HALLIBURTON

iCem® Service

ANADARKO PETROLEUM CORP - EBUS

For: Pat Cain
Date: Thursday, October 02, 2014

BURKHARDT 15N-3 HZ
Production Liner

Sincerely,
Ken Broom

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1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **BURKHARDT 15N-3 HZ** cement **Production Liner** 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 [Fort Lupton]

Job Times

	Date	Time	Time Zone
Called Out	10/1/14	1900	
On Location	10/1/14	2300	
Job Started	10/2/14	0530	
Job Completed	10/2/14	0846	
Departed Location	10/2/14	0945	

1.2 Cementing Job Summary

Sold To #: 300466	**Ship To #:** 3457911	**Quote #:**	**Sales Order #:** 0901711609
Customer: ANADARKO PETROLEUM CORP - EBUS		**Customer Rep:** Pat Cain	
Well Name: BURKHARDT	**Well #:** 15N-3 HZ		**API/UWI #:** 05-123-39181-00
Field: WATTENBERG	**City (SAP):** FORT LUPTON	**County/Parish:** WELD	**State:** COLORADO
Legal Description: NW NE-3-1N-66W-420FNL-1950FEL			
Contractor: XTREME DRLG		**Rig/Platform Name/Num:** XTREME 6	
Job BOM: 7525			
Well Type: HORIZONTAL GAS			
Sales Person: HALAMERICA\H117930		**Srvc Supervisor:** Kendall Broom	

Job

Formation Name				
Formation Depth (MD)	**Top**		**Bottom**	
Form Type			**BHST**	
Job depth MD	11782ft		**Job Depth TVD**	
Water Depth			**Wk Ht Above Floor**	
Perforation Depth (MD)			**To**	

Well Data

	New / Used	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
Drill Pipe		4	3.34	14			0	6719		
Casing		7	6.276	26		HCP110	0	7717		
Casing		4.5	4	11.6		HCP110	6719	11929		
Open Hole Section			6.125				7717	11929		

Tools and Accessories

Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make
Guide Shoe	4.5	1		11782		**Top Plug**	4.5	1	HES
Float Shoe	4.5	1				**Bottom Plug**	4.5	1	HES
Float Collar	4.5	1				**SSR plug set**	4.5	1	HES
Insert Float	4.5	1				**Plug Container**	4.5	1	HES
	4.5	1				**Centralizers**	4.5	1	HES

Miscellaneous Materials

Gelling Agt		**Conc**		**Surfactant**		**Conc**		**Acid Type**		**Qty**			
Treatment Fld		**Conc**				Conc		**Sand Type**					

Fluid Data

Stage/Plug #: 1

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
1	11.5 lb/gal Tuned Spacer III	Tuned Spacer III	40	bbl	11.5	3.73	24		
36 gal/bbl									
149.45 lbm/bbl		**03680)**							

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
2	Lead Cement	EXPANDACEM (TM) SYSTEM	340	sack	13.8	1.67		6	7.7

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
3	Displacement		138	bbl	10.5				

ft In Pipe	Amount	ft		

Comment

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1.4 Planned Pumping Schedule

1. **Fill Lines with Water**
    a. Density =8.33
    b. Volume 2
2. **Pressure Test Lines to 4500psi**
3. **Pump X Spacer**
    a. Density =11.5 lb/gal
    b. Volume = 40 bbl
    c. Rate = 5 bpm
4. **Pump X (Lead)**
    a. Density = 13.8
    b. Yield =1.67
    c. Water Requirement = 7.7
    d. Volume = 340 sks (X bbls)
    e. Rate = 5 bpm
5. **Drop Top Plug**
6. **Start Displacement**
7. **Pump Displacement Water**
    a. Density = 8.33 lb/gal
    b. Volume =138 bbls
    c. Rate = 5 bpm
8. Land Plug – Anticipated Final Circulation Pressure X psi

Calculated Total Displacement = 138bbls

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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	0	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	200	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness	7	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	0	ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature	60	^{o}F	50-80 ^{o}F	High temps will accelerate; Low temps may risk freezing in cold weather

Submitted Respectfully by: _____

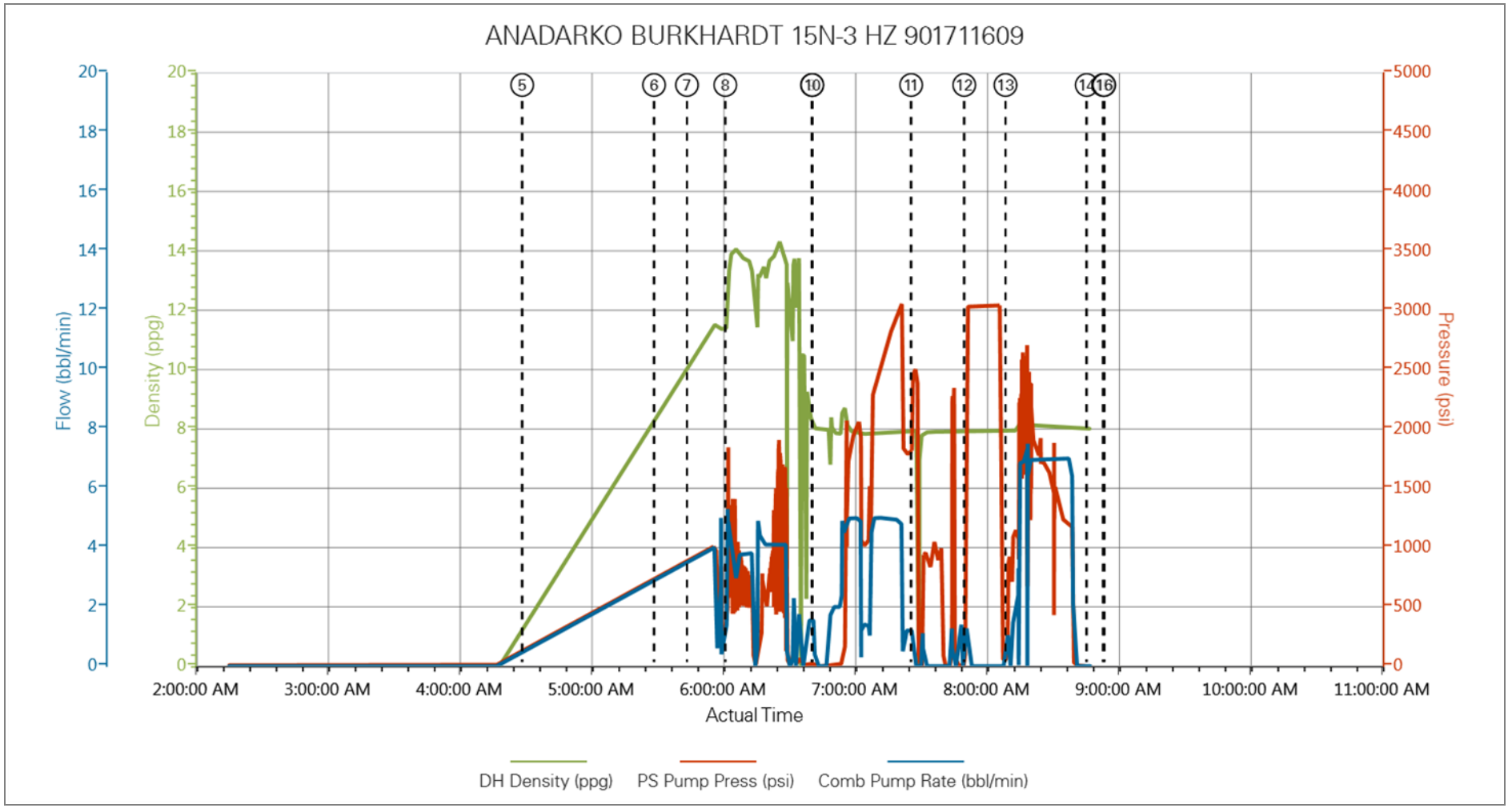
1.6 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density *(ppg)*	PS Pump Press *(psi)*	Comb Pump Rate *(bbl/min)*	Comment
Event	1	Call Out	Call Out	10/1/2014	19:00:00	USER				Called out crew to be on location at 0030
Event	2	Depart Shop for Location	Depart Shop for Location	10/1/2014	20:30:00	USER				Held a safety huddle before leaving for location
Event	3	Arrive At Loc	Arrive At Loc	10/1/2014	23:00:00	USER				Arrived at location and met with company man and tool hand
Event	4	Rig-up Lines	Rig-up Lines	10/1/2014	23:30:00	USER				Held a hazard hunt before spotting ing trucks and rigging up
Event	5	Safety Meeting	Safety Meeting	10/2/2014	04:30:00	USER				Held a safety meeting with the rig crew to discuss the operation and safety
Event	6	Start Job	Start Job	10/2/2014	05:30:00	USER				Filled the lines with 2 bbl water and pressure tested the lines to 4500psi
Event	7	Pump Spacer 1	Pump Spacer 1	10/2/2014	05:45:00	USER				Pumped 40 bbl 11.5 Tuned Spacer
Event	8	Pump Lead Cement	Pump Lead Cement	10/2/2014	06:02:27	COM4	13.40	946.00	4.10	Pumped 101.12 bbls #13.8 1.67 yield 7.7 gal/sks expandacem
Event	9	Drop Plug	Drop Plug	10/2/2014	06:41:54	COM4	8.02	-1.00	0.00	
Event	10	Pump Displacement	Pump Displacement	10/2/2014	06:42:05	COM4	8.02	-2.00	0.00	Pumped 138 bbls water displacement
Event	11	Bump Plug	Bump Plug	10/2/2014	07:27:03	COM4	8.03	2501.00	0.00	Bumped dart at 2300psi held and checked floats
Event	12	Other	Back side test	10/2/2014	07:51:13	COM4	8.00	3048.00	0.00	Pressured up the back side to 2500 psi held for 15 mins.
Event	13	Other	Circulate hole	10/2/2014	08:10:00	USER	7.88	941.00	0.00	Pumped to clean hole , all 40 bbls spacer returned and 15 bbls cement returned

Event	14	End Job	End Job	10/2/2014	08:46:57	COM4	8.00	-6.00	0.00	
Event	15	Rig Down Lines	Rig Down Lines	10/2/2014	08:54:26	USER				Held safety huddle before rigging down lines
Event	16	Depart Location	Depart Location	10/2/2014	08:54:57	USER				Held safety meeting before leaving location

2.0 Custom Graphs

2.1 Custom Graph



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