

# PlugAdvisor Summary Report



Company: Nighthawk  
Well Name: Big Sky 4-11  
Field Name: DJ

State: Colorado

Date: 4/28/2013  
Well Location: Sec 11 - T6S - R54W  
API/UWI Number:  
Proposal Number:  
Contact: Chuck Wilson

Objective: Set 500 foot KOP using 1 bottom wiper plug and 1 top wiper plug.

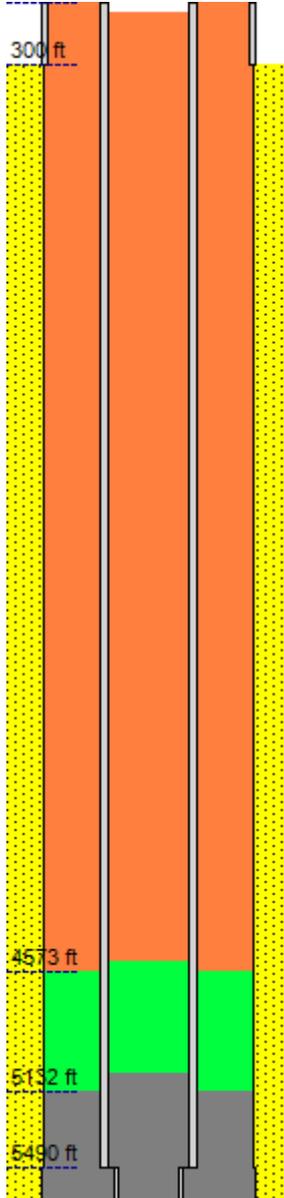
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## WELL DATA



### Well Data

Job Type:	Kick-off Plug
Rig Type:	Land
Total Depth (Measured):	5650 ft
True Vertical Depth (TVD):	5650 ft
TOC in pipe before POOH:	5056.4 ft
TOC in annulus before POOH:	5132.4 ft

### Open Hole

Bottom Depth	Mean Calliper Diameter	Mean Excess	Mean Equiv. Diameter
5650 ft	7.875 in	20 %	8.442 in

### Drill Pipe

Bottom Measured Depth	OD	ID	Weight
5490 ft	4 in	3.34 in	14 lbm/ft
5650 ft	2.875 in	2.441 in	6.4 lbm/ft

### Casing

Bottom Measured Depth	OD	ID	Weight
300 ft	8.625 in	8.097 in	24 lbm/ft

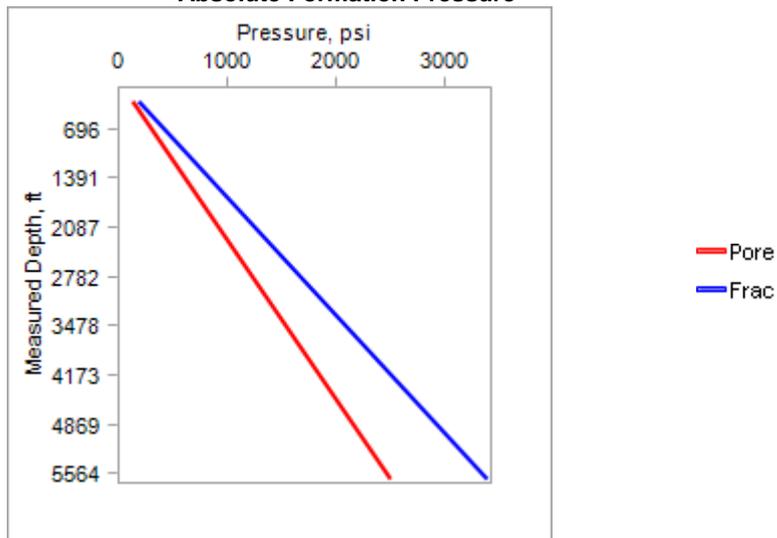


# FORMATION DATA

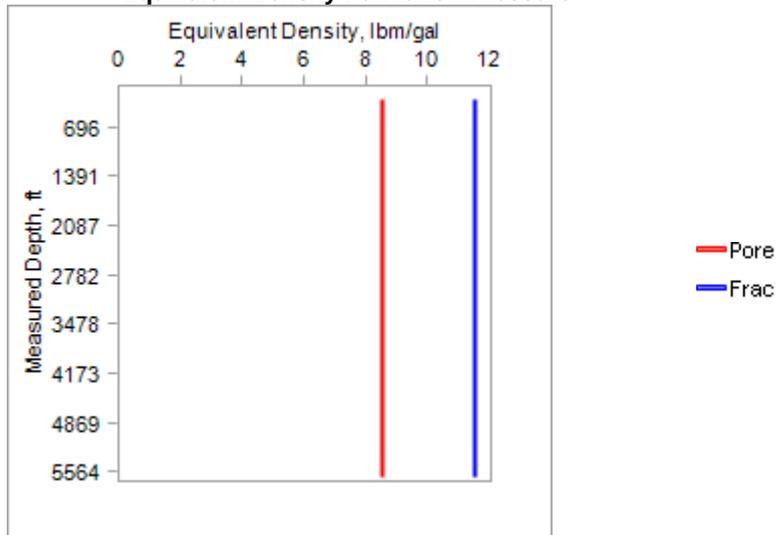
## Formation Data

MD Top	MD Bottom	Pore Top	Pore Bottom	Frac Top	Frac Bottom	Name / Lithology	Res. Fluid
0 ft	5650 ft	0 psi	2500 psi	0 psi	3390 psi	Sandstone	

**Absolute Formation Pressure**



**Equivalent Density Formation Pressure**





## FLUIDS DATA

### Fluids Data

Name	Type	Density, lbm/gal	Model	Consistency, lbf.s <sup>n</sup> /100ft <sup>2</sup>	Power Index	Ty, lbf/100ft <sup>2</sup>	Gel Strength, lbf/100ft <sup>2</sup>
Mud	MUD	9.1	Bingham	0.03551	1	13	0
MUDPUSH	SPACER	12.5	Bingham	0.02297	1	30	0
Tail Slurry	SLURRY	16.5	Herschel-B.	0.12774	0.97	4.7	16.01

## PLACEMENT VOLUMES

### Placement Summary

Volume Optimization	
Plug Length	500 ft
Plug top MD after POOH	5150 ft
Plug Volume	34.83 bbl
Original Fluid	Mud
Underdisplacement Volume	1.26 bbl
Drill Pipe Volume	60.42 bbl

### Fluid Sequence

Name	Balanced	Volume, bbl	Annular Length, ft	Top MD, ft	Density, lbm/gal	Length, ft
Mud		243.7	4573.1	0	9.1	4573.1
MUDPUSH	✓	30	559.3	4573.1	12.5	559.3
Tail Slurry	✓	29.2	517.6	5132.4	16.5	517.6
Tail Slurry	✓	5.6	0	5056.4	16.5	593.6
MUDPUSH	✓	5.8	0	4520.1	12.5	536.4
Mud		48.4	0	53.2	9.1	4466.8

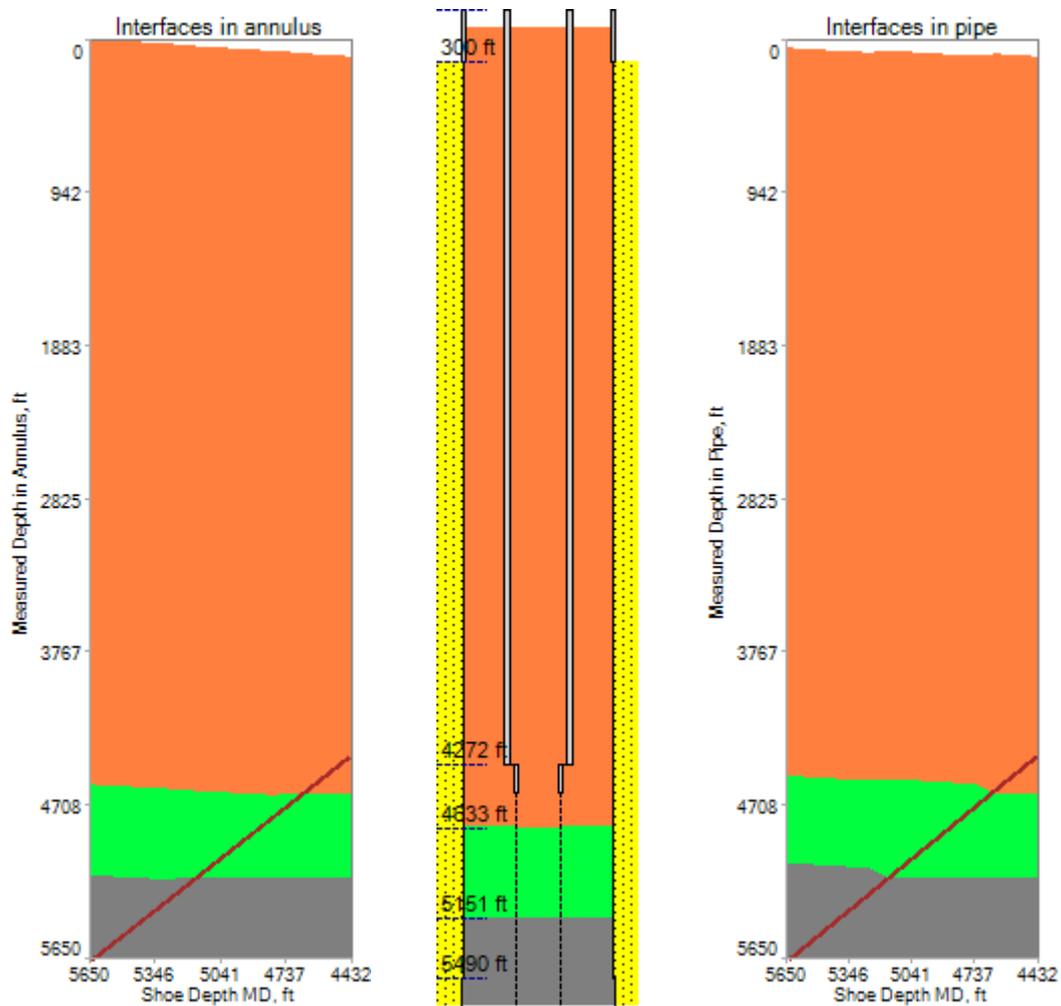


# STATIC PULL OUT OF HOLE (POOH)

## POOH Summary

Final drill pipe shoe depth after POOH:	4432.36 ft
Length of uncontaminated cement after POOH:	499.23 ft
Length of contaminated cement after POOH:	0 ft
Top MD of uncontaminated cement after POOH:	5150.77 ft

## POOH Simulation Results



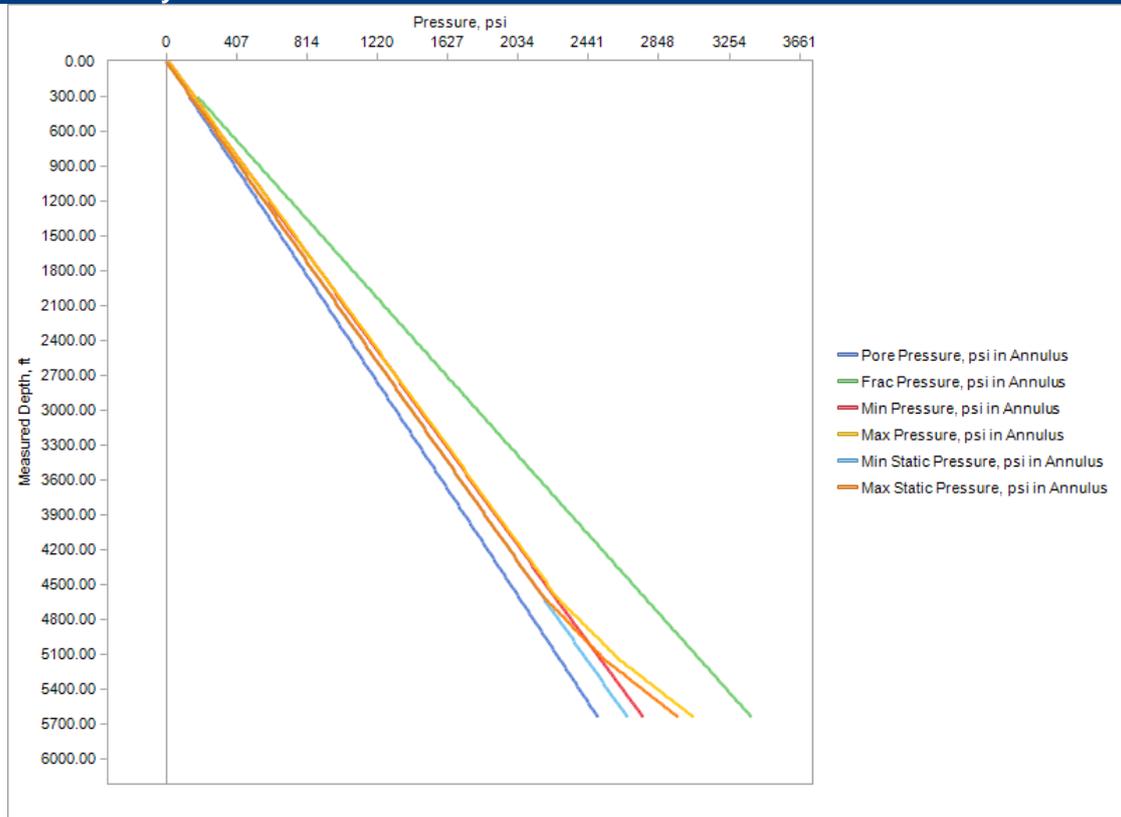


## PLACEMENT

### Pumping Schedule

Fluid Name	Flow Rate, bbl/min	Volume, bbl	Time, min	Backpressure, psi	Cumulative Time, min
MUDPUSH	4	30	7.5	0	7.5
Mechanical Separator	0	0	0	0	7.5
Tail Slurry	4	34.83	8.71	0	16.21
Mechanical Separator	0	0	0	0	16.21
MUDPUSH	4	5.81	1.45	0	17.66
Mud	4	48.41	12.1	0	29.76

### Well Security

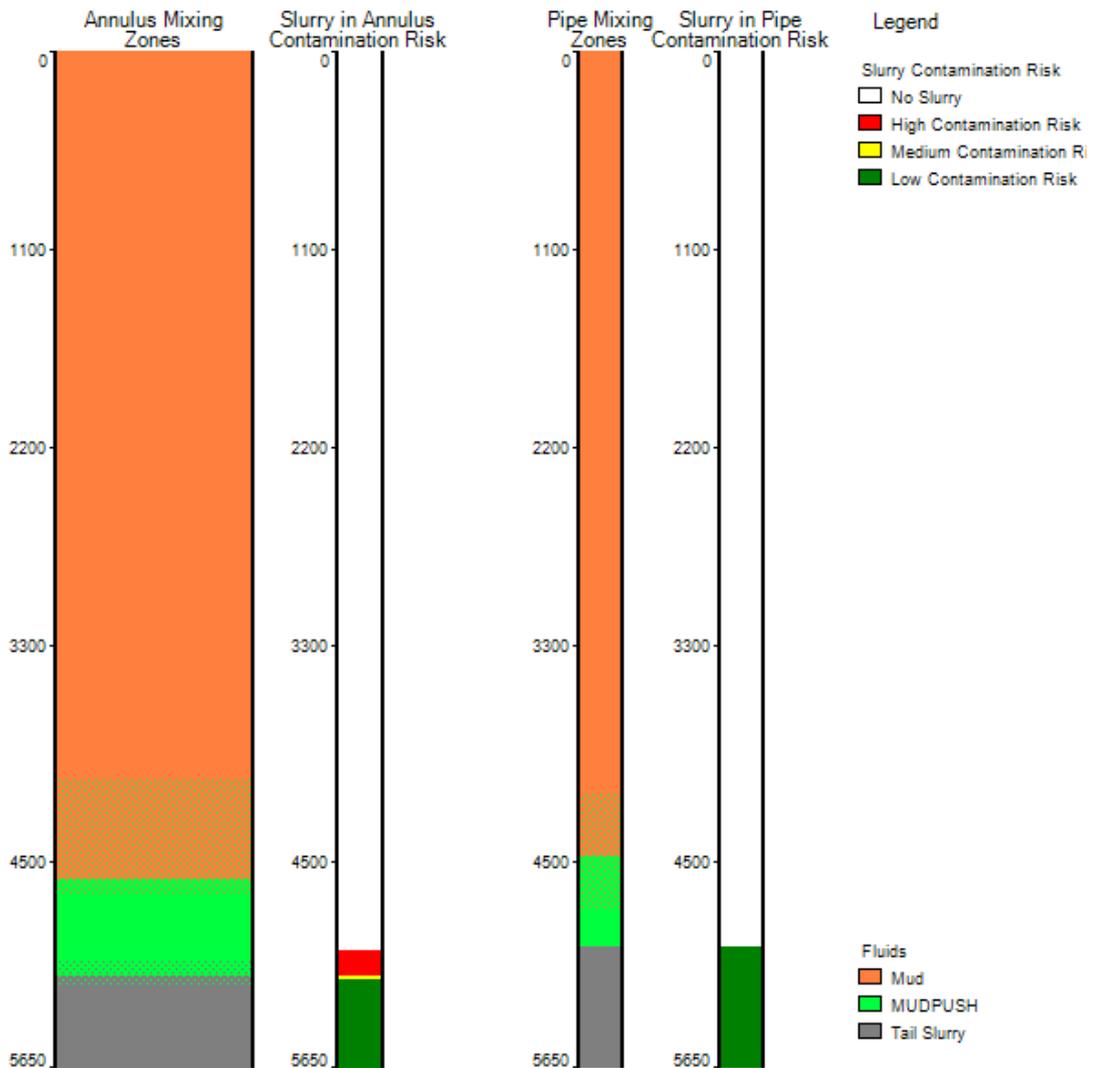


Dynamic Well Security	Pore	Min annular pore security 10.2% (222psi) at MD = 4911.8ft.
	Frac	Min annular frac security 9.8% (332.6psi) at MD = 5650ft.
Static Well Security	Pore	Min annular static pore security 6.8% (44.4psi) at MD = 1466.9ft.
	Frac	Min annular static frac security 12.4% (421.3psi) at MD = 5650ft.



# FLUID MIXING BEFORE POOH

## Fluid Mixing at the end of placement

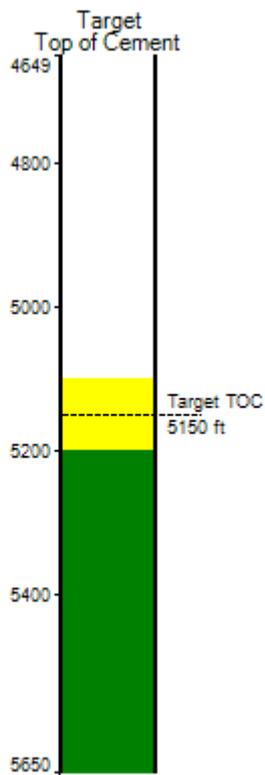


### Slurry Contamination Risk

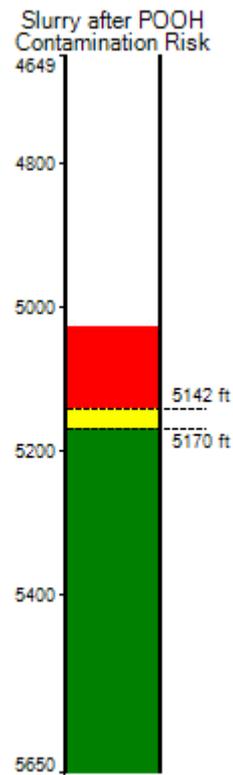
Location	High Contamination Risk (Red)	Medium Contamination Risk (Yellow)	Low Contamination Risk (Green)
Pipe	High: 0 ft	Medium: 0 ft	Low: 673 ft
Annulus	High: 141 ft	Medium: 28 ft	Low: 494 ft



## FINAL MIXING RISKS AFTER PLACEMENT AND POOH



5100 ft < Target TOC < 5200 ft



5142 ft < Top MD of Cement after POOH < 5170 ft