

NGL

C10

Interval

DJINJ Formation

Weld County, CO

API: 05-123-40772

Prepared for: Heidi Reger

July 21, 2018

Stimulation Treatment Post Job Report

Prepared By:

Zackery Roberson

Patrick Stirewalt

Bravo Crew

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Engineering Executive Summary

On July 21, 2018 a stimulation treatment was performed in the DJINJ formation on the C10 well in Weld County, CO. The proposed treatment consists of:

10,000 gallons of 15% HCl Acid

The actual treatment consisted of:

12,008 gallons of 15% HCl Acid

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:

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,

Zackery Roberson
Feid Technology
Halliburton Energy Services

Customer NGL
Formation DJINJ
Lease C10
API 05-123-40772
Date July 21, 2018

Stage Summaries

Interval	Fluids											
	Average		Max		ISIP		Treated Recycled Water		15% HCl Acid		Total Fluid	
	Pressure	Rate	Pressure	Rate	psi	psi/ft	gal	bbl	gal	bbl	gal	bbl
1	3908	30.3	4344	36.3	1497	0.576	21,609	514.5	12,008	285.9	33,617	800

	Fluids											
	Average		Max		ISIP		Treated Recycled Water		15% HCl Acid		Total Fluid	
	Pressure	Rate	Pressure	Rate	psi	psi/ft	gal	bbl	gal	bbl	gal	bbl
Planned							6,946	165	10,000	238	16,946	403
Recorded	3908	30	4344	36	1497	0.576	21,609	514.5	12,008	285.9	33,617	800

Customer NGL
Lease C10
Formation Niobrara
API 05-123-40772
Date July 21, 2018



Directional Data

KOP
Avg. TVD 10,487 ft
Total MD 10,482 ft

Zone #	Displacement to Top Perf (gal)	Displacement to Top Perf (bbl)
1	6,843	163

Customer
Lease
Formation

NGL
C10
Niobrara

05-123-40772
Sec 35 T7N R65W

API
Legals

Treatment Interval	Stage Number	Fluid Description	Stage Description	Slurry Rate (bpm)	Design Clean Volume (gal)	Actual Clean Volume (gal)
Interval	1-1	Treated Water	Injection	40.0	100	10,775
	1-2	15% HCl Acid	Acid	40.0	10,000	12,008
	1-3	Treated Water	Flush	40.0	6,846	10,834
Job Totals					16,946	33,617

NGL

C10

Interval

Niobrara Formation

Weld County, CO

API: 05-123-40772

Stimulation Treatment

Appendix

Stage Comments

Chemical Summary

Plan Design

Customer NGL
Formation Niobrara
Lease C10
API 05-123-40772
Date 7/21/2018

Interval 1

Start	8:34:00 AM	Date	7/21/2018
End	9:05:00 AM	Engineer	Zackery Roberson

Technical Comments

8:34am Online. Dispaced 12008gal of 15% acid. Came offline at 9:05am ISIP: 1497 PSI. 5 min ISIP:1194PSI 10 min ISIP:1090PSI 15 min ISIP: 1001 PSI. Per customer requested monitored the pressure for an hour after coming offline.

Customer
Formation
Lease
API
Date

Chemical Summary - *Chemicals used per physical strap*

Interval	Acid Additives	
	HAI-404M	LoSurf-300D
	(lbs)	(lbs)
1	72	24
Total	72	24
BBLs	1.7	0.6

Customer

Lease

Formation

NGL

C10

Niobrara

05-123-40772

Sec 35 T7N R65W

Treatment Interval	Stage Number	Fluid Description	Stage Description	Slurry Rate <i>(bpm)</i>	Design Clean Volume <i>(gal)</i>	Design Clean Volume <i>(bbl)</i>	Design Slurry Volume <i>(bbl)</i>	Stage Time <i>(hh:mm:ss)</i>
Interv	1-1	Treated Water	Injection	40.0	100	2	2	00:00:04
	1-2	15% HCl Acid	Acid	40.0	10,000	238	238	00:05:57
	1-3	Treated Water	Flush	40.0	6,846	163	163	00:04:05
Job Totals					16,946	403	403	00:10:05

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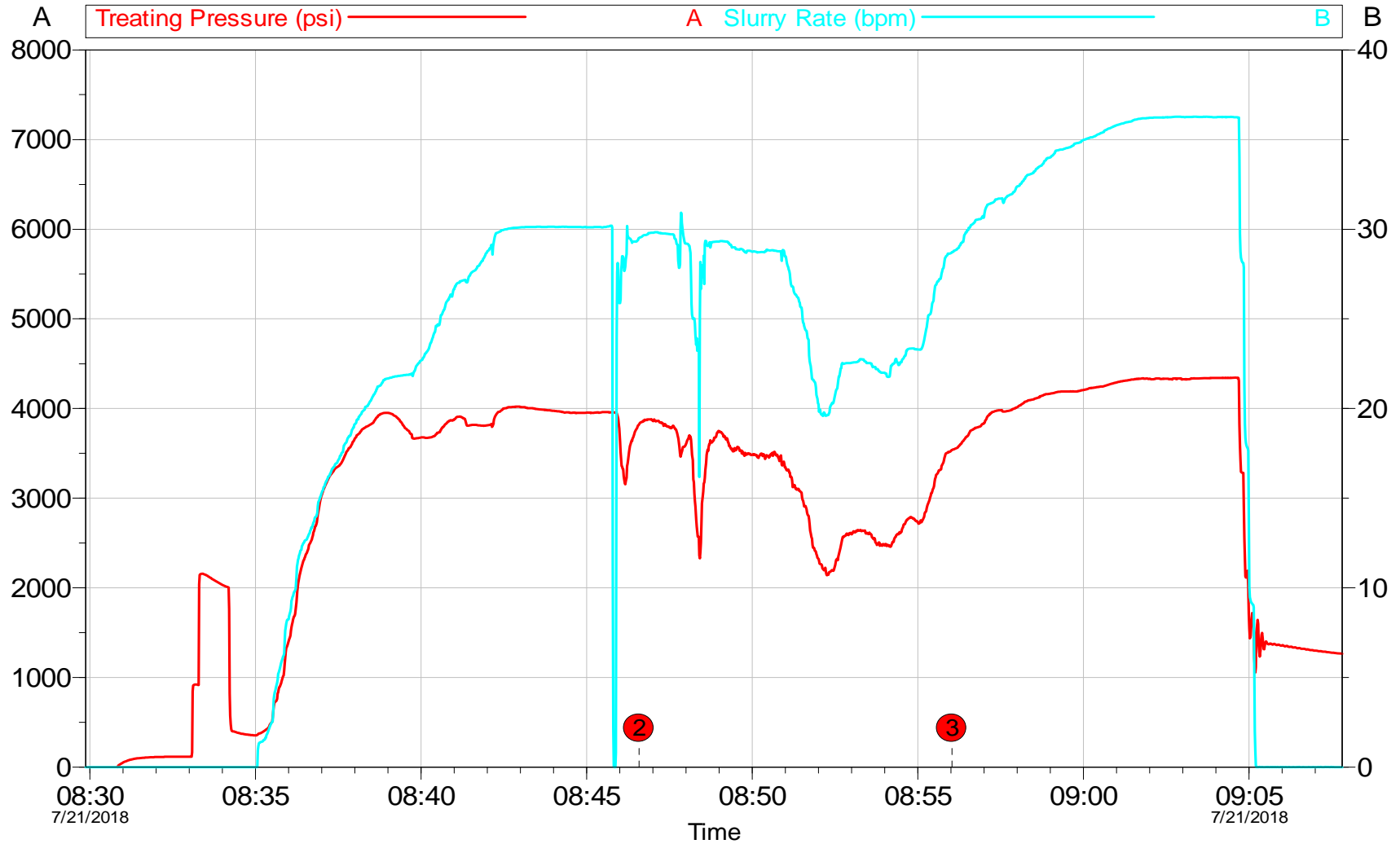
EXECUTIVE SUMMARY

Company:	NGL		
Well:	C10		
Date:	7/21/2018		
Zone:	DJINJ		
Fluid System:	Hybor G		
Avg. Slurry Rate:	30.3 BPM	Start:	8:34:00
Avg. Pressure:	3908 psi	End:	9:05:00
Max. Slurry Rate:	36.3 BPM	Pump Time:	0:31
Max. Pressure:	4344 psi		
Zone Opening Pressure:	355 psi		
Total Fluid:	800 bbls		
Flush/Displacement Volume:	514 bbls		
ISIP:	1497 psi		
Frac. Gradient:	0.58 psi/ft		
Average Horsepower:	2903.22 hhp		

5min =
10min =
15min =

8:34am Online. Dispaced 12008gal of 15% acid. Came offline at 9:05am ISIP:
1497 PSI. 5 min ISIP:1194PSI 10 min ISIP:1090PSI 15 min ISIP: 1001 PSI. Per
customer requested monitured the pressure for an hour after comnig offline.

C10 Interval 1 Treatment Plot NGL C10 - Acid



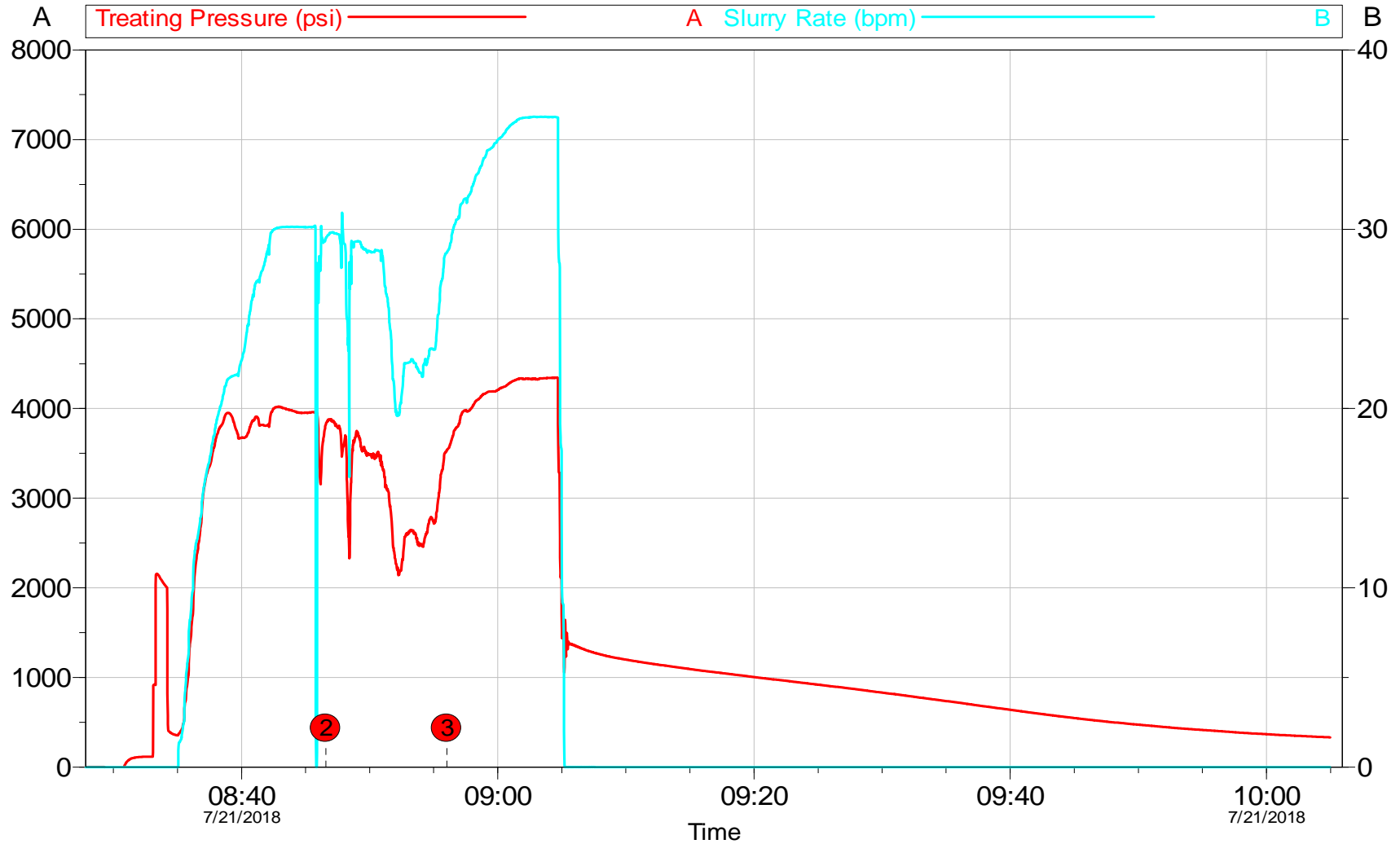
Customer: NGL
Well Description: NGL C10

Job Date: 21-Jul-2018
UWI: 05-123-40772

Sales Order #: 0905008161

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C10 Interval 1 Treatment Plot NGL C10 - Acid



Customer: NGL
Well Description: NGL C10 C10

Job Date: 21-Jul-2018
UWI: 05-123-40772

Sales Order #: 0905008161

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C10 Interval 1

Net Pressure Plot

NGL C10 - Acid

— Net Calc'd BH Pres (psi)	A
— BH Proppant Conc (lb/gal)	B
— Slope of Net Pressure (psi/min)	C

Time	NetPr	BPC	Slope
① 673.31	1169	0.000	-0.957



Customer: NGL
Well Description: NGL C10 C10

Job Date: 21-Jul-2018
UWI: 05-123-40772

Sales Order #: 0905008161

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