



FracCAT Treatment Report

Well : Miera 2130 #35-1
Field : Bravo Dome, west
Formation : Tubb Sand

Well Location :
County : Harding
State : new mexico
Country : United States

Prepared for
Client : Whiting
Client Rep : Robert McNaughton
Proposal No : 1
Date Prepared : 02/04/2014

Prepared by
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Comments : Stage1

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Section 1: Well Description

Deviated Hole: NO
 Treating Down: CASING
 Flush Volume to 1981.0 ft is 47.2 bbl

Casing			
OD (in)	Weight (lb/ft)	ID (in)	Depth (ft)
5.500	15.5	4.950	2170.0

Section 2: Perforations

Perforations						
Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Shot Density (shot/ft)	Number	Diameter (in)
1981.0	1981.0	1997.0	1997.0	6.00	96	0.32
2006.0	2006.0	2027.0	2027.0	6.00	126	0.32

Section 3: Proppant Description

Proppant				
Proppant Name	Mesh Size	Spec Gravity	Prop Fric Coeff. Laminar	Prop Fric Coeff. Turbulent
SinterLite Bauxite 16/30	16/30	3.30	1.00	0.70

Section 4: Fluid Description

Fluid Name: WF140

Additive Name	Additive Type	Solid Conc (lb/mgal)	Liquid Conc (gal/mgal)
J580, Gelling Agent	GELLINGAGT	40.0	
J218, Breaker	BREAKER	2.0	
B244B, Microbiocide	BIOCIDE		0.2
L071, Temporary Clay Stabilizer	CLAYSTABILIZ		1.0
L065, Scale Inhibitor	INHIBITORAID		0.5

Fluid Name: WF140 [CO2 65Q]

Additive Name	Additive Type	Solid Conc (lb/mgal)	Liquid Conc (gal/mgal)
J580, Gelling Agent	GELLINGAGT	40.0	
J218, Breaker	BREAKER	2.0	
F109, Foaming Agent	SURFACTANT		4.0
F112, EZEFL0 Surfactant	SURFACTANT		2.0
B244B, Microbiocide	BIOCIDE		0.2
L071, Temporary Clay Stabilizer	CLAYSTABILIZ		1.0
J475, EB-CLEAN Breaker	BREAKERENCAP	1.0	
L065, Scale Inhibitor	INHIBITORAID		0.5

Section 5: Designed Pump Sched. - Ramp

Designed Pump Schedule Ramp

Step #	Step Name	Slurry Volume (bbl)	Pump Rate (bbl/min)	Pump Time (min)	Fluid Name	Fluid Volume (gal)	Prop Name	Prop Conc (PPA)	Prop Mass (lb)
1	PrePAD	47.6	30.0	1.6	WF140	2000		0.0	0
2	PAD	58.3	10.5	5.6	WF140 [CO2 65Q]	2450		0.0	0
3	2.0 PPA	30.2	11.8	2.6	WF140 [CO2 65Q]	1050	SinterLite Bauxite 16/30	5.7	6000
4	4.0 PPA	37.7	13.0	2.9	WF140 [CO2 65Q]	1120	SinterLite Bauxite 16/30	11.4	12800
5	6.0 PPA	61.5	17.7	3.5	WF140 [CO2 65Q]	1800	SinterLite Bauxite 16/30	12.0	21600
6	8.0 PPA	40.3	21.9	1.8	WF140 [CO2 65Q]	1170	SinterLite Bauxite 16/30	12.3	14400
7	Flush	47.2	30.0	1.6	WF140	1980		0.0	0

Designed CO2 Pump Schedule Ramp

Step #	Step Name	CO2 Rate (bbl/min)
1	PrePAD	0.0
2	PAD	16.9
3	2.0 PPA	15.8
4	4.0 PPA	14.8
5	6.0 PPA	10.9
6	8.0 PPA	7.5
7	Flush	0.0

Designed Ramp Totals

Slurry (bbl)	Pump Time (min)	Clean Fluid (gal)	Proppant (lb)	CO2 (bbl)
322.9	19.5	11570	54800	228.9

Section 6: As Measured Pump Schedule

As Measured Pump Schedule

Step #	Step Name	Slurry Volume (bbl)	Slurry Rate (bbl/min)	Pump Time (min)	Fluid Name	Fluid Volume (gal)	Proppant Name	Max Prop Conc (PPA)	Prop Conc (PPA)	Prop Mass (lb)
1	PrePAD	68.7	17.6	4.7	WF140	2786		0.0	0.0	0
2	PAD	58.3	9.7	6.2	WF140 [CO2 65Q]	2457		0.0	0.0	0
3	2.0 PPA	30.2	10.1	3.0	WF140 [CO2 65Q]	1067	SinterLite Bauxite 16/30	5.8	0.5	5487
4	4.0 PPA	37.7	11.1	3.4	WF140 [CO2 65Q]	1130	SinterLite Bauxite 16/30	11.6	9.7	12385
5	6.0 PPA	61.5	15.4	4.0	WF140 [CO2 65Q]	1814	SinterLite Bauxite 16/30	12.2	5.1	21133
6	8.0 PPA	52.2	19.0	2.7	WF140 [CO2 65Q]	1612	SinterLite Bauxite 16/30	12.7	0.0	16100
7	Flush	40.0	19.1	2.1	WF140	1693	SinterLite Bauxite 16/30	0.0	0.0	10

Stage Pressures & Rates

Step #	Step Name	Average Slurry Rate (bbl/min)	Maximum Slurry Rate (bbl/min)	Average Treating Pressure (psi)	Maximum Treating Pressure (psi)	Minimum Treating Pressure (psi)
1	PrePAD	17.6	20.0	1450	2805	511
2	PAD	9.7	19.9	2606	2912	2028
3	2.0 PPA	10.1	10.2	2532	2618	2465
4	4.0 PPA	11.1	11.3	2522	2651	2402
5	6.0 PPA	15.4	17.8	2467	2720	2281
6	8.0 PPA	19.0	19.4	2236	2351	2153
7	Flush	19.1	19.2	2314	2609	91

As Measured CO2 Pump Schedule

Step #	Step Name	CO2 Volume (bbl)	CO2 Rate (bbl/min)	Injection Rate (bbl/min)
1	PrePAD	7.3	2.5	18.9
2	PAD	88.3	13.7	23.4
3	2.0 PPA	41.9	14.1	24.2
4	4.0 PPA	43.9	13.0	24.1
5	6.0 PPA	35.7	9.0	24.3
6	8.0 PPA	19.5	7.1	26.1
7	Flush	13.6	7.1	25.7

As Measured Totals

Slurry (bbl)	Pump Time (min)	Clean Fluid (gal)	Proppant (lb)
346.7	26.1	12559	55115

Average Treating Pressure: 2258 psi
 Maximum Treating Pressure: 2912 psi
 Minimum Treating Pressure: 91 psi
 Average Injection Rate: 23.6 bbl/min
 Maximum Injection Rate: 26.5 bbl/min
 Average Horsepower: 810.7 hhp
 Maximum Horsepower: 1367.0 hhp
 Maximum Prop Concentration: 12.7 PPA

Section 7: Material Balance

Material Balance	
Material Name	Quantity Pumped
WF140	4479 gal
WF140 (CO2 65Q)	8080 gal
SinterLite Bauxite 16/30	55115 lb
J580, Gelling Agent	500 lb
J218, Breaker	22 lb
B244B, Microbiocide	5 gal
L071, Temporary Clay Stabilizer	12 gal
L065, Scale Inhibitor	5 gal
F109, Foaming Agent	30 gal
F112, EZEFLO Surfactant	15 gal
J475, EB-CLEAN Breaker	27 lb
CO2	250.0 bbl

Section 8: Job Messages

Message Log							
#	Time	Message	Treating Pressure (psi)	Annulus Pressure (psi)	Total Slurry (bbl)	Slurry Rate (bbl/min)	Prop. Conc. (PPA)
1	12:55:15	Prime Up SPF-37974	126	-3750	0.0	4.9	0.0
2	12:58:21	Prime Up SPF-26339	178	-3750	0.0	4.8	0.0
3	13:00:19	Set Brakes	258	-3750	0.0	0.0	0.0
4	13:00:47	Knock Off Prime Up Hose	259	-3750	0.0	0.0	0.0
5	13:02:13	Area Clear	261	-3750	0.0	0.0	0.0
6	13:05:41	Low PSI Test	2961	-3750	0.0	0.0	0.0
7	13:06:18	High PSI Test	5243	-3750	0.0	0.0	0.0
8	13:06:44	Pressure Test Lines	5176	-3750	0.0	0.0	0.0
9	13:07:04	Pressure Test Ok	5176	-3750	0.0	0.0	0.0
10	13:08:45	Open Wellhead	784	-3750	0.0	0.0	0.0
11	13:08:49	Start PrePAD Automatically	454	-3750	0.0	0.0	0.0
12	13:08:49	Start Propped Frac Automatically	454	-3750	0.0	0.0	0.0
13	13:08:49	Start Stage 1 Automatically	454	-3750	0.0	0.0	0.0
14	13:08:49	Started Pumping	454	-3750	0.0	0.0	0.0
15	13:08:54	Activated Extend Stage	548	-3750	0.0	0.0	0.0
16	13:14:12	Stage at Perfs: PrePAD	2358	-3750	44.7	19.9	0.0
17	13:15:18	Deactivated Extend Stage	2688	-3750	66.7	20.0	0.0
18	13:15:18	Start PAD Manually	2688	-3750	66.7	20.0	0.0
19	13:17:47	Stage at Perfs: PAD	2854	-3750	90.4	9.2	0.0
20	13:21:33	Start 2.0 PPA Automatically	2597	-3750	125.1	10.0	0.0
21	13:21:33	Started Pumping Prop	2597	-3750	125.1	10.0	0.0
22	13:23:53	Stage at Perfs: 2.0 PPA	2451	-3750	148.8	10.2	5.8
23	13:24:31	Start 4.0 PPA Automatically	2547	-3750	155.2	10.2	5.8
24	13:26:53	Stage at Perfs: 4.0 PPA	2382	-3750	181.4	11.1	11.4
25	13:27:55	Start 6.0 PPA Automatically	2733	-3750	193.1	14.4	9.4
26	13:30:18	Stage at Perfs: 6.0 PPA	2370	-3750	229.5	15.3	12.1
27	13:31:54	Start 8.0 PPA Automatically	2273	-3750	254.6	17.7	10.8
28	13:32:00	Activated Extend Stage	2335	-3750	256.3	18.2	11.6
29	13:34:08	Stage at Perfs: 8.0 PPA	2212	-3750	297.1	19.0	12.8
30	13:34:38	Deactivated Extend Stage	2158	-3750	306.7	19.1	-0.0
31	13:34:38	Start Flush Manually	2158	-3750	306.7	19.1	-0.0
32	13:37:02	Shutdown - ISIP	1581	-3750	346.7	0.0	0.0
33	13:42:02	5 MIN	1498	-3750	346.7	0.0	-0.2
34	13:47:02	10 MIN	1468	-3750	346.7	0.0	-0.1
35	13:51:02	15 MIN	1450	-3750	346.7	0.0	-0.0
36	13:53:46	Close Wellhead	1462	-3750	346.7	0.0	-0.0
37	13:55:15	Bleed Off lines	84	-3750	346.7	0.0	-0.0
38	13:55:17	Stopped Pumping Prop	79	-3750	346.7	0.0	-0.0

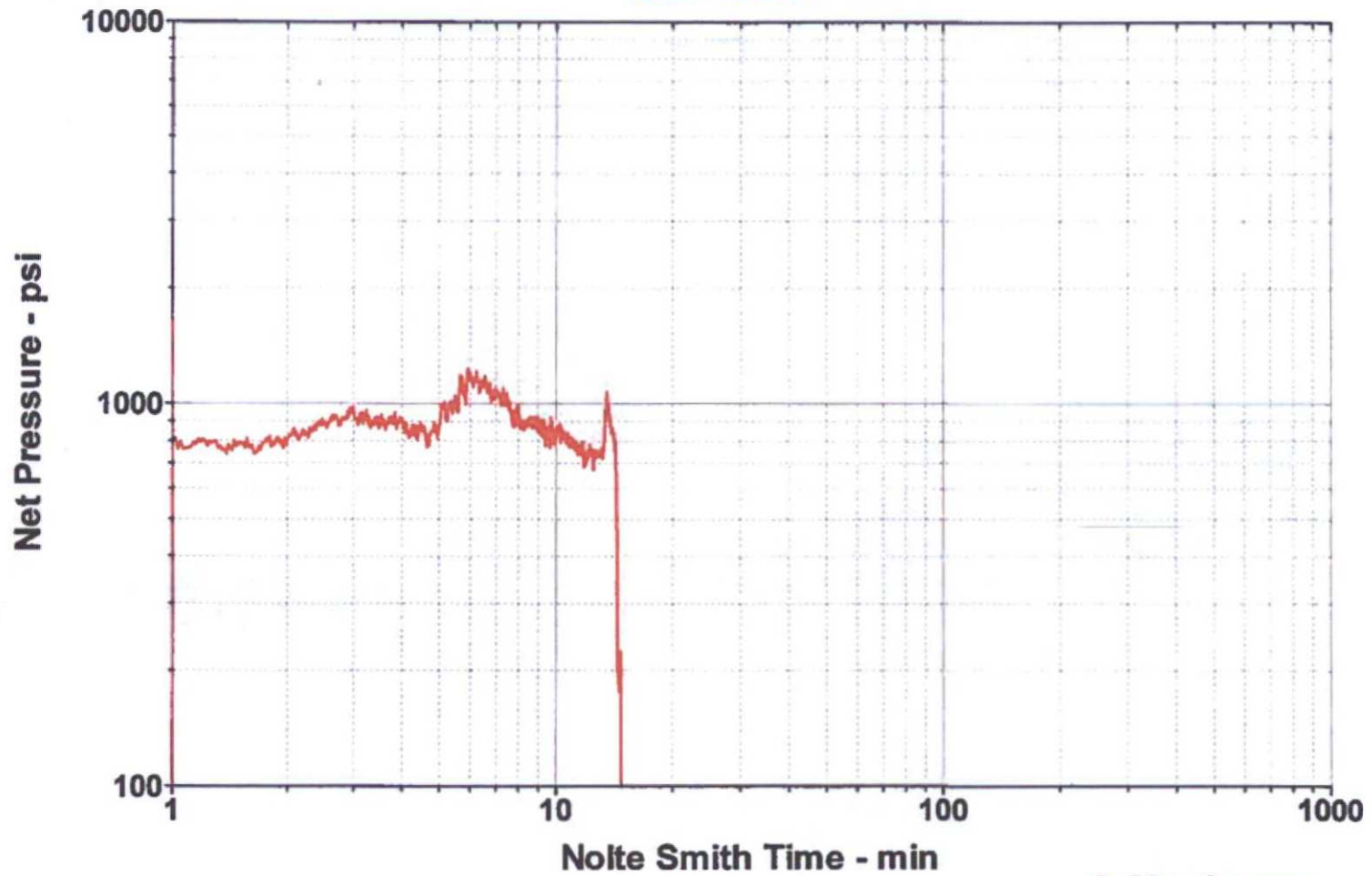
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Closure Pressure = 2500 psi

Whiting
Miera 2130 #35-1
06-04-2014

Nolte Smith Post Job Plot

— Net Pressure



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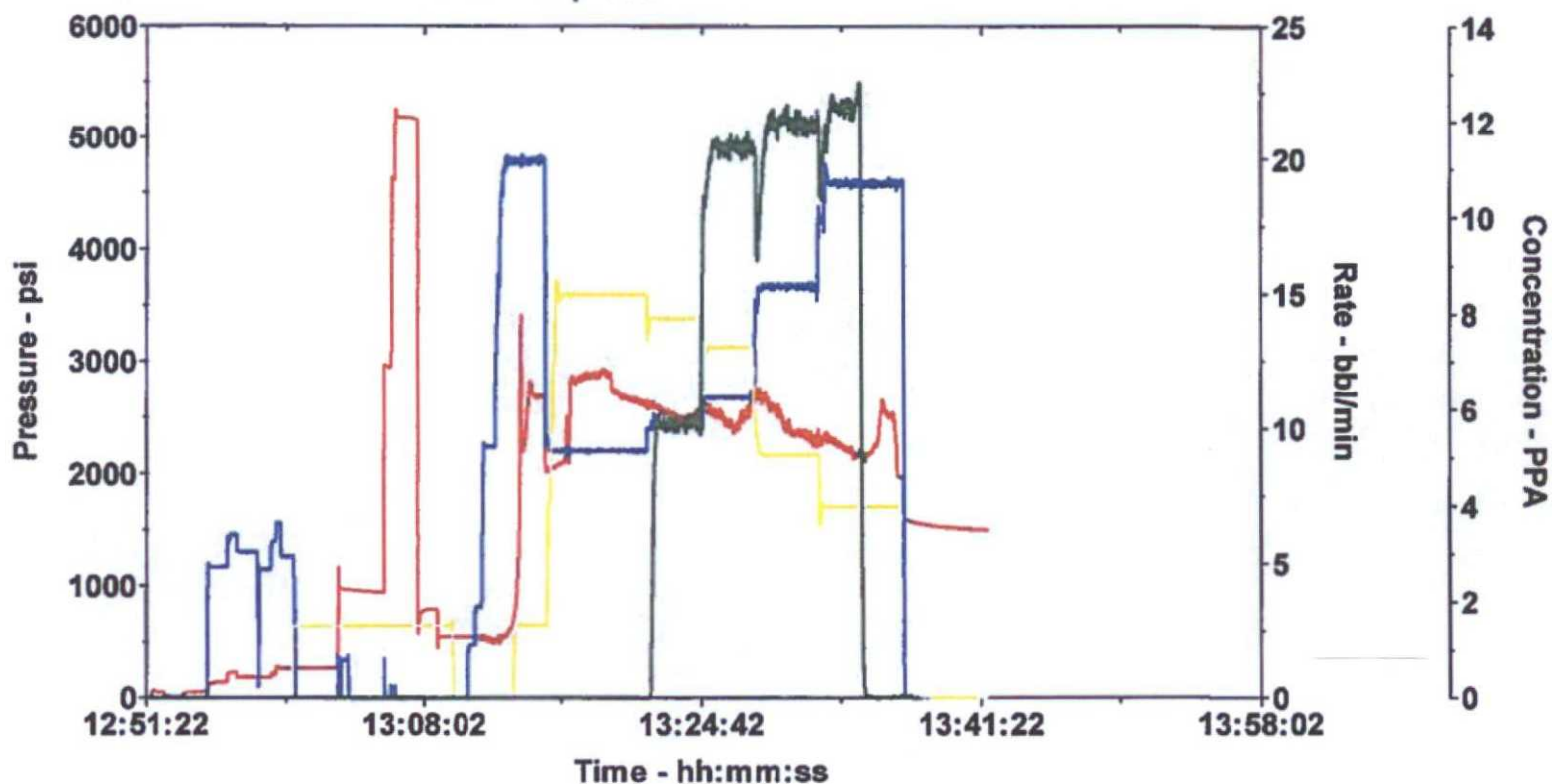
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PRC Post Job Plot

Tr. Press Slurry Rate CO₂_RATE
Prop Con

Whiting
Miera 2130 #35-1
06-04-2014



GAS/VAPOR FRACTIONAL ANALYSIS

SAMPLE ID	COMPONENT	MOL %	GPM
Customer..... Whiting Oil & Gas Corp.	Nitrogen N2	0.310	0.034
	Carbon D. CO2	99.652	16.989
Well No..... 2130 35-1	Hyd.Sulf. H2S	-----	-----
Operator..... Whiting Oil & Gas Corp.	Oxygen O2	-----	-----
Lease..... Miera	Helium He	0.002	0.000
Sample Point.. Wellhead	Hydrogen H2	0.000	0.000
	Argon Ar	-----	-----
Pressure..... 40 psig	Methane C1	0.014	0.002
Temperature... N/A	Ethane C2	0.015	0.004
Atm. Temp..... 42 F	Propane C3	0.003	0.001
Sample Date... 04/17/14	i-Butane iC4	0.001	0.000
Sample Time... 8:00 AM	n-Butane nC4	0.001	0.000
Sampled By.... Whiting/JH	i-Pentane iC5	0.001	0.000
Analysis Date. 04/21/14	n-Pentane nC5	0.000	0.000
Sample Cyl.No. PL996	Hexanes+ C6+	0.001	0.000
	Totals:	100.000	17.030

CALCULATIONS/METHODS

Real Gas, 14.65 psia & 60 F
 Applicable current GPA methods,
 procedures, and constants are used.

DISTRIBUTION

Whiting Oil & Gas Corp.
 • Robert McNaughton; Midland, TX
 (robert_mcnaughton@whiting.com)
 • Mike Raines; Midland, TX
 (mike_raines@whiting.com)

GASOLINE CONTENT (GPM)

Ethane & Heavier	0.005
Propane & Heavier	0.001
Butanes & Heavier	0.000
Pentanes & Heavier	0.000
26# Gasoline	0.000

HEATING VALUE (Gross Btu/CF)

Water Vapor Saturated ..	1.5
Dry.....	0.6

SPECIFIC GRAVITY

Water Vapor Saturated ..	1.5107
Dry.....	1.5258

COMPRESSIBILITY FACTOR (Z)

Water Vapor Saturated ..	0.99390
Dry.....	0.99434

REMARKS/COMMENTS/OTHER