DATE IN 04/28/16	SUSPENSE —	ENGINEER PRG	LOGGED IN 05/02/16	TYPE IPI	APP NO. pPRG1617953918

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION

- Engineering Bureau -

1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Maljamar AGI No. 2
30-025-42628
Frontier Field Services

Check One Only for [B] or [C]

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☐ SWD ☒ IPI ☐ EOR ☐ PPR

[D] Other: Specify R-13443-B

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or Does Not Apply

[A] ☐ Working, Royalty or Overriding Royalty Interest Owners

[B] ☐ Offset Operators, Leaseholders or Surface Owner

[C] ☐ Application is One Which Requires Published Legal Notice

[D] ☐ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☐ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

[4] **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Alberto Gutierrez / David Littlejohn	See Attachments	Consultant / Geolex Inc.	04/28/2016
Print or Type Name	Signature	Title	Date

aag@geolex.com
e-mail Address

Goetze, Phillip, EMNRD

From:	Alberto A.Gutierrez, RG {Geolex} <aag@geolex.com>
Sent:	Thursday, April 28, 2016 1:05 PM
To:	Goetze, Phillip, EMNRD; Wade, Gabriel, EMNRD
Cc:	'Mike Selke'; COY BRYANT; Seale, Marvin
Subject:	Maljamar AGI#2 SRT results and request for Administrative MAOP increase to 3200 psig for consistency with AGI#1 MAOP
Attachments:	C-103 Maljamar AGI #2 SRT #1 2.pdf; Demo of No Oil #2 Sundry (submitted).pdf
Importance:	High

Dear Mr. Goetze,

Pursuant to our discussion this morning relative to the SRT results for the basal zone and 3 upper zones within the approved injection zone for the Maljamar AGI #2, I am attaching our analysis of the two SRTs which were conducted on the well.
As I mentioned, the lower zone has far better permeability than the upper three zones in the well and all zones are significantly better developed in terms of porosity and permeability than the AGI#1. We feel good about this as it was the goal in the placement of the bottom hole location for this well. Furthermore, as I explained, and as you will clearly see from the attached SRT results, this well should take the equal volume of gas that the #1 is taking at a significantly lower pressure. There is no doubt we are in the same zone as the #1 well because when we swabbed for a formation fluid sample which we did retrieve we detected 1900ppm H2S in the flowback. I have included the results of these analyses which supplemented our BLM demonstration of no recoverable hydrocarbons here for your information as well.

Frontier/Aka is proceeding with the completion of the well in this following week and we look forward to initiating injection into the well after surface facilities are connected and bottom hole PT sensors are verified working. We will then collect a couple of weeks of static pressure data from downhole to evaluate in conjunction with the injection conditions observed in the AGI#1 prior to switchover.

I would appreciate your feedback on our request as soon as you are able to evaluate it and as always, I stand ready to answer any questions you may have about the attached.

Thanks and have a good weekend.

Alberto A. Gutiérrez, RG
Geolex, Incorporated®
500 Marquette Avenue, NW Suite 1350
Albuquerque, NM 87102
505-842-8000
505-842-7380 Fax

Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised July 18, 2013

WELL API NO. 30-025-42628

5. Indicate Type of Lease STATE ☐ FEE ☐ FEDERAL ☒

6. State Oil & Gas Lease No. NMLC029509A

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name: Maljamar AGI

1. Type of Well: Oil Well ☐ Gas Well ☐ Other: Acid Gas Injection Well ☒

8. Well Number #2

2. Name of Operator: Frontier Field Services LLC

9. OGRID Number 221115

3. Address of Operator: 65 Mercado Street, Suite 250, Durango, CO 81301

10. Pool name or Wildcat: AGI: Wolfcamp

4. Well Location
Unit Letter O : 400 feet from the SOUTH line and 2,100 feet from the EAST line
Section 21 Township 17S Range 32E NMPM County Lea

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)* 4,019 (GR)

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	☐	PLUG AND ABANDON	☐	REMEDIAL WORK	☐	ALTERING CASING	☐
TEMPORARILY ABANDON	☐	CHANGE PLANS	☐	COMMENCE DRILLING OPNS.	☐	P AND A	☐
PULL OR ALTER CASING	☐	MULTIPLE COMPL	☐	CASING/CEMENT JOB	☐		
DOWNHOLE COMMINGLE	☐						
CLOSED-LOOP SYSTEM	☐						
OTHER:	☐			OTHER: Step-Rate Test Results to support Admin Press Increase Request			☒

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

SRT No. 1: An 8-hour notice was sent via email to the NMOCD Hobbs Office on April 14, 2016. Later in the afternoon a step-rate test was performed by Halliburton on Zone 4 through perforations from 10,739 feet (9,968 TVD) to 10,900 feet (10,100 TVD). The surface pressures and bottom hole pressures from each rate step are provided on the attached BLM Step Rate Data Form. The surface pressures over the first three steps (shown in red) were corrected to reflect the difference in fluid weight between the fresh water in the tubing and the 10.0 lbs per gallon injection brine. The test was done in 11 steps, and each step was not completed until the last two 5-minute intervals had corrected bottom hole pressures with less than 15 psig difference.

As shown in the graph of pressure vs injection rates for all steps, there is no indication from the Zone 4 step-rate test that the formation parting pressure was reached even through the maximum pumping rate of 5 bbls per minute. Note that on the blue line showing bottom hole pressure there is no break in the slope. In summary, even at the maximum surface pressure reached in Zone 4 (2,160 psig) there is no indication of fracturing of this highly permeable formation which additionally has evidence of secondary porosity.

SRT No. 2: On April 24, 2016 a step-rate test was performed by Halliburton on Zone 1 through perforations from 10,268 feet (9,609 TVD) to 10,302 feet (9,635 TVD), Zone 2 through perforations from 10,538 feet (9,812 TVD) to 10,552 feet (9,822 TVD), and Zone 3 through perforations from 10,648 feet (9,896 TVD) to 10,678 feet (9,920 TVD). Zone 4 was isolated from this test by a temporary packer. The surface pressures and bottom hole pressures from each rate step are provided on the attached BLM Step Rate Data Form.

It was apparent during the initial pumping rates that the permeability of the upper three zones was much less that what was observed from the step-rate test performed on Zone 4. As a result, the test included only 4 complete steps and was terminated prematurely due to a previously unknown Schlumberger pressure limitation policy concerning its wellhead to lubricator adaptor.

Although incomplete, the graph of pressure vs injection rates indicates that the formation parting pressure was likely reached at the second stage pumping rate of approximately 0.5 bbls per minute and surface pressure of 2,163 psig using 10.2 lbs per gallon brine. The bottom hole pressure at that stage was 7,346 psig which is consistent with a calculated parting pressure of approximately 7,112 psig based on initial formation pressure. When the difference in the TAG gradient and the test brine gradient (0.372 psig/ft and 0.530 psig/ft) is

taken into account, a surface pressure 3,641 psig using the anticipated TAG injection fluid would be required to reach the formation parting pressure. For this reason, Frontier requests that OCD approve an MAOP for this well of 3,200 psig consistent with the Maljamar AGI#1. This is especially conservative when considering that the lower zone (Zone 4) is even more permeable and would require much higher pressures to cause it to part.

In addition to the BLM Step Rate Data Forms for each test, the Halliburton Summary Reports for each test are also attached.

Spud Date: January 25, 2016 Rig Release Date: March 12, 2016

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Dale T. Littlejohn TITLE Consultant to Frontier Energy LLC DATE 4-29-16

Type or print name Dale T Littlejohn E-mail address: dale@geolex.com PHONE: 505-842-8000

For State Use Only

APPROVED BY:_____ TITLE_____ DATE_____
Conditions of Approval (if any):

STEP RATE TEST DATA for BLM, CFO

Operator: Frontier Energy Services | Well: Maljamar AGI #2

API#: 3002542628 | Lease: LC029509a

Data Collection Date: 4/14/16 | Sfc Loc: Sec. 21, T-17-S, R-32-E, Lea Co., NM

Tbg O.D.:	2.875	Tbg Wt.:	6.50	Grade:	L-80	Pipe I.D.:	7.0"	TVD Packer:	**9949**
Top Inj. Depth (TVD):	**9,968**			X	0.20 psig/ft	=	Generic Surface Injection psig:		**1994**
Beginning Wellhead psig:	**987**			Msrd No Flow Formation psig:	**5398**			BHP TVD:	**10084**
Testing Wtr measured wth Mud Wt Scale - lbs/gal:	**10.0**						Calc Production Water - lbs/gal:		**8.9**
							Target Maximum Rate bpd (barrels per day):		**5760**
							Minimum Bbls of Disposal Production Water to be on Location for S. R. T.:		**443**

1. Take a charted record of shut in psig for no less than 48 hours. If the wellhead shut in psig is not less than the approved injection pressure, bled the wellhead pressure below 0.2psig/ft x depth at top of injection before beginning the Step Rate Test.

2. Preform a minimum of seven steps, recording rate to ±1/10bpm, surface and down hole pressures to ±10psig in five minute intervals. The first two psig(s) must be below 0.2psig/ft x top injection depth.

3. The last two five minute surface pressure readings of each (minimum 30 minute) step are to be within 15psig of each other. And the last two five minute formation pressure readings of each (minimum 30 minute) step are to be within 15psig of each other. If if either are not, continue 5 minute readings. Record the (surface pressure, formation pressure, & rate) of the last reading as the Data Point for that Step.

Step 1

Target Test Rate (5% of maximum) = 0.25 bpm for **Step 1**

Step 1 data at:	5 min	10 min	15 min	20 min	25 min	30 min	Start Time:	**14:47**
Surface (psig):	204	180	157	123	100		Corr. For FW in Tubing	
Formation (psig)	5427	5434	5439	5442	5448		target bpd:	360
bpm:	0.25	0.25	0.25	0.25	0.25		Data Point **#1**	
Step 1 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd:	360
Surface (psig):							Sfc psig:	153
Formation (psig):							F psig:	5438
bpm:							@ bpm:	0.25

Step 2

Target Test Rate (10% of maximum) = 0.50 bpm for **Step 2**

Step 2 data at:	5 min	10 min	15 min	20 min	25 min	30 min		
Surface (psig):	88	76	49	45			Corr. For FW in Tubing	
Formation (psig):	5454	5458	5463	5465			target bpd:	720
bpm:	0.5	0.5	0.5	0.5			Data Point **#2**	
At bpm Rate:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd:	720
Surface (psig):							Sfc psig:	65
Formation (psig):							F psig:	5460
bpm:							bpm:	0.50

Step 3

Target Test Rate (20% of maximum) = 1.00 bpm for **Step 3**

Step 3 data at:	5 min	10 min	15 min	20 min	25 min	30 min		
Surface (psig):	68	94	128	142			Corr. For FW in Tubing	
Formation (psig):	5479	5485	5491	5496			target bpd:	1440
bpm:	1.0	1.0	1.0	1.0			Data Point **#3**	
Step 3 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd:	1440
Surface (psig):							Sfc psig:	108
Formation (psig)							F psig:	5488
bpm:							bpm:	1.00

STEP RATE TEST DATA for BLM, CFO

Operator: Frontier Energy Services | Well: Maljamar AGI #2

API#: 3002542628 | Lease: LC029509a

Data Collection Date: 4/14/16 | Sfc Loc: Sec. 21, T-17-S, R-32-E, Lea Co., NM

Step 4

Target Test Rate (37.5% of maximum) = 1.50 bpm for **Step 4**

Step 4 data at:	5 min	10 min	15 min	20 min	25 min	30 min
Surface (psig):	312	420	425	428		
Formation (psig):	5516	5525	5530	5538		
Rate bbl/min:	1.50	1.50	1.50	1.50		
Step 4 data at:	35 min	40 min	45 min	50 min	25 min	60 min
Surface (psig):						
Formation (psig):						
bpm:						

Corr. For FW in Tubing

target bpd: 2160

Data Point **#4**

@ bpd: 2160

Sfc psig: 396

F psig: 5527

bpm: 1.5

Step 5

Target Test Rate (50% of maximum) = 2.00 bpm for **Step 5**

Step 5 data at:	5 min	10 min	15 min	20 min	25 min	30 min
Surface (psig):	570	600	610	610		
Formation (psig)	5561	5573	5580	5584		
bpm:	2.00	2.00	2.00	2.00		
Step 5 data at:	35 min	40 min	45 min	50 min	25 min	60 min
Surface (psig):						
Formation (psig):						
bpm:						

target bpd: 3600

Data Point **#5**

@ bpd: 2880

Sfc psig: 598

F psig: 5575

bpm: 2.0

Step 6

Target Test Rate (62.5% of maximum) = 2.50 bpm for **Step 6**

Step 6 data at:	5 min	10 min	15 min	20 min	25 min	30 min
Surface (psig):	830	860	890	900		
Formation (psig)	5629	5641	5650	5659		
Rate bbl/min:	2.50	2.50	2.50	2.50		
Step 6 data at:	35 min	40 min	45 min	50 min	25 min	60 min
Surface (psig):						
Formation (psig):						
bpm:						

target bpd: 3600

Data Point **#6**

@ bpd: 3600

Sfc psig: 870

F psig: 5645

bpm: 2.5

Step 7

Target Test Rate (75% of maximum) = 3.00 bpm for **Step 7**

Step 7 data at:	5 min	10 min	15 min	20 min	25 min	30 min
Surface (psig):	1100	1070	1100	1100		
Formation (psig):	5684	5697	5709	5714		
bpm:	3.00	3.00	3.00	3.00		
Step 7 data at:	35 min	40 min	45 min	50 min	25 min	60 min
Surface (psig):						
Formation (psig):						
bpm:						

target bpd: 4320

Data Point **#7**

@ bpd: 4320

Sfc psig: 1093

F psig: 5701

bpm: 3.0

STEP RATE TEST DATA for BLM, CFO

Operator: Frontier Energy Services | Well: Maljamar AGI #2

API#: 3002542628 | Lease: LC029509a

Data Collection Date: 4/14/16 | Sfc Loc: Sec. 21, T-17-S, R-32-E, Lea Co., NM

Step 8

Target Test Rate (87.5% of maximum) = 3.50 bpm for **Step 8**

Step 8 data at:	5 min	10 min	15 min	20 min	25 min	30 min		
Surface (psig):	1300	1400	1400	1430	1440			
Formation (psig):	5755	5771	5782	5793	5800		target bpd:	5040
bpm:	3.50	3.50	3.50	3.50	3.50		Data Point **#8**	
Step 8 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd:	5040
Surface (psig):							Sfc psig:	1394
Formation (psig):							F psig:	5780
bpm:							bpm:	3.5

Step 9

Target Test Rate (100% of maximum) = 4.0 bpm for **Step 9**

Step 9 data at:	5 min	10 min	15 min	20 min	25 min	30 min		
Surface (psig):	1500	1600	1590	1590				
Formation (psig):	5822	5830	5840	5848			target bpd:	5760
bpm:	4.00	4.00	4.00	4.00			Data Point **#9**	
Step 9 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd:	5760
Surface (psig):							Sfc psig:	1570
Formation (psig):							F psig:	5835
bpm:							bpm:	4.0

Step 10

Target Test Rate (112.5% of maximum) = 4.5 bpm for **Step 10**

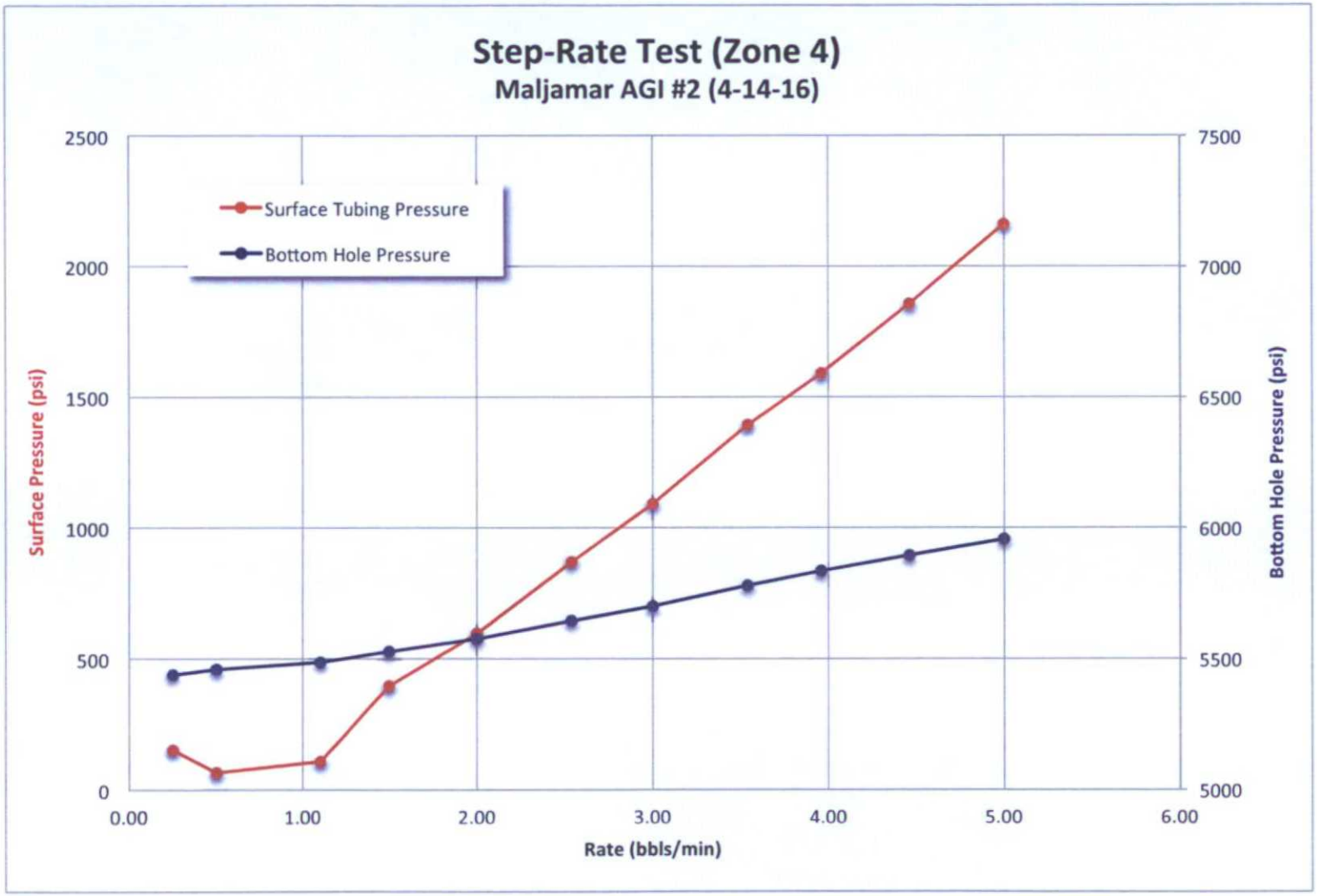
Step 9 data at:	5 min	10 min	15 min	20 min	25 min	30 min		
Surface (psig):	1850	1850	1860	1860				
Formation (psig):	5880	5892	5903	5908			target bpd:	5760
bpm:	4.50	4.50	4.50	4.50			Data Point **#10**	
Step 9 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd:	6480
Surface (psig):							Sfc psig:	1855
Formation (psig):							F psig:	5896
bpm:							bpm:	4.5

Step 11

Target Test Rate (125% of maximum) = 5.0 bpm for **Step 11**

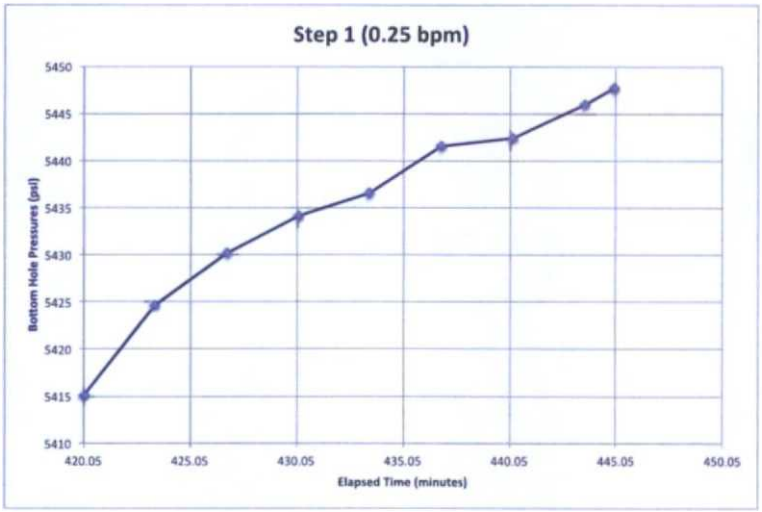
Step 9 data at:	5 min	10 min	15 min	20 min	25 min	30 min	End Time:	**18:39**
Surface (psig):	2160	2160	2160					
Formation (psig):	5948	5960	5962	Ran out of Treatment Watrer			target bpd:	5760
bpm:	5.00	5.00	5.00				Data Point **#11**	
Step 9 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd:	7200
Surface (psig):							Sfc psig:	2160
Formation (psig):							F psig:	5957
bpm:							bpm:	5.0

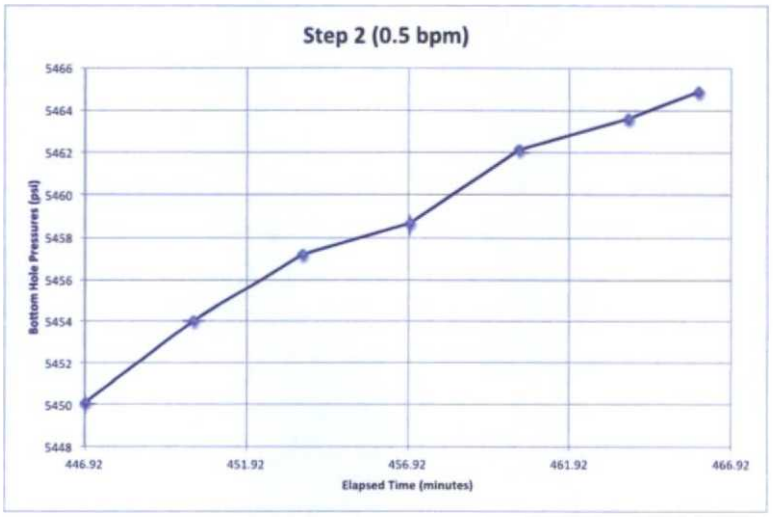
	Surface	Formation	
Instant Shut In Pressure:	725	5955	psig
5 minute Shut In Pressure:	510	5788	psig
10 minute Shut In Pressure:	460	5743	psig
15 minute Shut In Pressure:	427	5699	psig

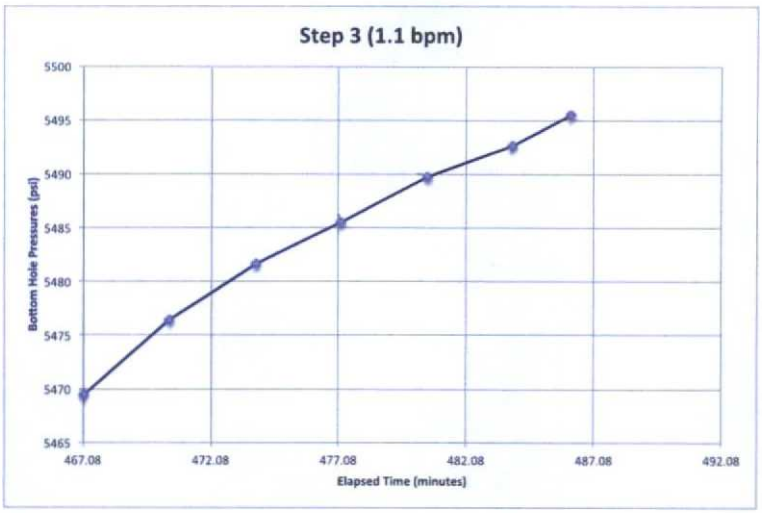

Step-Rate Test (Zone 4)
Maljamar AGI #2 (4-14-16)
Surface Tubing Pressure
Bottom Hole Pressure
Surface Pressure (psi)
Bottom Hole Pressure (psi)
Rate (bbls/min)
2500
2000
1500
1000
500
0
7500
7000
6500
6000
5500
5000
0.00
1.00
2.00
3.00
4.00
5.00
6.00

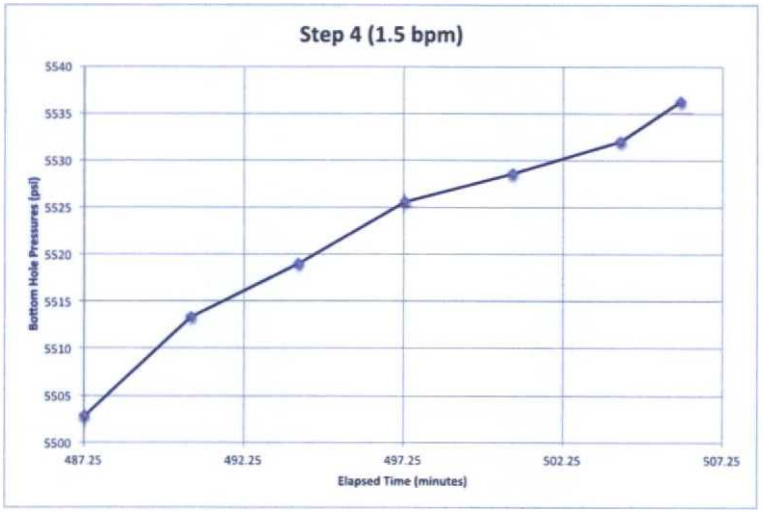
Maljamar AGI #2 Zone 4 Step-Rate Test Bottom-Hole Pressures

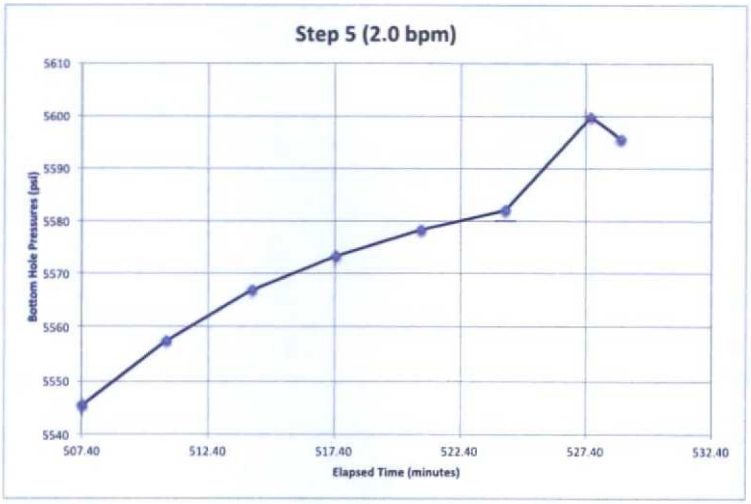
The BHP for each 5-minute interval during each step was determined using the following graphs. This was necessary for completing the BLM SRT form because the Schlumberger BHP data was provided at time intervals that did not correlate with the surface pressures provided by Halliburton and recorded on site.

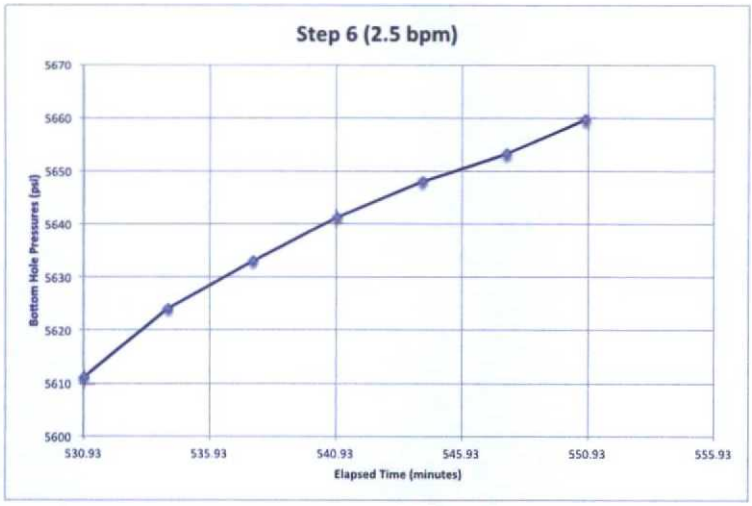




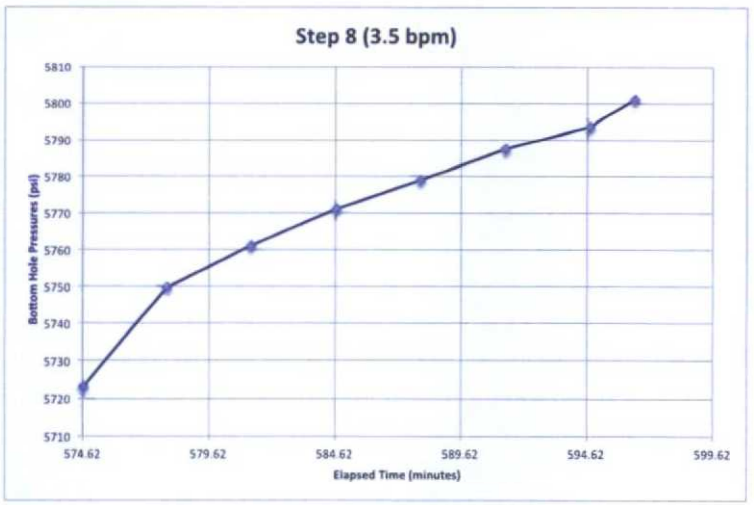

Step 3 (1.1 bpm)
Bottom Hole Pressures (psi)
5500
5495
5490
5485
5480
5475
5470
5465
467.08
472.08
477.08
482.08
487.08
492.08
Elapsed Time (minutes)

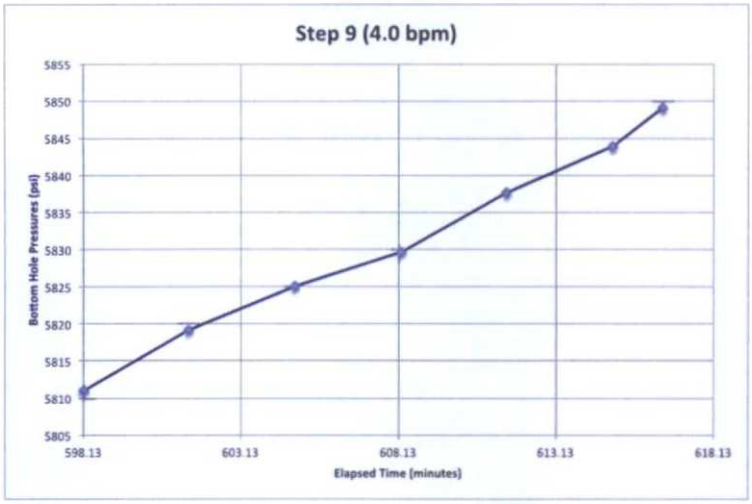

Step 4 (1.5 bpm)
Bottom Hole Pressures (psi)
5540
5535
5530
5525
5520
5515
5510
5505
5500
487.25
492.25
497.25
502.25
507.25
Elapsed Time (minutes)

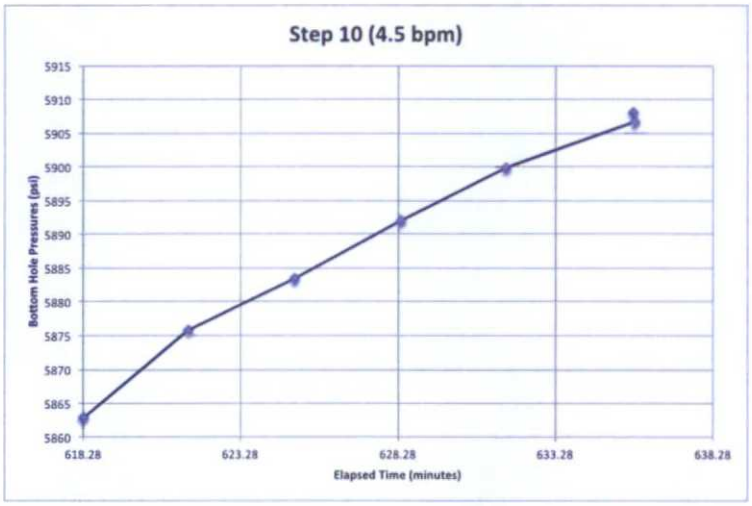

Step 5 (2.0 bpm)
Bottom Hole Pressures (psi)
5610
5600
5590
5580
5570
5560
5550
5540
507.40
512.40
517.40
522.40
527.40
532.40
Elapsed Time (minutes)

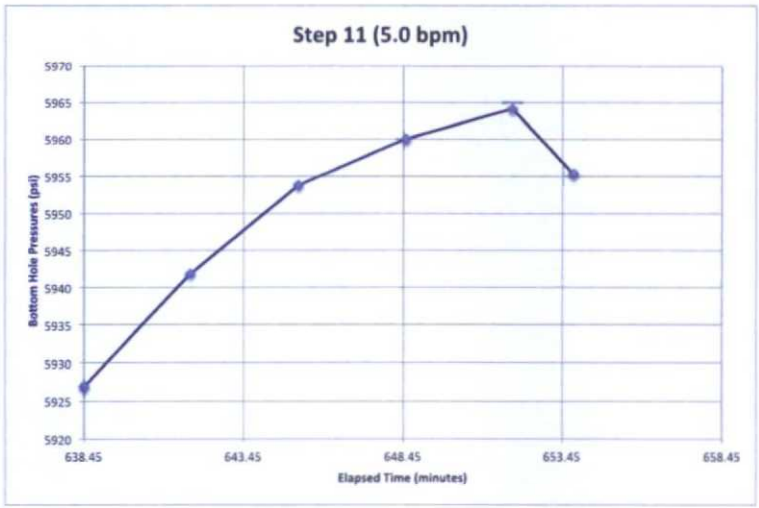

Step 6 (2.5 bpm)
Bottom Hole Pressures (psi)
5670
5660
5650
5640
5630
5620
5610
5600
530.93
535.93
540.93
545.93
550.93
555.93
Elapsed Time (minutes)


Step 7 (3.0 bpm)
Bottom Hole Pressures (psi)
5730
5720
5710
5700
5690
5680
5670
5660
5650
551.08
556.08
561.08
566.08
571.08
576.08
Elapsed Time (minutes)


Step 8 (3.5 bpm)
Bottom Hole Pressures (psi)
5810
5800
5790
5780
5770
5760
5750
5740
5730
5720
5710
574.62
579.62
584.62
589.62
594.62
599.62
Elapsed Time (minutes)


Step 9 (4.0 bpm)
Bottom Hole Pressures (psi)
5855
5850
5845
5840
5835
5830
5825
5820
5815
5810
5805
598.13
603.13
608.13
613.13
618.13
Elapsed Time (minutes)


Step 10 (4.5 bpm)
Bottom Hole Pressures (psi)
5915
5910
5905
5900
5895
5890
5885
5880
5875
5870
5865
5860
618.28
623.28
628.28
633.28
638.28
Elapsed Time (minutes)


Step 11 (5.0 bpm)
Bottom Hole Pressures (psi)
5970
5965
5960
5955
5950
5945
5940
5935
5930
5925
5920
638.45
643.45
648.45
653.45
658.45
Elapsed Time (minutes)

Running Horse

Maljamar AGI 2

Sales Order: 903243737

Post Job Report

For: N/A
Date: Thursday, April 14, 2016

HALLIBURTON

Table of Contents

1.0 EXECUTIVE SUMMARY

Halliburton appreciates the opportunity to perform the stimulation treatment. A pre-job safety meeting was held where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined. Pump time was 230.00 min.

The proposed treatment for Running Horse AGI2 Step Rate Test consisted of:

- 33096 gal of TREATED WATER.

The treatment actually pumped consisted of:

- 24037 gal of TREATED WATER.

The average BH treating rate was 2.0 bpm and average WH pressure was 1058 psi.
The total liquid load to recover is 24036 gal.

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.

Respectfully,

2.0 WELL INFORMATION

2.1 Customer Information

Sales Order	903243737
Interval	1
Job Date	14-Apr-2016

2.2 Perforation Intervals

Top MD ft	Bottom MD ft
10820.0	10825.0

2.3 Initial Fluid Position Pressures

Expected Bottom Hole Pressure	-1	psi
Reservoir Pressure	-1	psi
Closed-In WHP	-1	psi
Fluid Free to Flow into Formation	No	
Surface Lines Full	No	
Top of Fluid Depth	-1.#J	ft

3.0 PUMPING SCHEDULE

3.1 Designed Pumping Schedule

Stage Number	Description	Flow Path	Fluid System	Clean Volume gal	Slurry Volume gal	Rate Stage Start bpm	Rate Stage End bpm
1	Step Rate Test	In	TREATED WATER	336	336	0.2	0.2
2	Step Rate Test	In	TREATED WATER	630	630	0.5	0.5
3	Step Rate Test	In	TREATED WATER	1260	1260	1.0	1.0
4	Step Rate Test	In	TREATED WATER	1890	1890	1.5	1.5
5	Step Rate Test	In	TREATED WATER	2520	2520	2.0	2.0
6	Step Rate Test	In	TREATED WATER	3150	3150	2.5	2.5
7	Step Rate Test	In	TREATED WATER	3780	3780	3.0	3.0
8	Step Rate Test	In	TREATED WATER	4410	4410	3.5	3.5
9	Step Rate Test	In	TREATED WATER	5040	5040	4.0	4.0
10	Step Rate Test	In	TREATED WATER	5040	5040	4.5	4.5
11	Step Rate Test	In	TREATED WATER	5040	5040	4.5	4.5
12	Shut-In	In		0	0	0.0	0.0
Total				33096	33096		

3.2 Designed Pumping Schedule (continued)

Stage Number	Description	Stage Time min
1	Step Rate Test	32.00
2	Step Rate Test	30.00
3	Step Rate Test	30.00
4	Step Rate Test	30.00
5	Step Rate Test	30.00
6	Step Rate Test	30.00
7	Step Rate Test	30.00
8	Step Rate Test	30.00
9	Step Rate Test	30.00
10	Step Rate Test	26.67
11	Step Rate Test	26.67
12	Shut-In	0.00
Total		325.33

4.0 ACTUAL STAGE SUMMARY

4.1 Stage Summary

Stage Number	Stage Time	Start Time	End Time	Time min	Pump Time min	Max Treat Pr psi	Max Slurry Rate bpm
1	14-Apr-16 16:12:25	15:31:53	14-Apr-16 16:12:25	40.54	22.58	1139	49.0
2	14-Apr-16 16:32:43	16:12:26	14-Apr-16 16:32:43	20.31	20.32	740	1.0
3	14-Apr-16 16:52:19	16:32:44	14-Apr-16 16:52:19	19.60	19.60	547	1.5
4	14-Apr-16 17:12:07	16:52:20	14-Apr-16 17:12:07	19.80	19.82	651	2.2
5	14-Apr-16 17:32:16	17:12:08	14-Apr-16 17:32:16	20.15	20.17	769	2.5
6	14-Apr-16 17:57:18	17:32:17	14-Apr-16 17:57:18	25.02	25.03	1124	3.0
7	14-Apr-16 18:17:08	17:57:19	14-Apr-16 18:17:08	19.83	19.83	1440	3.5
8	14-Apr-16 18:43:29	18:17:09	14-Apr-16 18:43:29	26.35	26.33	2926	6.3
9	14-Apr-16 19:02:24	18:43:30	14-Apr-16 19:02:24	18.93	18.92	1925	4.5
10	14-Apr-16 19:22:48	19:02:25	14-Apr-16 19:22:48	20.40	20.40	2242	5.0
11	14-Apr-16 20:21:53	19:22:50	14-Apr-16 20:21:53	59.09	17.00	2575	5.5
12	14-Apr-16 20:28:27	20:21:54	14-Apr-16 20:28:27	6.56	0.00	0	0.0

Stage Number	Stage Time	Max Wellhead Rate bpm	Avg Treating Pressure psi	Avg Clean Rate bpm	Avg Slurry Rate bpm	Avg Wellhead Rate bpm	Avg Hydraulic Horsepower hp
1	14-Apr-16 16:12:25	49.0	824	0.3	0.3	0.3	7
2	14-Apr-16 16:32:43	1.0	622	0.5	0.5	0.5	8
3	14-Apr-16 16:52:19	1.5	436	1.1	1.1	1.1	12
4	14-Apr-16 17:12:07	2.2	423	1.5	1.5	1.5	16
5	14-Apr-16 17:32:16	2.5	593	2.0	2.0	2.0	29
6	14-Apr-16 17:57:18	3.0	862	2.5	2.5	2.5	54
7	14-Apr-16 18:17:08	3.5	1085	3.0	3.0	3.0	79
8	14-Apr-16 18:43:29	6.3	1403	3.3	3.3	3.3	113
9	14-Apr-16 19:02:24	4.5	1551	4.0	4.0	4.0	151
10	14-Apr-16 19:22:48	5.0	1842	4.5	4.5	4.5	203
11	14-Apr-16 20:21:53	5.5	2129	5.0	5.0	5.0	260
12	14-Apr-16 20:28:27	0.0	0	0.0	0.0	0.0	0

Stage Number	Stage Time	Clean Volume gal	Slurry Volume gal	Wellhead Volume gal
1	14-Apr-16 16:12:25	351	351	349
2	14-Apr-16 16:32:43	468	468	468
3	14-Apr-16 16:52:19	896	896	896
4	14-Apr-16 17:12:07	1263	1263	1263

Stage Number	Stage Time	Clean Volume gal	Slurry Volume gal	Wellhead Volume gal
5	14-Apr-16 17:32:16	1694	1694	1694
6	14-Apr-16 17:57:18	2673	2673	2673
7	14-Apr-16 18:17:08	2468	2468	2468
8	14-Apr-16 18:43:29	3634	3634	3634
9	14-Apr-16 19:02:24	3169	3169	3169
10	14-Apr-16 19:22:48	3852	3852	3852
11	14-Apr-16 20:21:53	3569	3569	3569
12	14-Apr-16 20:28:27	0	0	0
Total		24036	24036	24034

4.2 Bottom Hole Stage Summary

Stage Number	Start Time	Max BH Pressure psi	Avg BH Pressure psi	Max BH Rate bpm	Avg BH Rate bpm
1	15:33:46	5293	2960	2.1	0.1
2	17:15:28	5114	5077	2.0	2.0
3	17:21:07	5127	5090	2.0	2.0
4	17:31:53	5575	5166	2.8	2.4
5	17:44:01	5413	5227	2.9	2.6
6	17:59:18	6862	5363	5.4	2.8
7	18:21:58	5594	5408	3.6	3.4
8	18:38:54	6673	5351	6.2	3.9
9	19:00:56	5919	5371	4.5	4.4
10	19:17:55	5827	5433	5.4	4.8
11	19:36:44	5516	5081	5.5	1.1

5.0 PERFORMANCE HIGHLIGHTS

5.1 Job Summary

Start Time	14-Apr-16 10:28:30	
End Time	14-Apr-16 20:28:27	
Pump Time	230.00	min
Start Averaging Time	14-Apr-16 15:31:54	
End Averaging Time	14-Apr-16 20:28:27	
Max Treating Pressure	2926	psi
Max Slurry Rate	49.0	bpm
Max Wellhead Rate	49.0	bpm
Max Gel Rate	49.0	bpm
Avg Treating Pressure	1058	psi
Avg Clean Rate	2.5	bpm
Avg Slurry Rate	2.5	bpm
Avg Wellhead Rate	2.5	bpm
Avg Gel Rate	2.5	bpm
Avg Hydraulic Horsepower	64	hp
Clean Volume	24036	gal
Slurry Volume	24036	gal
Wellhead Volume	24034	gal
Gel Volume	24036	gal
BH Max Treating Pressure	6862	psi
BH Avg Treating Pressure	4388	psi
BH Max Rate	6.2	bpm
BH Avg Rate	2.0	bpm
Load to Recover	24036	gal
Volumes Pumped	**Total**	**Units**
TREATED WATER	24037	gal

Disclaimer: The average and maximum values (except volumes and bottom hole values) are based on the start and end averaging times.

5.2 Job Stage Log

Time	Description	Comment	Treating Pressure psi	Calc'd BH Pres psi	Slurry Rate bpm	Job Clean Vol gal
14-Apr-16 15:31:53	Stage 1	Step Rate Test	941	2385	0.0	1
16:12:26	Stage 2	Step Rate Test	730	2385	0.5	351
16:32:44	Stage 3	Step Rate Test	528	2385	1.0	819
16:52:20	Stage 4	Step Rate Test	392	3385	1.5	1715
17:12:08	Stage 5	Step Rate Test/Shifted transmission gear.rate drop then stabilized	551	5041	2.0	2978
17:32:17	Stage 6	Step Rate Test	766	5124	2.5	4672
17:57:19	Stage 7	Step Rate Test	1059	5254	3.0	7345
18:17:08	Stage 8	Step Rate Test	1320	5326	3.5	9813
18:43:29	Stage 9	Step Rate Test	1615	5391	4.0	13447
19:02:25	Stage 10	Step Rate Test	1816	5316	4.5	16616
19:22:49	Stage 11	Step Rate Test	2194	5484	5.0	20471
20:21:54	Stage 12	Shut-In	-3583	4776	0.0	24036

Time	Description	Comment	Job Slurry Vol gal	Job Proppant 100*lb	Hydraulic Power hp	Backside Pressure psi
15:31:53	Stage 1	Step Rate Test	1	0.00	0	750
16:12:26	Stage 2	Step Rate Test	351	0.00	8	570
16:32:44	Stage 3	Step Rate Test	819	0.00	13	556
16:52:20	Stage 4	Step Rate Test	1715	0.00	14	559
17:12:08	Stage 5	Step Rate Test/Shifted transmission gear.rate drop	2978	0.00	27	508

Time	Description	Comment	Job Slurry Vol gal	Job Proppant 100*lb	Hydraulic Power hp	Backside Pressure psi
		then stabilized				
17:32:17	Stage 6	Step Rate Test	4672	0.00	46	546
17:57:19	Stage 7	Step Rate Test	7345	0.00	80	638
18:17:08	Stage 8	Step Rate Test	9813	0.00	106	560
18:43:29	Stage 9	Step Rate Test	13447	0.00	157	614
19:02:25	Stage 10	Step Rate Test	16616	0.00	203	503
19:22:49	Stage 11	Step Rate Test	20471	0.00	267	613
20:21:54	Stage 12	Shut-In	24036	0.00	0	-3643

5.3 Job Event Log

Stage Number	Event Number	Time	Description	Comment	Treating Pressure psi	Calc'd BH Pres psi	Slurry Rate bpm	Job Clean Vol gal
	1	14-Apr-16 10:28:30	Start Job	Starting Job				
	2	10:41:44	Test Lines	4000 psi	4305	2385	0.0	1
	3	10:55:35	Other	Start Stage 1	987	2385	0.0	1
1		15:31:53	Stage 1	Step Rate Test	941	2385	0.0	1
		15:31:54	Start Averaging	Start Avg Trt 1	941	2385	0.0	0
2		16:12:26	Stage 2	Step Rate Test	730	2385	0.5	351
3		16:32:44	Stage 3	Step Rate Test	528	2385	1.0	819
4		16:52:20	Stage 4	Step Rate Test	392	3385	1.5	1715
5		17:12:08	Stage 5	Step Rate Test/Shifted transmission gear.rate drop then stabilized	551	5041	2.0	2978

Stage Number	Event Number	Time	Description	Comment	Treating Pressure psi	Calc'd BH Pres psi	Slurry Rate bpm	Job Clean Vol gal
6		17:32:17	Stage 6	Step Rate Test	766	5124	2.5	4672
7		17:57:19	Stage 7	Step Rate Test	1059	5254	3.0	7345
8		18:17:08	Stage 8	Step Rate Test	1320	5326	3.5	9813
9		18:43:29	Stage 9	Step Rate Test	1615	5391	4.0	13447
10		19:02:25	Stage 10	Step Rate Test	1816	5316	4.5	16616
11		19:22:49	Stage 11	Step Rate Test	2194	5484	5.0	20471
	4	19:39:52	ISIP		725	5514	0.1	24036
	5	19:44:54	Shut-In Pressure @ 5 Minutes		510	5296	0.0	24036
	6	19:49:52	Shut-In Pressure @ 10 Minutes		460	5245	0.0	24036
	7	19:54:52	Shut-In Pressure @ 15 Minutes		427	5211	0.0	24036
	8	20:09:07	Shut-In Pressure @ 30 Minutes		367	5150	0.0	24036
12		20:21:54	Stage 12	Shut-In	-3583	4776	0.0	24036
		20:28:27	End Averaging	End Avg Trt 1	-3583	4776	0.0	24036
	9	20:28:31	End Job	Ending Job	-3583	4776	0.0	24036

Stage Number	Event Number	Time	Description	Comment	Job Slurry Vol gal	Job Proppant 100*lb	Hydraulic Power hp	Backside Pressure psi
	1	10:28:30	Start Job	Starting Job				
	2	10:41:44	Test Lines	4000 psi	1	0.00	0	4

Stage Number	Event Number	Time	Description	Comment	Job Slurry Vol gal	Job Proppant 100*lb	Hydraulic Power hp	Backside Pressure psi
	3	10:55:35	Other	Start Stage 1	1	0.00	0	799
1		15:31:53	Stage 1	Step Rate Test	1	0.00	0	750
		15:31:54	Start Averaging	Start Avg Trt 1	0	0.00	0	750
2		16:12:26	Stage 2	Step Rate Test	351	0.00	8	570
3		16:32:44	Stage 3	Step Rate Test	819	0.00	13	556
4		16:52:20	Stage 4	Step Rate Test	1715	0.00	14	559
5		17:12:08	Stage 5	Step Rate Test/Shifted transmission gear.rate drop then stabilized	2978	0.00	27	508
6		17:32:17	Stage 6	Step Rate Test	4672	0.00	46	546
7		17:57:19	Stage 7	Step Rate Test	7345	0.00	80	638
8		18:17:08	Stage 8	Step Rate Test	9813	0.00	106	560
9		18:43:29	Stage 9	Step Rate Test	13447	0.00	157	614
10		19:02:25	Stage 10	Step Rate Test	16616	0.00	203	503
11		19:22:49	Stage 11	Step Rate Test	20471	0.00	267	613
	4	19:39:52	ISIP		24036	0.00	2	603
	5	19:44:54	Shut-In Pressure @ 5 Minutes		24036	0.00	0	627
	6	19:49:52	Shut-In Pressure @ 10 Minutes		24036	0.00	0	672
	7	19:54:52	Shut-In Pressure @ 15 Minutes		24036	0.00	0	717
	8	20:09:07	Shut-In Pressure @ 30 Minutes		24036	0.00	0	838
12		20:21:54	Stage 12	Shut-In	24036	0.00	0	-3643
		20:28:27	End Averaging	End Avg Trt 1	24036	0.00	0	-3643

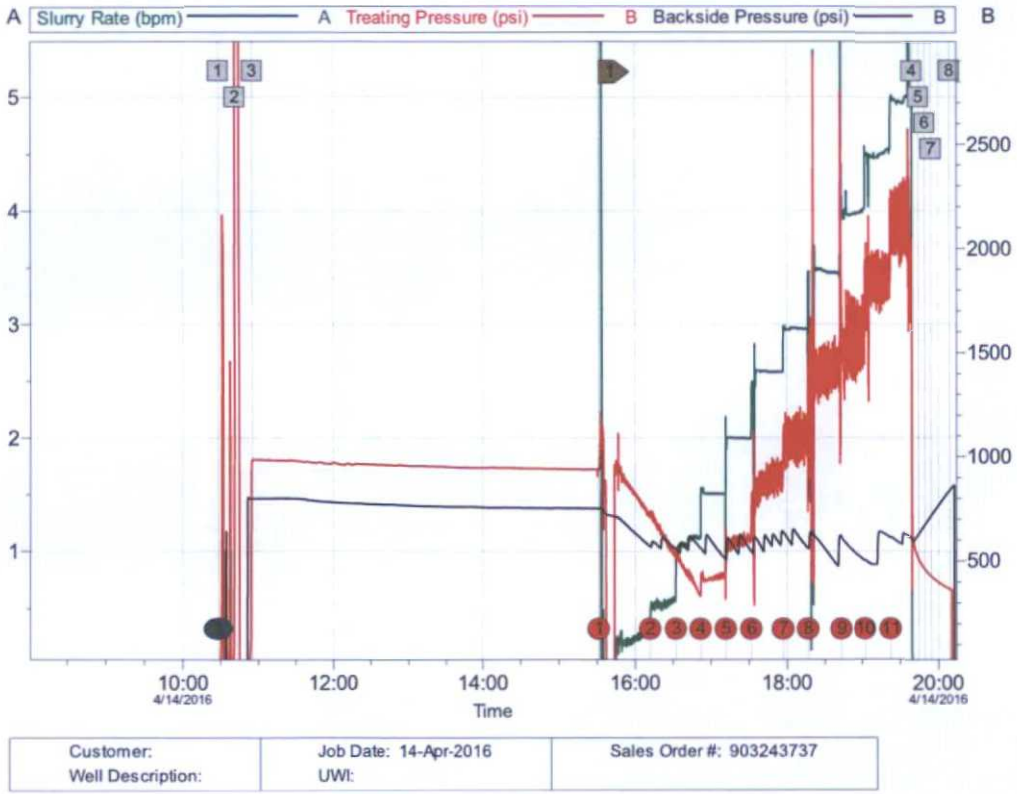
Stage Number	Event Number	Time	Description	Comment	Job Slurry Vol gal	Job Proppant 100*lb	Hydraulic Power hp	Backside Pressure psi
	9	20:28:31	End Job	Ending Job	24036	0.00	0	-3643

5.4 ISIP

Time	Description	Treating Pressure psi
19:39:52	ISIP	725
19:44:54	Shut-In Pressure @ 5 Minutes	510
19:49:52	Shut-In Pressure @ 10 Minutes	460
19:54:52	Shut-In Pressure @ 15 Minutes	427
20:09:07	Shut-In Pressure @ 30 Minutes	367

6.0 ATTACHMENTS

6.1 Step Rate Test



STEP RATE TEST DATA for BLM, CFO

Operator: Frontier Energy Services | Well: Maljamar AGI #2

API#: 3002542628 | Lease: LC029509a

Data Collection Date: 4/24/16 | Sfc Loc: Sec. 21, T-17-S, R-32-E, Lea Co., NM

Tbg O.D.:	2.875	Tbg Wt.:	6.50	Grade:	L-80	Pipe I.D.:	7.0"	TVD Packer:	**9589**
Top Inj. Depth (TVD):	**9,609**			X	0.20 psig/ft	=	Generic Surface Injection psig:		**1922**
Beginning Wellhead psig:	**86**			Msrd No Flow Formation psig:		**5239**	BHP TVD:		**9763**
Testing Wtr measured wth Mud Wt Scale - lbs/gal:		**10.2**					Calc Production Water - lbs/gal:		**10.2**
Calc. No Flow Form. psig:	**5264**						Target Maximum Rate bpd (barrels per day):		**5760**
							Minimum Bbls of Disposal Production Water to be on Location for S. R. T.:		**443**

1. Take a charted record of shut in psig for no less than 48 hours. If the wellhead shut in psig is not less than the approved injection pressure, bled the wellhead pressure below 0.2psig/ft x depth at top of injection before beginning the Step Rate Test.

2. Preform a minimum of seven steps, recording rate to ±1/10bpm, surface and down hole pressures to ±10psig in five minute intervals. The first two psig(s) must be below 0.2psig/ft x top injection depth.

3. The last two five minute surface pressure readings of each (minimum 30 minute) step are to be within 15psig of each other. And the last two five minute formation pressure readings of each (minimum 30 minute) step are to be within 15psig of each other. If if either are not, continue 5 minute readings. Record the (surface pressure, formation pressure, & rate) of the last reading as the Data Point for that Step.

Step 1

Target Test Rate (5% of maximum) = 0.25 bpm for **Step 1**

Step 1 data at:	5 min	10 min	15 min	20 min	25 min	30 min
Surface (psig):	1585	1710	1797	1857	1860	1868
Formation (psig)	6860	6955	7030	7075	7055	7040
bpm:	0.30	0.30	0.30	0.30	0.30	0.3
Step 1 data at:	35 min	40 min	45 min	50 min	25 min	60 min
Surface (psig):						
Formation (psig):						
bpm:						

Start Time: **9:37**

target bpd: 360

Data Point **#1**

@ bpd: 432

Sfc psig: 1780

F psig: 7003

@ bpm: 0.30

Step 2

Target Test Rate (10% of maximum) = 0.50 bpm for **Step 2**

Step 2 data at:	5 min	10 min	15 min	20 min	25 min	30 min
Surface (psig):	2097	2087	2100	2160	2204	2235
Formation (psig):	7260	7265	7280	7350	7400	7420
bpm:	0.5	0.5	0.5	0.5	0.5	0.5
At bpm Rate:	35 min	40 min	45 min	50 min	25 min	60 min
Surface (psig):	2260					
Formation (psig):	7445					
bpm:	0.5					

target bpd: 720

Data Point **#2**

@ bpd: 720

Sfc psig: 2163

F psig: 7346

bpm: 0.50

Step 3

Target Test Rate (20% of maximum) = 1.00 bpm for **Step 3**

Step 3 data at:	5 min	10 min	15 min	20 min	25 min	30 min
Surface (psig):	2546	2568	2600	2618	2639	2662
Formation (psig):	7715	7735	7752	7772	7800	7810
bpm:	1.0	1.0	1.0	1.0	1.0	1.0
Step 3 data at:	35 min	40 min	45 min	50 min	25 min	60 min
Surface (psig):						
Formation (psig):						
bpm:						

target bpd: 1440

Data Point **#3**

@ bpd: 1440

Sfc psig: 2606

F psig: 7764

bpm: 1.00

STEP RATE TEST DATA for BLM, CFO

Operator: Frontier Energy Services | Well: Maljamar AGI #2

API#: 3002542628 | Lease: LC029509a

Data Collection Date: 4/24/16 | Sfc Loc: Sec. 21, T-17-S, R-32-E, Lea Co., NM

Step 4

Target Test Rate (37.5% of maximum) = 1.50 bpm for **Step 4**

Step 4 data at:	5 min	10 min	15 min	20 min	25 min	30 min	End Time: **11:42**
Surface (psig):	2930	2998	3008	3010	3035	3075	
Formation (psig):	8030	8070	8075	8092	8116	8125	target bpd: 2160
Rate bbl/min:	1.50	1.50	1.50	1.50	1.50	1.5	Data Point **#4**
Step 4 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd: 2160
Surface (psig):							Sfc psig: 3009
Formation (psig):	**Terminated Test Due to Equipment Pressure Limits**						F psig: 8085
bpm:							bpm: 1.5

Step 5

Target Test Rate (50% of maximum) = 2.00 bpm for **Step 5**

Step 5 data at:	5 min	10 min	15 min	20 min	25 min	30 min	
Surface (psig):							
Formation (psig)							target bpd: 3600
bpm:							Data Point **#5**
Step 5 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd: #DIV/0!
Surface (psig):							Sfc psig: #DIV/0!
Formation (psig):							F psig: #DIV/0!
bpm:							bpm: #DIV/0!

Step 6

Target Test Rate (62.5% of maximum) = 2.50 bpm for **Step 6**

Step 6 data at:	5 min	10 min	15 min	20 min	25 min	30 min	
Surface (psig):							
Formation (psig)							target bpd: 3600
Rate bbl/min:							Data Point **#6**
Step 6 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd: #DIV/0!
Surface (psig):							Sfc psig: #DIV/0!
Formation (psig):							F psig: #DIV/0!
bpm:							bpm: #DIV/0!

Step 7

Target Test Rate (75% of maximum) = 3.00 bpm for **Step 7**

Step 7 data at:	5 min	10 min	15 min	20 min	25 min	30 min	
Surface (psig):							
Formation (psig):							target bpd: 4320
bpm:							Data Point **#7**
Step 7 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd: #DIV/0!
Surface (psig):							Sfc psig: #DIV/0!
Formation (psig):							F psig: #DIV/0!
bpm:							bpm: #DIV/0!

STEP RATE TEST DATA for BLM, CFO

Operator: Frontier Energy Services | Well: Maljamar AGI #2

API#: 3002542628 | Lease: LC029509a

Data Collection Date: 4/24/16 | Sfc Loc: Sec. 21, T-17-S, R-32-E, Lea Co., NM

Step 8

Target Test Rate (87.5% of maximum) = 3.50 bpm for **Step 8**

Step 8 data at:	5 min	10 min	15 min	20 min	25 min	30 min	
Surface (psig):							
Formation (psig):							target bpd: 5040
bpm:							Data Point **#8**
Step 8 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd: #DIV/0!
Surface (psig):							Sfc psig: #DIV/0!
Formation (psig):							F psig: #DIV/0!
bpm:							bpm: #DIV/0!

Step 9

Target Test Rate (100% of maximum) = 4.0 bpm for **Step 9**

Step 9 data at:	5 min	10 min	15 min	20 min	25 min	30 min	
Surface (psig):							
Formation (psig):							target bpd: 5760
bpm:	4.00	4.00	4.00	4.00			Data Point **#9**
Step 9 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd: 5760
Surface (psig):							Sfc psig: #DIV/0!
Formation (psig):							F psig: #DIV/0!
bpm:							bpm: 4.0

Step 10

Target Test Rate (112.5% of maximum) = 4.5 bpm for **Step 10**

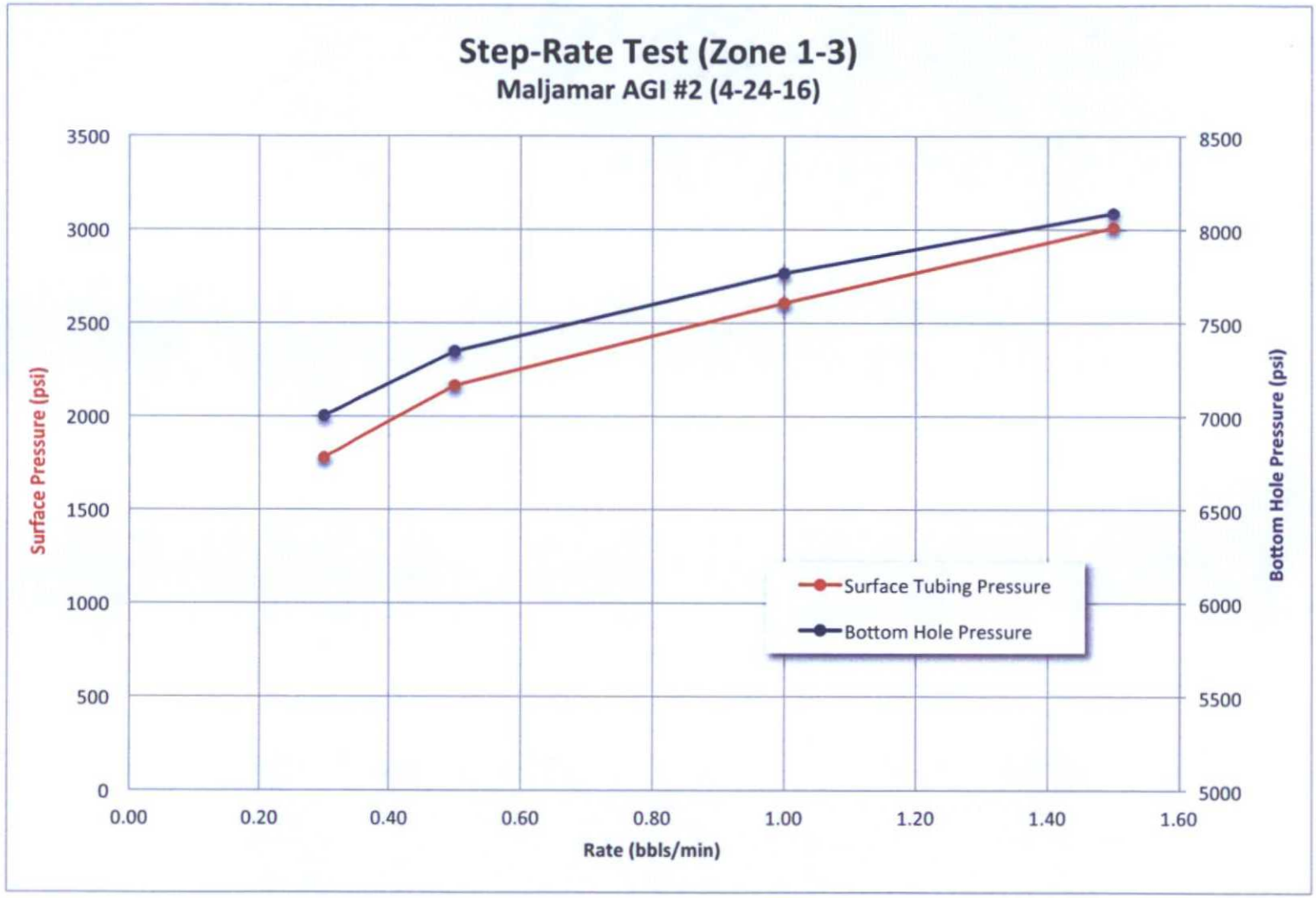
Step 9 data at:	5 min	10 min	15 min	20 min	25 min	30 min	
Surface (psig):							
Formation (psig):							target bpd: 5760
bpm:							Data Point **#10**
Step 9 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd: #DIV/0!
Surface (psig):							Sfc psig: #DIV/0!
Formation (psig):							F psig: #DIV/0!
bpm:							bpm: #DIV/0!

Step 11

Target Test Rate (125% of maximum) = 5.0 bpm for **Step 11**

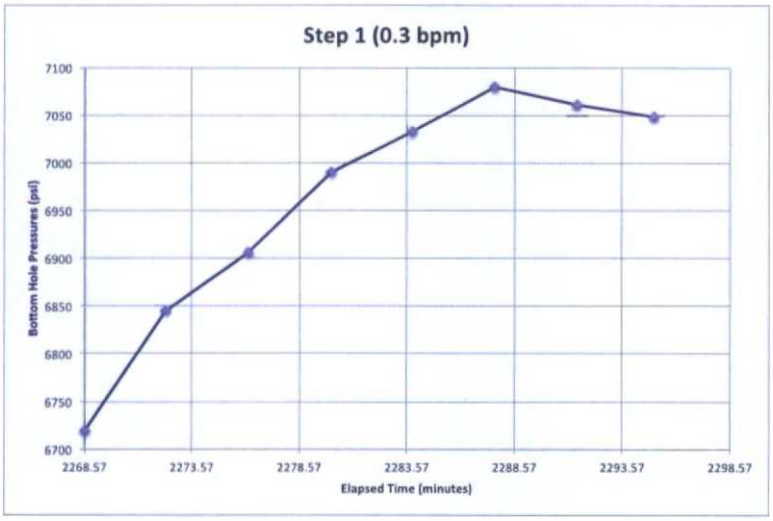
Step 9 data at:	5 min	10 min	15 min	20 min	25 min	30 min	End Time: **18:39**
Surface (psig):							
Formation (psig):							target bpd: 5760
bpm:							Data Point **#11**
Step 9 data at:	35 min	40 min	45 min	50 min	25 min	60 min	@ bpd: #DIV/0!
Surface (psig):							Sfc psig: #DIV/0!
Formation (psig):							F psig: #DIV/0!
bpm:							bpm: #DIV/0!

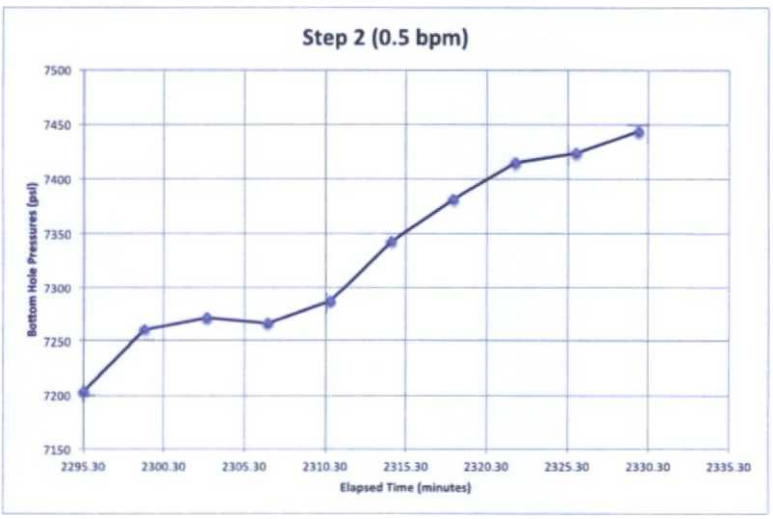
	Surface	Formation	
Instant Shut In Pressure:	2767	8120	psig
5 minute Shut In Pressure:	2305	7500	psig
10 minute Shut In Pressure:	2068	7260	psig
15 minute Shut In Pressure:	1870	7080	psig


Step-Rate Test (Zone 1-3)
Maljamar AGI #2 (4-24-16)
Surface Pressure (psi)
Bottom Hole Pressure (psi)
Rate (bbls/min)
3500
3000
2500
2000
1500
1000
500
0
8500
8000
7500
7000
6500
6000
5500
5000
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
Surface Tubing Pressure
Bottom Hole Pressure

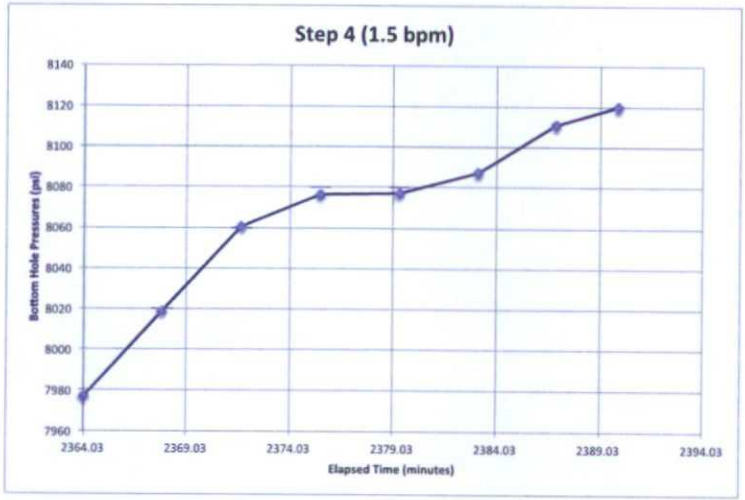
Maljamar AGI #2 Zone 1-3 Step-Rate Test Bottom-Hole Pressures

The BHP for each 5-minute interval during each step and following shut down was determined using the following graphs. This was necessary for completing the BLM SRT form because the Schlumberger BHP data was provided at time intervals that did not correlate with the surface pressures provided by Halliburton and recorded on site.






Step 3 (1.0 bpm)
Bottom Hole Pressures (psi)
7820
7800
7780
7760
7740
7720
7700
7680
7660
2333.48
2338.48
2343.48
2348.48
2353.48
2358.48
2363.48
Elapsed Time (minutes)


Step 4 (1.5 bpm)
Bottom Hole Pressures (psi)
8140
8120
8100
8080
8060
8040
8020
8000
7980
7960
2364.03
2369.03
2374.03
2379.03
2384.03
2389.03
2394.03
Elapsed Time (minutes)


Shut Down
Bottom Hole Pressures (psi)
8500
8000
7500
7000
6500
6000
11:42:01
11:47:01
11:52:01
11:57:02
12:02:02
12:07:02
12:12:02
12:17:03
Clock Time (hr:min:sec)

RUNNING HORSE PRODUCTION CO LLC
PO BOX 369
IGNACIO, CO 81137

MALJAMAR AGI 2

Interval 1
Lea County, New Mexico

Sales Order: 0903266369

Post Job Report

For: JOHN TARPLEY
Date: Sunday, April 24, 2016

HALLIBURTON

Table of Contents

1.0 EXECUTIVE SUMMARY

JOHN TARPLEY
RUNNING HORSE PRODUCTION CO LLC
PO BOX 369
IGNACIO , CO 81137

Dear JOHN TARPLEY ,

Halliburton appreciates the opportunity to perform the stimulation treatment on the MALJAMAR AGI 2. A pre-job safety meeting was held where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined. Pump time was 123.40 min.

The proposed treatment for RUNNING HORSE MALJAMAR AGI # 2 consisted of:

- 23016 gal of Treated Water.

The treatment actually pumped consisted of:

- 4286 gal of Treated Water.

The average BH treating rate was 0.7 bpm and average WH pressure was 2367 psi.
The total liquid load to recover is 4287 gal.

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.

Respectfully,

DAVID ZAMBRANO

2.0 WELL INFORMATION

2.1 Customer Information

Customer	RUNNING HORSE PRODUCTION CO LLC
Sales Order	0903266369
Well Name	MALJAMAR AGI
Interval	1
Well Number	2
Job Date	24-Apr-2016
County	Lea
State	New Mexico
UWI/API	30-025-42628-00
Latitude	32° 48' 50.3" N (32.813967°)
Longitude	103° 46' 10.9" W (-103.769693°)
Country	United States of America
H2S Present	Unknown
CO2 Present	Unknown
Customer Representative	JOHN TARPLEY
Customer Telephone Number	3035718249
Halliburton Representative	DAVID ZAMBRANO

2.2 Pipe Information

Equipment	Top MD ft	Bottom MD ft	OD in	ID in	Grade	Weight lb/ft
Surface Pipe	0.0	50.0	2.620	1.870		
Tubing	0.0	10473.0	2.875	2.441	J-55	6.50
Casing	0.0	11048.0	7.000	6.184		29.00
Formation	10474.0	11000.0				
Open Hole	11048.0	11248.0		6.500		

2.3 Initial Fluid Position Pressures

Expected Bottom Hole Pressure	7600	psi
Reservoir Pressure	4333	psi
Reservoir Pressure Gradient	0.440	psi/ft
Closed-In WHP	0	psi
Fluid Free to Flow into Formation	Yes	
Surface Lines Full	No	
Fluid in Tubing	Brine	
Top of Fluid Depth	0.00	ft

2.4 Temperature Profile Information

Ambient Temperature	60.0	°F
Injected Fluid	60.0	°F
Proppant	60.0	°F

Earth Surface	60.0	°F
BH Static	130.0	°F
Gradient	0.6223	°F/(100*ft)

3.0 PUMPING SCHEDULE

3.1 Designed Pumping Schedule

Stage Number	Description	Fluid System	Clean Volume gal	Slurry Volume gal	Rate Stage Start bpm	Rate Stage End bpm	Stage Time min
1	Step Rate Test	Treated Water	336	336	0.3	0.3	32.00
2	Step Rate Test	Treated Water	630	630	0.5	0.5	30.00
3	Step Rate Test	Treated Water	1260	1260	1.0	1.0	30.00
4	Step Rate Test	Treated Water	1890	1890	1.5	1.5	30.00
5	Step Rate Test	Treated Water	2520	2520	2.0	2.0	30.00
6	Step Rate Test	Treated Water	3150	3150	2.5	2.5	30.00
7	Step Rate Test	Treated Water	3780	3780	3.0	3.0	30.00
8	Step Rate Test	Treated Water	4410	4410	3.5	3.5	30.00
9	Step Rate Test	Treated Water	5040	5040	4.0	4.0	30.00
Total			23016	23016			272.00
Total							

4.0 ACTUAL STAGE SUMMARY

4.1 Stage Summary

Stage Number	Stage Time ucts	Start Time ucts	End Time ucts	Time min	Pump Time min	Max Treat Pr psi	Max Slurry Rate bpm
1	24-Apr-16 10:07:06	09:37:41	24-Apr-16 10:07:06	29.45	28.33	1883	0.6
2	24-Apr-16 10:42:06	10:07:07	24-Apr-16 10:42:06	35.00	35.03	2277	0.7
3	24-Apr-16 11:12:24	10:42:08	24-Apr-16 11:12:24	30.30	30.32	2669	1.1
4	24-Apr-16 14:22:01	11:12:25	24-Apr-16 14:22:01	189.62	29.72	3078	1.5

Stage Number	Stage Time ucts	Max Wellhead Rate bpm	Avg Treating Pressure psi	Avg Clean Rate bpm	Avg Slurry Rate bpm	Avg Wellhead Rate bpm	Avg Hydraulic Horsepower hp
1	24-Apr-16 10:07:06	0.6	1750	0.3	0.3	0.3	15
2	24-Apr-16 10:42:06	0.7	2146	0.5	0.5	0.5	26
3	24-Apr-16 11:12:24	1.1	2593	1.0	1.0	1.0	63
4	24-Apr-16 14:22:01	1.5	2986	1.5	1.5	1.5	109

Stage Number	Stage Time ucts	Clean Volume gal	Slurry Volume gal	Wellhead Volume gal
1	24-Apr-16 10:07:06	424	424	417

Stage Number	Stage Time ucts	Clean Volume gal	Slurry Volume gal	Wellhead Volume gal
2	24-Apr-16 10:42:06	733	733	733
3	24-Apr-16 11:12:24	1271	1271	1271
4	24-Apr-16 14:22:01	1858	1858	1858
Total		4287	4287	4280

4.2 Bottom Hole Stage Summary

Stage Number	Start Time ucts	Max BH Pressure psi	Avg BH Pressure psi	Max BH Rate bpm	Avg BH Rate bpm
WB/SL	00:00:00	-15	-15	0.0	0.0
WB/SL	00:00:00	-15	-15	0.0	0.0
1	11:29:04	7961	7934	1.5	1.5
2	11:35:47	7995	6363	1.5	0.4

5.0 PERFORMANCE HIGHLIGHTS

5.1 Job Summary

Start Time	24-Apr-16 09:30:59	ucts
End Time	24-Apr-16 14:22:01	ucts
Pump Time	123.40	min
Start Averaging Time	24-Apr-16 09:37:41	ucts
End Averaging Time	24-Apr-16 14:22:00	ucts
Max Treating Pressure	3078	psi
Max Slurry Rate	1.5	bpm
Max Wellhead Rate	1.5	bpm
Max Gel Rate	1.5	bpm
Avg Treating Pressure	2367	psi
Avg Clean Rate	0.8	bpm
Avg Slurry Rate	0.8	bpm
Avg Wellhead Rate	0.8	bpm
Avg Gel Rate	0.8	bpm
Avg Hydraulic Horsepower	48	hp
Clean Volume	4287	gal
Slurry Volume	4287	gal
Wellhead Volume	4280	gal
Gel Volume	4287	gal
BH Max Treating Pressure	7995	psi
BH Avg Treating Pressure	6729	psi
BH Max Rate	1.5	bpm
BH Avg Rate	0.7	bpm
Load to Recover	4287	gal
Volumes Pumped	**Total**	**Units**
Treated Water	4286	gal

Disclaimer: The average and maximum values (except volumes and bottom hole values) are based on the start and end averaging times.

5.2 Job Stage Log

Time ucts	Description	Comment	Treating Pressure psi	Backside Pressure psi	Slurry Rate bpm	Job Slurry Vol gal
24-Apr-16 09:37:40	Stage 1	Step Rate Test	87	0	0.0	0
10:07:06	Stage 2	Step Rate Test	1872	0	0.4	424
10:42:07	Stage 3	Step Rate Test	2283	493	0.7	1158
11:12:25	Stage 4	Step Rate Test	2670	487	1.1	2428

Time ucts	Description	Comment	Hydraulic Power hp	Hydrostatic Pressure psi	Slurry Left In Stage gal	Slurry Stage Size gal
09:37:40	Stage 1	Step Rate Test	0	4856	336	336
10:07:06	Stage 2	Step Rate Test	18	4884	-88	336
10:42:07	Stage 3	Step Rate Test	38	4892	1260	1260
11:12:25	Stage 4	Step Rate Test	69	4906	-11	1260

5.3 Job Event Log

Stage Number	Event Number	Time ucts	Description	Comment	Treating Pressure psi	Backside Pressure psi	Slurry Rate bpm	Job Slurry Vol gal
	1	24-Apr-16 04:20:00	Safety Meeting - Service Center or other Site	JOURNEY MANAGEMENT				
	2	04:30:00	Depart from Service Center or Other Site					
	3	07:00:00	Arrive at Location					

Stage Number	Event Number	Time ucts	Description	Comment	Treating Pressure psi	Backside Pressure psi	Slurry Rate bpm	Job Slurry Vol gal
			from Service Center					
	4	07:05:00	Safety Meeting - Assessment of Location					
	5	07:10:00	Other	SPOT PUMP				
	6	07:20:00	Safety Meeting - Pre Rig-Up					
	7	07:25:00	Rig-Up Equipment					
	8	08:40:00	Rig-Up Completed					
	9	08:45:00	Other	ENTERING WELLBORE DATA				
	10	09:11:02	Safety Meeting - Pre Job					
	11	09:30:56	Start Job	Starting Job	0	0	0.0	0
	12	09:35:31	Test Lines		3005	0	0.0	2
1		09:37:40	Stage 1	Step Rate Test	87	0	0.0	0
		09:37:41	Start Averaging	Start Avg Trt 1	88	0	0.0	0
2		10:07:06	Stage 2	Step Rate Test	1872	0	0.4	424
3		10:42:07	Stage 3	Step Rate Test	2283	493	0.7	1158
4		11:12:25	Stage 4	Step Rate Test	2670	487	1.1	2428
	13	11:42:07	Other	SHUTTING DOWN PRE MATURELY BECAUSE SCHLUMBERGER SWEDGE ONLY RATED TO 3,000 PSI	2718	501	0.1	4286
	14	11:42:08	Wait on Customer or Customer Sub-Contractor Equip - Start Time	WAITING ON ORDERS FROM COMPANY REP	2755	500	0.1	4286

Stage Number	Event Number	Time ucts	Description	Comment	Treating Pressure psi	Backside Pressure psi	Slurry Rate bpm	Job Slurry Vol gal
	15	11:42:09	ISIP		2767	500	0.1	4286
	16	11:47:09	Shut-In Pressure @ 5 Minutes		2305	488	0.0	4287
	17	11:52:09	Shut-In Pressure @ 10 Minutes		2068	494	0.0	4287
	18	11:57:09	Shut-In Pressure @ 15 Minutes		1870	503	0.0	4287
	19	12:12:09	Shut-In Pressure @ 30 Minutes		1413	532	0.0	4287
	20	12:42:09	Other	SHUT IN ONE HOUR	873	486	0.0	4287
	21	13:44:08	Wait on Customer or Customer Sub-Contractor Equipment - End Tim	COMPANY REP SAID TO RIG IT DOWN	419	564	0.0	4287
	22	13:45:00	Safety Meeting - Pre Rig-Down		416	564	0.0	4287
	23	13:50:00	Rig-Down Equipment		-6	570	0.0	4287
		14:22:00	End Averaging	End Avg Trt 1	-3791	-3810	0.0	4287
	24	14:22:04	End Job	Ending Job	-3791	-3810	0.0	4287
	25	14:50:00	Rig-Down Completed		-3791	-3810	0.0	4287
	26	14:55:00	Safety Meeting - Departing Location		-3791	-3810	0.0	4287
	27	15:00:00	Depart Location for Service Center or Other Site		-3791	-3810	0.0	4287
	28	17:30:00	Return to Service Center from Job		-3791	-3810	0.0	4287

Stage Number	Event Number	Time ucts	Description	Comment	Treating Pressure psi	Backside Pressure psi	Slurry Rate bpm	Job Slurry Vol gal
	29	17:31:00	Other	TOTAL LOAD 102 BBLS	-3791	-3810	0.0	4287
	30	17:32:00	Other	8.0 HRS TOTAL ON LOCATION	-3791	-3810	0.0	4287

Stage Number	Event Number	Time ucts	Description	Comment	Hydraulic Power hp	Hydrostatic Pressure psi	Slurry Left In Stage gal	Slurry Stage Size gal
	1	04:20:00	Safety Meeting - Service Center or other Site	JOURNEY MANAGEMENT				
	2	04:30:00	Depart from Service Center or Other Site					
	3	07:00:00	Arrive at Location from Service Center					
	4	07:05:00	Safety Meeting - Assessment of Location					
	5	07:10:00	Other	SPOT PUMP				
	6	07:20:00	Safety Meeting - Pre Rig-Up					
	7	07:25:00	Rig-Up Equipment					
	8	08:40:00	Rig-Up Completed					
	9	08:45:00	Other	ENTERING WELLBORE DATA				
	10	09:11:02	Safety Meeting - Pre Job					
	11	09:30:56	Start Job	Starting Job	0	0	0	0
	12	09:35:31	Test Lines		0	4854	0	0

Stage Number	Event Number	Time ucts	Description	Comment	Hydraulic Power hp	Hydrostatic Pressure psi	Slurry Left In Stage gal	Slurry Stage Size gal
1		09:37:40	Stage 1	Step Rate Test	0	4856	336	336
		09:37:41	Start Averaging	Start Avg Trt 1	0	4856	336	336
2		10:07:06	Stage 2	Step Rate Test	18	4884	-88	336
3		10:42:07	Stage 3	Step Rate Test	38	4892	1260	1260
4		11:12:25	Stage 4	Step Rate Test	69	4906	-11	1260
	13	11:42:07	Other	SHUTTING DOWN PRE MATURELY BECAUSE SCHLUMBERGER SWEDGE ONLY RATED TO 3,000 PSI	9	4912	32	1890
	14	11:42:08	Wait on Customer or Customer Sub-Contractor Equip - Start Time	WAITING ON ORDERS FROM COMPANY REP	7	4913	32	1890
	15	11:42:09	ISIP		4	4913	32	1890
	16	11:47:09	Shut-In Pressure @ 5 Minutes		0	4904	32	1890
	17	11:52:09	Shut-In Pressure @ 10 Minutes		0	4898	32	1890
	18	11:57:09	Shut-In Pressure @ 15 Minutes		0	4893	32	1890
	19	12:12:09	Shut-In Pressure @ 30 Minutes		0	4884	32	1890
	20	12:42:09	Other	SHUT IN ONE HOUR	0	4873	32	1890
	21	13:44:08	Wait on Customer or Customer Sub-Contractor Equipment - End Tim	COMPANY REP SAID TO RIG IT DOWN	0	4865	32	1890
	22	13:45:00	Safety Meeting - Pre		0	4865	32	1890

Stage Number	Event Number	Time ucts	Description	Comment	Hydraulic Power hp	Hydrostatic Pressure psi	Slurry Left In Stage gal	Slurry Stage Size gal
			Rig-Down					
	23	13:50:00	Rig-Down Equipment		0	4859	32	1890
		14:22:00	End Averaging	End Avg Trt 1	0	4858	32	1890
	24	14:22:04	End Job	Ending Job	0	4858	32	1890
	25	14:50:00	Rig-Down Completed		0	4858	32	1890
	26	14:55:00	Safety Meeting - Departing Location		0	4858	32	1890
	27	15:00:00	Depart Location for Service Center or Other Site		0	4858	32	1890
	28	17:30:00	Return to Service Center from Job		0	4858	32	1890
	29	17:31:00	Other	TOTAL LOAD 102 BBLS	0	4858	32	1890
	30	17:32:00	Other	8.0 HRS TOTAL ON LOCATION	0	4858	32	1890

5.4 ISIP

Time	Description	Treating Pressure psi
11:42:09	ISIP	2767
11:47:09	Shut-In Pressure @ 5 Minutes	2305
11:52:09	Shut-In Pressure @ 10 Minutes	2068
11:57:09	Shut-In Pressure @ 15 Minutes	1870
12:12:09	Shut-In Pressure @ 30 Minutes	1413

6.0 ATTACHMENTS

6.1 RUNNING HORSE MALJAMAR AGI # 2 MISCELLANOUS PUMPING