

HALLIBURTON

iCem[®] Service

ADVANCED EXTRACTION TECHNOLOGIES

For:

Date: Monday, November 03, 2014

Diamond Valley East

Extraction Diamond Valley East #12

Sincerely,

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1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the Extraction Diamond Valley East #12 cement intermediate casing job. A pre-job safety meeting was held before the job where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined.

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,

Halliburton Brighton

Job Times

	Date	Time	Time Zone
Called Out	11/3	0700	MST
On Location	11/3	1130	MST
Job Started	11/3	1409	MST
Job Completed	11/3	1602	MST
Departed Location	11/3	1700	MST

1.2 Cementing Job Summary



<i>The Road to Excellence Starts with Safety</i>											
Sold To #: 369404			Ship To #: 3594481			Primary Sales Order #: 0901793166					
Customer: EXTRACTION OIL & GAS						Job Purpose: 7522 CMT INTERMEDIATE CASING BOM					
Well Name: DIAMOND VALLEY EAST						Well #: 12		API/UWI #: 05-123-40318-00			
Field: WATTENBERG			City: WINDSOR			Country/Parish: WELD			State/Prov: COLORADO		
Legal Description:											
Rig Name & Number / Phone Number: Frontier 10 / 720-245-4546									Location: LAND		
myCem id# : 112729			Job Criticality Status: GREEN			iFacts Request id #: 2187251, 2187250					
Contacts											
Type	Name					Email			Phone		
Company Man											
Account Rep	Mark Dean					Chris.Dean@Halliburton.com			+13035068462		
Service Coordinator	Mark Dean					Chris.Dean@Halliburton.com			+13035068462		
<i>PPE, Safety Huddles, JSA's, HOC & Near Miss Reporting, BBP Observations</i>											
Distance/Mileage(1 way)		50 mile				Distance/Mileage(1 way) Mtls:		50 mile			
Srvcs:						Rqstd Job Start Date/Time:		11/22/2014			
HSE Information											
H2S Present:		Unknown				CO2 Present:		Unknown			
<i>Drive Safely. Lights On for Safety. Wear Seat Belts. Observe all HES / Customer Safety Policies.</i>											
Directions:											
East of Windsor on Eastman Park Dr and 257, go .9 miles East on Eastman Park Dr.											
Instruction											
Cementer: Bring a 7" Double stack, manifold & Crossover. 100# of sugar											
General Equipment											
3rd Party / Inventory Items											
SAP Number	Description					Quantity	UoM	Pricing Enabled			
Job Info / Well Data											
Job Depth (MD) ft	Job Depth (TVD) ft	Well Fluid Type		Well Fluid Weight lbm/gal		Displacement Fluid		Displ Fluid Weight lbm/gal			
7348		Water Based Mud		10.3		Displacement		8.33			
BHST degF	BHCT degF	Log Temp degF				Time Since Circ Stopped HH:MM:SS					
225	160										
Job Tubulars/Tools											
Description	Size in	Weight lbm/ft	ID in	Thread	Grade	Top MD ft	Btm MD ft	Top TVD ft	Btm TVD ft	Shoe Jnt ft	% Excess
9-5/8" Surface Casing	9.625	36	8.921	BTC	J-55	0	804	0	0	42	
7" Intermediate	7	26	6.276	BTC	P-110	0	7345	0	0	42	

Casing											
8.75" Open Hole			8.75			804	7348	0	0		20

Mud conditioning plan

The condition of the drilling fluid is one of the most important variables in achieving a cement barrier. Prior to cementing, circulate the mud at the planned highest displacement rate for the cement job for at least 2 bottoms-up until the well is clean, mud is free of gas and pump pressures have stabilized.

Materials

Stage/Plug #: 1

Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time
1	Fresh Water		10	bbl	8.33	0	0	6		

iFacts Test id #

Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time
2	11.5 lb/gal Tuned Spacer III		40	bbl	11.5	3.73	24	6		

149.45 lbm/bbl Barite

iFacts Test id #

Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time hr
3	Lead Cement	ECONOCEM (TM) SYSTEM	489	sack	12.7	1.89	9.97	6	9.97	

61.10 lbm Type I-II Cement Pre-Mix Dry

9.97 Gal FRESH WATER Mix-On-Fly to Slurry

iFacts Test id # **2187250**

Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time hr
4	Tail Cement	EXPANDACEM (TM) SYSTEM	282	sack	13.8	1.67	7.71	6	7.71	

0.10 % HR-5 Pre-Mix Dry

7.71 Gal FRESH WATER Mix-On-Fly to Slurry

iFacts Test id # **2187251**

Fluid #	Fluid Name	Package/SBM/Material Name	Rqstd Del Qty	UOM	Density lbm/gal	Yield ft3/sack	Water Req Gal/sack	Rate bbl/min	Total Mix Fluid Gal/sack	Surface Batch Mixing Time
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									Gal/sack	
5	Displacement		289.2	bbl	8.33					
iFacts Test id #										
Caution: Displacement quantities and densities are estimates ONLY! Do not use them for the actual job.										
Packaged Materials										
SAP #		Material		Qty		UOM		Comments		
		FRESH WATER		8437.5		Gal				
100003681		Barite		5978		lbm				
Casing Equipment										

Pre-Job Customer Review Risk Assessment for Call Sheet:

The following risks must be reviewed and discussed with the Customer Representative before the job. If all of the steps of the listed Mitigation Plans or Contingency Plans cannot be followed, conducting a Management of Change (reference ST-GL-HAL-HMS-712) invoking your Stop Work Authority (reference ST-GL-HAL-HSE-0612) may be appropriate. Contact the Halliburton office to discuss how to resolve any issues, including whether Contingency Plans can be applied or whether you should exercise your Stop Work Authority so that any changes can be managed with the Customer.

Reminder: You are empowered to exercise Stop Work Authority any time (reference ST-GL-HAL-HSE-0612), even before contacting the Halliburton office

Note: This pre-job customer review risk assessment does not replace the need to complete and review the job specific JSA's.

1.3 Planned Pumping Schedule

- 1. Fill Lines with Water**
 - a. Density = 8.33ppg
 - b. Volume = 2bbl
- 2. Pressure Test Lines to X 4008psi**
- 3. Pump X Spacer**
 - a. Density = X 11.5lb/gal
 - b. Volume = X 40bbl
 - c. Rate = X 4bpm
- 4. Drop Bottom Plug**
- 5. Pump X (Lead)**
 - a. Density = X 12.7ppg
 - b. Yield = X 1.87
 - c. Water Requirement = X 9.97
 - d. Volume = X 489sks (X 164.6bbbls)
 - e. Rate = X 6bpm
- 6. Pump X (Tail)**
 - a. Density = X 13.8ppg
 - b. Yield = X 1.67
 - c. Water Requirement = X 7.71
 - d. Volume = X 282sks (X 83.9bbbls)
 - e. Rate = X 6bpm
- 7. Drop Top Plug**
- 8. Start Displacement**
- 9. Pump Displacement Water**
 - a. Density = X 10.3lb/gal
 - b. Volume = X 284bbbls
 - c. Rate = X 8bpm

Calculated Total Displacement = X 284bbbls

1.4 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	43
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	WBM
3	Actual mud density	lb/gal	10.5
4	Time circulated before job	HH:MM	0100
5	Mud volume circulated	Bbls	
6	Rate at which well was circulated	Bpm	9.5
7	Pipe movement during hole circulation	Y/N	none
8	Rig pressure while circulating	Psi	859
9	Time from end mud circulation to start of job	HH:MM	00:10
10	Pipe movement during cementing	Y/N	None
11	Calculated displacement	Bbls	283./8
12	Job displaced by	Rig/HES	HES
13	Annular before job)?	Y/N	No
14	Annular flow after job	Y/N	No
15	Length of rat hole	Ft	10
16	Units of gas detected while circulating	Units	
17	Was lost circulation experienced at any time ?	Y/N	No

1.5 Water Field Test

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	7	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	500	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	200	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness		ppm	500 mg/L	High concentrations will accelerate the set of the cement
Calcium		ppm	500 ppm	High concentrations will accelerate the set of the cement
Total Alkalinity		ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all (typically occurs @ pH ≥ 8.3).
Bicarbonates		ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all
Potassium		ppm	5000 ppm	High concentrations will shorten the pump time of cement (indicates the presence of chlorides, therefore if Potassium levels are measured as high, so should the chlorides)
Iron	Pass	ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature	60	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

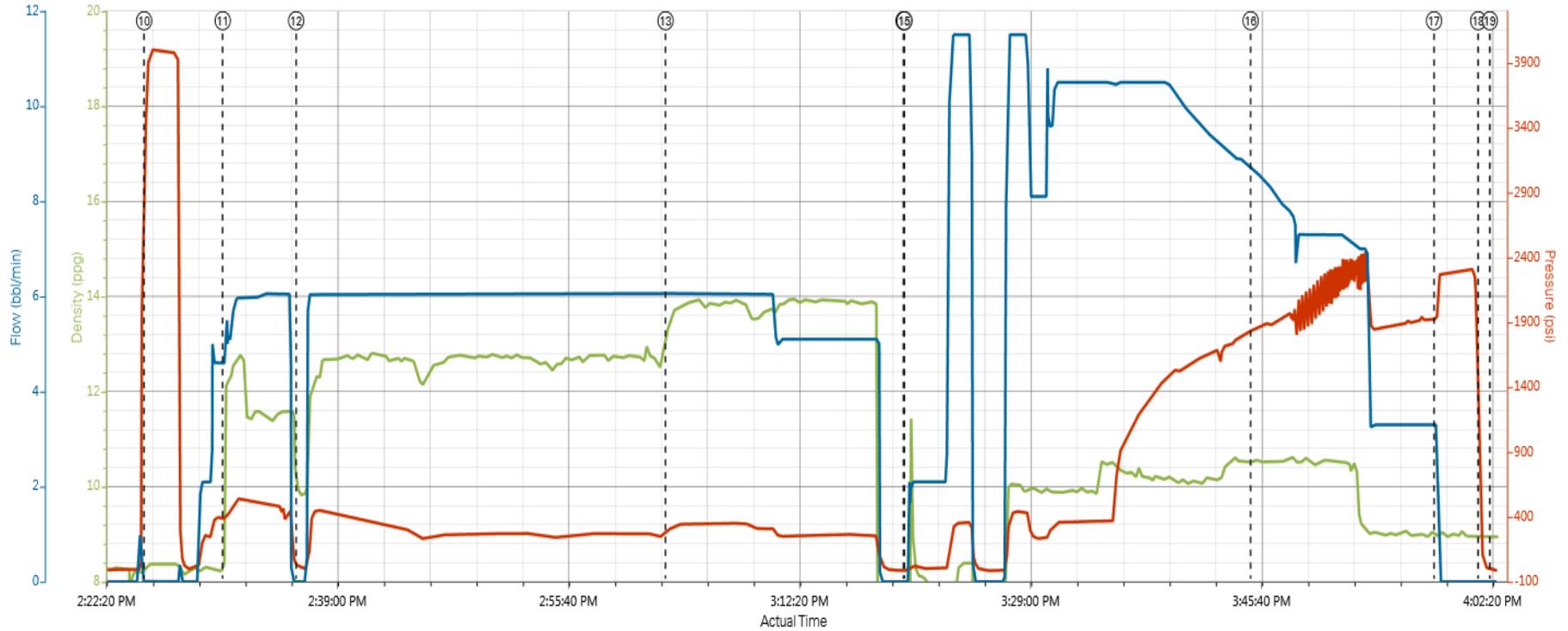
Submitted Respectfully by: _____

1.6 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Comb Pump Rate (bbl/min)	DH Density (ppg)	PS Pump Press (psi)	Comment
Event	1	Arrive at Location from Other Job or Site	Arrive at Location	11/3/2014	11:30:00	USER				Requested on location 1100. Rig Still Running Casing
Event	2	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	11/3/2014	11:35:00	USER				Hazard Hunt and review location set up
Event	3	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	11/3/2014	11:45:00	USER				Discuss rig up layout and fluid sources
Event	4	Rig-Up Equipment	Rig-Up Equipment	11/3/2014	12:00:00	USER				Rig up to redzone
Event	5	Rig-Up Completed	Rig-Up Completed	11/3/2014	12:40:00	USER				
Event	6	Casing on Bottom	Casing on Bottom	11/3/2014	13:10:00	USER				
Event	7	Circulate Well	Circulate Well	11/3/2014	13:15:00	USER				
Event	8	Pre-Job Safety Meeting	Pre-Job Safety Meeting	11/3/2014	13:24:04	USER	0.00	8.29	-1.00	With Customer and Rig Crew
Event	9	Start Job	Start Job	11/3/2014	14:09:34	COM7	0.00	8.32	-9.00	
Event	10	Test Lines	Test Lines	11/3/2014	14:25:12	COM7	0.00	8.35	3691.00	4008psi
Event	11	Pump Spacer 1	Tuned Spacer	11/3/2014	14:30:52	COM7	4.60	10.97	389.00	11.5ppg
Event	12	Pump Lead Cement	Pump Lead Cement	11/3/2014	14:36:10	COM7	0.00	9.86	12.00	164.6bbls @ 12.7ppg
Event	13	Pump Tail Cement	Pump Tail Cement	11/3/2014	15:02:49	COM7	6.00	13.30	299.00	83.9bbls @ 13.8ppg
Event	14	Drop Top Plug	Drop Top Plug	11/3/2014	15:19:59	COM7				
Event	15	Pump Displacement	Pump Displacement	11/3/2014	15:20:03	COM7				20FW 240mud 23.8bbls FW
Event	16	Other	Spacer to Surface	11/3/2014	15:45:02	USER	8.70	10.52	1841.00	207bbls Displaced
Event	17	Other	Bump Plug	11/3/2014	15:58:16	USER	3.30	8.97	1920.00	2295psi final over pressure 30bbls Cement to Surface
Event	18	Check Floats	Check Floats	11/3/2014	16:01:27	USER	0.00	8.96	481.00	Floats Good 2bbls Back
Event	19	End Job	End Job	11/3/2014	16:02:17	COM7	0.00	8.91	-10.00	

2.0 Custom Graphs

Custom Results



DH Density (ppg) PS Pump Press (psi) Comb Pump Rate (bbl/min)

- | | | | | | | |
|---|--------------------------------|------------------------------------|------------------------------|---------------------------------|------------------------------------|----------------------|
| ① Arrive at Location n/a;n/a;n/a | ④ Rig-Up Equipment n/a;n/a;n/a | ⑦ Circulate Well n/a;n/a;n/a | ⑩ Test Lines 8.35;3691;0 | ⑬ Pump Tail Cement 13.3;299;6 | ⑯ Spacer to Surface 10.52;1841;8.7 | ⑲ End Job 8.91;-10;0 |
| ② Assessment Of Location Safety Meeting n/a;n/a;n/a | ⑤ Rig-Up Completed n/a;n/a;n/a | ⑧ Pre-Job Safety Meeting 8.29;-1;0 | ⑫ Tuned Spacer 10.97;389;4.6 | ⑭ Drop Top Plug -0.57;-13;0 | ⑰ Bump Plug 8.97;1920;3.3 | |
| ③ Pre-Rig Up Safety Meeting n/a;n/a;n/a | ⑥ Casing on Bottom n/a;n/a;n/a | ⑨ Start Job 8.32;-9;0 | ⑪ Pump Lead Cement 9.86;12;0 | ⑮ Pump Displacement -0.58;-13;0 | ⑱ Check Floats 8.96;481;0 | |

3.0 Appendix
