

**EXXONMOBIL CORPORATION**

**HOUSTON, Texas**

PCU 296-5A10

H&P 321

## **Post Job Summary**

# **Cement Intermediate Casing**

Prepared for:  
Date Prepared:  
Version: 1

Service Supervisor: ASHBY, ANDREW

Submitted by: M.C. Dube

**HALLIBURTON**

# HALLIBURTON

## Wellbore Geometry

Job Tubular					MD		TVD		Excess %	Shoe Joint Length ft
Type	Description	Size in	ID in	Wt lbm/ft	Top ft	Bottom ft	Top ft	Bottom ft		
Casing	Surface Casing	10.75	9.950	45.50	0.00	4,649.00	0.00	4,612.00		80.00
Open Hole Section	Intermediate Open Hole		9.875		4,649.00	9,883.00	4,612.00	9,846.00	100.00	
Casing	Intermediate Casing	7.00	6.276	26.00	0.00	9,836.00	0.00	9,800.00		91.40

## Pumping Schedule

Stage/Plug #	Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal	Avg Rate bbl/min	Surface Volume	Downhole Volume
1	1	Spacer	TUNED SPACER III	10.00	6.00	80.0 bbl	80.0 bbl
1	2	Cement Slurry	New Vernal Tuned Light	11.00	6.00	1405.0 sacks	1405.0 sacks
1	3	Spacer	Fresh Water w/Barcor & Aldacide	8.44	6.00	373.0 bbl	373.0 bbl

## Fluids Pumped

# HALLIBURTON

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**Stage/Plug # 1    Fluid 1:**    TUNED SPACER III  
TUNED SPACER III - SBM (483826)  
59.8 lbm/bbl    Barite

Fluid Density: 10.00 lbm/gal  
Fluid Volume: 80.00 bbl  
Pump Rate: 6.00 bbl/min

**Stage/Plug # 1    Fluid 2:**    New Vernal Tuned  
Light  
TUNED LIGHT (TM) SYSTEM  
0.5 lbm    HR-601

Fluid Weight: 11.00 lbm/gal  
Slurry Yield: 2.21 ft<sup>3</sup>/sack  
Total Mixing Fluid: 9.70 Gal  
Surface Volume: 1405.0 sacks  
Sacks: 1405.0 sacks  
Calculated Fill: 5,748.00 ft  
Calculated Top of Fluid: 4,144.00 ft  
Estimated Top of Fluid:  
Pump Rate: 6.00 bbl/min

**Stage/Plug # 1    Fluid 3:**    Fresh Water w/Barcor  
& Aldacide  
DUMMY MUD / FLUSH / SPACER SBC MATERIAL

Fluid Density: 8.44 lbm/gal  
Fluid Volume: 373.00 bbl  
Pump Rate: 6.00 bbl/min

# HALLIBURTON

## Job Summary

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### Job Information

<b>Job Start Date</b>	1/25/2011 1:00:00 PM
<b>Job MD</b>	9,830.0 ft
<b>Job TVD</b>	9,794.0 ft
<b>Height of Plug Container/Swage Above Rig Floor</b>	4.0 ft
<b>Surface Temperature at Time of Job</b>	30 degF
<b>Mud Type</b>	Water Based Mud
<b>Name of Mud Company</b>	BAROID
<b>Actual Mud Density</b>	9 lbm/gal
<b>Mud loss while running Casing</b>	3,300.00 bbl
<b>Pipe Movement During Hole Circulation</b>	None
<b>Mud loss during Cement Job</b>	1,000.00 bbl
<b>Pipe Movement During Cementing</b>	None
<b>Calculated Displacement</b>	372.65 bbl
<b>Job Displaced by (rig/halco)</b>	Cement Unit HP Pumps
<b>Annular flow Before Job? (Water/Gas)</b>	No
<b>Annular flow After Job? (Water/Gas)</b>	Unknown
<b>Length of Rat Hole</b>	47.00 ft

### Cementing Equipment

<b>Number of Centralizers Used</b>	54
<b>Pipe Centralization</b>	Through Entire Cement Column
<b>Brand of Float Equipment Used</b>	Halliburton
<b>Did Float Equipment Hold?</b>	Yes
<b>Plug set used?</b>	Yes
<b>Brand of Plug set used?</b>	Halliburton
<b>Did Plugs Bump?</b>	Yes
<b>Calculated Pressure to Bump Plugs</b>	1,400.0 psig
<b>Did Stage Cementing Tool Open Properly?</b>	Unknown

# HALLIBURTON

## Service Supervisor Reports

### Job Log

Date/Time	Activity Code	Pump Rate	Cum Vol	Pressure (psig)	Comments
01/21/2011 04:30	Call Out				Crew Called out for Job. Plug Container#D1263
01/21/2011 07:25	Pre-Convoy Safety Meeting				Met w/crew to discuss safety and hazards of travel to location
01/21/2011 07:30	Depart from Service Center or Other Site				Entered into Journey Management.
01/21/2011 11:30	Arrive At Loc				Ended Journey Management. [Casing being ran - 3000ft to go]
01/21/2011 11:45	Assessment Of Location Safety Meeting				Met w/crew to discuss hazards of site, location of materials and safety precautions.
01/21/2011 12:00	Other				Spot Equipment
01/21/2011 12:15	Pre-Rig Up Safety Meeting				Met w/crew to discuss the best way to rig up, safety and hazards involved.
01/21/2011 12:20	Rig-Up Equipment				Rig up Ground & Standpipe
01/21/2011 15:00	Wait on Customer or Customer Sub-Contractor Equip				Rigged up as far as possible - everything except the floor - waiting on casing.
01/23/2011 10:00	Depart Location for Service Center or Other Site				Released from the well site to go to the White River City Ranch to wait. Entered into Journey Management.
01/24/2011 12:00	Other				Called back to the rig to move trucks off location.
01/24/2011 14:00	Arrive At Loc				Ended Journey Management.
01/24/2011 15:00	Depart Location for Service Center or Other Site				Moved trucks off location and headed back to the White River City Ranch. Entered into Journey Management.
01/24/2011 18:15	Other				Called back to the rig. 400 ft left to go with casing.
01/24/2011 19:50	Arrive At Loc				Ended Journey Management
01/24/2011 20:00	Pre-Rig Up Safety Meeting				Met w/crew to discuss the safety and hazards of spotting the trucks back in place and connecting the product lines, buddy lines, water lines, and Iron.
01/24/2011 20:10	Rig-Up Equipment				Spotted trucks and rigged-up equipment.
01/25/2011 08:31	Rig-Up Equipment				Rig-up the rig floor.
01/25/2011 08:31	Pre-Job Safety Meeting				Met w/Rig Crew, Co. Rep, and our crew to discuss job procedres, contingencies, and safety measures.

# HALLIBURTON

Date/Time	Activity Code	Pump Rate	Cum Vol	Pressure (psig)	Comments
01/25/2011 09:00	Other				Casing on bottom - Rig pulled out 1 joint of casing to control lost circulation issues.
01/25/2011 12:45	Pre-Job Safety Meeting				Discuss job procedure and safety precautions with new rig crew.
01/25/2011 13:10	Pressure Test			330.0	Low pressure test to 330 psi. Lost 9 psi in 3 minutes - passed.
01/25/2011 13:15	Pressure Test			5104.0	High pressure test to 5104 psi. Lost 261 psi in 5 minutes - passed.
01/25/2011 13:24	Pump Spacer	6	80	777.0	Begin pumping 80 barrels of 10 lb/gal Tuned Spacer III. Calculated water requirement 73 barrels. Actual volume pumped: 73 barrels, actual water used: 64 barrels
01/25/2011 13:30	Pump Cement				Begin pumping 553 bbl 11 lb/gal Tuned Light. Calculated yield: 2.21 ft <sup>3</sup> /sk, calculated water requirement: 9.67 gal/sk, estimated total water usage: 323 bbl, actual volume pumped 587 bbl, actual water used 347 bbl
01/25/2011 15:40	Shutdown				Shutdown, wash lines to pit.
01/25/2011 15:47	Pump Displacement	8	372.5	355.0	Pump 373 barrels displacement water treated with Barracor and Aldacide
01/25/2011 15:53	Displ Reached Cmnt	8	35	817.0	Displacement reached cement with 35 barrels gone.
01/25/2011 16:13	Slow Rate	6	205	1200.0	Slow rate to 6 barrels per minute with 205 barrels gone.
01/25/2011 16:29	Slow Rate	5	300	1325.0	Slow displacement rate to 5 barrels per minute with 300 barrels gone.
01/25/2011 16:31	Slow Rate	4	308	1215.0	Reduce displacement rate to 4 barrels per minute with 308 barrels gone.
01/25/2011 16:36	Slow Rate	3	325	1185.0	Slow displacement rate to 3 bpm with 325 barrels gone.
01/25/2011 16:45	Slow Rate	2	350	1230.0	Slow displacement rate to 2 barrels per minute with 350 barrels gone.
01/25/2011 16:55	Bump Plug	2	371	1281.0	Bump plugs after 371 barrels displacement gone, final circulating pressure: 1281 psi.
01/25/2011 17:01	Check Floats	0		1900.0	Floats held - 2.5 barrels back.
01/25/2011 17:05	End Job				Job Complete
01/25/2011 17:20	Post-Job Safety Meeting (Pre Rig-Down)				Met w/crew to discuss rigging down safely.
01/25/2011 17:30	Rig-Down Equipment				Rig everything down.
01/25/2011 22:45	Pre-Convoy Safety Meeting				Met w/crew to discuss fit-for-duty, safety and hazards of travel back.

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Date/Time	Activity Code	Pump Rate	Cum Vol	Pressure (psig)	Comments
01/25/2011 23:00	Depart Location for Service Center or Other Site				Entered into Journey Management.
01/25/2011 23:00	Other				Thanks for using Halliburton!!!

**The Road to Excellence Starts with Safety**

<b>Sold To #:</b> 331699	<b>Ship To #:</b> 2753406	<b>Quote #:</b>	<b>Sales Order #:</b> 7898228
<b>Customer:</b> EXXONMOBIL CORPORATION		<b>Customer Rep:</b>	
<b>Well Name:</b> PCU		<b>Well #:</b> 296-5A10	<b>API/UWI #:</b> 05103112390000
<b>Field:</b>	<b>City (SAP):</b> MEEKER	<b>County/Parish:</b> Rio Blanco	<b>State:</b> Colorado
<b>Legal Description:</b> Section 5 Township 2S Range 96W			
<b>Contractor:</b> H&P		<b>Rig/Platform Name/Num:</b> 321	
<b>Job Purpose:</b> Cement Intermediate Casing			
<b>Well Type:</b> Development Well		<b>Job Type:</b> Cement Intermediate Casing	
<b>Sales Person:</b> MCNARY, GEORGE		<b>Srvc Supervisor:</b> ASHBY, ANDREW	<b>MBU ID Emp #:</b> 450544

**Job Personnel**

HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #	HES Emp Name	Exp Hrs	Emp #
ASHBY, ANDREW A	74.5	450544	DUBE, CRAIG	21	476241	MUTASA, SIMUKAYI Taiziveyi	22	464970
PACE, GARRET L	43.5	475041	PARTRIDGE, TRAVIS M	25.5	484614	POOLE, ALAN	40	388188
SAGE, JAMES Edwin	74.5	470468	SMITH, KC Hyrum	74.5	462378	STILL, MICHEAL Wayne	6	258213
TEICHERT, RONDO Chad	28	476071						

**Equipment**

HES Unit #	Distance-1 way						
10741125	140 mile	10829454	140 mile	10991613	140 mile	11019277	140 mile
11127525	140 mile	11189139	140 mile	11410664	140 mile	11526496	140 mile
6325	140 mile	6573	140 mile	D1263	140 mile		

**Job Hours**

Date	On Location Hours	Operating Hours	Date	On Location Hours	Operating Hours	Date	On Location Hours	Operating Hours
21 Jan 2010	24.5	0	22 Jan 2010	24	0	23 Jan 2010	10	0
24 Jan 2010	5	0	25 Jan 2010	23	4			

**TOTAL** Total is the sum of each column separately

Job				Job Times				
Formation Name	Formation Depth (MD)	Top	Bottom	Called Out	Date	Time	Time Zone	
				On Location	21 - Jan - 2011	04:30	MST	
<b>Form Type</b>			BHST	210 degF	On Location	21 - Jan - 2011	11:30	MST
<b>Job depth MD</b>	9830. ft		<b>Job Depth TVD</b>	9794. ft	Job Started	25 - Jan - 2011	13:00	MST
<b>Water Depth</b>			<b>Wk Ht Above Floor</b>	4. ft	Job Completed	25 - Jan - 2011	17:00	MST
<b>Perforation Depth (MD)</b>	From		To		Departed Loc	25 - Jan - 2011	23:00	MST

**Well Data**

Description	New / Used	Max pressure psig	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft
Intermediate Open Hole				9.875				4649.	9883.	4612.	9846.
Intermediate Casing	Unknown		7.	6.276	26.	HYDRIL - SERIES 500 TYPE 513	P-110	.	9836.	.	9800.
Surface Casing	Unknown		10.75	9.95	45.5	BTC	J-55	.	4649.	.	4612.

**Tools and Accessories**

Type	Size	Qty	Make	Depth	Type	Size	Qty	Make	Depth	Type	Size	Qty	Make
------	------	-----	------	-------	------	------	-----	------	-------	------	------	-----	------

Guide Shoe				Packer		0		Top Plug		1	
Float Shoe	1			Bridge Plug		0		Bottom Plug		1	
Float Collar	1			Retainer		0		SSR plug set		0	
Insert Float	0							Plug Container		1	
Stage Tool	0							Centralizers		54	

### Miscellaneous Materials

Gelling Agt		Conc		Surfactant		Conc		Acid Type		Qty		Conc	%
Treatment Fld		Conc		Inhibitor		Conc		Sand Type		Size		Qty	

### Fluid Data

#### Stage/Plug #: 1

Fluid #	Stage Type	Fluid Name	Qty	Qty uom	Mixing Density lbm/gal	Yield ft3/sk	Mix Fluid Gal/sk	Rate bbl/min	Total Mix Fluid Gal/sk
1	TUNED SPACER III	TUNED SPACER III - SBM (483826)	80.00	bbl	10.	6.15	42.02	6.0	
	38.32 gal/bbl	FRESH WATER							
	59.8 lbm/bbl	BARITE, 100 LB SK (100003680)							
2	New Vernal Tuned Light	TUNED LIGHT (TM) SYSTEM (452984)	1405.0	sacks	11.	2.21	9.7	6.0	9.7
	0.5 lbm	HR-601, 50 LB BAG (101328348)							
	9.7 Gal	FRESH WATER							
3	Fresh Water w/Barcor & Aldacide		373.00	bbl	8.44	.0	.0	6.0	

#### Calculated Values

#### Pressures

#### Volumes

Displacement	373	Shut In: Instant		Lost Returns		Cement Slurry	587	Pad	
Top Of Cement		5 Min		Cement Returns		Actual Displacement		Treatment	
Frac Gradient		15 Min		Spacers		Load and Breakdown		Total Job	

#### Rates

Circulating		Mixing		6	Displacement		8	Avg. Job		7
Cement Left in Pipe	Amount	91.4 ft	Reason	Shoe Joint						
Frac Ring # 1 @	ID	Frac ring # 2 @	ID	Frac Ring # 3 @	ID	Frac Ring # 4 @	ID			

The Information Stated Herein Is Correct

**Customer Representative Signature**

## LOCATION WATER TEST

### General Information

Customer: EXXONMOBIL CORPORATION Date: 21 - Jan - 2011  
 Sales Order #: 7898228 Time: 13:00  
 Lease Name & #: PCU 296-5A10 Water Source: 3 Uprights  
 SL Name & Employee #: ASHBY, ANDREW (00450544)

### TestResultsSample#1

	Field		Lab	Standards
Temp	<u>65.4</u> °F		<u>        </u> °F	Max Temp 120°F
pH	<u>6</u>		<u>        </u>	6.0-8.0
Sulfates	<u>&lt; 200</u> mg/L		<u>        </u> mg/L	Less Than 1800 mg/L
Chlorides	<u>64</u> mg/L		<u>        </u> mg/L	Less Than 3000 mg/L
Tanin&Lignin	<u>N</u> Y/N		<u>        </u> Y/N	No Trace
Bicarbonates	<u>XXXXXXXXXX</u>		<u>        </u> mg/L	Less Than 500 mg/L
Iron = 0				

### TestResultsSample#2

	Field		Lab	Standards
Temp	<u>57.2</u> °F		<u>        </u> °F	MaxT emp 120°F
pH	<u>6</u>		<u>        </u>	6.0-8.0
Sulfates	<u>&lt; 200</u> mg/L		<u>        </u> mg/L	Less Than 1800 mg/L
Chlorides	<u>81</u> mg/L		<u>        </u> mg/L	Less Than 3000 mg/L
Tanin&Lignin	<u>N</u> Y/N		<u>        </u> Y/N	No Trace
Bicarbonates	<u>XXXXXXXXXX</u>		<u>        </u> mg/L	Less Than 500 mg/L
Iron = 0				

### TestResultsSample#3

	Field		Lab	Standards
Temp	<u>69.8</u> °F		<u>        </u> °F	Max Temp 120°F
pH	<u>7</u>		<u>        </u>	6.0-8.0
Sulfates	<u>&lt; 200</u> mg/L		<u>        </u> mg/L	Less Than 1800 mg/L
Chlorides	<u>&lt; 33</u> mg/L		<u>        </u> mg/L	Less Than 3000 mg/L
Tanin&Lignin	<u>N</u> Y/N		<u>        </u> Y/N	No Trace
Bicarbonates	<u>XXXXXXXXXX</u>		<u>        </u> mg/L	Less Than 500 mg/L
Iron = 0				
Remarks:				

# HALLIBURTON

## Lab Data

### Job Information

Request/Slurry	121873/4	Rig Name	H&P 321	Date	12/JAN/2011
Submitted By	Simukayi Mutasa	Job Type	Intermediate Casing	Bulk Plant	Vernal
Customer	ExxonMobil	Location	Rio Blanco	Well	PCU 296-5A10

### Well Information

Casing/Liner Size	7"	Depth MD	10195 ft	BHST	210 F
Hole Size	9 7/8"	Depth TVD	10159 ft	BHCT	154 F

### Cement Information - Primary Design

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties	
		<b>Tuned Light</b>				Slurry Density	11.00 PPG
						Slurry Yield	2.21 ft3/sk
36.88	%	> Boral Craig Pozmix	Bulk	Jan 16, 2011		Water Requirement	9.69 GPS
11	%	> HGS 6000 (PB)	Bulk	Jan 16, 2011			
53.19	%	> Holcim Type V	Bulk	Jan 16, 2011			
13	%	> Silicalite - Compacted	Bulk	Jan 16, 2011			
100.00	% BWOC	Cement Blend					
0.500	lb/sk	HR-601	Bulk	Jan 16, 2011			
0.500	lb/sk	D-Air 3000	Bulk	Jan 16, 2011			
0.200	lb/sk	FWCA	Bulk	Jan 16, 2011			
9.69	gal/sack	Field (Fresh) Water	Lab	Jan 13, 2011	1-13-2011		

### Operation Test Results Request ID 121873/4

#### UCA Comp. Strength, Request Test ID:1250423

End Temp (°F)	Pressure (psi)	50 psi (hh:mm)	500 psi (hh:mm)	12 hr CS (psi)	24 hr CS (psi)	48 hr CS (psi)	End CS (psi)	End Time (hrs)
191	3,000	07:51	09:27	1,722	1,900	1,874	1,899	72

#### Thickening Time, Request Test ID:1249910

Temp (°F)	Pressure (psi)	Reached in (min)	Start BC	30 Bc (hh:mm)	50 Bc (hh:mm)	70 Bc (hh:mm)	100 Bc (hh:mm)
154	6,149	60	13	03:46	04:04	04:37	05:30

#### Mixability (0 - 5) - 0 is not mixable, Request Test ID:1249911

Mixability rating (0 - 5)

5

#### Marsh Funnel, Request Test ID:1250424

Volume [ml]	Time [Sec]	Foam Quality
102	50	0

Stopped flowing after 50 seconds

#### Free Water, Request Test ID:1250422

Test Temp (°F)	% FW 45 Inc
154	0

# HALLIBURTON

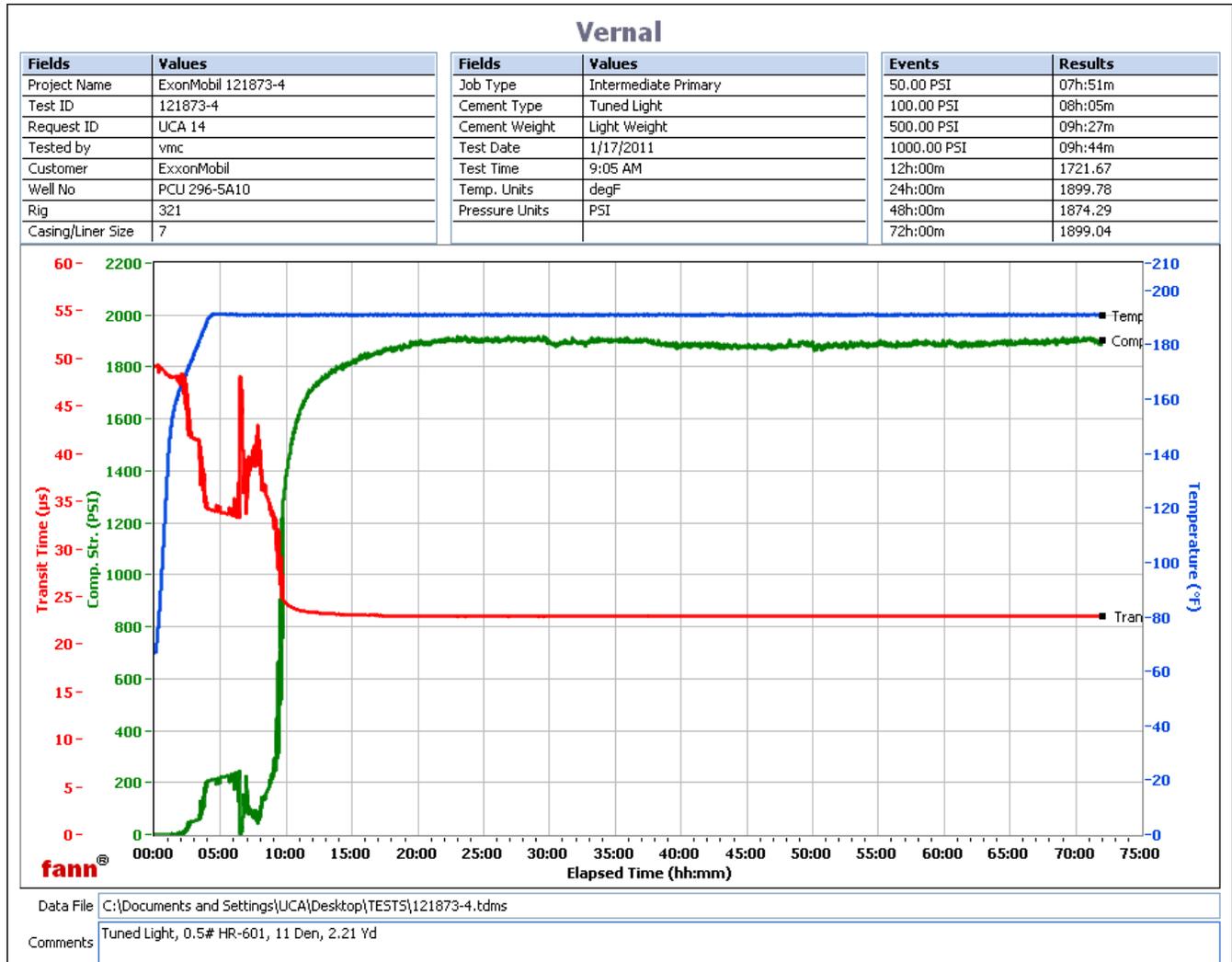
## API Rheology, Request Test ID:1250420

Temp (°F)	600	300	200	100	60	30	6	3	Cond Time (min)	PV/YP
80	245	140	109	76	64	52	31	24	20	109.9 / 36.5

## API Fluid Loss, Request Test ID:1250421

Test Temp (°F)	Test Pressure (psi)	Test Time (min)	Meas. Vol (< 30 min, cc)	Extr. ISO FL (cc/30 min)
154	1,000	3.5	33	193

## Additional Comments



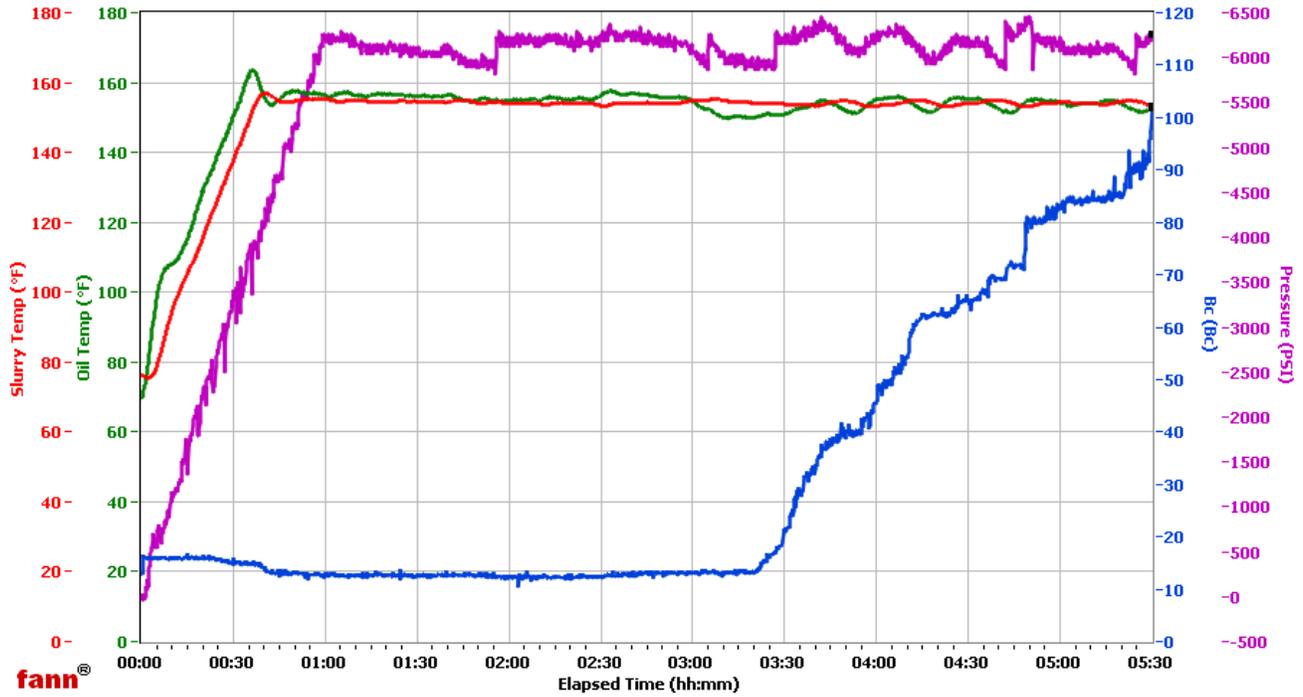
# HALLIBURTON

## Vernal

Fields	Values
Project Name	ExxonMobil 121873-4
Test ID	121873-4
Request ID	
Tested by	ADF
Customer	ExxonMobil
Well No	PCU 296-5A10
Rig	321
Casing/Liner Size	7

Fields	Values
Job Type	Inter Prm
Cement Type	V
Cement Weight	Light Weight
Test Date	01/16/11
Test Time	05:48 PM
Temp. Units	degF
Pressure Units	PSI

Events	Results
30.00 Bc	03h:36m
50.00 Bc	04h:04m
60.00 Bc	04h:12m
70.00 Bc	04h:37m
100.00 Bc	05h:30m
200.00 Bc	NaN
03h:00m	12.94
06h:00m	NaN



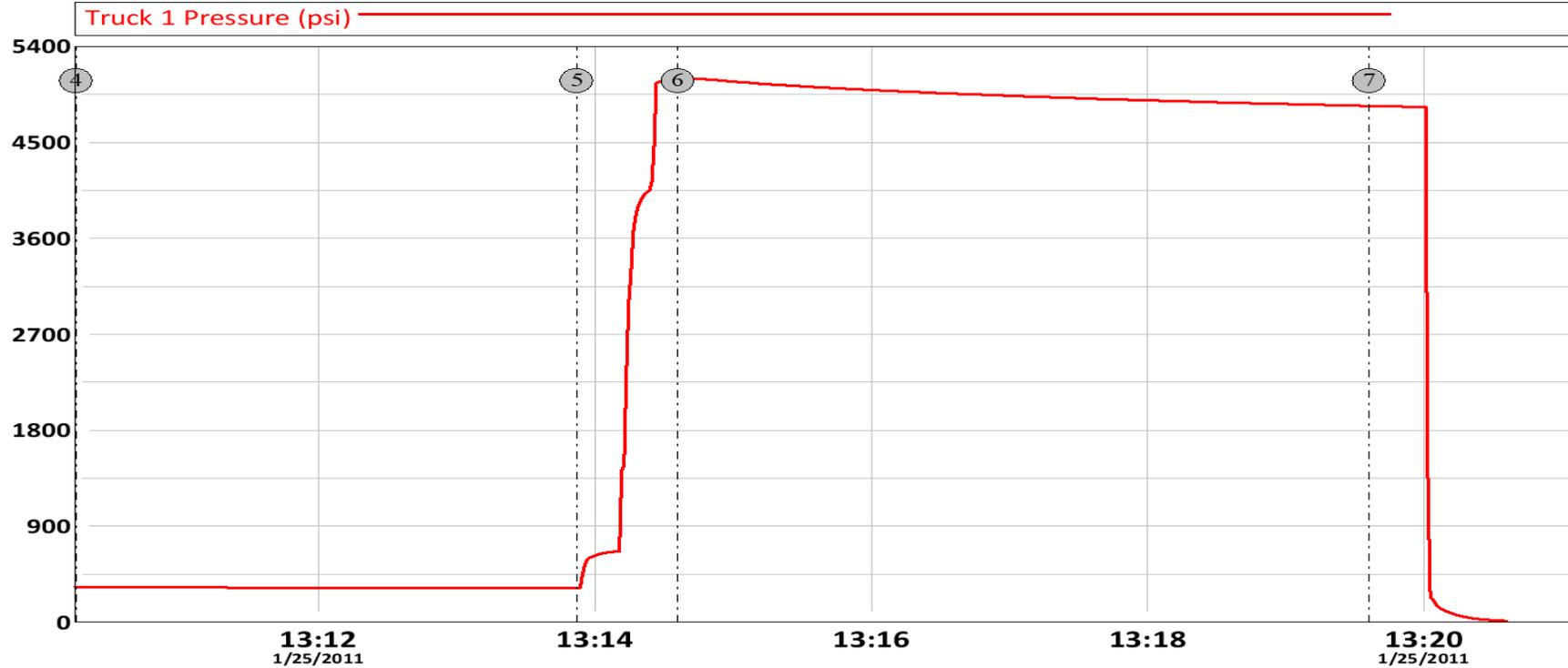
Data File O:\HPHT Data Files\Vernal Consistometer #5\ExxonMobil 121873-4.tdms

Comments 11 D, 2.21 Y

# HALLIBURTON

## Data Acquisition

### Pressure Test PCU 296-5A10 Intermediate



4 Begin Low Pressure Test 13:10:15 330.8 5 End Low Pressure Test 13:13:52 321.0  
6 Begin High Pressure Test 13:14:36 5104 7 End High Pressure Test 13:19:36 4842

Customer: ExxonMobil  
Well Description: PCU 296-5A10

Job Date: Jan, 25th, 2011  
UWI: 05-103-11239

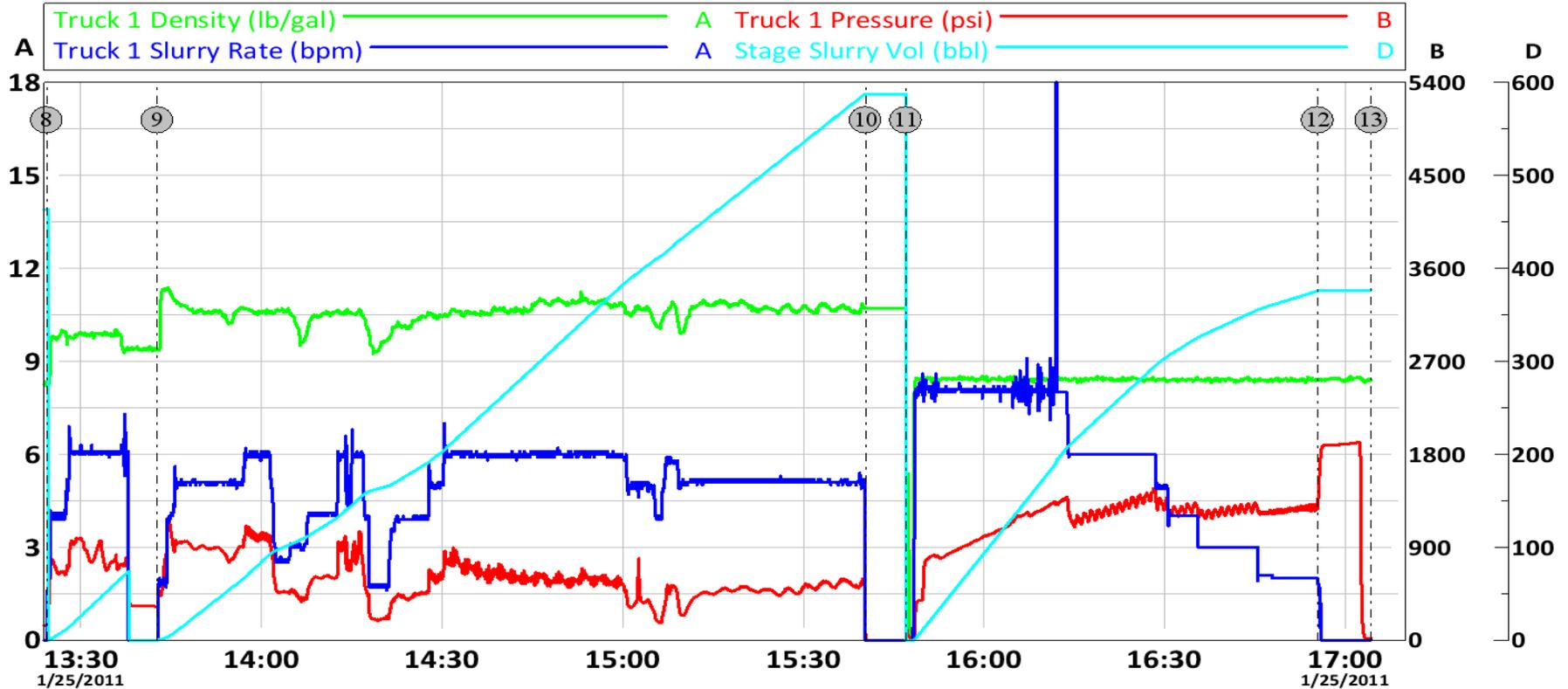
Sales Order #: 7898228  
Rig: H&P 321

OptiCem v6.4.9  
25-Jan-11 13:20

# HALLIBURTON

## ExxonMobil

### PCU 296-5A10 Intermediate



8	80 bbl 10# Tuned Spacer III	13:24:19	145.0	9	1405 sk 11# Tuned Light	13:42:41	324.0
10	Shutdown, Wash To Pit	15:40:19	0.000	11	Treated Water Displacement	15:47:01	170.9
12	Bump Plugs	16:55:25	1281	13	Ending Job	17:04:19	15.00

**Customer:** ExxonMobil  
**Well Description:** PCU 296-5A10

**Job Date:** Jan, 25th, 2011  
**UWI:** 05-103-11239

**Sales Order #:** 7898228  
**Rig:** H&P 321

OptiCem v6.4.9  
 25-Jan-11 17:05