

**Well Name: Apache Canyon 18-16**

**Conductor Casing Cement**

API/UWI 05071089280000	Location T34S-R67W-S18	Field Name Purgatoire River	Permit Number 20063025	State/Province Colorado	Well Configuration Type Vertical
Gr Elev (ft) 7,898.00	Casing Flange Elevation (ft)	KB-Ground Distance (ft) 0.00	KB-Casing Flange Distance (ft)	Spud Date 1/30/2007 11:45	Rig Release Date 2/2/2007 23:30

**Conductor Casing Cement, 1/30/2007 12:45**

Type Casing	Cementing Start Date 1/30/2007	Cementing End Date 1/30/2007	Wellbore Original Hole	String Conductor, 20.0ftKB
Cementing Company Wal-Mart	Evaluation Method	Cement Evaluation Results		

Comment  
Cmt'd cond w/ 8 sks Quik-Crete

**1, 3.0-20.0ftKB**

Top Depth (ftKB) 3.0	Bottom Depth (ftKB) 20.0	Full Return? Yes	Vol Cement Ret (bbl) 0.0	Top Plug? No	Bottom Plug? No
Initial Pump Rate (bbl/min) 1	Final Pump Rate (bbl/min) 1	Avg Pump Rate (bbl/min) 1		Final Pump Pressure (psi) 0.0	Plug Bump Pressure (psi) 0.0
Pipe Reciprocated? No	Reciprocation Stroke Length (ft)	Reciprocation Rate (spm)		Pipe Rotated? No	Pipe RPM (rpm)
Tagged Depth (ftKB)	Tag Method	Depth Plug Drilled Out To (ftKB)		Drill Out Diameter (in)	Drill Out Date

**Cement**

Fluid Type Cement	Fluid Description 18.0	Amount (sacks) 8	Class A	Volume Pumped (bbl) 1.4
Estimated Top (ftKB) 3.0	Estimated Bottom Depth (ftKB) 20.0	Percent Excess Pumped (%)	Yield (ft³/sack) 1.00	Mix H2O Ratio (gal/sack) 5.00
Free Water (%)	Density (lb/gal) 18.00	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

**Cement Fluid Additives**

Add	Type	Conc

**Surface Casing Cement, 1/31/2007 10:00**

Type Casing	Cementing Start Date 1/31/2007	Cementing End Date 1/31/2007	Wellbore Original Hole	String Surface, 586.4ftKB
Cementing Company Halliburton Energy Services	Evaluation Method	Cement Evaluation Results		

Comment  
Cmt'd surf csg w/ 267 sks MIDCON II Trinidad Surf Blend

**1, 0.0-590.0ftKB**

Top Depth (ftKB) 0.0	Bottom Depth (ftKB) 590.0	Full Return? Yes	Vol Cement Ret (bbl) 40.0	Top Plug? No	Bottom Plug? No
Initial Pump Rate (bbl/min) 4	Final Pump Rate (bbl/min) 4	Avg Pump Rate (bbl/min) 4		Final Pump Pressure (psi) 270.0	Plug Bump Pressure (psi)
Pipe Reciprocated? No	Reciprocation Stroke Length (ft)	Reciprocation Rate (spm)		Pipe Rotated? No	Pipe RPM (rpm)
Tagged Depth (ftKB)	Tag Method	Depth Plug Drilled Out To (ftKB)		Drill Out Diameter (in)	Drill Out Date

**Spacer**

Fluid Type Spacer	Fluid Description 8.34	Amount (sacks)	Class	Volume Pumped (bbl) 70.0
Estimated Top (ftKB) 0.0	Estimated Bottom Depth (ftKB) 590.0	Percent Excess Pumped (%)	Yield (ft³/sack)	Mix H2O Ratio (gal/sack)
Free Water (%)	Density (lb/gal) 8.34	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

**Cement Fluid Additives**

Add	Type	Conc

**Surface Cement**

Fluid Type Surface Cement	Fluid Description 14.0	Amount (sacks) 267	Class Midcon II	Volume Pumped (bbl) 79.0
Estimated Top (ftKB) 0.0	Estimated Bottom Depth (ftKB) 590.0	Percent Excess Pumped (%)	Yield (ft³/sack) 1.66	Mix H2O Ratio (gal/sack) 7.76
Free Water (%)	Density (lb/gal) 14.00	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

**Cement Fluid Additives**

Add	Type	Conc
Surface Blend		

**Displacement**

Fluid Type Displacement	Fluid Description 8.34	Amount (sacks)	Class	Volume Pumped (bbl) 34.0
Estimated Top (ftKB) 0.0	Estimated Bottom Depth (ftKB) 540.0	Percent Excess Pumped (%)	Yield (ft³/sack)	Mix H2O Ratio (gal/sack)
Free Water (%)	Density (lb/gal) 8.34	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

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API/UWI 05071089280000	Location T34S-R67W-S18	Field Name Purgatoire River	Permit Number 20063025	State/Province Colorado	Well Configuration Type Vertical
Gr Elev (ft) 7,898.00	Casing Flange Elevation (ft)	KB-Ground Distance (ft) 0.00	KB-Casing Flange Distance (ft)	Spud Date 1/30/2007 11:45	Rig Release Date 2/2/2007 23:30

Cement Fluid Additives		
Add	Type	Conc

Production Casing Cement, 2/2/2007 23:30				
Type Casing	Cementing Start Date 2/2/2007	Cementing End Date 2/3/2007	Wellbore Original Hole	String Production, 2,428.6ftKB
Cementing Company Halliburton Energy Services	Evaluation Method	Cement Evaluation Results		

Comment  
Cmt'd prod csg w/ 365 sks HES MIDCON II Trinidad Prod Blend

1, 2,176.0-2,455.0ftKB					
Top Depth (ftKB) 2,176.0	Bottom Depth (ftKB) 2,455.0	Full Return? No	Vol Cement Ret (bbl) 0.0	Top Plug? Yes	Bottom Plug? No
Initial Pump Rate (bbl/min) 4	Final Pump Rate (bbl/min) 4	Avg Pump Rate (bbl/min) 4		Final Pump Pressure (psi) 20.0	Plug Bump Pressure (psi) 1,200.0
Pipe Reciprocated? No	Reciprocation Stroke Length (ft)	Reciprocation Rate (spm)		Pipe Rotated? No	Pipe RPM (rpm)
Tagged Depth (ftKB) 2,382.0	Tag Method	Depth Plug Drilled Out To (ftKB)		Drill Out Diameter (in)	Drill Out Date

PW spacer				
Fluid Type PW spacer	Fluid Description 8.6	Amount (sacks)	Class	Volume Pumped (bbl) 60.0
Estimated Top (ftKB)	Estimated Bottom Depth (ftKB)	Percent Excess Pumped (%)	Yield (ft³/sack)	Mix H2O Ratio (gal/sack)
Free Water (%)	Density (lb/gal) 8.60	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

Cement Fluid Additives		
Add	Type	Conc

Dynamic LCM				
Fluid Type Dynamic LCM	Fluid Description 9.0	Amount (sacks)	Class	Volume Pumped (bbl) 100.0
Estimated Top (ftKB)	Estimated Bottom Depth (ftKB)	Percent Excess Pumped (%)	Yield (ft³/sack)	Mix H2O Ratio (gal/sack)
Free Water (%)	Density (lb/gal) 9.00	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

Cement Fluid Additives		
Add	Type	Conc

PW spacer				
Fluid Type PW spacer	Fluid Description 8.6	Amount (sacks)	Class	Volume Pumped (bbl) 10.0
Estimated Top (ftKB)	Estimated Bottom Depth (ftKB)	Percent Excess Pumped (%)	Yield (ft³/sack)	Mix H2O Ratio (gal/sack)
Free Water (%)	Density (lb/gal) 8.60	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

Cement Fluid Additives		
Add	Type	Conc

HES Super Flush				
Fluid Type HES Super Flush	Fluid Description 9.0	Amount (sacks)	Class	Volume Pumped (bbl) 50.0
Estimated Top (ftKB)	Estimated Bottom Depth (ftKB)	Percent Excess Pumped (%)	Yield (ft³/sack)	Mix H2O Ratio (gal/sack)
Free Water (%)	Density (lb/gal) 9.00	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

Cement Fluid Additives		
Add	Type	Conc

PW spacer				
Fluid Type PW spacer	Fluid Description 8.6	Amount (sacks)	Class	Volume Pumped (bbl) 10.0
Estimated Top (ftKB)	Estimated Bottom Depth (ftKB)	Percent Excess Pumped (%)	Yield (ft³/sack)	Mix H2O Ratio (gal/sack)
Free Water (%)	Density (lb/gal) 8.60	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

Cement Fluid Additives		
Add	Type	Conc

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Gr Elev (ft) 7,898.00	Casing Flange Elevation (ft)	KB-Ground Distance (ft) 0.00	KB-Casing Flange Distance (ft)	Spud Date 1/30/2007 11:45	Rig Release Date 2/2/2007 23:30

Cement				
Fluid Type Cement	Fluid Description 13.0	Amount (sacks) 140	Class Midcon II	Volume Pumped (bbl) 51.0
Estimated Top (ftKB) 1,658.3	Estimated Bottom Depth (ftKB) 2,455.0	Percent Excess Pumped (%)	Yield (ft³/sack) 2.04	Mix H2O Ratio (gal/sack) 10.58
Free Water (%)	Density (lb/gal) 13.00	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

Cement Fluid Additives		
Add	Type	Conc
Prod Blend		

Displacement				
Fluid Type Displacement	Fluid Description 8.6	Amount (sacks)	Class	Volume Pumped (bbl) 57.0
Estimated Top (ftKB) 2,455.0	Estimated Bottom Depth (ftKB) 2,455.0	Percent Excess Pumped (%)	Yield (ft³/sack)	Mix H2O Ratio (gal/sack)
Free Water (%)	Density (lb/gal) 8.60	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

Cement Fluid Additives		
Add	Type	Conc

2, 138.0-1,658.3ftKB					
Top Depth (ftKB) 138.0	Bottom Depth (ftKB) 1,658.3	Full Return? Yes	Vol Cement Ret (bbl) 11.0	Top Plug? Yes	Bottom Plug? No
Initial Pump Rate (bbl/min) 4	Final Pump Rate (bbl/min) 4	Avg Pump Rate (bbl/min) 4	Final Pump Pressure (psi) 550.0	Plug Bump Pressure (psi) 2.4	
Pipe Reciprocated? No	Reciprocation Stroke Length (ft)	Reciprocation Rate (spm)	Pipe Rotated? No	Pipe RPM (rpm)	
Tagged Depth (ftKB)	Tag Method	Depth Plug Drilled Out To (ftKB)	Drill Out Diameter (in)	Drill Out Date	

PW Spacer				
Fluid Type PW Spacer	Fluid Description 8.6	Amount (sacks)	Class	Volume Pumped (bbl) 10.0
Estimated Top (ftKB)	Estimated Bottom Depth (ftKB)	Percent Excess Pumped (%)	Yield (ft³/sack)	Mix H2O Ratio (gal/sack)
Free Water (%)	Density (lb/gal) 8.60	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

Cement Fluid Additives		
Add	Type	Conc
Prod Blend		

2nd Stage Lead				
Fluid Type 2nd Stage Lead	Fluid Description 12.0	Amount (sacks) 135	Class Midcon II	Volume Pumped (bbl) 62.0
Estimated Top (ftKB) 0.0	Estimated Bottom Depth (ftKB) 1,160.0	Percent Excess Pumped (%)	Yield (ft³/sack) 2.56	Mix H2O Ratio (gal/sack) 14.50
Free Water (%)	Density (lb/gal) 12.00	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

Cement Fluid Additives		
Add	Type	Conc
Prod Blend		

2nd Stage Tail				
Fluid Type 2nd Stage Tail	Fluid Description 13.0	Amount (sacks) 90	Class Midcon II	Volume Pumped (bbl) 33.0
Estimated Top (ftKB) 1,160.0	Estimated Bottom Depth (ftKB) 1,658.0	Percent Excess Pumped (%)	Yield (ft³/sack) 2.04	Mix H2O Ratio (gal/sack) 13.00
Free Water (%)	Density (lb/gal) 13.00	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

Cement Fluid Additives		
Add	Type	Conc
Prod Blend		

PW Displacement				
Fluid Type PW Displacement	Fluid Description 8.6	Amount (sacks)	Class	Volume Pumped (bbl) 39.0
Estimated Top (ftKB) 0.0	Estimated Bottom Depth (ftKB) 1,658.0	Percent Excess Pumped (%)	Yield (ft³/sack)	Mix H2O Ratio (gal/sack)
Free Water (%)	Density (lb/gal) 8.60	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

Cement Fluid Additives		
Add	Type	Conc

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Gr Elev (ft) 7,898.00	Casing Flange Elevation (ft)	KB-Ground Distance (ft) 0.00	KB-Casing Flange Distance (ft)	Spud Date 1/30/2007 11:45	Rig Release Date 2/2/2007 23:30

**Cement Squeeze, 2/13/2007 00:00**

Type Squeeze	Cementing Start Date 2/13/2007	Cementing End Date	Wellbore Original Hole	String Production, 2,428.6ftKB
Cementing Company Halliburton Energy Services	Evaluation Method	Cement Evaluation Results		

Comment

**<stagenum>, 1,658.3-2,110.0ftKB**

Top Depth (ftKB) 1,658.3	Bottom Depth (ftKB) 2,110.0	Full Return? No	Vol Cement Ret (bbl)	Top Plug? No	Bottom Plug? No
Initial Pump Rate (bbl/min)	Final Pump Rate (bbl/min)	Avg Pump Rate (bbl/min)		Final Pump Pressure (psi)	Plug Bump Pressure (psi)
Pipe Reciprocated? No	Reciprocation Stroke Length (ft)	Reciprocation Rate (spm)		Pipe Rotated? No	Pipe RPM (rpm)
Tagged Depth (ftKB)	Tag Method	Depth Plug Drilled Out To (ftKB)		Drill Out Diameter (in)	Drill Out Date

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Fluid Type	Fluid Description	Amount (sacks)	Class	Volume Pumped (bbl)
Estimated Top (ftKB)	Estimated Bottom Depth (ftKB)	Percent Excess Pumped (%)	Yield (ft <sup>3</sup> /sack)	Mix H2O Ratio (gal/sack)
Free Water (%)	Density (lb/gal)	Plastic Viscosity (cP)	Thickening Time (hr)	1st Compressive Strength (psi)

**Cement Fluid Additives**

Add	Type	Conc