

Chevron
University 9-2
Interval 1

Fruitland Coal Formation

La Plata County, CO

API: 05-067-07864

Prepared for: Loren DeMers

September 29, 2015

Stimulation Treatment
Post Job Report

Delta 140 w/ Expedite

Prepared By:

Chuck Ross

Bill Holle

Red Crew

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Engineering Executive Summary

On September 29, 2015 a stimulation treatment was performed in the Fruitland Coal formation on the University 9-2 well in La Plata County, CO. The University 9-2 was a 1 stage Vertical Plug and Perf Design. The proposed treatment consisted of:

0 gallons of Fresh Water
0 gallons of Treated Water
135,323 gallons of Delta Frac 140 R (20#)
5,700 gallons of Sandwedge ABC
2,533 gallons of Water Frac G R (20#)
0 pounds of 20/40 Brown

The actual treatment fully completed 1 of 1 stages. 0 stages were skipped, and 0 stages screened out or were otherwise cut short of design. The actual treatment consisted of:

0 gallons of Fresh Water
0 gallons of Treated Water
107,668 gallons of Delta Frac 140 R (20#)
5,739 gallons of Sandwedge ABC
2,628 gallons of Water Frac G R (20#)
241,460 pounds of 20/40 Brown

A more detailed description of the actual treatment can be found in the attached reports. The following comments were provided to summarize events and changes to the proposed treatment:

Interval pumped to completion. Proppant placed at under flush volume by design. Customer asked for a re-design to transfer the proppant from the 0.5 lb stage to the 8 lb stage. Customer cut short the pad and went straight into the 1 lb stage.

Halliburton is strongly committed to quality control on location. Before and after each job all chemicals, proppants, and fluid volumes are measured to assure the highest level of quality control. Tank fluid analysis, crosslink time, and break tests are performed before each job in order to optimize the performance of the treatment fluids.

Halliburton maintains a continuous quality improvement process and appreciates any comments or suggestions that you may have. Halliburton again thanks you for the opportunity to perform service work on this well. We hope to be your solutions provider for future projects.

Thank you,

Chuck Ross

Technical Professional

Halliburton Energy Services

Interval Summary

University 9-2 - Fruitland Coal - Interval 1

Interval Summary

Date: 9/29/2015
Start Time: 11:27:00 AM
End Time: 12:58:00 PM

Initial Rate (Breakdown):	39.3	bpm
Initial Pressure (Breakdown):	558	psi
Max Rate:	50.5	bpm
Max Pressure:	725	psi
Max Pressure (SLF):	725	psi
Average Rate:	40.1	bpm
Average Pressure:	492	psi
Average Missile Pressure	511	psi
Average Missile HHP:	497	hhp
Initial Braden Pressure:	0	psi
Max Braden Pressure:	0	psi
Average Visc:	19.2	cP
Average Temp:	70	F
Average pH:	9	
ISDP:	604	psi
Final Fracture Gradient:	0.720	psi/ft
5 min:	460	psi
10 min:	394	psi
15 min:	331	psi

Proppant Summary

20/40 Brown Pumped:	241,460	lbs
Total Proppant Pumped* :	241,460	lbs
Proppant in Formation:	234,300	lbs

Fluid Summary (by fluid description)

Fresh Water Volume:	0	gal	0	bbls
Treated Water Volume:	0	gal	0	bbls
Delta Frac 140 R (20#) Volume:	107,668	gal	2,564	bbls
Sandwedge ABC Volume:	5,739	gal	137	bbls
Water Frac G R (20#) Volume:	2,628	gal	63	bbls

Fluid Summary (by stage description)

Pre-Pad Volume:	5,739	gal	137	bbls
Pad Volume:	9,587	gal	228	bbls
Proppant Laden Fluid Volume:	98,081	gal	2,335	bbls
Flush Volume:	2,628	gal	63	bbls
Treatment Volume:	116,035	gal	2,763	bbls
Total Fluid Volume:	116,035	gal	2,763	bbls

Interval Status: Completed

Comments:

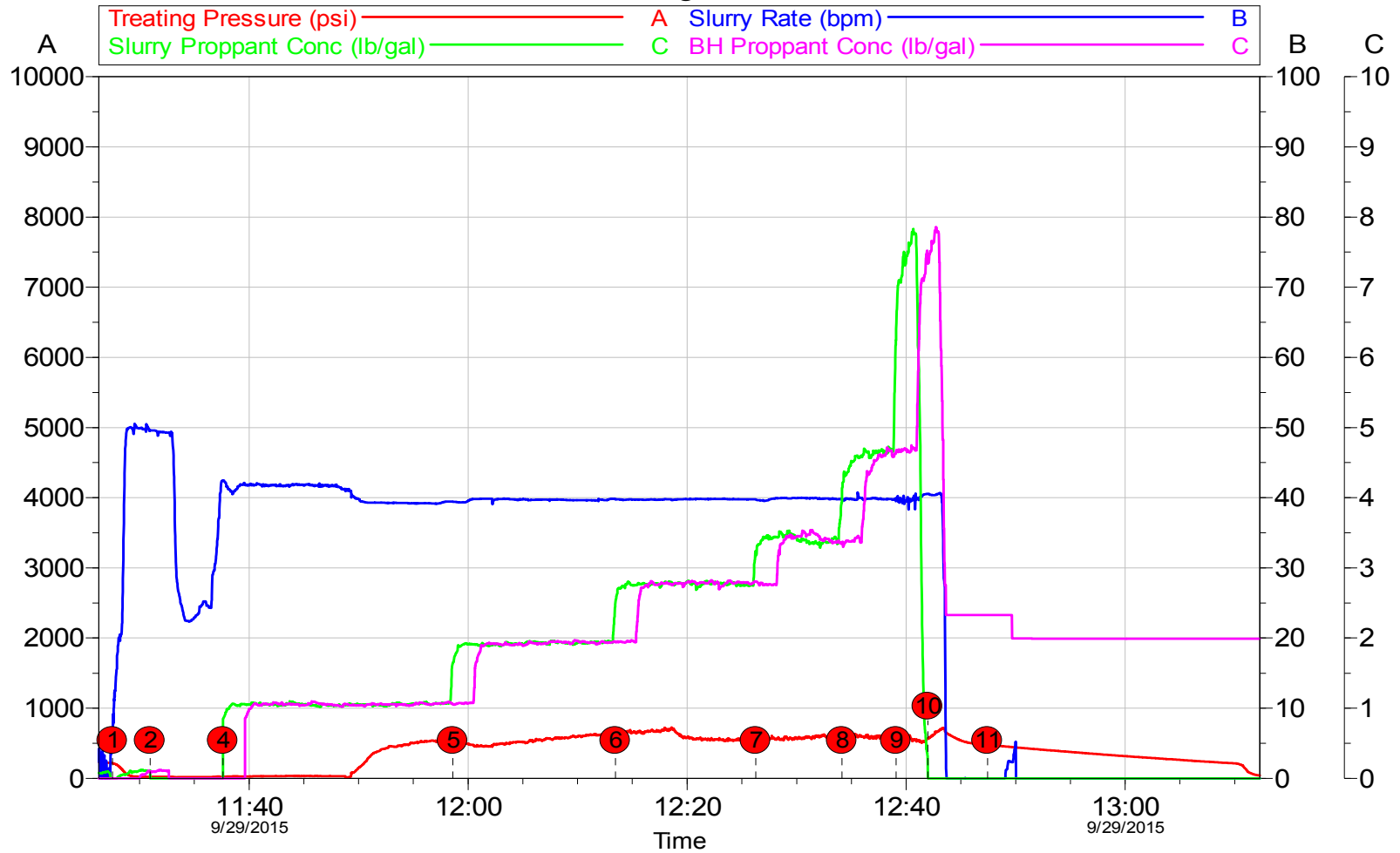
Interval pumped to completion. Proppant placed at under flush volume by design. Customer asked for a re-design to transfer the proppant from the 0.5 lb stage to the 8 lb stage. Customer cut short the pad and went straight into the 1 lb stage.

Engineer: Chuck Ross
Treater: Timothy Gray
Supervisor: Bill Holle

*Values for proppant are taken from software calculations based on multiple variables. Proppant is billed off of weight ticket volumes and may vary slightly from this number.

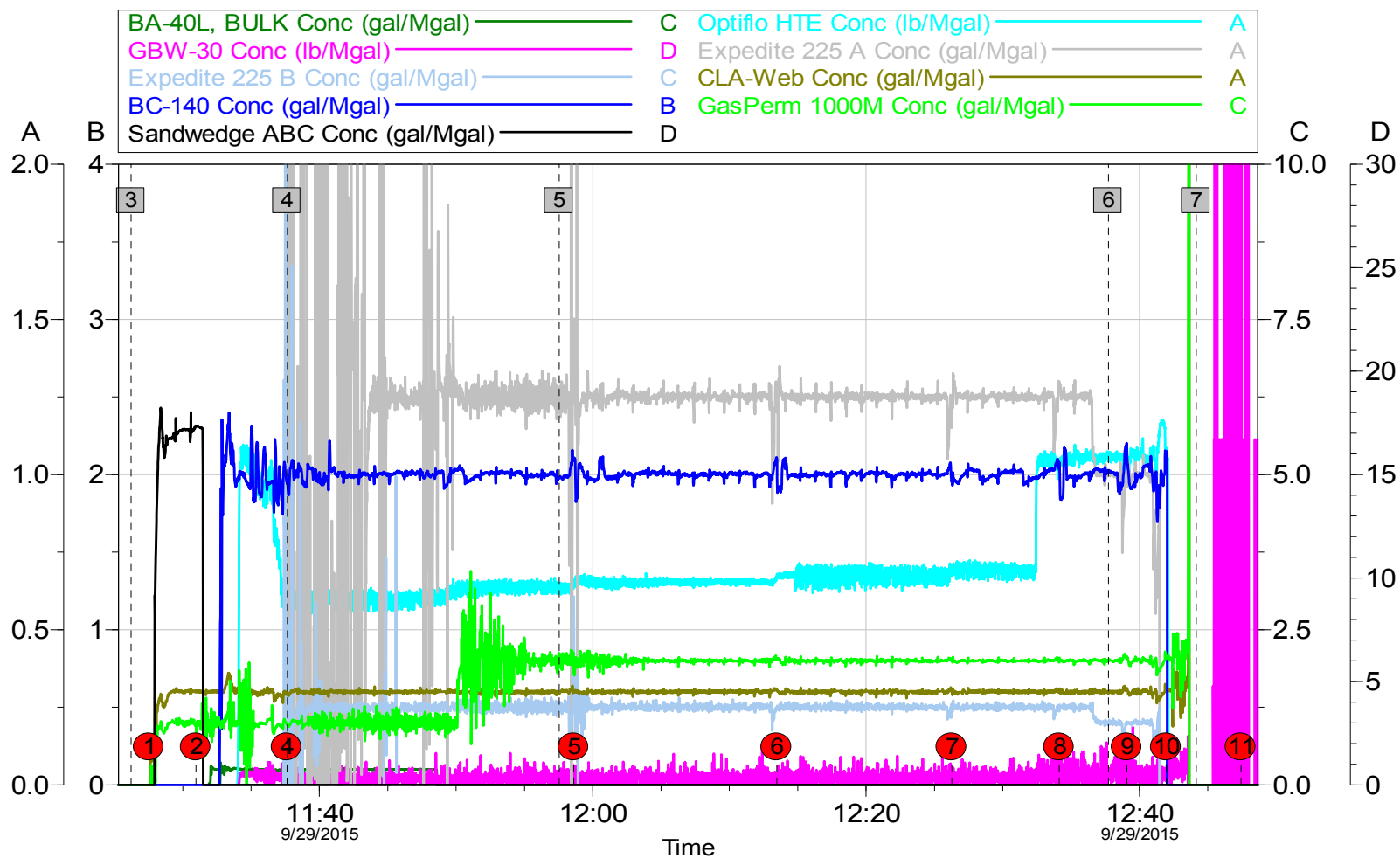
Customer Rep: Loren DeMers

Treating Chart



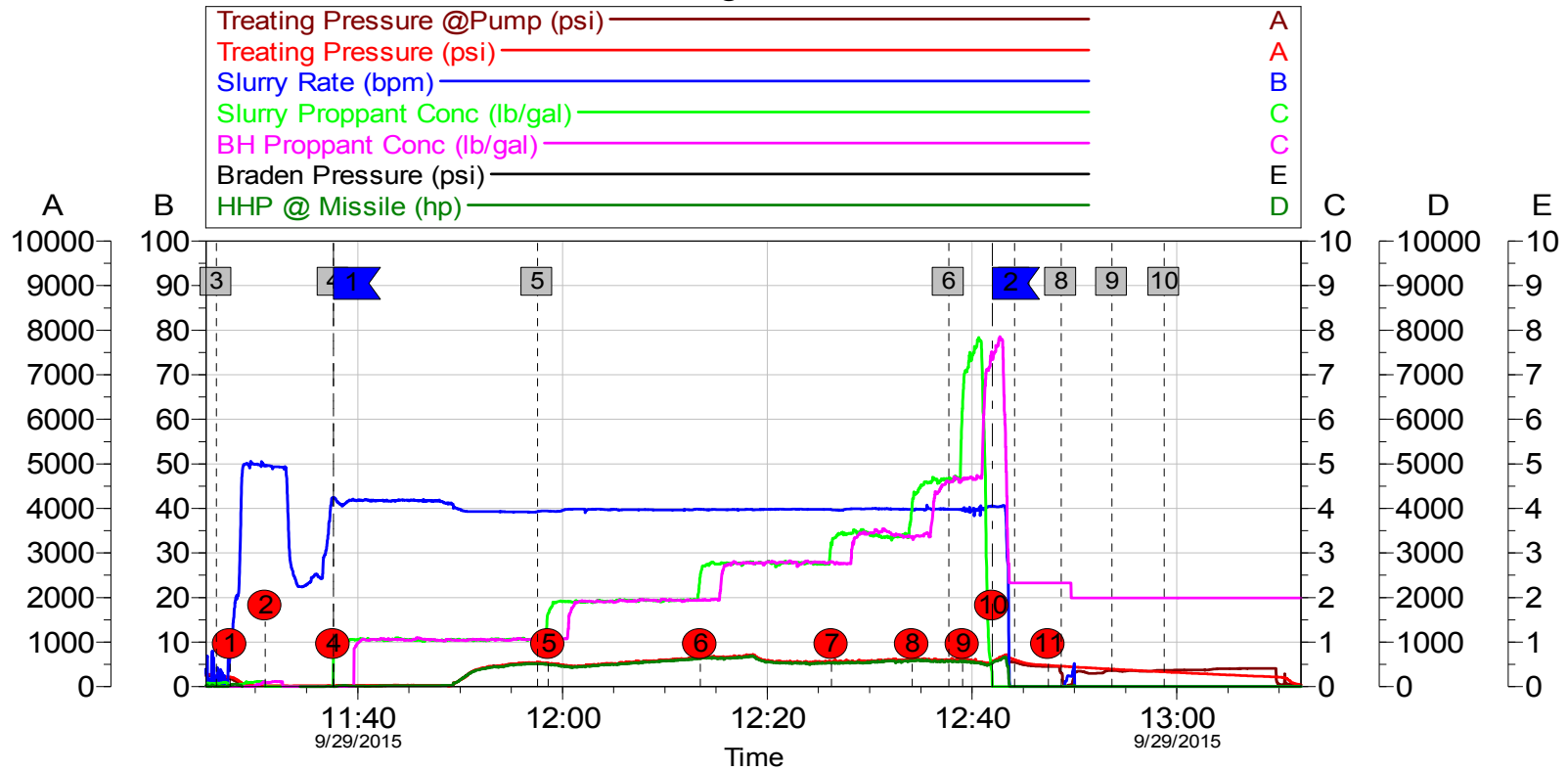
Customer: CHEVRON - MID-CONTINENT EBIZ	Job Date: 29-Sep-2015	Sales Order #: 902788666
Well Description: University 9-2	UWI: 05-067-07864	

Chemical Chart



Customer: CHEVRON - MID-CONTINENT EBIZ	Job Date: 29-Sep-2015	Sales Order #: 902788666
Well Description: University 9-2	UWI: 05-067-07864	

Averages Chart

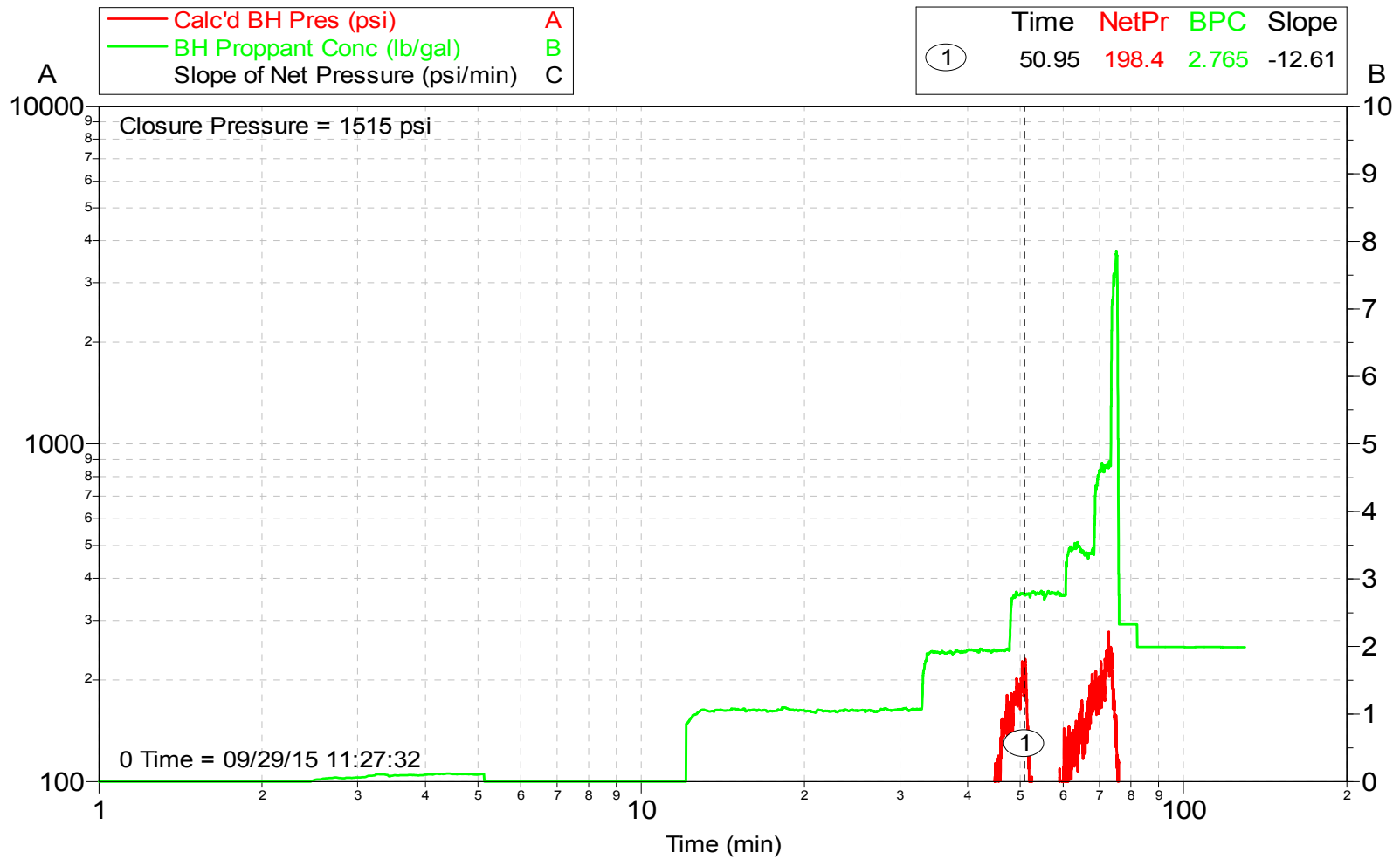


Local Event Log

Weighted Avg	TPP	TP	SR	SPC	BPC	NP	HM	BP	
1	11:37:38	511.0	492.2	40.06	2.376	2.208	-9.057	496.7	-1261
2	12:41:59	358.3	313.9	1.170	0.000	2.167	-381.2	17.03	Inf

Customer: CHEVRON - MID-CONTINENT EBIZ	Job Date: 29-Sep-2015	Sales Order #: 902788666
Well Description: University 9-2	UWI: 05-067-07864	

Net Pressure Plot



Customer: CHEVRON - MID-CONTINENT EBIZ	Job Date: 29-Sep-2015	Sales Order #: 902788666
Well Description: University 9-2	UWI: 05-067-07864	

Chevron

University 9-2

Interval 1

Fruitland Coal Formation

La Plata County, CO

API: 05-067-07864

Prepared for: Loren DeMers

September 29, 2015

Stimulation Treatment

Appendix

- Event Log
- Mt. Mover
- Chemical Counter
- Planned Design

Stage Number	Event Number	Time	Description	Comment	Treating Pressure psi	Job Clean Vol gal	Slurry Rate bpm	Braden Prssure psi
	1	9/29/2015 9:56	Start Job	Starting Job	0	0	0	0
	2	10:48:33	Pressure Test	Pressure Test 4907 psi	4907	4912	-7	0
	3	11:26:13	Open Well	Open Well 235 psi	235	186	-9	1.3
1		11:27:32	Stage 1	Pre-Pad	216	176	-9	6.9
2		11:30:58	Stage 2	Pad	23	-17	-9	49.6
4		11:37:37	Stage 4	Proppant Laden Fluid	21	5	-10	42.5
	4	11:37:38	Other	Customer asked for a re-design and changed the pump schedule. The proppant from the 1/2 lb stage has been added to the 8 lb stage.	21	4	-10	42.5
	5	11:57:32	Break Formation	Break Formation 558 psi, 39.3 bpm	558	535	-8	39.3
5		11:58:36	Stage 5	Proppant Laden Fluid	529	512	-9	39.4
6		12:13:27	Stage 6	Proppant Laden Fluid	648	649	-8	39.8
7		12:26:16	Stage 7	Proppant Laden Fluid	560	537	-10	39.8
8		12:34:08	Stage 8	Proppant Laden Fluid	614	600	-10	39.8
	6	12:37:43	Other	Expedite conc adjusted to a 1.0 from 1.25 gal/Mgal to match redesigned schedule.	602	581	-10	39.8
9		12:39:05	Stage 9	Proppant Laden Fluid	574	576	-11	39.6
10		12:41:58	Stage 10	Flush	565	534	-11	40.5
	7	12:44:09	ISIP	ISDP 604 psi, 0.720 psi/ft	604	548	-11	0
11		12:47:26	Stage 11	Shut-In	478	452	-10	0
	8	12:48:42	Shut-In Pressure @ 5 Minutes	Shut-In Pressure @ 5 Minutes 460 psi	460	306	-10	0
	9	12:53:39	Shut-In Pressure @ 10 Minutes	Shut-In Pressure @ 10 Minutes 394 psi	394	360	-11	0
	10	12:58:46	Shut-In Pressure @ 15 Minutes	Shut-In Pressure @ 15 Minutes 331 psi	331	368	-11	0
	11	13:37:25	End Job	Ending Job	-3634	-3739	-1261	0

University 9-2: Interval 1

TOTAL	#1 (560)		#2 (460)		#3 (460)		#4 (460)		#5 (560)		470	ARC
	20/40 Brown	20/40 Brown	20/40 Brown	20/40 Brown	20/40 Brown	20/40 Brown	20/40 Brown	20/40 Brown	20/40 Brown	20/40 Brown	Proppant Type	
2414.6	551.4	450.4	452.2	450.8	509.8							Initial Strap (sks)
0	0	0	0	0	0							Amt. Pumped (sks)
2414.6	551.4	450.4	452.2	450.8	509.8							Ending Strap (sks)
												Ticket Number

Bin Order	5	4	3	2	1	20/40 Sieve Stack ↓					
	Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%	
-	-	-	-	-	-	-	-	-	-	-	Pan #16
-	-	-	-	-	-	-	-	-	-	-	Pan #20
-	-	-	-	-	-	-	-	-	-	-	Pan #25
-	-	-	-	-	-	-	-	-	-	-	Pan #30
-	-	-	-	-	-	-	-	-	-	-	Pan #35
-	-	-	-	-	-	-	-	-	-	-	Pan #40
-	-	-	-	-	-	-	-	-	-	-	Pan #50
-	-	-	-	-	-	-	-	-	-	-	Pan
-	-	-	-	-	-	-	-	-	-	-	Total
-	-	-	-	-	-	-	-	-	-	-	Retained



***	Medium Brown 20/4	No Sand	No Sand	No Sand	No Sand	Proppant Type
***	2,414.6	0.0	0.0	0.0	0.0	Beginning of Stage Straps (sks)
***	2,414.6	0.0	0.0	0.0	0.0	End of Stage (sks)
***	0.0	0.0	0.0	0.0	0.0	Called Pumped in Zone (sks)
***	0	2,415	2,415	2,415	2,415	Total Delivered from Tickets (sks)

University 9-2

Prime Up										
Chemicals used to Prime Up	GasPerm 1000M	CLA-WEB	Sandwedge ABC	BC-140	Redite 225 Part A - Redite 225 Part B - Harc	BA-40L	WG-36	Optiflo H T E	GBW-30	
	0	0	0	0	0	0	0	0	0	0
1										
Interval #1 End	GasPerm 1000M	CLA-WEB	Sandwedge ABC	BC-140	Redite 225 Part A - Redite 225 Part B - Harc	BA-40L	WG-36	Optiflo H T E	GBW-30	
Chem. Delivered During Interval	0	0	0	0	0	0	0	0	0	0
Chem. Leaving During Interval	0	0	0	0	0	0	0	0	0	0
Beginning Interval Strap	280	260	163	275	320	305	40	6192	140	100
Ending Interval Strap	65	220	50	60	25	5	36	3247	35	24
Used to Prime Up	0	0	0	0	0	0	0	0	0	0
Beginning Interval Micro	0	0	0	0	0	0	0	0	0	0
End Interval Micro	206	37	118	218	336	314	6.7	3078	73	40
Interval Used Strap	215	40	113	215	295	300	4	2945	105	76
Interval Used Micro	206	37	118	218	336	314	7	3078	73	40
Total Interval Design	226	35	115	215	309	309	2	2321	108	74
Total Interval Physical Difference	-11	5	-2	0	-14	-9	2	624	-3	2
Total Interval Straps % Variance	-5.0%	14.9%	-1.6%	-0.2%	-4.6%	-3.0%	66.9%	26.9%	-2.5%	3.2%
Total Interval Micro Difference	-20	2	3	3	27	5	4	757	-35	-34
Total Interval Micro % Variance	-9.0%	6.3%	2.8%	1.2%	8.6%	1.5%	179.5%	32.6%	-32.2%	-45.7%
Total Job Design	226	35	115	215	309	309	2	2321	108	74
Total Job Physical Straps	215	40	113	215	295	300	4	2945	105	76
Total Job Physical Difference	-11	5	-2	0	-14	-9	2	624	-3	2
Total Job Straps %Variance	-5.0%	14.9%	-1.6%	-0.2%	-4.6%	-3.0%	66.9%	26.9%	-2.5%	3.2%
Total Job Micro	206	37	118	218	336	314	7	3078	73	40
Total Job Micro Difference	-20	2	3	3	27	5	4	757	-35	-34
Total Job Micro % Variance	-9.0%	6.3%	2.8%	1.2%	8.6%	1.5%	179.5%	32.6%	-32.2%	-45.7%

HALLIBURTON

Fann 35 Analysis Data Sheet

Field Test
Grand Junction, CO

Customer: Chevron
Location: University 9-2
Interval: Fruitland Coal
Date: 28-Sep-15

Test No: 1
Submitted By: Joe Boucher

Temperature of Test 95 °F
Fluid: Delta 140

Pre Gel			
Submitted Location Water	1000	mL	
WG-36	0.00	mL	
Viscosity	cP	°F	

Hydrated
7.8 pH

The following components are mixed in 1000 mls of hydrated gel.

Surfactants			
2.00	gal/M Gaspem	2.000	mL
Clay Control			
0.30	gal/M Cla-Web	0.300	mL
Buffers			
0.25	gal/M BA-40L	0.250	mL
Crosslinkers			
2.00	gal/M BC-140	2.000	mL

Buffered
9.2 pH

Breakers			
0.50	lb/M GBW-30	0.060	gms
1.00	lb/M Optiflo HTE	0.120	gms

Lot #

Final
9.8 pH

Time	Dial Reading	Temperature
0	105	83
5	70	92
10	50	95
15	47	95
20	45	95
25	29	83
30	50	83
35	40	100
40	40	95
45	50	86
50	35	100
55	43	93
60	45	89
65	50	98
70	40	96
75	30	95
80	30	95
85	35	95
90	25	95
95	22	95
99	20	95
106	12	95
109	10	95
110	10	95

This test was performed in a heat cup on a Fann-35 with an RL-B2 rotor-bot combination at 100 rpm.

This test was performed in a heat cup on a Fann-35 with an RL-B2 rotor-bot combination at 100 rpm.

Crosslink Time: instant

Time	Visc (cP)	°F
1	10	70
3	13	70
5	13	70
7	14	

