



WELL STIMULATION REPORT

Bayswater Exploration

Ruby West 8

05-123-51749-00

March 09, 2023

HALLIBURTON

Production
Enhancement

Engineering Executive Summary

On Tuesday, January 03, 2023 the stimulation of treatment(s) was performed in the Niobrara formation on the Ruby West 8 well in WELD county, COLORADO.

The proposed treatment(s) consisted of:

23,500	gallons of	15% HCl
0	gallons of	3ppt HVFR(FightR EC-4M)
460,791	gallons of	FR Water (FightR EC-1)
20,698,219	gallons of	HVFR (FightR EC-4M)
0	gallons of	Pump Down
23,000	gallons of	Treated Water
1,987,200	pounds of	100 Mesh Premium White
15,530,300	pounds of	30/50 Premium White
0	pounds of	40/70 Premium White
0	pounds of	SS-200 Premium White

The actual treatment(s) consisted of:

1,997	gallons of	15% HCl
0	gallons of	3ppt HVFR(FightR EC-4M)
1,466,043	gallons of	FR Water (FightR EC-1)
5,247,573	gallons of	HVFR (FightR EC-4M)
521,766	gallons of	Pump Down
15,432,156	gallons of	Treated Water
1,961,165	pounds of	100 Mesh Premium White
15,539,349	pounds of	30/50 Premium White
0	pounds of	40/70 Premium White
0	pounds of	SS-200 Premium White

46 of 46 treatment(s) were fully completed. 0 treatment(s) were skipped, and 0 treatment(s) were screened out or otherwise cut short of design.

The well was first opened Tuesday, January 03, 2023 at 12:29 with an opening pressure of 4,114.0 psi.

The total amount of proppant pumped was 17,500,514.0 lbm with an average concentration of 0.79 ppg and maximum concentration of 2.0 ppg. Treating pressure averaged 7032.08 psi and rate averaged 76.62 bpm.

The operation came offline at 06:29 and the well was shut in Tuesday, January 24, 2023 at 06:47 with a final shut-in pressure of 4,374.0 psi. A more detailed description of the actual treatment can be found further down in this report.

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.

Regards,

Thomas Nowak

Chad Lewis

Crew Service Leader

Crew Lead Engineer

WELL COMPLETION DATA

Treatment Interval	Perforation Top (ft)	Perforation Bottom (ft)	Plug Depth (ft)	Vertical Depth (ft)	Perforation Count	Cluster Count	Cluster Spacing	Perforation Phasing	SalesOrder Number
1	17798	17803	17808	7245	22	9	200	120	908283141
2	17586	17760	17765	7245	22	9	200	120	908283141
3	17386	17560	17565	7245	22	9	200	120	908283141
4	17186	17360	17365	7246	22	9	200	120	908283141
5	16986	17160	17165	7246	22	9	200	120	908283141
6	16786	16960	16965	7247	22	9	200	120	908283141
7	16586	16760	16765	7247	22	9	200	120	908283141
8	16386	16560	16565	7247	22	9	200	120	908283141
9	16186	16360	16365	7248	22	9	200	120	908283141
10	15986	16160	16165	7248	22	9	200	120	908283141
11	15786	15960	15965	7249	22	9	200	120	908283141
12	15586	15760	15765	7249	22	9	200	120	908283141
13	15386	15560	15565	7249	22	9	200	120	908283141
14	15186	15360	15365	7250	22	9	200	120	908283141
15	14986	15160	15165	7250	22	9	200	120	908283141
16	14786	14960	14965	7251	22	9	200	120	908283141
17	14586	14760	14765	7251	22	9	200	120	908283141
18	14386	14560	14565	7252	22	9	200	120	908283141
19	14186	14360	14365	7252	22	9	200	120	908283141
20	13986	14160	14165	7252	22	9	200	120	908283141
21	13786	13960	13965	7253	22	9	200	120	908283141
22	13586	13760	13765	7253	22	9	200	120	908283141

WELL COMPLETION DATA

Treatment Interval	Perforation Top (ft)	Perforation Bottom (ft)	Plug Depth (ft)	Vertical Depth (ft)	Perforation Count	Cluster Count	Cluster Spacing	Perforation Phasing	SalesOrder Number
23	13386	13560	13565	7254	22	9	200	120	908283141
24	13186	13360	13365	7254	22	9	200	120	908283141
25	12986	13160	13165	7254	22	9	200	120	908283141
26	12786	12960	12965	7255	22	9	200	120	908283141
27	12186	12760	12765	7256	22	9	200	120	908283141
28	11986	12160	12165	7256	22	9	200	120	908283141
29	11786	11960	11965	7257	22	9	200	120	908283141
30	11586	11760	11765	7257	22	9	200	120	908283141
31	11386	11560	11565	7258	22	9	200	120	908283141
32	11186	11360	11365	7258	22	9	200	120	908283141
33	10986	11160	11165	7258	22	9	200	120	908283141
34	10786	10960	10965	7259	22	9	200	120	908283141
35	10586	10760	10765	7259	22	9	200	120	908283141
36	10386	10560	10565	7260	22	9	200	120	908283141
37	10186	10360	10365	7260	22	9	200	120	908283141
38	9986	10160	10165	7261	22	9	200	120	908283141
39	9786	9960	9965	7261	22	9	200	120	908283141
40	9586	9760	9765	7261	22	9	200	120	908283141
41	9386	9560	9565	7262	22	9	200	120	908283141
42	9186	9360	9365	7262	22	9	200	120	908283141
43	8986	9160	9165	7263	22	9	200	120	908283141
44	8786	8960	8965	7263	22	9	200	120	908283141

WELL COMPLETION DATA

Treatment Interval	Perforation Top (ft)	Perforation Bottom (ft)	Plug Depth (ft)	Vertical Depth (ft)	Perforation Count	Cluster Count	Cluster Spacing	Perforation Phasing	SalesOrder Number
45	8586	8760	8765	7263	22	9	200	120	908283141
46	8386	8560	8565	7264	22	9	200	120	908283141

FLUID SYSTEM SUMMARY

Treatment Interval	15% HCl		3ppt HVFR(FightR EC-4M)		FR Water (FightR EC-1)		HVFR (FightR EC-4M)		Pump Down		Treated Water		Total Fluid	
	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)
1	1000	499	0	0			456820	0	0	0	500	462799	458320	463298
2	500	250	0	0			463530	489098	0	21168	500	5483	464530	515999
3	500	0	0	0			464144	474884	0	19782	500	5118	465144	499784
4	500	0	0	0			463958	475900	0	21840	500	4093	464958	501833
5	500	0	0	0			463772	478663	0	20874	500	5131	464772	504668
6	500	0	0	0			463585	470545	0	20580	500	4461	464585	495586
7	500	0	0	0			463399	480303	0	19152	500	4340	464399	503795
8	500	0	0	0			463213	473927	0	17556	500	4008	464213	495491
9	500	0	0	0			463026	481816	0	18774	500	4534	464026	505124
10	500	0	0	0			462840	463714	0	15918	500	4558	463840	484190
11	500	0	0	0			462654	491090	0	17304	500	7195	463654	515589
12	500	0	0	0			462468	0	0	15414	500	470441	463468	485855
13	500	0	0	0			462281	0	0	17136	500	473493	463281	490629
14	500	0	0	0			462095	0	0	14448	500	484248	463095	498696
15	500	0	0	0			461909	0	0	18564	500	475829	462909	494393
16	500	0	0	0			461722	0	0	13272	500	486079	462722	499351
17	500	0	0	0			461536	0	0	13608	500	499053	462536	512661
18	500	0	0	0			461350	0	0	14868	500	497958	462350	512826
19	500	0	0	0			461163	0	0	13398	500	478300	462163	491698
20	500	0	0	0			460977	0	0	14910	500	482654	461977	497564
21	500	0	0	0	460791	0	0	0	0	12600	500	469612	461791	482212
22	500	0	0	0	0	0	460605	0	0	11970	500	475663	461605	487633

FLUID SYSTEM SUMMARY

Treatment Interval	15% HCl		3ppt HVFR(FightR EC-4M)		FR Water (FightR EC-1)		HVFR (FightR EC-4M)		Pump Down		Treated Water		Total Fluid	
	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)
23	500	0	0	0	0	0	460418	0	0	11508	500	479915	461418	491423
24	500	0	0	0	0	0	460232	0	0	11046	500	465098	461232	476144
25	500	0	0	0	0	0	460046	0	0	11004	500	468756	461046	479760
26	500	0	0	0	0	0	459859	0	0	10710	500	470093	460859	480803
27	500	0	0	0	0	0	459301	0	0	10038	500	466150	460301	476188
28	500	998	0	0	0	0	459114	0	0	8820	500	473724	460114	483542
29	500	0	0	0	0	0	458928	0	0	8652	500	468711	459928	477363
30	500	250	0	0	0	0	458742	0	0	8064	500	543008	459742	551322
31	500	0	0	0	0	0	458555	0	0	8442	500	479995	459555	488437
32	500	0	0	0	0	0	458369	0	0	7266	500	492224	459369	499490
33	500	0	0	0	0	0	458183	0	0	7182	500	482613	459183	489795
34	500	0	0	0	0	0	457997	0	0	7308	500	470510	458997	477818
35	500	0	0	0	0	0	457810	0	0	6048	500	512419	458810	518467
36	500	0	0	0	0	0	457624	0	0	8106	500	482373	458624	490479
37	500	0	0	0	0	0	457438	0	0	6090	500	494382	458438	500472
38	500	0	0	0	0	0	457251	0	0	6510	500	491733	458251	498243
39	500	0	0	0	0	0	457065	0	0	5166	500	457378	458065	462544
40	500	0	0	0	0	0	456879	467633	0	4830	500	13103	457879	485566
41	500	0	0	0	0	0	456693	0	0	4326	500	467356	457693	471682
42	500	0	0	0	0	487854	456506	0	0	4158	500	0	457506	492012
43	500	0	0	0	0	0	456320	0	0	3570	500	466707	457320	470277
44	500	0	0	0	0	511319	456134	0	0	3108	500	0	457134	514427

FLUID SYSTEM SUMMARY

Treatment Interval	15% HCl		3ppt HVFR(FightR EC-4M)		FR Water (FightR EC-1)		HVFR (FightR EC-4M)		Pump Down		Treated Water		Total Fluid	
	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)	Proposed (gal)	Pumped (gal)
45	500	0	0	0	0	0	455947	0	0	4242	500	480858	456947	485100
46	500	0	0	0	0	466870	455761	0	0	2436	500	0	456761	469306
Total	23500	1997	0	0	460791	1466043	20698219	5247573	0	521766	23000	15432156	21205510	22669535

FLUID SYSTEM SUMMARY

Treatment Interval	Slurry Volume
	Pumped (gal)
1	470541.12
2	534774.66
3	519082.2
4	521961.72
5	524036.1
6	514118.22
7	520920.54
8	514830.12
9	523830.72
10	502480.02
11	533918.28
12	504268.38
13	509389.86
14	517610.94
15	513583.98
16	517859.58
17	530739.3
18	538077.96
19	509904.78
20	516712.98
21	500674.02
22	506056.32

FLUID SYSTEM SUMMARY

Treatment Interval	Slurry Volume
	Pumped (gal)
23	510612.9
24	496150.62
25	498605.94
26	499193.94
27	494686.92
28	501927.72
29	495909.96
30	569081.1
31	507239.04
32	517448.4
33	506667.42
34	495825.12
35	535989.72
36	507979.08
37	520296.84
38	515928.42
39	479639.16
40	503199.48
41	488604.9
42	509793.06
43	487596.06
44	532355.46

FLUID SYSTEM SUMMARY

Treatment Interval	Slurry Volume
	Pumped (gal)
45	502968.9
46	487110.12
Total	23510182.08

PROPPANT SUMMARY

Treatment Interval	100 Mesh Premium White		30/50 Premium White		40/70 Premium White		SS-200 Premium White		Total	
	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)
1	43200	43110	149300	149330	0	0	0	0	192500	192440
2	43200	43460	341800	342530	0	0	0	0	385000	385990
3	43200	43200	341800	341870	0	0	0	0	385000	385070
4	43200	43230	341800	342070	0	0	0	0	385000	385300
5	43200	43320	341800	342250	0	0	0	0	385000	385570
6	43200	43240	341800	341830	0	0	0	0	385000	385070
7	43200	43260	341800	342130	0	0	0	0	385000	385390
8	43200	43220	341800	341670	0	0	0	0	385000	384890
9	43200	43280	341800	341990	0	0	0	0	385000	385270
10	43200	43570	341800	341830	0	0	0	0	385000	385400
11	43200	43560	341800	342080	0	0	0	0	385000	385640
12	43200	42600	341800	341050	0	0	0	0	385000	383650
13	43200	43190	341800	342450	0	0	0	0	385000	385640
14	43200	43320	341800	342439	0	0	0	0	385000	385759
15	43200	43230	341800	342330	0	0	0	0	385000	385560
16	43200	43260	341800	341960	0	0	0	0	385000	385220
17	43200	43220	341800	341820	0	0	0	0	385000	385040
18	43200	43200	341800	341820	0	0	0	0	385000	385020
19	43200	43930	341800	341900	0	0	0	0	385000	385830
20	43200	43540	341800	341790	0	0	0	0	385000	385330
21	43200	43200	341800	341850	0	0	0	0	385000	385050
22	43200	43200	341800	341810	0	0	0	0	385000	385010

PROPPANT SUMMARY

Treatment Interval	100 Mesh Premium White		30/50 Premium White		40/70 Premium White		SS-200 Premium White		Total	
	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)
23	43200	43665	341800	341540	0	0	0	0	385000	385205
24	43200	43210	341800	341810	0	0	0	0	385000	385020
25	43200	43210	341800	341820	0	0	0	0	385000	385030
26	43200	43200	341800	341860	0	0	0	0	385000	385060
27	43200	43200	341800	341810	0	0	0	0	385000	385010
28	43200	43310	341800	341840	0	0	0	0	385000	385150
29	43200	43220	341800	341810	0	0	0	0	385000	385030
30	43200	13450	341800	371550	0	0	0	0	385000	385000
31	43200	43200	341800	341840	0	0	0	0	385000	385040
32	43200	43210	341800	341880	0	0	0	0	385000	385090
33	43200	43290	341800	341880	0	0	0	0	385000	385170
34	43200	43230	341800	341800	0	0	0	0	385000	385030
35	43200	43220	341800	341810	0	0	0	0	385000	385030
36	43200	43400	341800	342320	0	0	0	0	385000	385720
37	43200	43230	341800	342240	0	0	0	0	385000	385470
38	43200	43330	341800	341720	0	0	0	0	385000	385050
39	43200	43220	341800	323600	0	0	0	0	385000	366820
40	43200	43440	341800	341840	0	0	0	0	385000	385280
41	43200	43230	341800	332840	0	0	0	0	385000	376070
42	43200	43340	341800	342540	0	0	0	0	385000	385880
43	43200	43230	341800	341820	0	0	0	0	385000	385050
44	43200	43260	341800	341930	0	0	0	0	385000	385190

PROPPANT SUMMARY

Treatment Interval	100 Mesh Premium White		30/50 Premium White		40/70 Premium White		SS-200 Premium White		Total	
	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)	Proposed (lbm)	Pumped (lbm)
45	43200	43300	341800	341840	0	0	0	0	385000	385140
46	43200	43230	341800	342610	0	0	0	0	385000	385840
Total	1987200	1961165	15530300	15539349	0	0	0	0	17517500	17500514

AVG / MAX TECHNICAL DATA

Treatment Interval	Treatment Status	Average Pressure (psi)	Average Slurry Rate (bpm)	Average Proppant Conc (ppg)	Maximum Pressure (psi)	Maximum Slurry Rate (bpm)	Maximum Proppant Conc (ppg)
1	Completed	6858	68.97	0.41	8361	75.84	1
2	Completed	6778	77.55	0.76	7358	80	2
3	Completed	6692	77.6	0.79	7920	81.06	2
4	Completed	6821	76.74	0.76	8266	80	2
5	Completed	7188	77.49	0.77	7971	81.43	2
6	Completed	7278	78.22	0.79	8272	81.11	2
7	Completed	7427	77.72	0.78	8270	80	2
8	Completed	7268	76.63	0.78	8493	80.44	2
9	Completed	7603	76.24	0.77	8146	80	2
10	Completed	7162	77.93	0.78	7680	81.59	2
11	Completed	6999	75.29	0.74	7971	80	2
12	Completed	7380	78.48	0.79	8235	81.9	2
13	Completed	7190	78.84	0.79	8224	80	2
14	Completed	7277	76.88	0.78	8118	80	2
15	Completed	7347	77.73	0.78	7896	80.41	2
16	Completed	7382	77.5	0.79	8116	80	2
17	Completed	7151	73.83	0.76	8334	79.81	2
18	Completed	7572	74.51	0.79	8391	80.4	2
19	Completed	7223	78.46	0.82	8316	80.93	2
20	Completed	6676	70.24	0.78	8025	80.86	2
21	Completed	7470	74.15	0.8	8833	81.07	2
22	Completed	7752	77.19	0.81	8462	80.6	2

AVG / MAX TECHNICAL DATA

Treatment Interval	Treatment Status	Average Pressure (psi)	Average Slurry Rate (bpm)	Average Proppant Conc (ppg)	Maximum Pressure (psi)	Maximum Slurry Rate (bpm)	Maximum Proppant Conc (ppg)
23	Completed	7067	78.02	0.82	7658	80.82	2
24	Completed	7103	77.94	0.81	7666	81.4	2
25	Completed	7027	76.22	0.81	7831	81.05	2
26	Completed	7041	78.75	0.81	7795	81.56	2
27	Completed	7523	78.17	0.81	8203	80.9	2
28	Completed	7239	71.14	0.78	8949	83.74	2
29	Completed	6958	74.29	0.84	8483	81.04	2
30	Completed	7493	64.59	0.73	8443	83.09	2
31	Completed	6896	78.81	0.85	7893	80.46	2
32	Completed	6824	77.63	0.8	7954	81.16	2
33	Completed	6779	75.38	0.77	7581	80.17	2
34	Completed	6706	78.28	0.84	7619	80.88	2
35	Completed	7417	76.21	0.77	8441	80.76	2
36	Completed	6918	78.55	0.82	7574	80.84	2
37	Completed	6420	77.4	0.79	7884	81.1	2
38	Completed	6653	78.56	0.8	7902	80	2
39	Completed	7013	78.8	0.8	8465	80.48	2
40	Completed	6713	78.8	0.8	7660	80	2
41	Completed	6659	78.49	0.83	7745	80.95	2
42	Completed	6460	78.9	0.8	7691	80	2
43	Completed	6516	75.74	0.83	7850	81.53	2
44	Completed	5629	78.58	0.76	6191	80	2

AVG / MAX TECHNICAL DATA

Treatment Interval	Treatment Status	Average Pressure (psi)	Average Slurry Rate (bpm)	Average Proppant Conc (ppg)	Maximum Pressure (psi)	Maximum Slurry Rate (bpm)	Maximum Proppant Conc (ppg)
45	Completed	6578	78.4	0.81	7214	80.69	2
46	Completed	7349	78.68	0.83	8406	80	2

PRESSURE TECHNICAL DATA

Treatment Interval	Open Well Pressure (psi)	Initial Shut In Pressure (psi)	Fracture Gradient (psi/ft)	Max Annulus Pressure (psi)	5 Min Pressure (psi)	10 Min Pressure (psi)	15 Min Pressure (psi)	Final Shut In Pressure (psi)
1	4114	4623	1.07	5	0	0	0	4523
2	4136	4368	1.04	9	0	0	0	4360
3	4254	4863	1.1	7	0	0	0	4705
4	4245	4440	1.05	9	0	0	0	4436
5	4325	4505	1.06	10	0	0	0	4495
6	4369	4899	1.11	6	0	0	0	4367
7	4388	4587	1.07	8	0	0	0	4556
8	4398	4592	1.07	3	0	0	0	4280
9	4492	4524	1.06	4	0	0	0	4476
10	4305	4583	1.06	5	0	0	0	4261
11	4338	5417	1.18	5	0	0	0	4677
12	4365	4781	1.09	7	0	0	0	4769
13	4449	4602	1.07	5	0	0	0	4536
14	4502	4588	1.07	4	0	0	0	4540
15	4443	4835	1.1	0	0	0	0	4604
16	4486	4692	1.08	5	0	0	0	4605
17	4490	4769	1.09	6	0	0	0	4638
18	4458	4691	1.08	4	0	0	0	4672
19	4434	4832	1.1	5	0	0	0	4681
20	4380	4630	1.07	7	0	0	0	4628
21	4301	4571	1.06	6	0	0	0	4569
22	4753	4532	1.06	6	0	0	0	4508

PRESSURE TECHNICAL DATA

Treatment Interval	Open Well Pressure (psi)	Initial Shut In Pressure (psi)	Fracture Gradient (psi/ft)	Max Annulus Pressure (psi)	5 Min Pressure (psi)	10 Min Pressure (psi)	15 Min Pressure (psi)	Final Shut In Pressure (psi)
23	4592	4649	1.07	7	0	0	0	4464
24	4307	4520	1.06	5	0	0	0	4511
25	4376	4580	1.06	6	0	0	0	4577
26	4371	4790	1.09	0	0	0	0	4674
27	4586	4568	1.06	3	0	0	0	4530
28	4441	4569	1.06	0	0	0	0	4503
29	4473	4590	1.07	4	0	0	0	4587
30	4367	4650	1.07	6	0	0	0	4364
31	4366	4539	1.06	5	0	0	0	4475
32	4414	5234	1.15	7	0	0	0	4656
33	4279	4537	1.06	5.19	0	0	0	4513
34	4240	4509	1.05	6	0	0	0	4497
35	4237	4614	1.07	9	0	0	0	4576
36	4128	4560	1.06	7	0	0	0	4546
37	4528	4470	1.05	9.26	0	0	0	4396
38	5189	4452	1.05	3	0	0	0	4444
39	4569	4512	1.05	9	0	0	0	4472
40	4343	4920	1.11	4	0	0	0	4571
41	4503	4666	1.08	7	0	0	0	4643
42	4380	5364	1.17	7	0	0	0	4628
43	4657	4548	1.06	9	0	0	0	4534
44	4375	4449	1.04	5	0	0	0	4381

PRESSURE TECHNICAL DATA

Treatment Interval	Open Well Pressure (psi)	Initial Shut In Pressure (psi)	Fracture Gradient (psi/ft)	Max Annulus Pressure (psi)	5 Min Pressure (psi)	10 Min Pressure (psi)	15 Min Pressure (psi)	Final Shut In Pressure (psi)
45	4328	4464	1.05	6	0	0	0	4414
46	4231	4530	1.06	7	4442	4407	4385	4374