

33-33s-37w



Weatherford® Completion Systems

DRILL STEM TEST REPORT

Prepared For: **EOG Resources**

3817 NW EXPWY STE500
Oklahoma City OK,73112

CONFIDENTIAL

JUN 10 2009

KCC

ATTN: Dale Passig

15-189-22681

33/33/37

Willoughby 33#1

Start Date: 2009.04.08 @ 06:15:12

End Date: 2009.04.08 @ 16:29:42

Job Ticket #: 34032 DST #: 1

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ALPINE OIL SERVICES CORPORATION
2460, 240 - 4 Avenue S.W. Calgary, AB. T2P 4H4
ph: 263-7800 fax: 264-7260

EOG Resources

Willoughby 33#1

33/33/37

DST # 1

Lower Morrow

2009.04.08

33-085-29w



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DRILL STEM TEST REPORT

EOG Resources

Willoughby 33#1

3817 NW EXPWY STE500
Oklahoma City OK,73112

33/33/37

Job Ticket: 34032

DST#: 1

ATTN: Dale Passig

Test Start: 2009.04.08 @ 06:15:12

GENERAL INFORMATION:

Formation: **Lower Morrow**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 11:33:22

Time Test Ended: 16:29:42

Test Type: Conventional Bottom Hole

Tester: Mike Slemp

Unit No: 28

Interval: **6126.00 ft (KB) To 6245.00 ft (KB) (TVD)**

Reference Elevations: 3128.00 ft (KB)

Total Depth: 6245.00 ft (KB) (TVD)

3116.00 ft (CF)

Hole Diameter: 7.78 inches Hole Condition: Fair

KB to GR/CF: 12.00 ft

Serial #: 6752 Inside

Press@RunDepth: psig @ 6132.00 ft (KB)

Capacity: 7000.00 psig

Start Date: 2009.04.08

End Date: 2009.04.08

Last Calib.: 2009.04.08

Start Time: 06:15:13

End Time: 16:29:42

Time On Btm: 2009.04.08 @ 11:33:12

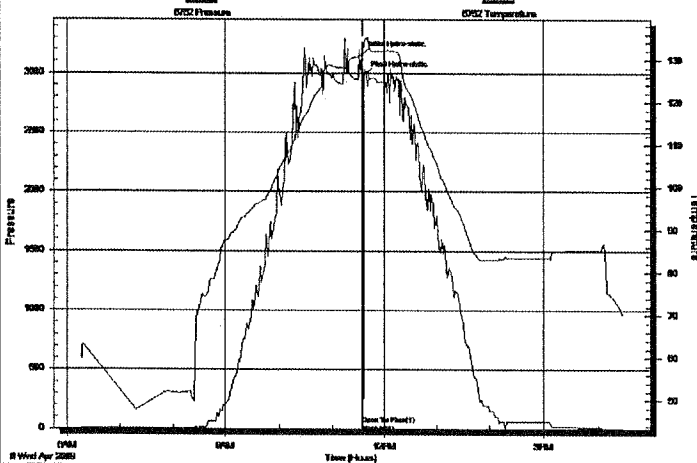
Time Off Btm: 2009.04.08 @ 11:36:22

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TEST COMMENT: Misrun- Packer failure

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Pressure vs. Time



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	3148.95	131.31	Initial Hydro-static
1	38.87	130.35	Open To Flow (1)
2	37.59	129.66	Shut-In(1)
4	2978.77	133.82	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
277.00	100% mud	1.36

Gas Rates

	Choke (Inches)	Pressure (psig)	Gas Rate (Mcf/d)



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DRILL STEM TEST REPORT

TOOL DIAGRAM

EOG Resources

Willoughby 33#1

3817 NW EXPWY STE500
 Oklahoma City OK,73112

33/33/37

Job Ticket: 34032

DST#: 1

ATTN: Dale Passig

Test Start: 2009.04.08 @ 06:15:12

Tool Information

Drill Pipe:	Length: 5741.00 ft	Diameter: 3.80 inches	Volume: 80.53 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 370.00 ft	Diameter: 2.25 inches	Volume: 1.82 bbl	Weight to Pull Loose: 100000.0 lb
			<u>Total Volume: 82.35 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	11.00 ft			String Weight: Initial 76000.00 lb
Depth to Top Packer:	6126.00 ft			Final 80000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	119.00 ft			
Tool Length:	145.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Length (ft) Serial No. Position Depth (ft) Accum. Lengths

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Change Over Sub	1.00			6101.00		
Shut In Tool	5.00			6106.00		
Sampler	3.00			6109.00		
Hydraulic tool	5.00			6114.00		
Jars	5.00			6119.00		
Safety Joint	2.00			6121.00		
Packer	5.00			6126.00	26.00	Bottom Of Top Packer
Packer - Shale	4.00			6130.00		
Stubb	1.00			6131.00		
Perforations	1.00			6132.00		
Recorder	0.00	8321	Inside	6132.00		
Recorder	0.00	6752	Inside	6132.00		
Perforations	15.00			6147.00		
Change Over Sub	1.00			6148.00		
Drill Pipe	93.00			6241.00		
Change Over Sub	1.00			6242.00		
Bullnose	3.00			6245.00	119.00	Anchor Tool
Total Tool Length:	145.00					

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DRILL STEM TEST REPORT

FLUID SUMMARY

EOG Resources

Willoughby 33#1

3817 NW EXPWY STE500
 Oklahoma City OK,73112

33/33/37

Job Ticket: 34032

DST#: 1

ATTN: Dale Passig

Test Start: 2009.04.08 @ 06:15:12

Mud and Cushion Information

Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	ppm
Viscosity: 50.00 sec/qt	Cushion Volume: bbl		
Water Loss: 8.17 cm ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 1000.00 ppm			
Filter Cake: inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
277.00	100% mud	1.362

Total Length: 277.00 ft Total Volume: 1.362 bbl
 Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:
 Laboratory Name: Laboratory Location: JUN 10 2009
 Recovery Comments: Misrun Packer failure

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DRILL STEM TEST REPORT

GAS RATES

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EOG Resources
3817 NW EXPWY STE500
Oklahoma City OK,73112

Willoughby 33#1

33/33/37

Job Ticket: 34032

DST#: 1

ATTN: Dale Passig

Test Start: 2009.04.08 @ 06:15:12

Gas Rates Information

Temperature: 59 deg C
Relative Density: 0.65
Z Factor: 0.8

Gas Rates Table

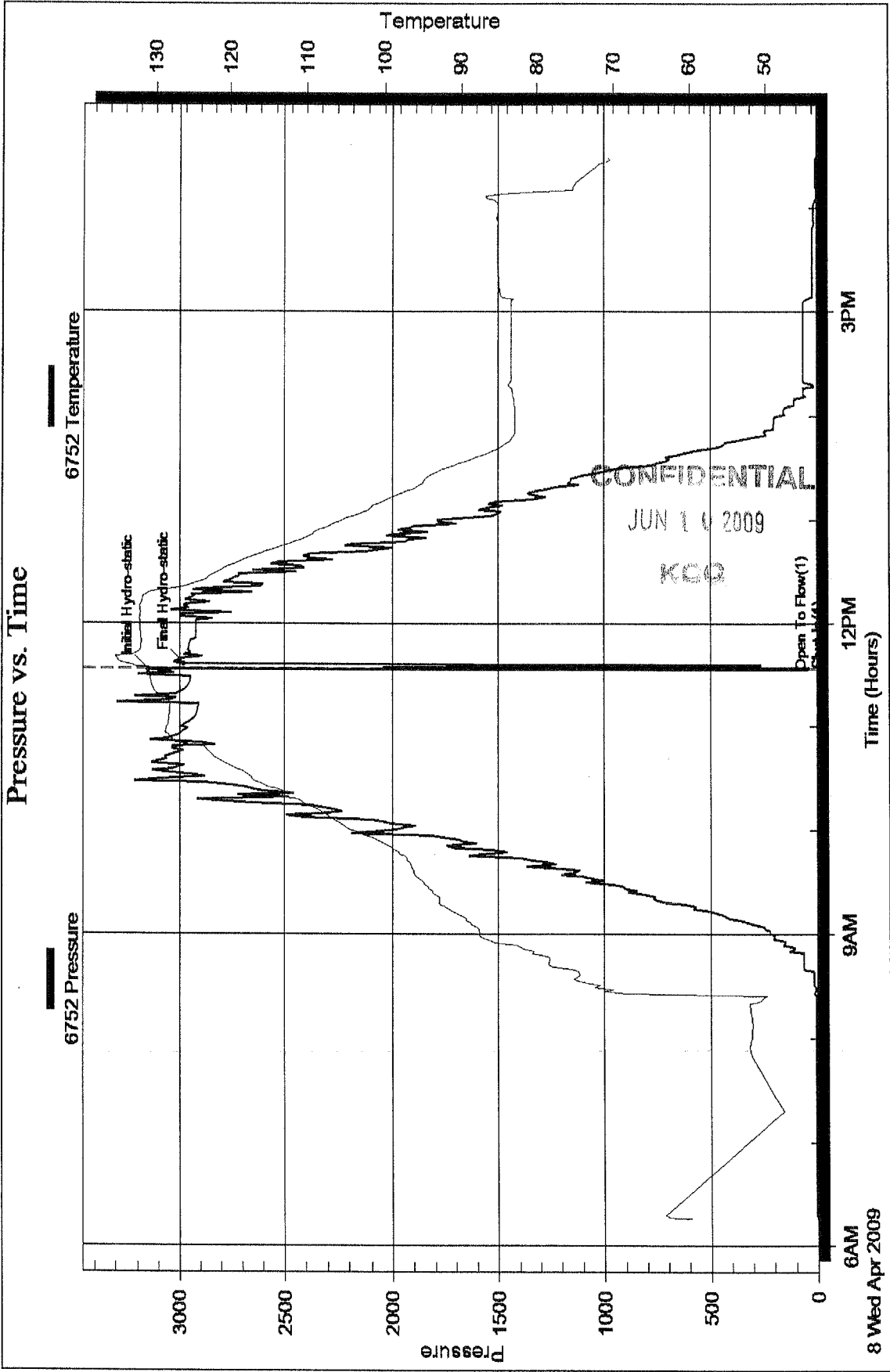
Flow Period	Elapsed Time	Choke (mm)	Pressure (kPaa)	Gas Rate (m ³ /d)
		0.00	0.00	0.00

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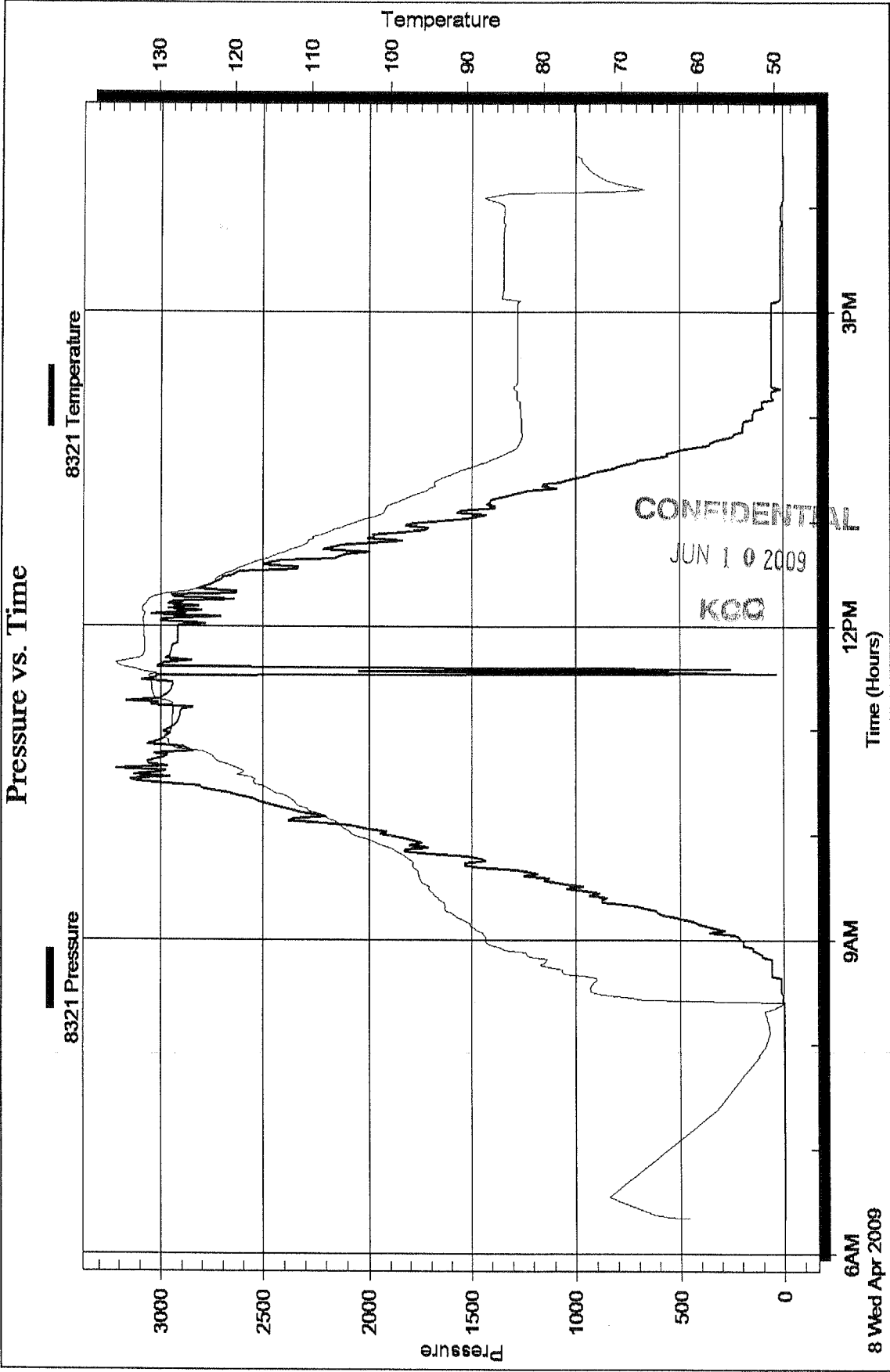
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Pressure vs. Time



Pressure vs. Time





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Prepared For: **EOG Resources**

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3817 NW EXPWY STE500
Oklahoma City OK,73112

ATTN: Dale Passig

33/33/37

Willoughby 33#1

Start Date: 2009.04.09 @ 01:25:00

End Date: 2009.04.09 @ 15:33:19

Job Ticket #: 34033 DST #: 2

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KCC WICHITA

ALPINE OIL SERVICES CORPORATION
2460, 240 - 4 Avenue S.W. Calgary, AB. T2P 4H4
ph: 263-7800 fax: 264-7260



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DRILL STEM TEST REPORT

EOG Resources

Willoughby 33#1

3817 NW EXPWY STE500
Oklahoma City OK,73112

33/33/37

Job Ticket: 34033

DST#: 2

ATTN: Dale Passig

Test Start: 2009.04.09 @ 01:25:00

GENERAL INFORMATION:

Formation: **Lower Morrow**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 06:35:50

Time Test Ended: 15:33:19

Test Type: Conventional Bottom Hole

Tester: Mike Slemp

Unit No: 28

Interval: **6139.00 ft (KB) To 6245.00 ft (KB) (TVD)**

Reference Elevations: 3128.00 ft (KB)

Total Depth: 6245.00 ft (KB) (TVD)

3116.00 ft (CF)

Hole Diameter: 7.78 inches Hole Condition: Fair

KB to GR/CF: 12.00 ft

Serial #: 6752 Inside

Press@RunDepth: 54.82 psig @ 6178.00 ft (KB)

Start Date: 2009.04.09

End Date: 2009.04.09

Start Time: 01:25:01

End Time: 06:33:19

Capacity: 7000.00 psig

Last Calib.: 2009.04.09

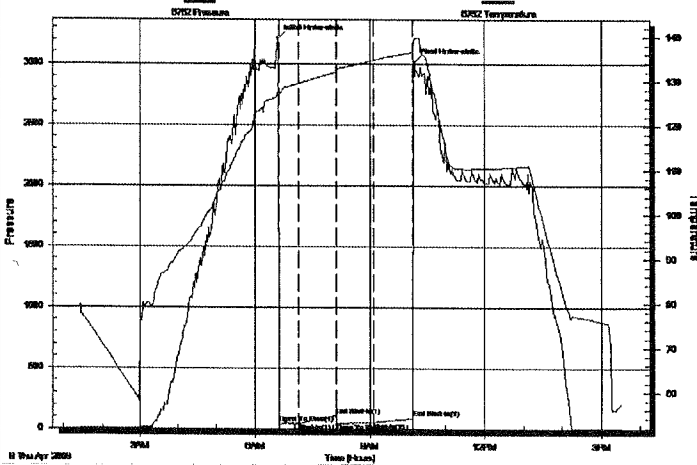
Time On Btm: 2009.04.09 @ 06:34:00

Time Off Btm: 2009.04.09 @ 10:11:00

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TEST COMMENT: IF- Weak steady blow , 1/2 inch in 30 min
IS- No blow back
FF- No blow
FSI- No blow back

Pressure vs. Time



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	3208.14	127.74	Initial Hydro-static
2	42.75	126.88	Open To Flow (1)
32	43.64	129.45	Shut-In(1)
91	111.23	131.96	End Shut-In(1)
92	49.73	132.24	Open To Flow(2)
152	54.82	134.74	Shut-In(2)
215	90.36	136.54	End Shut-In(2)
217	3016.70	139.48	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
30.00	100% mud	0.15

Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



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DRILL STEM TEST REPORT

TOOL DIAGRAM

EOG Resources

Willoughby 33#1

3817 NW EXPWY STE500
 Oklahoma City OK,73112

33/33/37

Job Ticket: 34033

DST#: 2

ATTN: Dale Passig

Test Start: 2009.04.09 @ 01:25:00

Tool Information

Drill Pipe:	Length: 5751.00 ft	Diameter: 3.80 inches	Volume: 80.67 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 370.00 ft	Diameter: 2.25 inches	Volume: 1.82 bbl	Weight to Pull Loose: 80000.00 lb
			<u>Total Volume: 82.49 bbl</u>	Tool Chased ft
Drill Pipe Above KB:	12.00 ft			String Weight: Initial 74000.00 lb
Depth to Top Packer:	6139.00 ft			Final 76000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	106.00 ft			
Tool Length:	136.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description

Length (ft) Serial No. Position Depth (ft) Accum. Lengths

Change Over Sub	1.00			6110.00		
Shut In Tool	5.00			6115.00		
Sampler	3.00			6118.00		
Hydraulic tool	5.00			6123.00		
Jars	5.00			6128.00		
Safety Joint	2.00			6130.00		
Packer - Shale	5.00			6135.00		
Packer	4.00			6139.00	30.00	Bottom Of Top Packer
Stubb	1.00			6140.00		
Perforations	38.00			6178.00		
Recorder	0.00	8321	Inside	6178.00		
Recorder	0.00	6752	Inside	6178.00		
Change Over Sub	1.00			6179.00		
Drill Pipe	62.00			6241.00		
Change Over Sub	1.00			6242.00		
Bullnose	3.00			6245.00	106.00	Anchor Tool
Total Tool Length:	136.00					

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DRILL STEM TEST REPORT

FLUID SUMMARY

EOG Resources

Willoughby 33#1

3817 NW EXPWY STE500
 Oklahoma City OK,73112

33/33/37

Job Ticket: 34033

DST#: 2

ATTN: Dale Passig

Test Start: 2009.04.09 @ 01:25:00

Mud and Cushion Information

Mud Type: Gel Chem	Cushion Type:	Oil API:	deg API
Mud Weight: 9.00 lb/gal	Cushion Length: ft	Water Salinity:	ppm
Viscosity: 50.00 sec/qt	Cushion Volume: bbl		
Water Loss: 6.19 cm ³	Gas Cushion Type:		
Resistivity: ohm.m	Gas Cushion Pressure: psig		
Salinity: 1000.00 ppm			
Filter Cake: inches			

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
30.00	100% mud	0.148

Total Length: 30.00 ft Total Volume: 0.148 bbl

Num Fluid Samples: 0 Num Gas Bombs: 0 Serial #:

Laboratory Name: Laboratory Location:

Recovery Comments: Sampler-0PSI 4000ml mud

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GAS RATES

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EOG Resources
3817 NW EXPWY STE500
Oklahoma City OK,73112

Willoughby 33#1

33/33/37

Job Ticket: 34033

DST#: 2

ATTN: Dale Passig

Test Start: 2009.04.09 @ 01:25:00

Gas Rates Information

Temperature: 59 deg C
Relative Density: 0.65
Z Factor: 0.8

Gas Rates Table

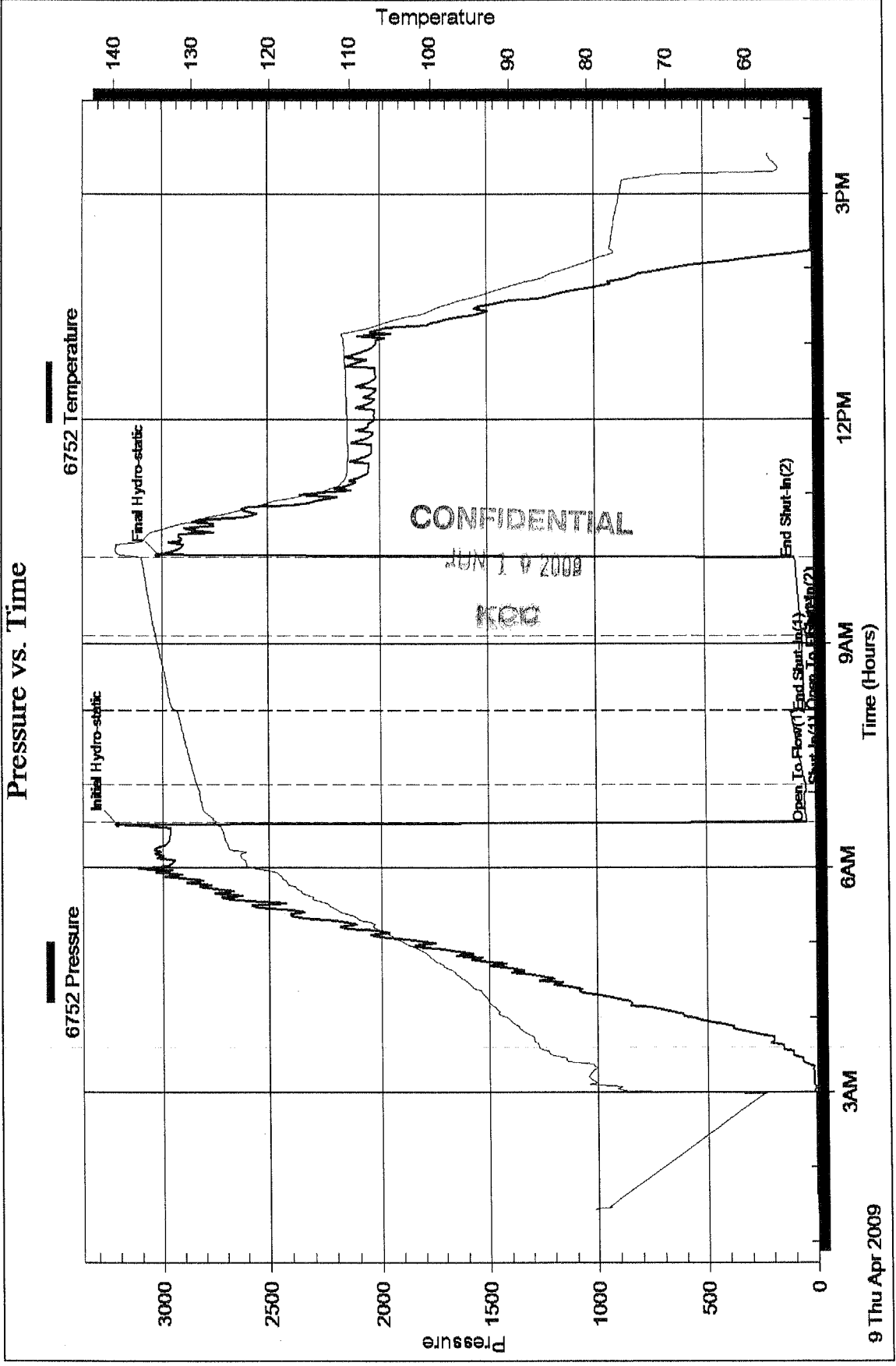
Flow Period	Elapsed Time	Choke (mm)	Pressure (kPaa)	Gas Rate (m ³ /d)
		0.00	0.00	0.00

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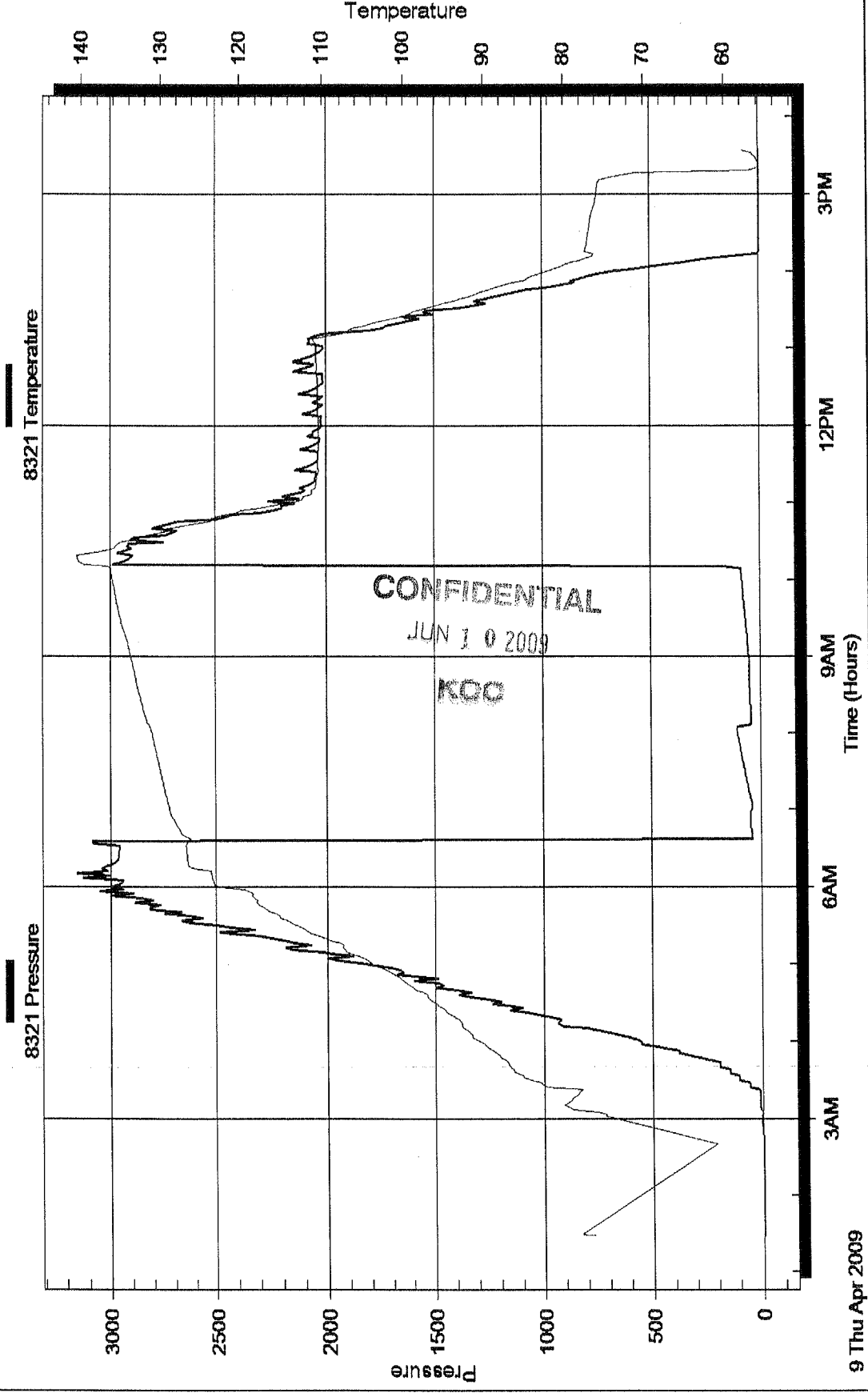
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Pressure vs. Time



Pressure vs. Time





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DRILL STEM TEST REPORT

Prepared For: **EOG Resources**

3817 NW EXPWY STE500
Oklahoma City OK,73112

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ATTN: Dale Passig

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Willoughby 33#1

Start Date: 2009.04.10 @ 09:00:00

End Date: 2009.04.10 @ 22:08:00

Job Ticket #: 31065 DST #: 3

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ALPINE OIL SERVICES CORPORATION
2460, 240 - 4 Avenue S.W. Calgary, AB. T2P 4H4
ph: 263-7800 fax: 264-7260



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DRILL STEM TEST REPORT

EOG Resources

Willoughby 33#1

3817 NW EXPWY STE500
Oklahoma City OK,73112

33/33/37

Job Ticket: 31065

DST#: 3

ATTN: Dale Passig

Test Start: 2009.04.10 @ 09:00:00

GENERAL INFORMATION:

Formation: **St. Louis**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 12:31:30

Time Test Ended: 22:08:00

Test Type: Conventional Bottom Hole

Tester: Harley Davidson

Unit No: 33

Interval: **6485.00 ft (KB) To 6576.00 ft (KB) (TVD)**

Reference Elevations: 3128.00 ft (KB)

Total Depth: 6576.00 ft (KB) (TVD)

3116.00 ft (CF)

Hole Diameter: 7.78 inches Hole Condition: Fair

KB to GR/CF: 12.00 ft

Serial #: 6751

Inside

Press@RunDepth: 1736.43 psig @ 6486.00 ft (KB)

Capacity: 7000.00 psig

Start Date: 2009.04.10

End Date: 2009.04.10

Last Calib.: 2009.04.10

Start Time: 09:00:01

End Time: 22:08:00

Time On Btm: 2009.04.10 @ 12:30:00

Time Off Btm: 2009.04.10 @ 17:02:15

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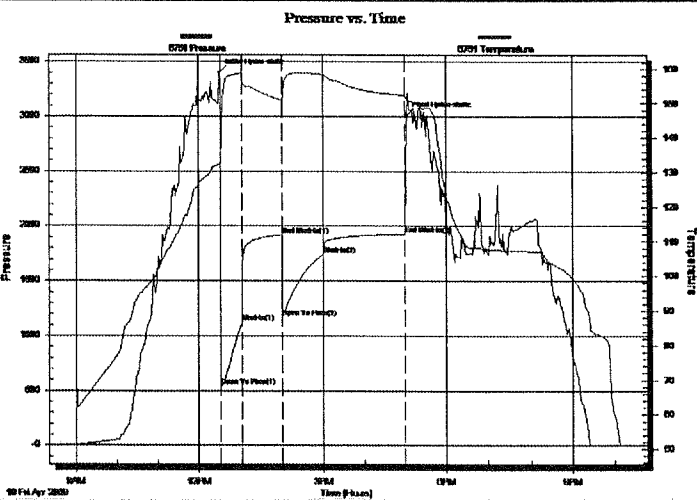
TEST COMMENT: IF- Strong blow BOB 1min.

ISI- No blow back.

FF- Strong blow BOB 2min. Started to die.

FSI- Strong blow back.

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PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	3397.79	132.31	Initial Hydro-static
2	543.47	131.13	Open To Flow (1)
32	1124.83	158.72	Shut-In(1)
90	1919.55	150.80	End Shut-In(1)
91	1166.87	150.61	Open To Flow (2)
150	1736.43	158.33	Shut-In(2)
270	1928.67	152.36	End Shut-In(2)
273	3005.78	151.21	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
3286.00	2%oil 5%mud 15%gas 73%w ater	42.72

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



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DRILL STEM TEST REPORT

TOOL DIAGRAM

EOG Resources

Willoughby 33#1

3817 NW EXPWY STE500
 Oklahoma City OK,73112

33/33/37

Job Ticket: 31065

DST#: 3

ATTN: Dale Passig

Test Start: 2009.04.10 @ 09:00:00

Tool Information

Drill Pipe:	Length: 6097.00 ft	Diameter: 3.80 inches	Volume: 85.52 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 25000.00 lb
Drill Collar:	Length: 370.00 ft	Diameter: 2.25 inches	Volume: 1.82 bbl	Weight to Pull Loose: 110000.0 lb
			<u>Total Volume: 87.34 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	12.00 ft			String Weight: Initial 75000.00 lb
Depth to Top Packer:	6485.00 ft			Final 93000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	91.00 ft			
Tool Length:	121.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		
Tool Comments:				

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Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
Shut In Tool	5.00			6460.00	
Sampler	2.00			6462.00	
Hydraulic tool	5.00			6467.00	
Jars	5.00			6472.00	
Safety Joint	3.00			6475.00	
Packer	5.00			6480.00	30.00 Bottom Of Top Packer
Packer	5.00			6485.00	
Stubb	1.00			6486.00	
Recorder	0.00	6751	Inside	6486.00	
Recorder	0.00	8355	Inside	6486.00	
Change Over Sub	1.00			6487.00	
Drill Pipe	62.00			6549.00	
Change Over Sub	1.00			6550.00	
Perforations	22.00			6572.00	
Bullnose	4.00			6576.00	91.00 Bottom Packers & Anchor

Total Tool Length: 121.00



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DRILL STEM TEST REPORT

FLUID SUMMARY

EOG Resources

Willoughby 33#1

3817 NW EXPWY STE500
 Oklahoma City OK,73112

33/33/37

Job Ticket: 31065

DST#: 3

ATTN: Dale Passig

Test Start: 2009.04.10 @ 09:00:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

0 ppm

Viscosity: 50.00 sec/qt

Cushion Volume:

bbl

Water Loss: 7.98 cm³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1100.00 ppm

Filter Cake: inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
3286.00	2%oil 5%mud 15%gas 73%w ater	42.723

Total Length: 3286.00 ft Total Volume: 42.723 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments: Sampler Data- 1% oil 1% mud, 4 CFD gas @ 1800 PSI.

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DRILL STEM TEST REPORT

GAS RATES

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EOG Resources
3817 NW EXPWY STE500
Oklahoma City OK,73112
ATTN: Dale Passig

Willoughby 33#1
33/33/37
Job Ticket: 31065 DST#: 3
Test Start: 2009.04.10 @ 09:00:00

Gas Rates Information

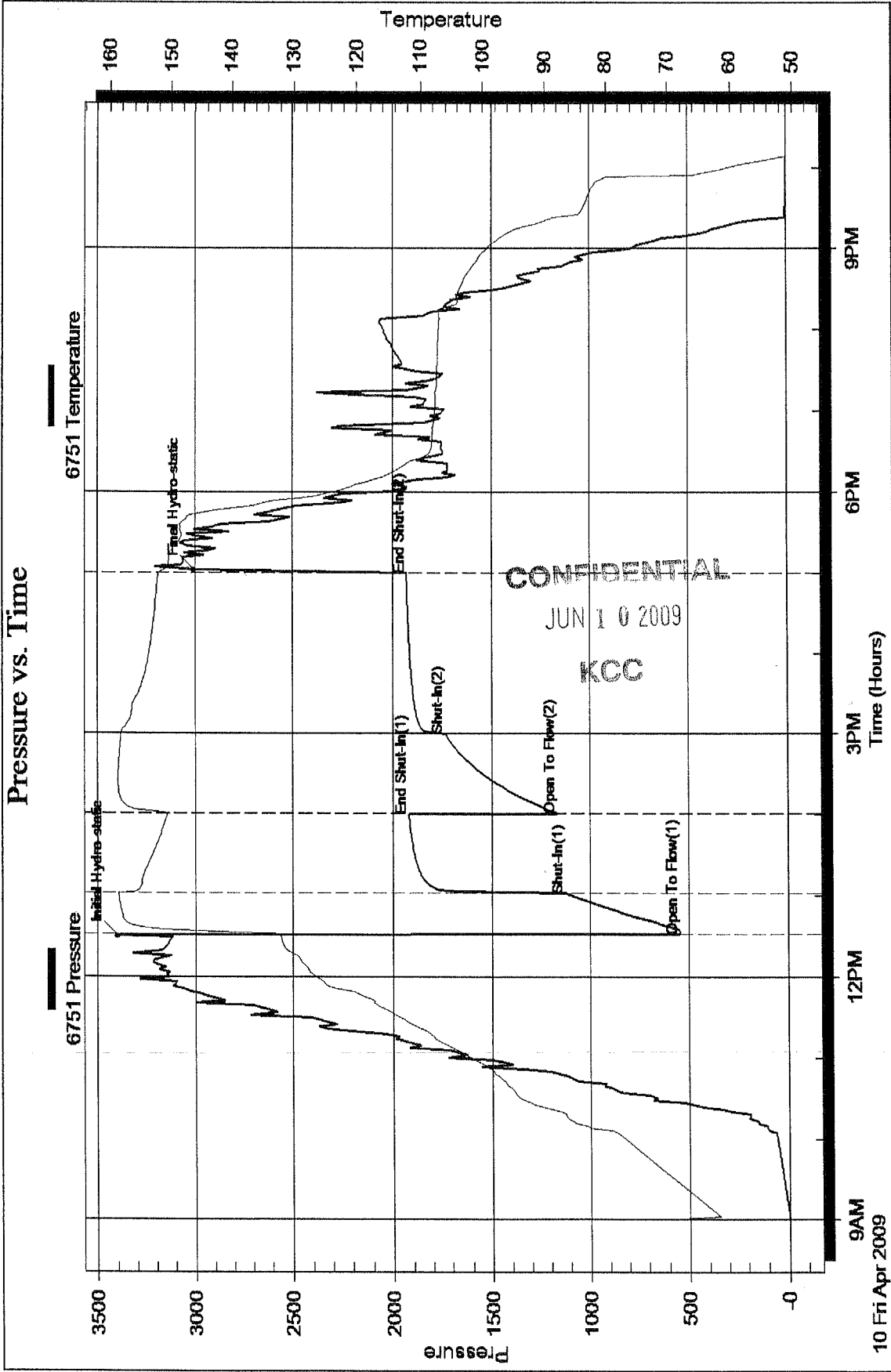
Temperature: 59 deg C
Relative Density: 0.65
Z Factor: 0.8

Gas Rates Table

Flow Period	Elapsed Time	Choke (mm)	Pressure (kPaa)	Gas Rate (m ³ /d)
		0.00	0.00	0.00

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Pressure vs. Time



Pressure vs. Time

