

Ladd

Schlumberger

FracCAT Treatment Report

Well : Ladd 1928 #17-1
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 : 07/03/2014

Prepared by
Name : Daniel Carrillo
Division : Schlumberger
Phone : 575-390-6098

Service Point : Hobbs, N.M.
Fax Number :

Comments : Stage1

est-

on loc fac

Prod...

ATP max

As Rate -

FSIPs

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Section 1: Well Description

Deviated Hole: NO
 Treating Down: CASING
 Flush Volume to 2642.0 ft is 62.9 bbl

Casing			
OD (in)	Weight (lb/ft)	ID (in)	Depth (ft)
5.500	15.5	4.950	2963.0

Section 2: Perforations

Perforations						
Top MD (ft)	Top TVD (ft)	Bottom MD (ft)	Bottom TVD (ft)	Shot Density (shot/ft)	Number	Diameter (in)
2726.0	2726.0	2741.0	2741.0	6.00	90	0.32
2745.0	2745.0	2765.0	2765.0	6.00	120	0.32
2773.0	2773.0	2784.0	2784.0	6.00	66	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: WF135

Additive Name	Additive Type	Solid Conc (lb/mgal)	Liquid Conc (gal/mgal)
J580, Gelling Agent	GELLINGAGT	35.0	
J218, Breaker	BREAKER	2.0	
B244B, Microbiocide	BIOCIDE		0.2
L071, Temporary Clay Stabilizer	CLAYSTABILIZ		
L065, Scale Inhibitor	INHIBITORAID		0.5

Fluid Name: WF135 [CO2 650]

Additive Name	Additive Type	Solid Conc (lb/mgal)	Liquid Conc (gal/mgal)
J580, Gelling Agent	GELLINGAGT	35.0	
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		
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	WF135	2000		0.0	0
2	PAD	54.2	10.5	5.2	WF135 [CO2 65Q]	2275		0.0	0
3	2.0 PPA	26.7	11.8	2.3	WF135 [CO2 65Q]	928	SinterLite Bauxite 16/30	5.7	5300
4	4.0 PPA	41.3	13.0	3.2	WF135 [CO2 65Q]	1225	SinterLite Bauxite 16/30	11.4	14000
5	6.0 PPA	63.2	17.7	3.6	WF135 [CO2 65Q]	1850	SinterLite Bauxite 16/30	12.0	22200
6	8.0 PPA	38.1	21.9	1.7	WF135 [CO2 65Q]	1105	SinterLite Bauxite 16/30	12.3	13600
7	Flush	62.9	30.0	2.1	WF135	2641		0.0	0

Designed CO2 Pump Schedule Ramp		
Step #	Step Name	CO2 Rate (bbl/min)
1	PrePAD	0.0
2	PAD	15.6
3	2.0 PPA	14.5
4	4.0 PPA	13.6
5	6.0 PPA	10.2
6	8.0 PPA	7.1
7	Flush	0.0

Designed Ramp Totals				
Slurry (bbl)	Pump Time (min)	Clean Fluid (gal)	Proppant (lb)	CO2 (bbl)
333.9	19.6	12024	55100	205.4

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	87.5	18.1	6.2	WF135	3662		0.0	0.0	0
2	PAD	54.2	10.7	5.4	WF135 [CO2 65Q]	2284		0.0	0.0	0
3	2.0 PPA	26.7	11.0	2.4	WF135 [CO2 65Q]	945	SinterLite Bauxite 16/30	5.8	1.2	4759
4	4.0 PPA	41.3	12.0	3.4	WF135 [CO2 65Q]	1238	SinterLite Bauxite 16/30	11.8	3.9	13610
5	6.0 PPA	63.2	14.5	4.4	WF135 [CO2 65Q]	1857	SinterLite Bauxite 16/30	12.1	4.4	21943
6	8.0 PPA	45.6	16.0	2.9	WF135 [CO2 65Q]	1424	SinterLite Bauxite 16/30	12.6	0.0	13609
7	Flush	50.4	16.2	3.2	WF135	2129	SinterLite Bauxite 16/30	0.0	0.0	8

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	18.1	23.8	427	1213	18
2	PAD	10.7	23.7	974	1138	704
3	2.0 PPA	11.0	11.9	1139	1181	1111
4	4.0 PPA	12.0	12.5	1106	1128	1088
5	6.0 PPA	14.5	15.1	1066	1145	1035

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)
6	8.0 PPA	16.0	16.3	979	1045	964
7	Flush	16.2	16.3	1160	1324	518

As Measured CO2 Pump Schedule				
Step #	Step Name	CO2 Volume (bbl)	CO2 Rate (bbl/min)	Injection Rate (bbl/min)
1	PrePAD	6.7	3.0	19.6
2	PAD	74.4	13.4	24.2
3	2.0 PPA	31.6	13.0	24.0
4	4.0 PPA	44.8	12.9	24.9
5	6.0 PPA	43.6	10.0	24.5
6	8.0 PPA	20.9	7.4	23.3
7	Flush	19.0	7.1	22.4

As Measured Totals			
Slurry (bbl)	Pump Time (min)	Clean Fluid (gal)	Proppant (lb)
368.9	27.9	13538	53929

Average Treating Pressure: 915 psi
 Maximum Treating Pressure: 1324 psi
 Minimum Treating Pressure: 18 psi
 Average Injection Rate: 22.9 bbl/min
 Maximum Injection Rate: 31.1 bbl/min
 Average Horsepower: 320.8 hhp
 Maximum Horsepower: 528.9 hhp
 Maximum Prop Concentration: 12.6 PPA

Section 7: Material Balance

Material Balance	
Material Name	Quantity Pumped
WF135	5791 gal
WF135 [CO2 65Q]	7748 gal
SinterLite Bauxite 16/30	53929 lb
J580, Gelling Agent	500 lb
J218, Breaker	22 lb
B244B, Microbiocide	3 gal
L071, Temporary Clay Stabilizer	15 gal
L065, Scale Inhibitor	10 gal
F109, Foaming Agent	30 gal
F112, EZEFLD Surfactant	15 gal
J475, EB-CLEAN Breaker	27 lb
CO2	240.9 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	9:55:07	Prime Up SPF-37974	57	-3750	0.0	0.0	0.0
2	9:59:47	Prime Up SPF-26339	246	-3750	0.0	5.1	0.0
3	10:02:19	Knock Off Prime Up Hose	243	-3750	0.0	0.0	0.0
4	10:03:05	Releaseing Brakes	243	-3750	0.0	0.0	0.0
5	10:04:00	Stall Out Pumps	457	-3750	0.0	0.0	0.0
6	10:04:19	Low PSI Test	3173	-3750	0.0	0.0	0.0
7	10:05:07	High PSI Test	5095	-3750	0.0	0.0	0.0
8	10:05:18	Pressure Test Lines	5037	-3750	0.0	0.0	0.0
9	10:06:03	Pressure Test Ok	4963	-3750	0.0	0.0	0.0
10	10:06:26	Bleed Off lines	494	-3750	0.0	0.0	0.0
11	10:07:12	Safety Meeting	677	-3750	0.0	0.0	0.0
12	10:21:12	Open Wellhead	679	-3750	0.0	0.0	0.0
13	10:21:28	Start PrePAD Automatically	679	-3750	0.0	0.0	0.0
14	10:21:28	Start Propped Frac Automatically	679	-3750	0.0	0.0	0.0
15	10:21:28	Start Stage 01 Automatically	679	-3750	0.0	0.0	0.0
16	10:21:28	Started Pumping	679	-3750	0.0	0.0	0.0
17	10:25:25	Break	607	-3750	30.0	5.9	0.0
18	10:26:29	Activated Extend Stage	350	-3750	37.6	9.2	0.0
19	10:28:17	Stage at Perfs: PrePAD	743	-3750	74.1	23.7	0.0
20	10:28:51	Deactivated Extend Stage	891	-3750	87.5	23.6	0.0
21	10:28:51	Start PAD Manually	891	-3750	87.5	23.6	0.0
22	10:31:59	Stage at Perfs: PAD	1050	-3750	119.2	9.8	0.0
23	10:34:16	Start 2.0 PPA Automatically	1142	-3750	141.7	11.2	0.0
24	10:34:16	Started Pumping Prop	1142	-3750	141.7	11.2	0.0
25	10:36:42	Start 4.0 PPA Automatically	1147	-3749	168.4	12.0	5.4
26	10:37:22	Stage at Perfs: 2.0 PPA	1083	-3750	176.4	12.0	11.6
27	10:39:45	Stage at Perfs: 4.0 PPA	1126	-3750	204.9	11.9	11.6
28	10:40:09	Start 6.0 PPA Automatically	1141	-3750	209.7	12.5	10.7
29	10:43:23	Stage at Perfs: 6.0 PPA	1047	-3750	255.9	15.1	12.1
30	10:44:31	Start 8.0 PPA Automatically	1045	-3750	273.0	15.1	12.0
31	10:45:16	Activated Extend Stage	991	-3750	284.5	18.0	11.8
32	10:47:22	Deactivated Extend Stage	987	-3750	318.5	16.2	-0.0
33	10:47:22	Start Flush Manually	987	-3750	318.5	16.2	-0.0
34	10:48:13	Stage at Perfs: 8.0 PPA	1113	-3750	332.3	16.3	0.0
35	10:48:23	Stopped Pumping Prop	1115	-3750	335.0	16.2	0.0
36	10:50:40	Shutdown - ISIP	890	-3750	368.9	0.0	0.0
37	10:55:40	5 MIN	611	-3750	368.9	0.0	0.0
38	11:00:40	10 MIN	548	-3750	368.9	0.0	0.0
39	11:05:40	15 MIN	520	-3750	368.9	0.0	0.0
40	11:06:06	Close Wellhead	518	-3750	368.9	0.0	0.0
41	11:06:22	Bleed Off lines	-3750	-3750	368.9	0.0	0.0
42	11:06:26	Rig Down SLB	-3750	-3750	368.9	0.0	0.0

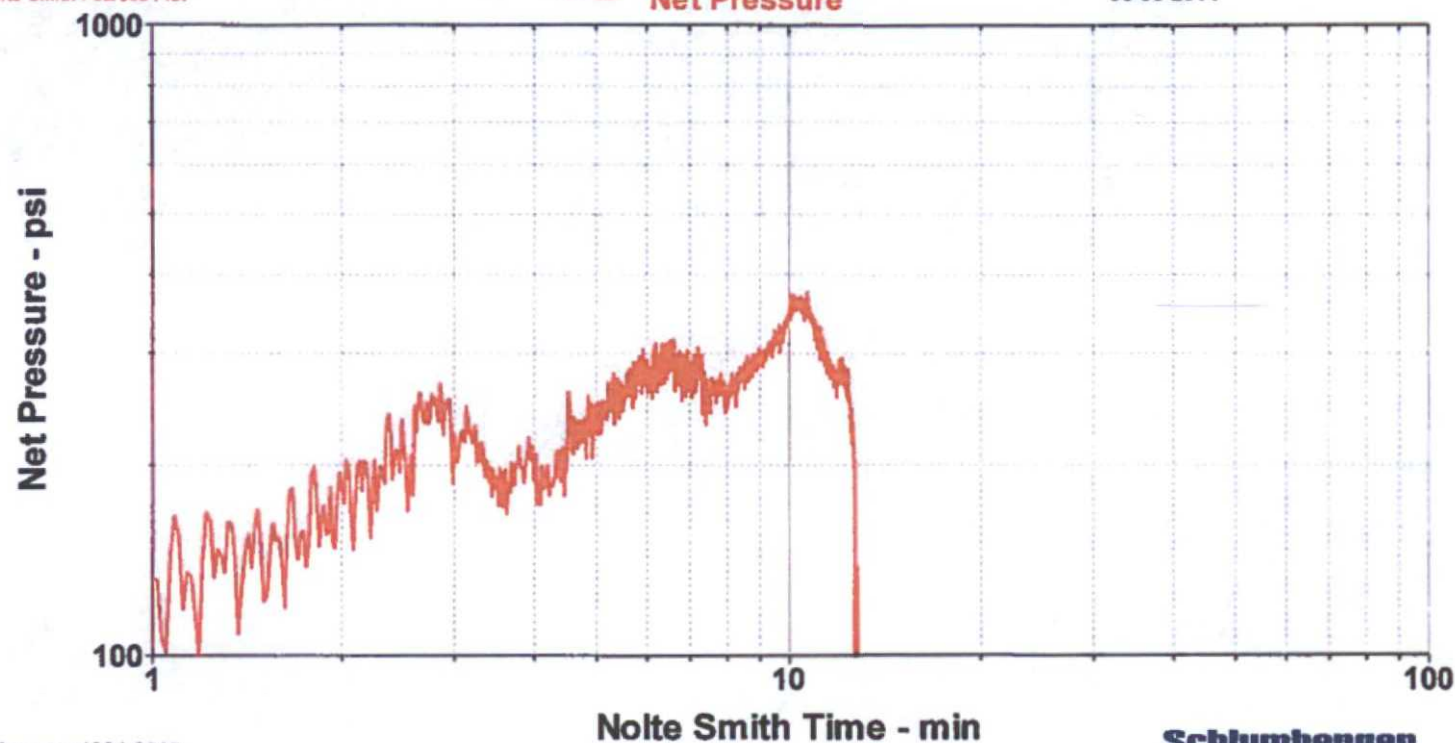
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Closure Pressure = 2168 psi

Whiting
Ladd 1928 #17-1
06-03-2014

Nolte Smith Post Job Plot

— Net Pressure



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PRG Post Job Plot

— Tr. Press — Slurry Rate — CO2_RATE
— Prop Con

Whiting
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