

Confidentiality Requested:

Yes  No

KANSAS CORPORATION COMMISSION 1258015  
OIL & GAS CONSERVATION DIVISION

Form ACO-1  
November 2016

Form must be Typed  
Form must be Signed  
All blanks must be Filled

WELL COMPLETION FORM  
WELL HISTORY - DESCRIPTION OF WELL & LEASE

OPERATOR: License # \_\_\_\_\_

Name: \_\_\_\_\_

Address 1: \_\_\_\_\_

Address 2: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ + \_\_\_\_\_

Contact Person: \_\_\_\_\_

Phone: ( \_\_\_\_\_ ) \_\_\_\_\_

CONTRACTOR: License # \_\_\_\_\_

Name: \_\_\_\_\_

Wellsite Geologist: \_\_\_\_\_

Purchaser: \_\_\_\_\_

Designate Type of Completion:

New Well  Re-Entry  Workover

Oil  WSW  SWD

Gas  DH  EOR

OG  GSW

CM (Coal Bed Methane)

Cathodic  Other (Core, Expl., etc.): \_\_\_\_\_

If Workover/Re-entry: Old Well Info as follows:

Operator: \_\_\_\_\_

Well Name: \_\_\_\_\_

Original Comp. Date: \_\_\_\_\_ Original Total Depth: \_\_\_\_\_

Deepening  Re-perf.  Conv. to EOR  Conv. to SWD

Plug Back  Liner  Conv. to GSW  Conv. to Producer

Commingled Permit #: \_\_\_\_\_

Dual Completion Permit #: \_\_\_\_\_

SWD Permit #: \_\_\_\_\_

EOR Permit #: \_\_\_\_\_

GSW Permit #: \_\_\_\_\_

Spud Date or Date Reached TD Completion Date or Recompletion Date

API No.: \_\_\_\_\_

Spot Description: \_\_\_\_\_

\_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West

\_\_\_\_\_ Feet from  North /  South Line of Section

\_\_\_\_\_ Feet from  East /  West Line of Section

Footages Calculated from Nearest Outside Section Corner:

NE  NW  SE  SW

GPS Location: Lat: \_\_\_\_\_, Long: \_\_\_\_\_  
(e.g. xx.xxxxx) (e.g. -xxx.xxxxx)

Datum:  NAD27  NAD83  WGS84

County: \_\_\_\_\_

Lease Name: \_\_\_\_\_ Well #: \_\_\_\_\_

Field Name: \_\_\_\_\_

Producing Formation: \_\_\_\_\_

Elevation: Ground: \_\_\_\_\_ Kelly Bushing: \_\_\_\_\_

Total Vertical Depth: \_\_\_\_\_ Plug Back Total Depth: \_\_\_\_\_

Amount of Surface Pipe Set and Cemented at: \_\_\_\_\_ Feet

Multiple Stage Cementing Collar Used?  Yes  No

If yes, show depth set: \_\_\_\_\_ Feet

If Alternate II completion, cement circulated from: \_\_\_\_\_

feet depth to: \_\_\_\_\_ w/ \_\_\_\_\_ sx cmt.

Drilling Fluid Management Plan

(Data must be collected from the Reserve Pit)

Chloride content: \_\_\_\_\_ ppm Fluid volume: \_\_\_\_\_ bbls

Dewatering method used: \_\_\_\_\_

Location of fluid disposal if hauled offsite:

Operator Name: \_\_\_\_\_

Lease Name: \_\_\_\_\_ License #: \_\_\_\_\_

Quarter \_\_\_\_\_ Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West

County: \_\_\_\_\_ Permit #: \_\_\_\_\_

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

Confidentiality Requested

Date: \_\_\_\_\_

Confidential Release Date: \_\_\_\_\_

Wireline Log Received  Drill Stem Tests Received

Geologist Report / Mud Logs Received

UIC Distribution

ALT  I  II  III Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

1258015



Operator Name: \_\_\_\_\_ Lease Name: \_\_\_\_\_ Well #: \_\_\_\_\_

Sec. \_\_\_\_\_ Twp. \_\_\_\_\_ S. R. \_\_\_\_\_  East  West County: \_\_\_\_\_

**INSTRUCTIONS:** Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to [kcc-well-logs@kcc.ks.gov](mailto:kcc-well-logs@kcc.ks.gov). Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Attach Additional Sheets)</i>  Samples Sent to Geological Survey <input type="checkbox"/> Yes <input type="checkbox"/> No  Cores Taken <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Run <input type="checkbox"/> Yes <input type="checkbox"/> No Geologist Report / Mud Logs <input type="checkbox"/> Yes <input type="checkbox"/> No List All E. Logs Run: _____	<input type="checkbox"/> Log Formation (Top), Depth and Datum <input type="checkbox"/> Sample  Name Top Datum
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CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> Used							
Report all strings set-conductor, surface, intermediate, production, etc.							
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives

ADDITIONAL CEMENTING / SQUEEZE RECORD				
Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
<input type="checkbox"/> Perforate <input type="checkbox"/> Protect Casing <input type="checkbox"/> Plug Back TD <input type="checkbox"/> Plug Off Zone				

1. Did you perform a hydraulic fracturing treatment on this well?  Yes  No *(If No, skip questions 2 and 3)*
2. Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons?  Yes  No *(If No, skip question 3)*
3. Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry?  Yes  No *(If No, fill out Page Three of the ACO-1)*

Date of first Production/Injection or Resumed Production/Injection:	Producing Method: <input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas Lift <input type="checkbox"/> Other <i>(Explain)</i> _____			
Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio Gravity

DISPOSITION OF GAS: <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	METHOD OF COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5) (Submit ACO-4)</i>	PRODUCTION INTERVAL: Top Bottom
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Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record <i>(Amount and Kind of Material Used)</i>

TUBING RECORD:	Size:	Set At:	Packer At:	
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Form	ACO1 - Well Completion
Operator	SandRidge Exploration and Production LLC
Well Name	Roberts 3408 2-16H
Doc ID	1258015

Tops

Name	Top	Datum
Base Heebner	3422	-2083
Lansing	3787	-2448
Cottage Grove	4071	-2732
Oswego	4380	-3041
Pawnee	4434	-3095
Cherokee	4482	-3143
Verdigris	4531	-3192
Red Fork	4566	-3227
Atoka	4615	-3276
Miss Unconformity	4629	-3290
Miss Lime	4644	0-3305



# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/20/2015
Job End Date:	7/21/2015
State:	Kansas
County:	Harper
API Number:	15-077-22143-01-00
Operator Name:	SandRidge Energy
Well Name and Number:	Roberts 3408 2-16H
Longitude:	-98.19371310
Latitude:	37.09457441
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	4,705
Total Base Water Volume (gal):	2,064,758
Total Base Non Water Volume:	0



## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Archer	Carrier/Base Fluid	Water	7732-18-5	100.00000	97.00729	None
Sand (Proppant)	Archer	Proppant	Silica Substrate	NA	100.00000	2.43509	None
Hydrochloric Acid (15%)	Archer	Acidizing	Hydrochloric Acid	7647-01-0	15.00000	0.07541	None
			Methyl Alcohol	67-56-1	80.00000	0.00062	None
			thiourea-formaldehyde copolymer	68527-49-1	15.00000	0.00012	None
			NONYL PHENOL, 4 MOL	104-40-5	10.00000	0.00005	None
AIC	Archer	Liquid Acid Iron Control	Acetic Acid	64-19-7	50.00000	0.00139	None
			Citric Acid	77-92-9	30.00000	0.00083	None
Chemflush	Archer	Enviro-Friendly Chemical Flush	Hydrotreated Petroleum Distillate	64742-47-8	99.00000	0.00148	None
			Alcohol Ethoxylate Surfactants	NA	10.00000	0.00015	None
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
		Other Chemicals					

		Water	7732-18-5		0.02334
		Aliphatic Hydrocarbon	64742-47-8		0.01167
		Anionic Polymer	N/A		0.01167
		Water	7732-18-5		0.00945
		Oxyalkylated Alcohol	68002-97-1		0.00194
		Polyol Ester	N/A		0.00194
		Sodium Salt of Phosphate Ester	68131-72-6		0.00158
		Acrylic Polymer	28205-96-1		0.00158
		Water	7732-18-5		0.00097
		Polyglycol Ester	N/A		0.00039
		WATER	7732-18-5		0.00028
		TRADE SECRET	N/A		0.00018
		Alcohol Ethoxylate Surfactants	N/A		0.00012
		n-olefins	N/A		0.00006
		Propargyl Alcohol	107-19-7		0.00005
		METHANOL	67-56-1		0.00005
		ISOPROPANOL	67-63-0		0.00005
		Tetrasodium Ethylenediaminetetraacetate	64-02-8		0.00004
		Water	7732-18-5		
		Cinnamic Aldehyde	104-55-2		
		Buffer	N/A		
		Surfactant	N/A		
		Acetic Acid	64-19-7		

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water

\*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

### Roberts 3408 2-16H Perforations & Shot Density

Stage Nbr	Date	Type	Top Depth	Top Depth (TVD)	Bottom Depth	Bottom Depth(TVD)	Zone	Shot Density	Current Status	Wellbore	String Perforated	Fluid Type
20	7/21/2015	Frac Sleeve	5,310.00	4,690.50	5,312.00	4,690.50	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
19	7/21/2015	Frac Sleeve	5,542.00	4,684.20	5,544.00	4,684.10	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
18	7/21/2015	Frac Sleeve	5,778.00	4,685.00	5,780.00	4,685.00	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
17	7/21/2015	Frac Sleeve	6,009.00	4,687.50	6,011.00	4,687.60	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
16	7/21/2015	Frac Sleeve	6,247.00	4,695.80	6,249.00	4,695.80	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
15	7/20/2015	Frac Sleeve	6,484.00	4,696.50	6,486.00	4,696.40	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
14	7/20/2015	Frac Sleeve	6,724.00	4,690.10	6,726.00	4,690.00	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
13	7/20/2015	Frac Sleeve	6,959.00	4,694.30	6,961.00	4,694.40	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
12	7/20/2015	Frac Sleeve	7,190.00	4,699.30	7,192.00	4,699.40	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
11	7/20/2015	Frac Sleeve	7,425.00	4,705.30	7,427.00	4,705.30	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
10	7/20/2015	Frac Sleeve	7,658.00	4,708.30	7,660.00	4,708.20	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
9	7/20/2015	Frac Sleeve	7,896.00	4,706.70	7,898.00	4,706.70	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
8	7/20/2015	Frac Sleeve	8,124.00	4,702.80	8,126.00	4,702.80	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
7	7/20/2015	Frac Sleeve	8,363.00	4,703.30	8,365.00	4,703.30	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
6	7/20/2015	Frac Sleeve	8,604.00	4,707.50	8,606.00	4,707.60	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
5	7/20/2015	Frac Sleeve	8,846.00	4,714.70	8,848.00	4,714.70	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
4	7/20/2015	Frac Sleeve	9,036.00	4,715.10	9,038.00	4,715.10	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
3	7/20/2015	Frac Sleeve	9,221.00	4,713.20	9,223.00	4,713.20	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
2	7/20/2015	Frac Sleeve	9,411.00	4,711.40	9,413.00	4,711.30	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water
1	7/20/2015	P-Sleeve	9,599.00	4,706.60	9,601.00	4,706.50	Miss Lime - Upper	1	Active	Original Hole	Production Liner	Fresh Water

**JOB SUMMARY**

COUNTY	STATE	PROJECT NUMBER	TICKET DATE
Harper	Kansas	SOK 5140	06/11/15
LEASE NAME	COMPANY	CUSTOMER REF	
Roberts 3408	Bridge Exploration & Produ	0	
EMP NAME	WELL NO.	EMPLOYEE NAME	
	2-16H	John Hall	
	Surface		

John Hall	0		
Cody Bonitz			
Roy Morris			
0.00			

Form. Name \_\_\_\_\_ Type: \_\_\_\_\_

Packer Type \_\_\_\_\_ Set At \_\_\_\_\_ 0

Bottom Hole Temp. \_\_\_\_\_ 80 Pressure

Retainer Depth \_\_\_\_\_ 850 Total Depth

Type and Size	Qty	Make
Auto Fill Tube	0	IR
Insert Float Va	0	IR
Centralizers	0	IR
Top Plug	0	IR
HEAD	0	IR
Limit clamp	0	IR
Weld-A	0	IR
Texas Pattern Guide Shoe	0	IR
Cement Basket	0	IR

Materials		WBM	Density	9	Lb/Gal
Disp. Fluid	Fresh Water	Density	8.33	Lb/Gal	
Spacer type	Fresh Water	BBL	10	Lb/Gal	8.33
Spacer type	BBL				
Acid Type	Gal.	%			
Acid Type	Gal.	%			
Surfactant	Gal.	In			
NE Agent	Gal.	In			
Fluid Loss	Gal/Lb	In			
Gelling Agent	Gal/Lb	In			
Fric. Red.	Gal/Lb	In			
MISC.	Gal/Lb	In			

Perfrac Balls	_____ Qty.
Other	_____ Qty.
Other	_____ Qty.
Other	_____ Qty.
Other	_____ Qty.

Date	Called Out	On Location	Job Started	Job Completed
6/11/2015	500pm	6/11/2015	830pm	6/11/2015
Time	800pm	830pm	1100pm	

Well Data				
Casing	New/Used	Weight	Size	Grade
Liner		36#	9 5/8"	850
Liner				Surface
Tubing			0	
Drill Pipe				
Open Hole			12 1/4"	850
Perforations				Surface
Perforations				

Hours On Location		Operating Hours		Description of Job	
Date	Hours	Date	Hours		
6/11	3.0	6/11	1.5	Surface	
Total	3.0	Total	1.5		

MAX	2,000 psi	AVG.	300 psi
MAX	6 BPM	AVG	5 bpm
Feet	46	Cement Left in Pipe	
		Reason	SHOE JOINT

Stage	Sacks	Cement	Additives	W/Rq.	Yield	Lbs/Gal
1	235	TEX Lite Premium Plus 65 (6% Gel) 2% Calcium Chloride - 3/4pps Cello-Flake	-0.2% X-Air	11.11	2.01	12.40
2	150	Premium Plus (Class C) 2% Calcium Chloride - 3/4pps Cello-Flake		6.32	1.32	14.80
3	100	Premium Plus (Class C) 2% Calcium Chloride on side to use if necessary		*6.32	*1.32	*14.8

Summary		Preflush:		Type:	
Breakdown	PSI	Load & Bkdn:	Gal - BBI	Pad:Bbl -Gal	Fresh Water
MAXIMUM	1,500	Excess/Return	BBI	N/A	N/A
Actual TOC	562	Calc. TOC:	BBI	35	62
Bump Plug PSI:	1,040	Final Circ.	PSI:	SURFACE	62.40
10 Min.	15 Min.	Cement Slurry	BBI	340	62.40
		Total Volume	BBI	119.3	
				191.70	

CUSTOMER REPRESENTATIVE Jim Miller SIGNATURE \_\_\_\_\_







### SECTION DETAILS

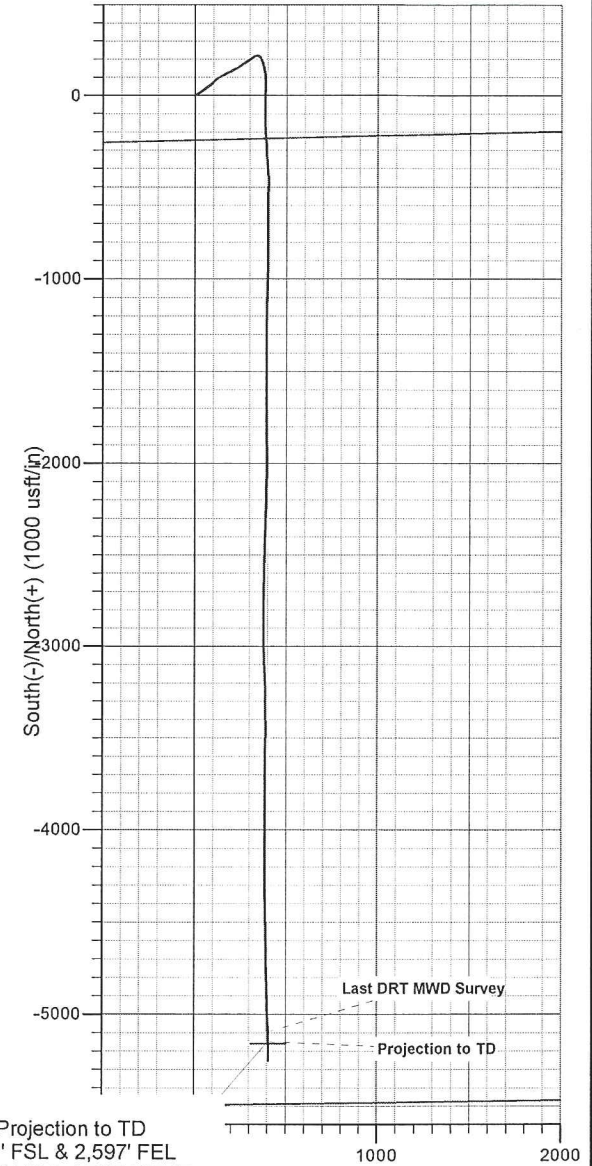
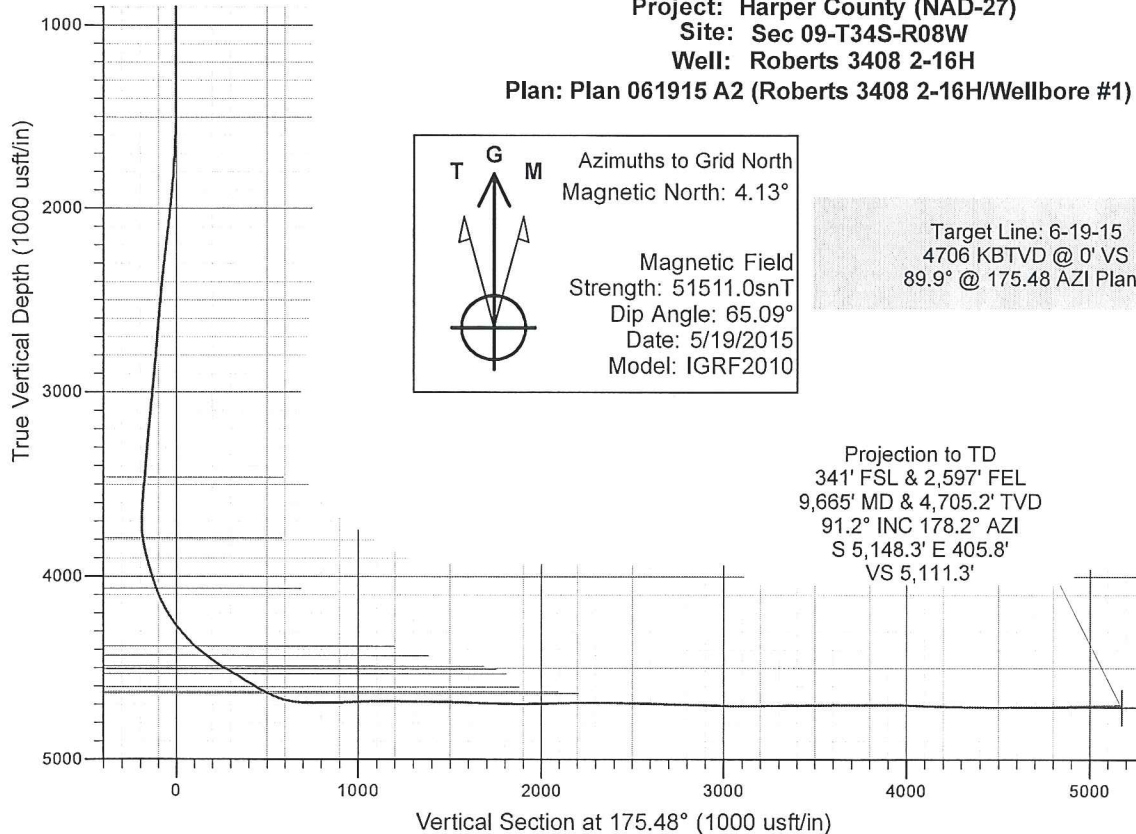
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V Sect	Annotation
8679.0	88.20	179.80	4710.1	-4162.7	386.5	0.00	0.00	4180.2	Start DLS 2.00 TFO -49.63
8749.2	89.11	178.73	4711.7	-4232.9	387.4	2.00	-49.63	4250.3	Start Turn 0.00
8849.2	89.11	178.73	4713.3	-4332.9	389.7	0.00	0.00	4350.1	Start DLS 2.00 TFO 0.00
8888.7	89.90	178.73	4713.6	-4372.3	390.5	2.00	0.00	4389.5	Start DLS 0.00 TFO -76.67
9675.6	89.90	178.73	4715.0	-5159.0	408.0	0.00	-76.67	5175.1	TD at 9675.6

### WELL DETAILS: Roberts 3408 2-16H

Ground Level: 1320.0

Northing	Easting	Latitude	Longitude
155957.00	2089340.00	37° 5' 40.473 N	98° 11' 37.370 W

**Project: Harper County (NAD-27)**  
**Site: Sec 09-T34S-R08W**  
**Well: Roberts 3408 2-16H**  
**Plan: Plan 061915 A2 (Roberts 3408 2-16H/Wellbore #1)**





# Survey Report

<b>Company:</b> Sandridge Energy <b>Project:</b> Harper County (NAD-27) <b>Site:</b> Sec 09-T34S-R08W <b>Well:</b> Roberts 3408 2-16H <b>Wellbore:</b> Wellbore #1 <b>Design:</b> Wellbore #1	<b>Local Co-ordinate Reference:</b> Well Roberts 3408 2-16H <b>TVD Reference:</b> KB @ 1339.0usft <b>MD Reference:</b> KB @ 1339.0usft <b>North Reference:</b> Grid <b>Survey Calculation Method:</b> Minimum Curvature <b>Database:</b> EDM 5000.1 Single User Db
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<b>Project</b> Harper County (NAD-27)	
<b>Map System:</b> US State Plane 1927 (Exact solution)	<b>System Datum:</b> Mean Sea Level
<b>Geo Datum:</b> NAD 1927 (NADCON CONUS)	
<b>Map Zone:</b> Kansas South 1502	

<b>Site</b> Sec 09-T34S-R08W	
<b>Site Position:</b>	<b>Northing:</b> 155,655.00 usft <b>Latitude:</b> 37° 5' 37.562 N
<b>From:</b>	<b>Eastng:</b> 2,087,032.00 usft <b>Longitude:</b> 98° 12' 5.867 W
<b>Position Uncertainty:</b>	<b>Slot Radius:</b> 0.0 usft <b>Grid Convergence:</b> 0.18 °

<b>Well</b> Roberts 3408 2-16H	
<b>Well Position</b>	<b>Northing:</b> 0.0 usft <b>Latitude:</b> 37° 5' 40.473 N
<b>+N/-S</b>	<b>Eastng:</b> 0.0 usft <b>Longitude:</b> 98° 11' 37.370 W
<b>+E/-W</b>	<b>Wellhead Elevation:</b> 0.0 usft <b>Ground Level:</b> 1,320.0 usft

<b>Wellbore</b> Wellbore #1	
<b>Magnetics</b>	<b>Model Name</b> IGRF2010 <b>Sample Date</b> 5/19/2015 <b>Declination (°)</b> 4.31 <b>Dip Angle (°)</b> 65.09 <b>Field Strength (nT)</b> 51,511

<b>Design</b> Wellbore #1	
<b>Audit Notes:</b>	
<b>Version:</b> 1.0	<b>Phase:</b> ACTUAL <b>Tie On Depth:</b> 0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b> <b>+N/-S (usft)</b> <b>+E/-W (usft)</b> <b>Direction (°)</b>
	0.0    0.0    0.0    175.48

<b>Survey Program</b> Date 6/22/2015	
<b>From (usft)</b>	<b>To (usft)</b> <b>Survey (Wellbore)</b> <b>Tool Name</b> <b>Description</b>
877.0	9,665.0 DRT MWD Surveys (Wellbore #1)    MWD    MWD - Standard

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
877.0	0.30	30.10	877.0	2.0	1.2	-1.9	0.03	0.03	0.00	
<b>First DRT MWD Survey</b>										
1,346.0	0.30	267.00	1,346.0	3.0	0.5	-2.9	0.11	0.00	-26.25	
1,536.0	2.20	86.10	1,536.0	3.2	3.7	-2.9	1.32	1.00	94.26	
1,631.0	4.70	60.40	1,630.8	5.3	8.9	-4.5	3.03	2.63	-27.05	
1,725.0	6.90	55.70	1,724.3	10.3	16.9	-9.0	2.39	2.34	-5.00	
1,820.0	9.50	61.30	1,818.3	17.3	28.5	-15.0	2.86	2.74	5.89	
1,915.0	10.10	53.80	1,911.9	26.0	42.1	-22.6	1.48	0.63	-7.89	
2,010.0	12.10	51.90	2,005.1	37.1	56.7	-32.5	2.14	2.11	-2.00	
2,104.0	10.60	47.60	2,097.3	49.0	70.8	-43.2	1.83	-1.60	-4.57	



# Survey Report

<b>Company:</b> Sandridge Energy	<b>Local Co-ordinate Reference:</b> Well Roberts 3408 2-16H
<b>Project:</b> Harper County (NAD-27)	<b>TVD Reference:</b> KB @ 1339.0usft
<b>Site:</b> Sec 09-T34S-R08W	<b>MD Reference:</b> KB @ 1339.0usft
<b>Well:</b> Roberts 3408 2-16H	<b>North Reference:</b> Grid
<b>Wellbore:</b> Wellbore #1	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Wellbore #1	<b>Database:</b> EDM 5000.1 Single User Db

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,199.0	12.20	52.20	2,190.4	61.0	85.2	-54.1	1.94	1.68	4.84
2,294.0	11.00	42.00	2,283.5	73.9	99.2	-85.9	2.50	-1.26	-10.74
2,389.0	10.70	57.90	2,376.8	85.3	112.7	-76.2	3.16	-0.32	16.74
2,483.0	11.20	54.90	2,469.1	95.2	127.6	-84.9	0.81	0.53	-3.19
2,578.0	9.70	51.60	2,562.5	105.5	141.4	-94.0	1.70	-1.58	-3.47
2,673.0	10.80	65.10	2,656.0	114.2	155.7	-101.6	2.77	1.16	14.21
2,767.0	13.20	65.50	2,748.0	122.4	173.5	-108.3	2.55	2.55	0.43
2,862.0	13.20	62.80	2,840.5	131.8	193.0	-116.2	0.65	0.00	-2.84
2,956.0	12.70	63.40	2,932.1	141.4	211.8	-124.2	0.55	-0.53	0.84
3,051.0	11.50	54.40	3,025.0	151.6	228.8	-133.0	2.35	-1.26	-9.47
3,146.0	10.20	54.30	3,118.3	162.0	243.4	-142.3	1.37	-1.37	-0.11
3,241.0	12.70	58.10	3,211.4	172.4	259.1	-151.4	2.75	2.63	4.00
3,336.0	11.70	59.50	3,304.2	182.8	276.2	-160.5	1.10	-1.05	1.47
3,428.0	9.60	57.60	3,394.6	191.7	290.8	-168.1	2.31	-2.28	-2.07
3,523.0	11.60	55.50	3,488.0	201.3	305.3	-176.6	2.14	2.11	-2.21
3,617.0	9.90	56.30	3,580.4	211.2	319.8	-185.3	1.82	-1.81	0.85
3,712.0	8.80	72.50	3,674.1	217.9	333.6	-190.9	2.99	-1.16	17.05
3,744.0	9.90	90.10	3,705.7	218.6	338.6	-191.2	9.53	3.44	55.00
3,775.0	10.70	106.40	3,736.2	217.8	344.1	-190.0	9.71	2.58	52.58
3,807.0	11.10	118.20	3,767.6	215.5	349.6	-187.3	7.07	1.25	36.88
3,838.0	11.70	131.50	3,798.0	212.0	354.6	-183.4	8.68	1.94	42.90
3,870.0	12.50	143.60	3,829.3	207.1	359.1	-178.1	8.29	2.50	37.81
3,901.0	13.70	154.30	3,859.5	201.1	362.7	-171.8	8.71	3.87	34.52
3,932.0	15.10	158.90	3,889.5	194.0	365.7	-164.5	5.83	4.52	14.84
3,964.0	16.00	159.60	3,920.4	186.0	368.8	-156.3	2.87	2.81	2.19
3,996.0	16.40	160.70	3,951.1	177.6	371.8	-147.7	1.58	1.25	3.44
4,027.0	17.20	163.00	3,980.8	169.0	374.6	-139.0	3.35	2.58	7.42
4,059.0	18.60	165.00	4,011.2	159.6	377.3	-129.3	4.78	4.38	6.25
4,090.0	19.80	168.90	4,040.5	149.7	379.6	-119.3	5.66	3.87	12.58
4,122.0	20.30	169.20	4,070.6	138.9	381.7	-108.4	1.60	1.56	0.94
4,185.0	24.40	173.60	4,128.8	115.2	385.2	-84.5	7.02	6.51	6.98
4,217.0	27.20	178.70	4,157.6	101.3	386.1	-70.6	11.16	8.75	15.94
4,249.0	30.10	180.30	4,185.7	86.0	386.2	-55.3	9.37	9.06	5.00
4,280.0	33.10	181.00	4,212.1	69.7	386.0	-39.1	9.75	9.68	2.26
4,312.0	35.00	181.40	4,238.6	51.8	385.6	-21.3	5.98	5.94	1.25
4,343.0	37.40	181.00	4,263.6	33.5	385.2	-8.5	7.78	7.74	-1.29
4,375.0	39.70	180.00	4,288.7	13.6	385.1	16.8	7.45	7.19	-3.13
4,406.0	41.60	180.60	4,312.2	-6.6	385.0	36.9	6.26	6.13	1.94
4,438.0	43.00	181.60	4,335.8	-28.1	384.6	58.4	4.85	4.38	3.13
4,469.0	44.50	180.90	4,358.2	-49.6	384.1	79.7	5.08	4.84	-2.26
4,501.0	46.60	179.20	4,380.6	-72.4	384.1	102.5	7.58	6.56	-5.31
4,532.0	48.60	177.70	4,401.5	-95.3	384.7	125.3	7.37	6.45	-4.84
4,563.0	50.90	176.90	4,421.6	-118.9	385.8	149.0	7.68	7.42	-2.58

# Survey Report

**Company:** Sandridge Energy  
**Project:** Harper County (NAD-27)  
**Site:** Sec 09-T34S-R08W  
**Well:** Roberts 3408 2-16H  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:**  
**TVD Reference:** KB @ 1339.0usft  
**MD Reference:** KB @ 1339.0usft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** EDM 5000.1 Single User Db

**Well Roberts 3408 2-16H**  
 KB @ 1339.0usft  
 KB @ 1339.0usft  
 Grid  
 Minimum Curvature  
 EDM 5000.1 Single User Db

## Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/S (usft)	+E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,595.0	53.30	177.70	4,441.2	-144.1	387.0	174.2	7.75	7.50	2.50
4,627.0	55.60	178.20	4,459.8	-170.2	387.9	200.2	7.30	7.19	1.56
4,659.0	57.60	178.00	4,477.5	-196.9	388.8	226.9	6.27	6.25	-0.63
4,722.0	60.00	177.60	4,510.1	-250.7	390.9	280.7	3.85	3.81	-0.63
4,754.0	59.90	177.10	4,526.1	-278.4	392.2	308.4	1.39	-0.31	-1.56
4,849.0	58.60	174.80	4,574.7	-359.8	397.9	390.0	2.49	-1.37	-2.42
4,912.0	58.60	176.30	4,607.5	-413.4	402.1	443.8	2.03	0.00	2.38
4,944.0	61.10	177.80	4,623.6	-441.0	403.5	471.5	8.80	7.81	4.89
4,976.0	63.80	178.60	4,638.4	-469.4	404.4	499.8	8.72	8.44	2.50
5,007.0	67.00	180.70	4,651.3	-497.6	404.6	527.9	12.02	10.32	6.77
5,039.0	70.20	181.80	4,663.0	-527.4	403.9	557.6	10.50	10.00	3.44
5,070.0	73.70	181.90	4,672.6	-556.8	403.0	586.8	11.29	11.29	0.32
5,101.0	77.70	181.40	4,680.2	-586.8	402.1	616.7	13.00	12.90	-1.61
5,133.0	82.00	181.40	4,685.9	-618.3	401.3	648.0	13.44	13.44	0.00
5,185.0	88.30	180.60	4,690.3	-670.1	400.4	699.6	12.21	12.12	-1.54
5,289.0	91.00	179.80	4,690.9	-774.1	400.1	803.2	2.71	2.60	-0.77
5,383.0	91.00	180.00	4,689.2	-868.1	400.2	896.9	0.21	0.00	0.21
5,478.0	92.40	179.70	4,686.4	-963.0	400.5	991.6	1.51	1.47	-0.32
5,572.0	91.20	181.10	4,683.5	-1,057.0	399.8	1,085.2	1.96	-1.28	1.49
5,666.0	89.00	181.50	4,683.3	-1,150.9	397.7	1,178.7	2.38	-2.34	0.43
5,760.0	89.20	180.80	4,684.8	-1,244.9	395.8	1,272.2	0.77	0.21	-0.74
5,853.0	90.10	180.70	4,685.4	-1,337.9	394.6	1,364.8	0.97	0.97	-0.11
5,947.0	89.10	180.70	4,686.0	-1,431.9	393.4	1,458.4	1.06	-1.06	0.00
6,040.0	87.60	179.80	4,688.7	-1,524.8	393.0	1,551.1	1.88	-1.61	-0.97
6,134.0	88.10	179.70	4,692.2	-1,618.8	393.4	1,644.8	0.54	0.53	-0.11
6,227.0	88.20	179.40	4,695.2	-1,711.7	394.2	1,737.5	0.34	0.11	-0.32
6,321.0	89.60	180.00	4,697.0	-1,805.7	394.7	1,831.2	1.62	1.49	0.64
6,414.0	89.90	179.10	4,697.4	-1,898.7	395.4	1,924.0	1.02	0.32	-0.97
6,508.0	92.20	179.90	4,695.7	-1,992.7	396.2	2,017.7	2.59	2.45	0.85
6,601.0	91.70	180.40	4,692.5	-2,085.6	396.0	2,110.3	0.76	-0.54	0.54
6,694.0	90.90	181.20	4,690.4	-2,178.6	394.7	2,202.9	1.22	-0.86	0.86
6,787.0	89.70	182.20	4,689.9	-2,271.5	391.9	2,295.4	1.68	-1.29	1.08
6,879.0	87.90	182.00	4,691.9	-2,363.4	388.5	2,386.7	1.97	-1.96	-0.22
6,974.0	88.70	181.90	4,694.7	-2,458.4	385.3	2,481.1	0.85	0.84	-0.11
7,069.0	89.70	181.90	4,696.0	-2,553.3	382.2	2,575.5	1.05	1.05	0.00
7,164.0	87.60	180.60	4,698.3	-2,648.2	380.1	2,670.0	2.60	-2.21	-1.37
7,258.0	88.30	181.10	4,701.6	-2,742.2	378.7	2,763.5	0.91	0.74	0.53
7,353.0	89.10	180.30	4,703.8	-2,837.1	377.5	2,858.1	1.19	0.84	-0.84
7,447.0	88.30	178.70	4,705.9	-2,931.1	378.4	2,951.8	1.90	-0.85	-1.70
7,542.0	89.00	177.60	4,708.1	-3,026.0	381.4	3,046.7	1.37	0.74	-1.16
7,636.0	90.60	178.20	4,708.5	-3,120.0	384.9	3,140.6	1.82	1.70	0.64
7,731.0	90.30	178.90	4,707.7	-3,214.9	387.3	3,235.4	0.80	-0.32	0.74
7,826.0	90.30	179.80	4,707.2	-3,309.9	388.4	3,330.2	0.95	0.00	0.95



## Survey Report

<b>Company:</b> Sandridge Energy <b>Project:</b> Harper County (NAD-27) <b>Site:</b> Sec 09-T34S-R08W <b>Well:</b> Roberts 3408 2-16H <b>Wellbore:</b> Wellbore #1 <b>Design:</b> Wellbore #1	<b>Local Co-ordinate Reference:</b> Well Roberts 3408 2-16H <b>TVD Reference:</b> KB @ 1339.0usft <b>MD Reference:</b> KB @ 1339.0usft <b>North Reference:</b> Grid <b>Survey Calculation Method:</b> Minimum Curvature <b>Database:</b> EDM 5000.1 Single User Db
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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,921.0	90.60	179.40	4,706.5	-3,404.9	389.0	3,425.0	0.53	0.32	-0.42
8,016.0	91.90	180.00	4,704.4	-3,499.9	389.5	3,519.7	1.51	1.37	0.63
8,111.0	90.00	180.80	4,702.8	-3,594.9	388.8	3,614.3	2.17	-2.00	0.84
8,205.0	89.60	181.20	4,703.2	-3,688.8	387.2	3,707.9	0.60	-0.43	0.43
8,300.0	89.90	180.30	4,703.6	-3,783.8	386.0	3,802.5	1.00	0.32	-0.95
8,395.0	90.90	180.40	4,702.9	-3,878.8	385.4	3,897.1	1.06	1.05	0.11
8,490.0	88.40	179.70	4,703.5	-3,973.8	385.3	3,991.8	2.73	-2.63	-0.74
8,584.0	87.70	179.50	4,706.7	-4,067.8	386.0	4,085.5	0.77	-0.74	-0.21
8,679.0	88.20	179.80	4,710.1	-4,162.7	386.5	4,180.2	0.61	0.53	0.32
8,774.0	88.20	179.60	4,713.1	-4,257.6	387.0	4,274.9	0.21	0.00	-0.21
8,869.0	89.60	179.40	4,714.9	-4,352.6	387.9	4,369.7	1.49	1.47	-0.21
8,963.0	89.90	178.10	4,715.3	-4,446.6	389.9	4,463.5	1.42	0.32	-1.38
9,057.0	90.50	179.40	4,715.0	-4,540.6	392.0	4,557.3	1.52	0.64	1.38
9,152.0	91.00	179.10	4,713.7	-4,635.6	393.2	4,652.1	0.61	0.53	-0.32
9,246.0	89.50	179.40	4,713.3	-4,729.5	394.4	4,745.9	1.63	-1.60	0.32
9,340.0	91.10	178.50	4,712.8	-4,823.5	396.2	4,839.7	1.95	1.70	-0.96
9,435.0	91.30	178.40	4,710.8	-4,918.5	398.7	4,934.6	0.24	0.21	-0.11
9,529.0	91.70	178.20	4,708.4	-5,012.4	401.5	5,028.4	0.48	0.43	-0.21
9,612.0	91.20	178.20	4,706.3	-5,095.3	404.1	5,111.3	0.60	-0.60	0.00
<b>Last DRT MWD Survey</b>									
9,665.0	91.20	176.20	4,705.2	-5,148.3	405.8	5,164.3	0.00	0.00	0.00
<b>Projection to TD - PBHL Roberts 2-16H</b>									

Design Annotations	Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
			+N-S (usft)	+E-W (usft)	
	877.0	877.0	2.0	1.2	First DRT MWD Survey
	9,612.0	4,706.3	-5,095.3	404.1	Last DRT MWD Survey
	9,665.0	4,705.2	-5,148.3	405.8	Projection to TD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_