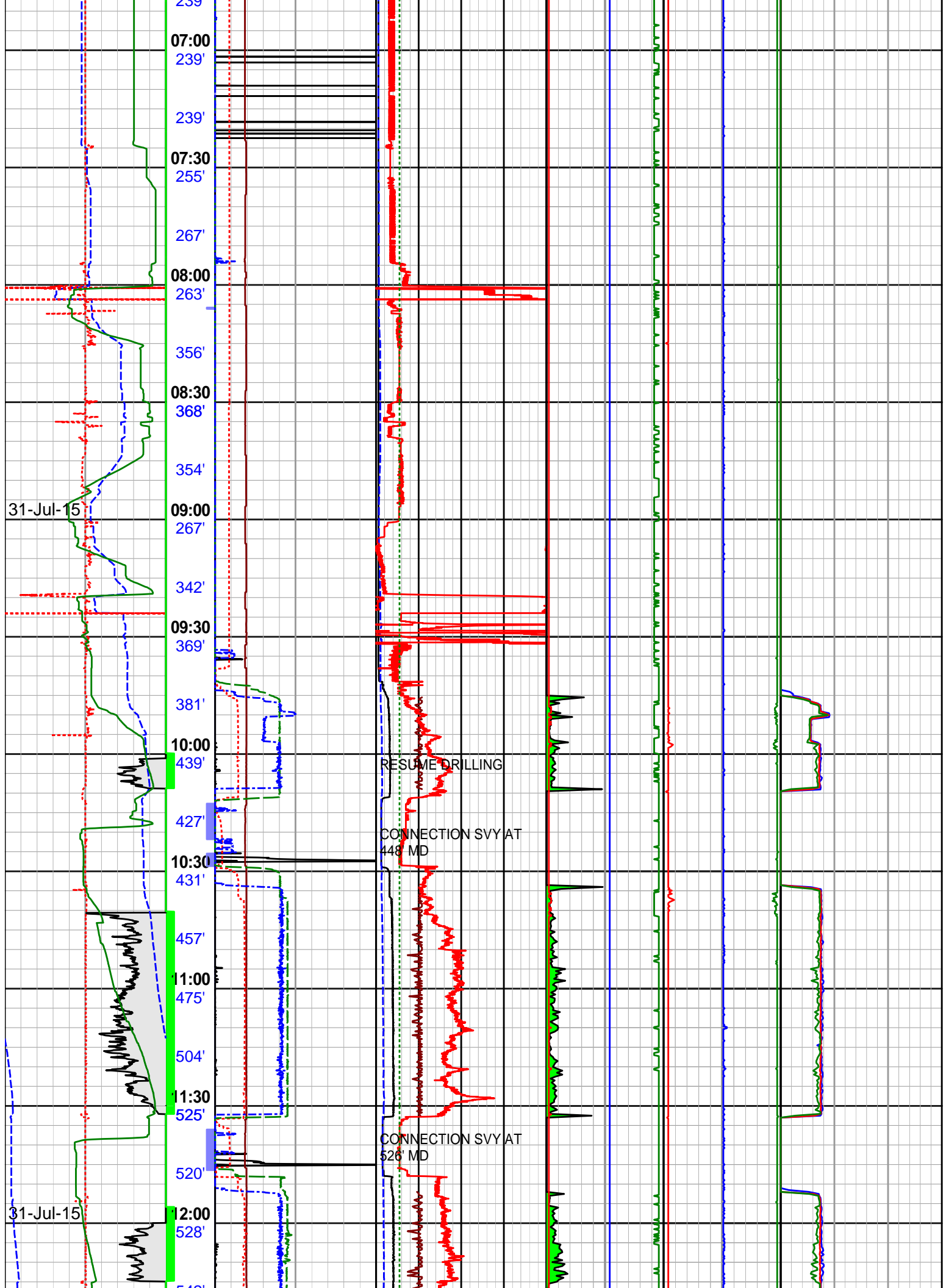
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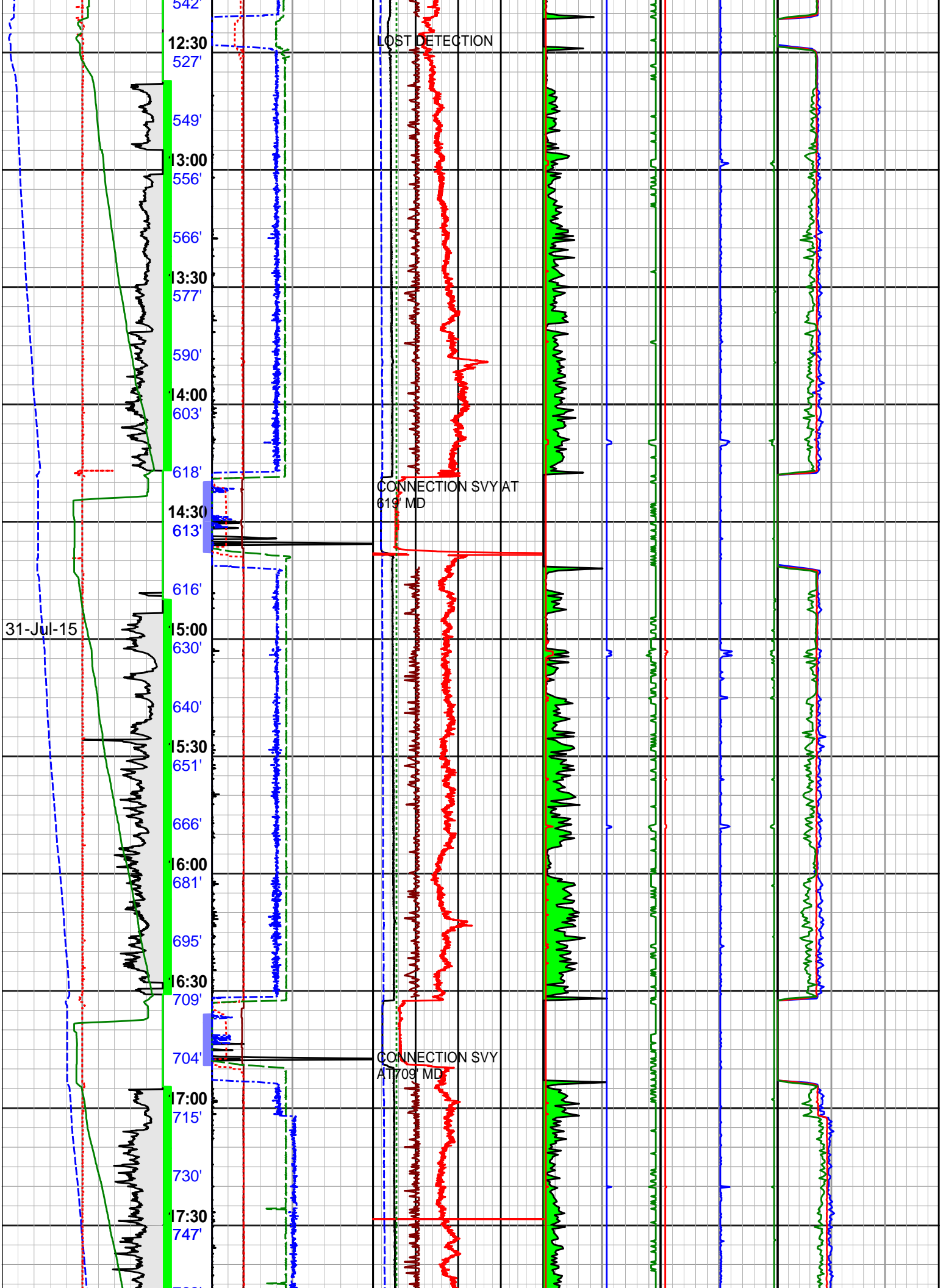
		<b>Hookload Avg</b>		<b>ADR Temperature</b>		<b>DDSr Stick Slip</b>					
		0 400		0 50 100 150 200		0 100 200 300 400					
		kilo pounds		fahrenheit							
<b>ROP Avg</b>		<b>Torque Abs</b>		<b>PWD Internal Pressure</b>		100- 150- < 100% 150% 200% > 200%					
400 0		0 25K		0 1.25K 2.5K 3.75K 5K		Low Med High Full Stall					
feet per hr		foot-pound		lbs / in2 gauge							
<b>Bit Depth</b>		<b>RPM Surface Avg</b>		<b>PWD Annular Pressure</b>		<b>DDSr Avg Z</b>		<b>DDSr Peak Z</b>		<b>DDSr RPM Max</b>	
0 500		0 200		0 1.25K 2.5K 3.75K 5K		-5 0 5		-50 0 50		0 100 200 300	
feet		rev per min		lbs / in2 gauge		g		g		rev per min	
<b>Block Position</b>		<b>Flow In</b>		<b>Dens Mud In</b>		<b>DDSr Avg Y</b>		<b>DDSr Peak Y</b>		<b>DDSr RPM Min</b>	
205 -5		0 1K 8		9 10 11 12		10 5 0		100 50 0		0 100 200 300	
feet		gallon per min		lbs per gal		g		g		rev per min	
<b>Running Speed</b>		<b>SPP Avg</b>		<b>PWD Annular EMW</b>		<b>DDSr Avg X</b>		<b>DDSr Peak X</b>		<b>DDSr RPM Mean</b>	
in Btm											
ps Status											













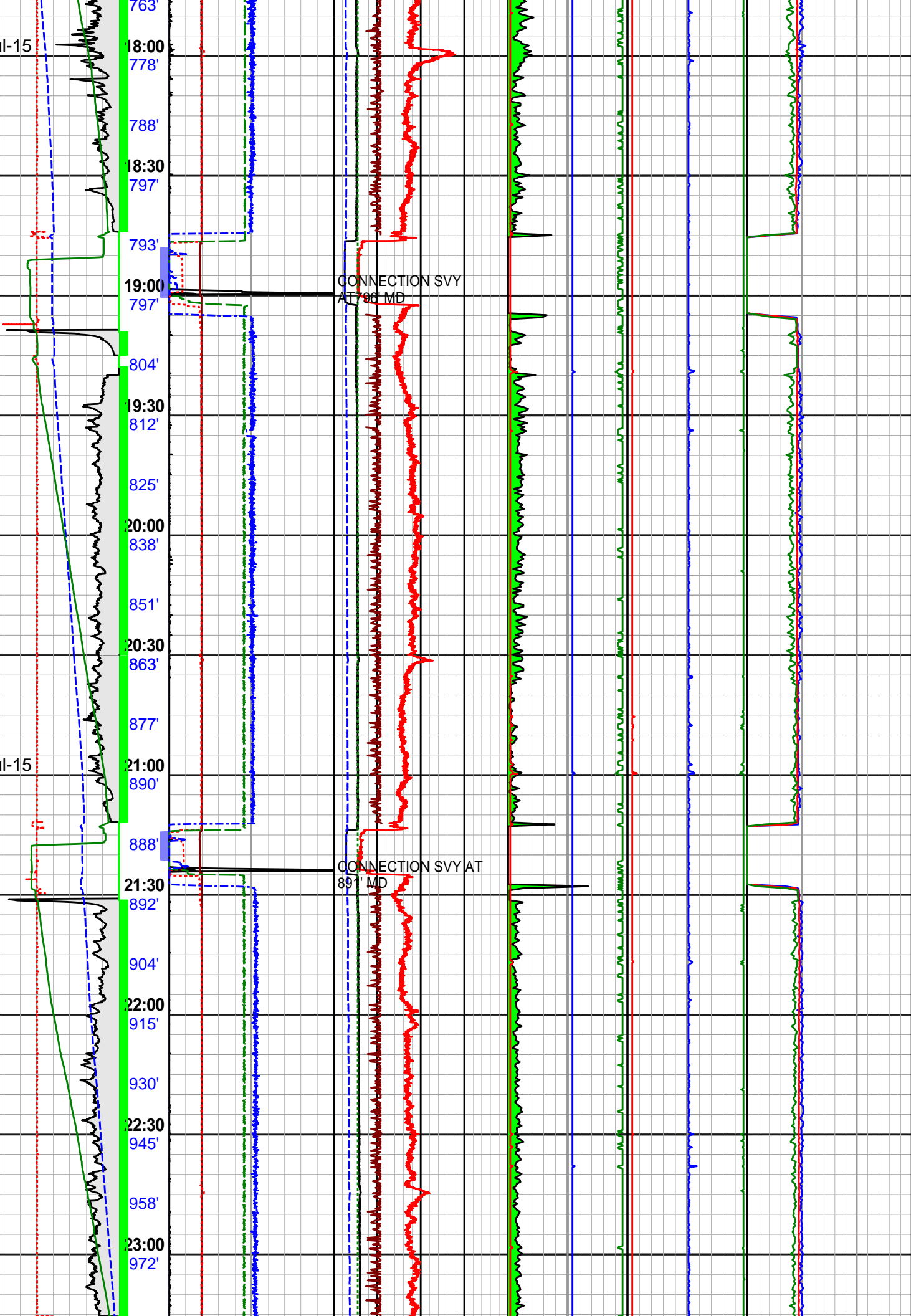
31-Jul-15

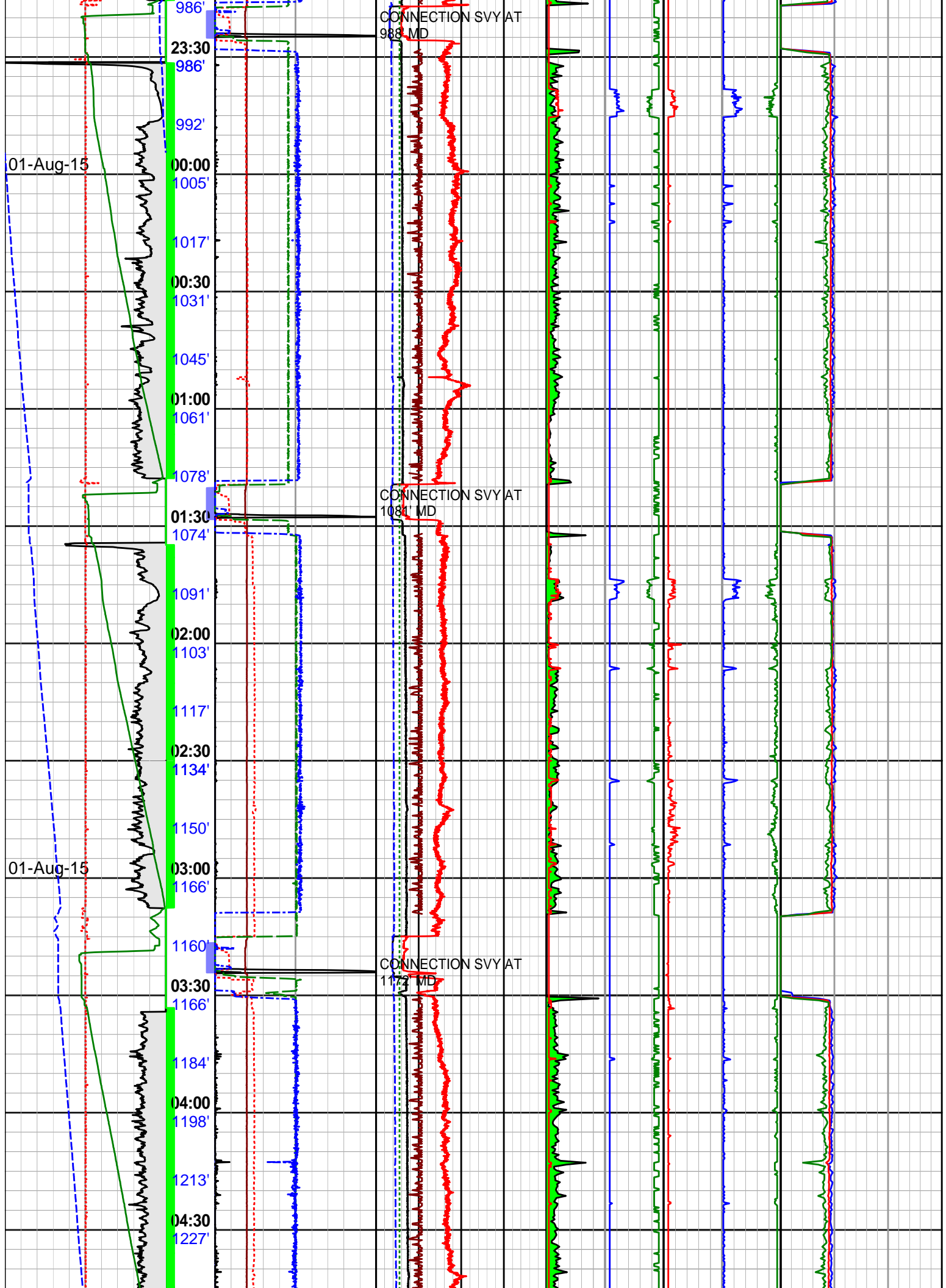
763'  
18:00  
778'  
788'  
18:30  
797'  
793'  
19:00  
797'  
804'  
19:30  
812'  
825'  
20:00  
838'  
851'  
20:30  
863'  
877'  
21:00  
890'  
888'  
21:30  
892'  
904'  
22:00  
915'  
930'  
22:30  
945'  
958'  
23:00  
972'

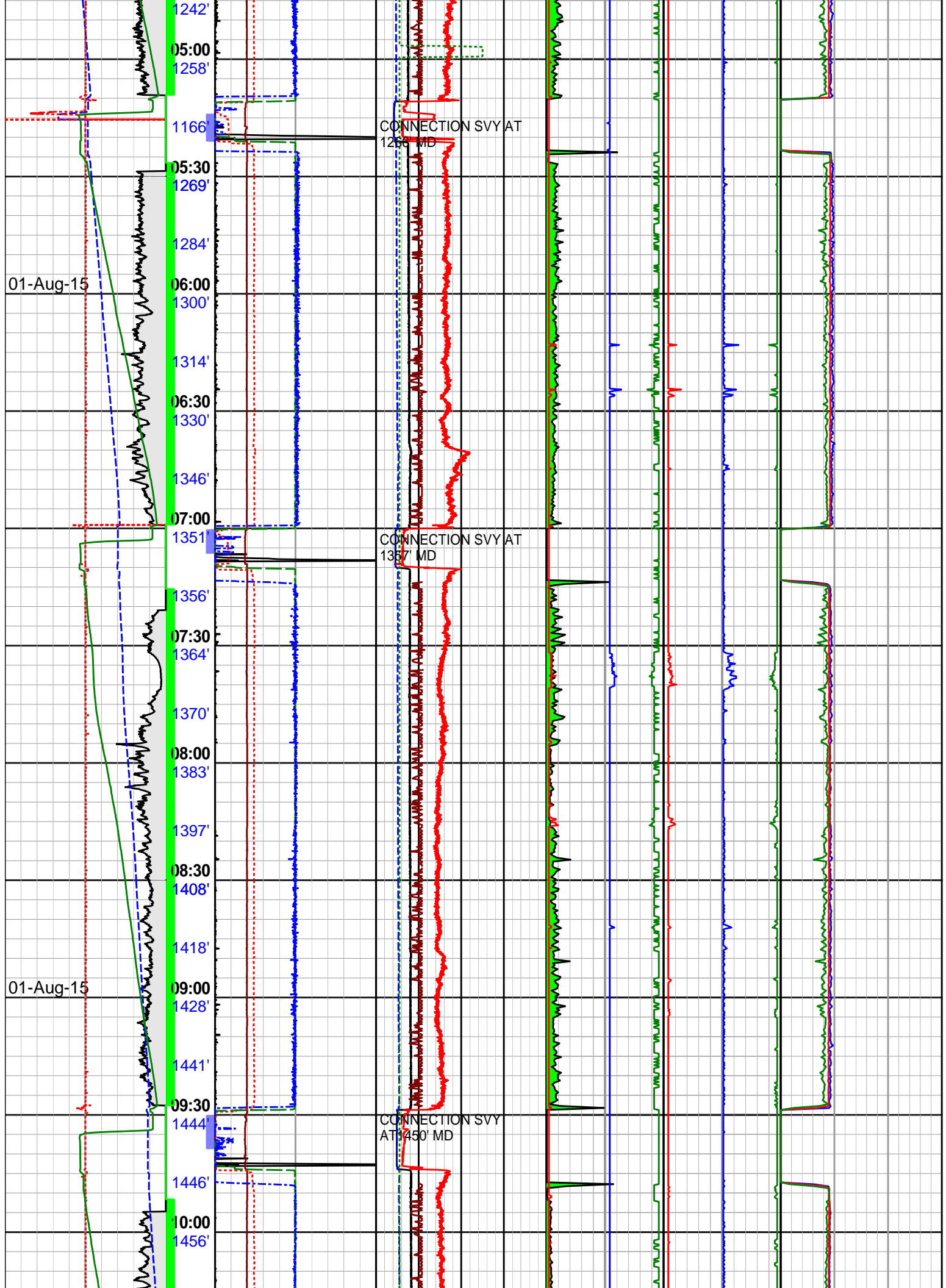
CONNECTION SVY AT 89' MD

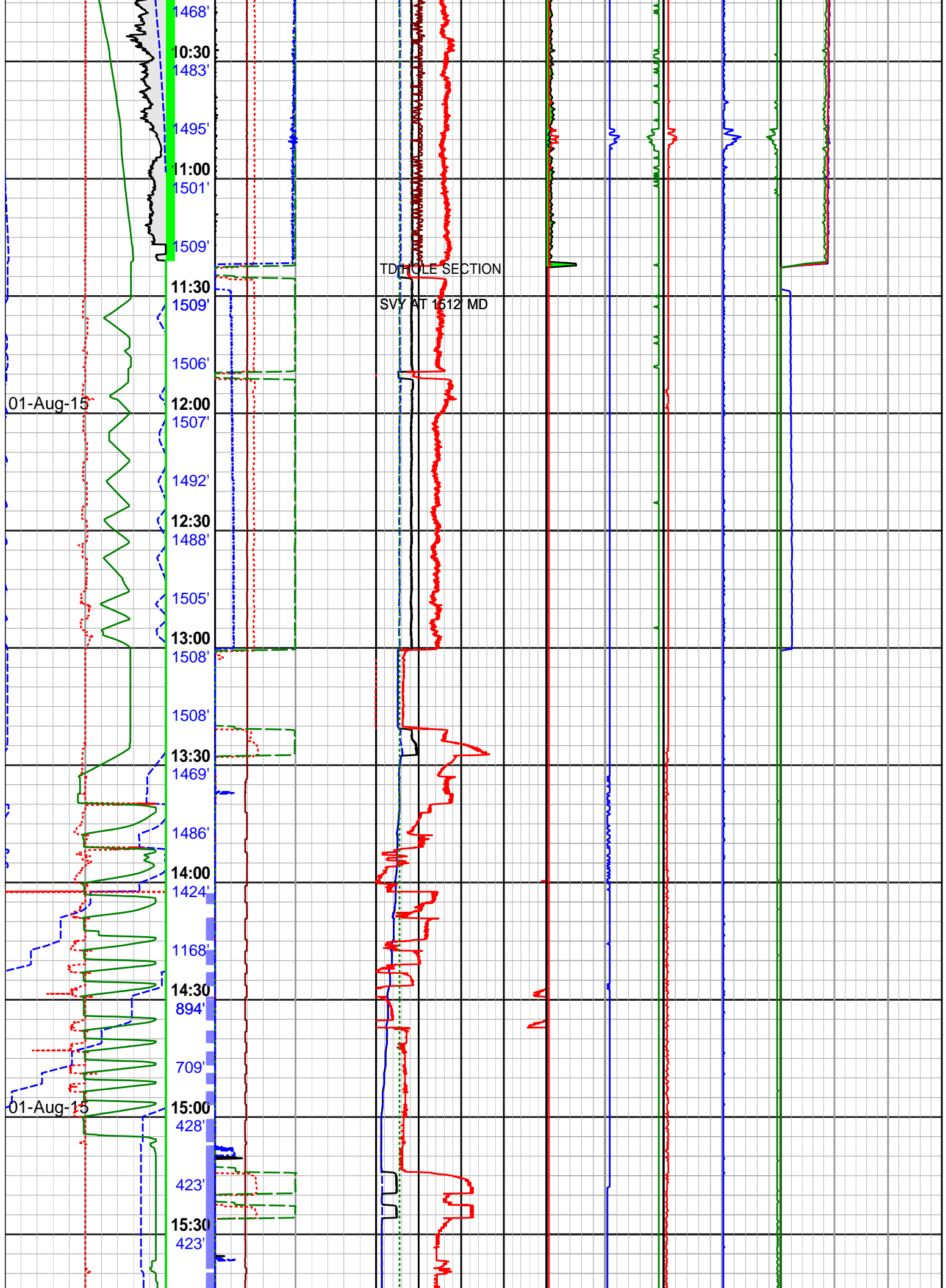
CONNECTION SVY AT 89' MD

31-Jul-15









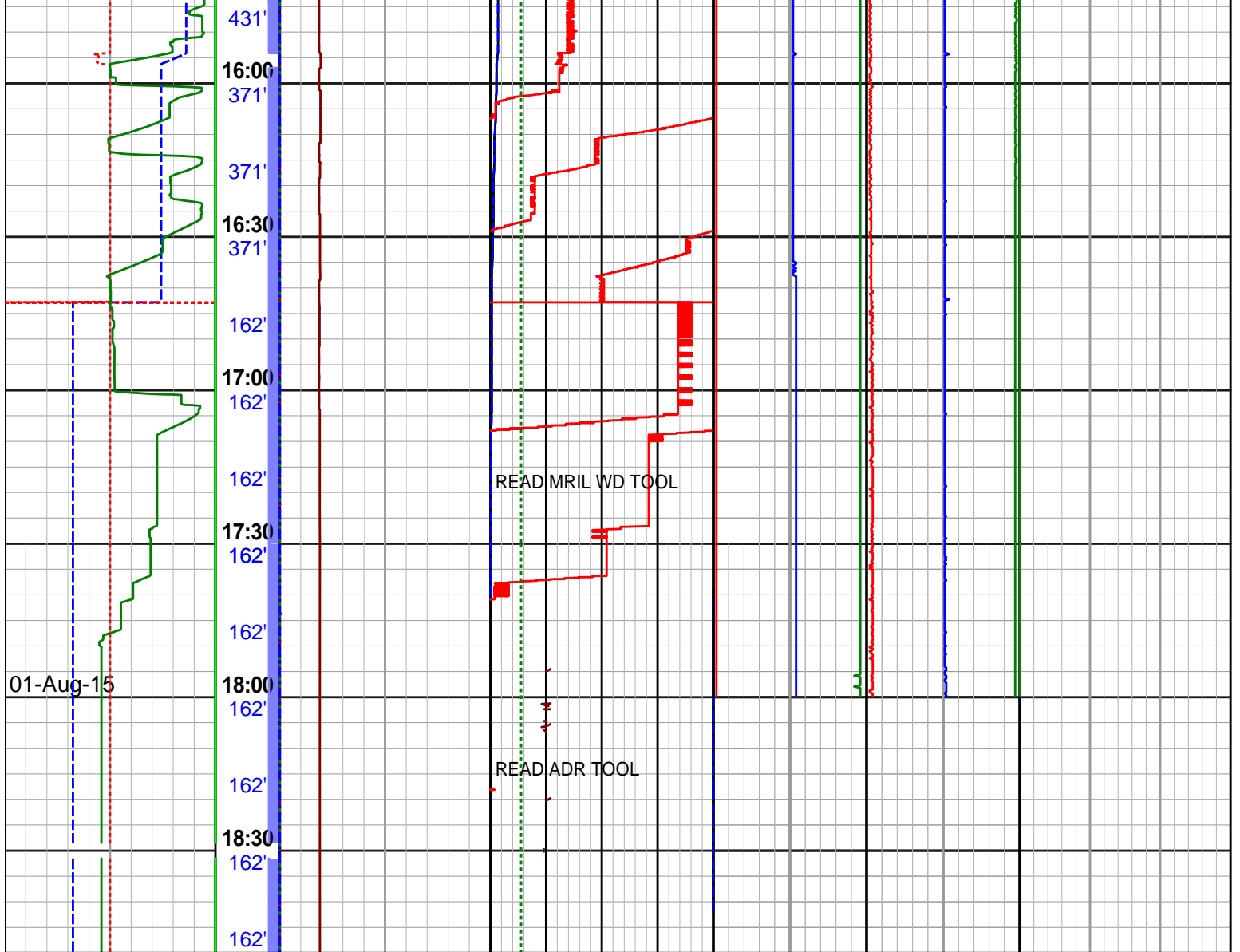
TD/HOLE SECTION  
SVY AT 1612 MD

01-Aug-15

01-Aug-15

1468'  
1483'  
1495'  
1501'  
1509'  
1509'  
1506'  
1507'  
1492'  
1488'  
1505'  
1508'  
1508'  
1469'  
1486'  
1424'  
1168'  
894'  
709'  
428'  
423'  
423'

10:30  
11:00  
11:30  
12:00  
12:30  
13:00  
13:30  
14:00  
14:30  
15:00  
15:30



<b>Running Speed</b> -250 250 feet per min	On Btm In Slips Status	<b>SPP Avg</b> 0 5K lbs / in2 gauge	<b>PWD Annular EMW</b> 8 9 10 11 12 lbs per gal	<b>DDSr Avg X</b> 0 5 10 g	<b>DDSr Peak X</b> 0 50 100 g	<b>DDSr RPM Mean</b> 0 100 200 300 rev per min								
<b>Block Position</b> 205 -5 feet		<b>Flow In</b> 0 1K gallon per min	<b>Dens Mud In</b> 8 9 10 11 12 lbs per gal	<b>DDSr Avg Y</b> 10 5 0 g	<b>DDSr Peak Y</b> 0 100 50 0 g	<b>DDSr RPM Min</b> 0 100 200 300 rev per min								
<b>Bit Depth</b> 0 500 feet	On BTM	<b>RPM Surface Avg</b> 0 200 rev per min	<b>PWD Annular Pressure</b> 0 1.25K 2.5K 3.75K 5K lbs / in2 gauge	<b>DDSr Avg Z</b> -5 0 5 g	<b>DDSr Peak Z</b> -50 0 50 g	<b>DDSr RPM Max</b> 0 100 200 300 rev per min								
<b>ROP Avg</b> 400 0 feet per hr		<b>Torque Abs</b> 0 25K foot-pound	<b>PWD Internal Pressure</b> 0 1.25K 2.5K 3.75K 5K lbs / in2 gauge	<b>DDSr Stick Slip</b> 0 100 200 300 400										
		<b>Hookload Avg</b> 0 400 kilo pounds	<b>ADR Temperature</b> 0 50 100 150 200 fahrenheit	<table border="1"> <tr> <td>&lt; 100%</td> <td>100- 150%</td> <td>150- 200%</td> <td>&gt; 200%</td> </tr> <tr> <td>Low</td> <td>Med</td> <td>High</td> <td>Full Stall</td> </tr> </table>			< 100%	100- 150%	150- 200%	> 200%	Low	Med	High	Full Stall
< 100%	100- 150%	150- 200%	> 200%											
Low	Med	High	Full Stall											

# HALLIBURTON

## DIRECTIONAL SURVEY REPORT

Shell Gulf of Mexico Inc.  
 OCS-Y-2321 BJ001 ST00BP00  
 Posey 6912  
 Alaska  
 USA

AK-XX-0901604700  
 Final Survey is projected to well TD

<i>Measured Depth (feet)</i>	<i>Inclination (degrees)</i>	<i>Direction (degrees)</i>	<i>Vertical Depth (feet)</i>	<i>Latitude (feet)</i>	<i>Departure (feet)</i>	<i>Vertical Section (feet)</i>	<i>Dogleg (deg/100ft)</i>
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
220.00	0.00	0.00	220.00	0.00 N	0.00 E	0.00	0.00
320.88	0.51	129.60	320.88	0.29 S	0.35 E	-0.29	0.50
406.77	0.31	89.93	406.76	0.53 S	0.88 E	-0.53	0.39
495.25	0.99	122.22	495.24	0.93 S	1.76 E	-0.93	0.84
590.43	0.31	82.72	590.41	1.34 S	2.71 E	-1.34	0.81
684.05	0.64	327.24	684.03	0.87 S	2.68 E	-0.87	0.88
866.10	0.28	101.20	866.08	0.09 S	2.55 E	-0.09	0.47
957.99	0.00	269.46	957.97	0.13 S	2.77 E	-0.13	0.30
1051.65	0.14	176.72	1051.63	0.24 S	2.78 E	-0.24	0.15
1144.54	0.26	120.65	1144.52	0.46 S	2.97 E	-0.46	0.23
1235.66	0.41	134.11	1235.63	0.80 S	3.38 E	-0.80	0.19
1328.60	0.51	59.75	1328.58	0.83 S	3.98 E	-0.83	0.61
1378.50	0.25	111.62	1378.48	0.76 S	4.27 E	-0.76	0.81
1540.18	0.12	50.83	1540.15	0.78 S	4.74 E	-0.78	0.14
1723.74	0.39	34.99	1723.71	0.14 S	5.26 E	-0.14	0.15
1818.58	0.58	50.01	1818.55	0.43 N	5.81 E	0.43	0.24
2003.18	1.06	39.81	2003.12	2.35 N	7.62 E	2.35	0.27
2095.93	0.87	35.51	2095.87	3.57 N	8.57 E	3.57	0.22
2186.15	0.69	72.12	2186.07	4.30 N	9.49 E	4.30	0.57
2373.34	0.75	76.36	2373.25	4.93 N	11.76 E	4.93	0.04
2463.93	0.78	75.65	2463.83	5.23 N	12.93 E	5.23	0.03
2555.30	0.79	70.25	2555.19	5.59 N	14.13 E	5.59	0.08
2646.22	0.79	76.51	2646.11	5.95 N	15.33 E	5.95	0.10
2743.03	0.70	74.08	2742.91	6.27 N	16.55 E	6.27	0.10
2837.42	0.74	67.59	2837.29	6.66 N	17.68 E	6.66	0.10
2875.38	0.64	69.95	2875.25	6.83 N	18.10 E	6.83	0.27
2978.31	0.74	64.69	2978.17	7.31 N	19.25 E	7.31	0.11
3074.55	0.58	52.33	3074.40	7.88 N	20.20 E	7.88	0.22
3169.04	0.67	47.05	3168.89	8.55 N	20.99 E	8.55	0.11
3258.93	0.77	27.36	3258.77	9.44 N	21.65 E	9.44	0.30
3351.80	0.94	33.05	3351.63	10.64 N	22.35 E	10.64	0.21
3445.40	0.89	33.34	3445.22	11.90 N	23.18 E	11.90	0.06
3537.90	0.88	39.68	3537.71	13.05 N	24.03 E	13.05	0.11
3630.29	0.86	29.57	3630.09	14.20 N	24.82 E	14.20	0.17
3724.13	1.05	46.97	3723.91	15.40 N	25.80 E	15.40	0.37
3815.47	1.16	37.46	3815.23	16.71 N	26.98 E	16.71	0.24
3909.95	1.11	27.77	3909.70	18.28 N	27.99 E	18.28	0.21
4001.96	1.54	18.87	4001.69	20.24 N	28.80 E	20.24	0.52
4095.18	1.55	21.22	4094.87	22.60 N	29.67 E	22.60	0.07
4189.17	1.52	19.27	4188.83	24.97 N	30.54 E	24.97	0.06
4280.67	1.73	13.84	4280.29	27.46 N	31.27 E	27.46	0.28
4373.26	2.11	22.24	4372.83	30.39 N	32.25 E	30.39	0.51
4465.71	1.69	19.56	4465.23	33.26 N	33.35 E	33.26	0.46
4559.04	2.02	19.56	4558.51	36.11 N	34.37 E	36.11	0.35
4651.17	2.19	23.91	4650.58	39.24 N	35.62 E	39.24	0.25
4743.27	2.64	25.07	4742.59	42.77 N	37.23 E	42.77	0.49
4836.87	3.09	32.03	4836.08	46.87 N	39.49 E	46.87	0.61
4929.20	3.15	34.87	4928.26	51.06 N	42.26 E	51.06	0.18
5021.52	3.28	37.85	5020.45	55.22 N	45.33 E	55.22	0.23
5113.59	3.34	39.69	5112.36	59.37 N	48.66 E	59.37	0.13
5206.14	3.59	47.76	5204.74	63.39 N	52.52 E	63.39	0.59
5299.05	3.70	48.27	5297.46	67.34 N	56.92 E	67.34	0.12
5364.19	3.45	52.11	5362.48	69.95 N	60.04 E	69.95	0.54
5429.81	3.65	46.91	5427.97	72.59 N	63.12 E	72.59	0.58
5518.31	3.73	45.18	5516.29	76.55 N	67.22 E	76.55	0.15
5612.70	3.58	42.26	5610.48	80.90 N	71.39 E	80.90	0.25
5704.09	3.56	42.97	5701.70	85.09 N	75.24 E	85.09	0.06
5795.19	3.47	41.51	5792.62	89.22 N	79.00 E	89.22	0.13
5889.32	3.48	42.48	5886.58	93.46 N	82.82 E	93.46	0.06
5980.70	3.42	42.67	5977.80	97.52 N	86.54 E	97.52	0.07
6075.07	3.43	41.69	6072.00	101.69 N	90.33 E	101.69	0.06
6167.81	3.55	39.12	6164.57	105.99 N	93.98 E	105.99	0.21
6259.59	3.53	39.52	6256.17	110.37 N	97.57 E	110.37	0.03
6346.61	3.75	37.26	6343.02	114.70 N	100.99 E	114.70	0.30
6445.34	3.99	34.54	6441.52	120.10 N	104.89 E	120.10	0.31
6536.48	3.96	35.37	6532.44	125.27 N	108.51 E	125.27	0.07

6628.63	3.92	37.01	6624.37	130.38 N	112.25 E	130.38	0.13
6721.62	3.89	35.41	6717.15	135.49 N	115.99 E	135.49	0.12
6745.05	3.99	35.86	6740.52	136.80 N	116.93 E	136.80	0.46
6800.00	3.99	35.86	6795.34	139.90 N	119.17 E	139.90	0.00

**CALCULATION BASED ON MINIMUM CURVATURE METHOD**

**SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT  
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT**

**VERTICAL SECTION RELATIVE TO WELL HEAD  
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 0.00 DEGREES (GRID)  
A TOTAL CORRECTION OF 10.95 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6800.00 FEET  
IS 183.78 FEET ALONG 40.42 DEGREES (GRID)**

**Map System: NAD 83 UTM Zones  
Geo Datum: North American Datum of 1983  
Map Zone: Universal Transverse Mercator Zone 03N**

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