



# PHOENIX

TECHNOLOGY SERVICES

MD  
5"  
Feet

Final Print

**Client:** Anadarko E&P Onshore LLC  
**Well Name:** University 19-0-7-16 C 13HB

**API:** 42-301-36462  
**County:** Loving  
**Permit #:** 891580  
**State:** TX

**Field:** Wolfcamp A  
**Country:** US

**Longitude:** 103° 26' 43.72925 W  
**Latitude:** 31° 42' 6.49155 N

## Personnel

**Job Number:** 73044  
**Rig Name:** H&P 267  
**Ground Level:** 2779.60 ft  
**Kelly Bushing:** 2804.60 ft  
**Permanent Datum:** Ground Level  
**Drilling Measured From:** Kelly Bushing  
**Spud Date:** August 27, 2023  
**Bottom Hole Temp:** 143.00°F  
**Log Start Depth:** 3500.00 ft  
**Log End Depth:** 11150.00 ft  
**Data Start Depth (MD):** 3372.49 ft  
**Data End Depth (MD):** 11115.00 ft

**Company Representative:** Danny Lacaze  
**Directional Driller(s):** Brandon Davis, Jordan Williams, Mike Karim, Steve Amstutz  
**MWD Operator(s):** Barry Ferguson, Joshua Sotelo, Christopher Marks, Zachary Kyle

## Reference Data

**North Reference:** Grid  
**Magnetic Declination:** 6.48°  
**Grid Convergence:** -1.60°  
**Total Correction:** 8.08°

**Geologist**

**Comments:**

**Leg Name:**

Main Leg

PHOENIX TECHNOLOGY SERVICES LP ("PHOENIX") DOES NOT MAKE AND EXPRESSLY DISCLAIMS ALL WARRANTIES, REPRESENTATIONS AND CONDITIONS, WITH RESPECT TO THE INFORMATION CONTAINED IN THIS DOCUMENT, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED OR ARISING FROM CONTRACT OR STATUTE INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY, ACCURACY AND FITNESS FOR A PARTICULAR PURPOSE. ANYONE USING THIS INFORMATION DOES SO AT THEIR OWN RISK AND ACKNOWLEDGES AND AGREES THAT PHOENIX SHALL NOT BE LIABLE FOR ANY ERROR, OMISSION, DEFECT, DEFICIENCY, OR NONCONFORMITY IN THE INFORMATION AND WITHOUT LIMITING THE FOREGOING, PHOENIX DOES NOT WARRANT THAT THE INFORMATION (OR THE USE THEREOF) WILL BE FREE OF ALL ERRORS OR THAT IT DOES NOT INFRINGE ANY THIRD PARTY RIGHTS. ANYONE USING THE INFORMATION AGREES TO INDEMNIFY AND HOLD PHOENIX HARMLESS FROM ALL CLAIMS, ACTIONS, COSTS (INCLUDING LEGAL COSTS ON A SOLICITOR AND HIS OWN CLIENT BASIS) AND LIABILITIES ARISING FROM OR IN CONNECTION WITH THE USE OF THE INFORMATION.

## Operational Run Summary

73044

	Run 1	Run 2	Run 3	Run 4	Run 5
Run Start Depth (ft)	131.00	1995.00	5215.00	8872.00	9977.00
Run End Depth (ft)	1995.00	5215.00	8872.00	9977.00	11115.00
Run Start Date	8/27/2023	9/7/2023	9/8/2023	9/11/2023	9/12/2023
Run Start Time	3:15 AM	4:15 AM	6:10 PM	4:15 AM	6:30 PM
Run End Date	8/27/2023	9/8/2023	9/11/2023	9/12/2023	9/13/2023
Run End Time	11:45 PM	5:10 PM	3:15 AM	4:45 PM	10:48 PM

## Tool Offset Diagrams

73044

Run 1	Run 2	Run 3
<ul style="list-style-type: none"> <li>16 HWDP (16)</li> <li>15 XO-HT55 B x NC56 P</li> <li>14 Collars (2)</li> <li>13 Rental Crossover 800</li> <li>12 8" Diffuser</li> <li>11 Rental Slick Collar All Sizes</li> <li>10 15 7/8 NM STAB (BFF)</li> <li>9 800 Gap Sub Assembly Peek Ring PHX Velocity</li> <li>8 800 Centralizer Collar Assembly Velocity</li> <li>7 800 Grounding Sub Assy - Morse Taper</li> <li>6 800 Crossover Sub PHX Velocity</li> </ul>	<ul style="list-style-type: none"> <li>18 HWDP (21)</li> <li>17 XO-HT55 B x NC56 P</li> <li>16 Collars (6)</li> <li>15 Rental Crossover 800</li> <li>14 Rental Slick Collar All Sizes</li> <li>13 800 Gap Sub Assembly Peek Ring PHX Velocity</li> <li>12 800 Centralizer Collar Assembly Velocity</li> <li>11 800 Grounding Sub Assy - Morse Taper</li> <li>10 800 Crossover Sub PHX Velocity</li> <li>9 12 1/8 NM STAB (NOT BFF)</li> <li>8 Rental Slick Pony Collar All Sizes</li> <li>7 Bico 9" 7/8 4.8 FXD NO AKO</li> </ul>	<ul style="list-style-type: none"> <li>16 HWDP (21)</li> <li>15 XO-HT55 B x NC56 P</li> <li>14 Collars (6)</li> <li>13 Rental Crossover 800</li> <li>12 8" Diffuser</li> <li>11 8" Pile Driver</li> <li>10 12 1/8 STEEL STAB ( BFF)</li> <li>9 Rental Slick Collar All Sizes</li> <li>8 800 Gap Sub Assembly Peek Ring PHX Velocity</li> <li>7 800 Centralizer Collar Assembly Velocity</li> <li>6 800 Grounding Sub Assy - Morse Taper</li> </ul>



## Gamma Ray

Scale:  <b>1:1200 Measured Depth</b>	<b>Company:</b> Anadarko E&P Onshore, LLC
	<b>Well:</b> University 19-0-7-16 C 13HB
	<b>Field:</b> Phantom (Wolfcamp)
Depth Reference:  <b>Driller's Depth</b>	<b>County:</b> Loving <b>Country:</b> United States
	<b>State:</b> Texas
Status:  <b>Final Print</b>	Surface Location: Latitude: 31° 42' 06.492" N Longitude: 103° 26' 43.733" W
API: 42301364620000	Other Services:  Directional
Job ID: 111962796	

## Operational Summary

## Rig &amp; Elevations

Dates	Drilled (ft)	Logged (ft)	Rig Contractor: Helmerich & Payne Drilling Co	Rig: H&P 267	Elev. KB: (ft)	N/A
From: 2023-09-18	Top: 11115.00	Top: 11102.00	Permanent Datum (P.D.): Mean Sea Level	Elevation: (ft) 0.00	Elev. DF: (ft)	2804.60
To: 2023-09-22	Bottom: 21642.00	Bottom: 21629.00	Log Measured From: Rig Floor	Above P.D.: (ft) 2804.60	Elev. GL: (ft)	2779.60

(C) 2023 Baker Hughes Company - All rights reserved. Baker Hughes and its affiliates provides this information on an "as is" basis for general information purposes and believes it to be accurate as of the date of publication. Baker Hughes does not make any representation as to the accuracy or completeness of the information and makes no warranties of any kind, specific, implied or oral, to the fullest extent permissible by law, including those of merchantability and fitness for a particular purpose or use. Baker Hughes hereby disclaims any and all liability for any direct, indirect, consequential or special damages, claims for lost profits, or third party claims arising from the use of the information, whether a claim is asserted in contract, tort, or otherwise. The Baker Hughes logo is a trademark of Baker Hughes Company.

## Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours (h)
						Top (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	
1	1	8.500	PDC	5.50	AutoTrak Curve	11102.00	21629.00	11115.00	21642.00	2023-09-18 00:15	2023-09-22 06:10	149.60

## Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Chris Hudon	2023-09-14	2023-09-25	Deron Sherman	2023-09-14	2023-09-25	Dustin Ogaard	2023-09-14	2023-09-25
Henry Mata	2023-09-14	2023-09-21	Jon Roop	2023-09-15	2023-09-21	Cody Flemming	2023-09-21	2023-09-22
John Gordon	2023-09-21	2023-09-25						

## Witness

Name	Run
Brandon/Justin	1

## Mud Properties Record

Date / Time	Run No.	Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2023-09-18 06:00	1	11115.00	Oil Based Mud	13.5	35	N/A	3.0	52/18.5	Flow Line	30888	N/A
2023-09-18 18:00	1	12100.00	Oil Based Mud	13.5	31	N/A	3.0	54/18	Flow Line	33557	N/A
2023-09-20 06:04	1	14600.00	Oil Based Mud	13.6	31	N/A	3.6	53.5/18	Flow Line	33557	N/A

## Equipment and Service Data

Run No.	Tool	Serial Number	Measurement	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
1	AutoTrak Curve Steering Unit	14645504	Near Bit VSS	5.93	6.83	6.938	4.330
1	AutoTrak Curve Steering Unit	14645504	Near Bit Inclination	5.93	6.83	6.938	4.330
1	AutoTrak Curve MWD	14375797	Gamma (single)	2.20	12.43	6.938	3.250
1	AutoTrak Curve MWD	14375797	Directional (mag)	12.27	22.50	6.938	3.250

## Service and Tool Mnemonics

Mnemonic	Name	Description
ATC SU	AutoTrak Curve SU	Auto Trak Curve Steering Unit
ATC MWD	AutoTrak Curve MWD	Auto Trak Curve MWD
ATC LCPM	AutoTrak Curve LCPM	Auto Trak Curve LCPM

## Comments

- Multiple GAPS in logs due to totco computer shutting down by it self, customer aware and approved drilling ahead with said issue.
- Baker Hughes Company run 1 utilized 6 3/4 inch NaviGamma services (Gamma Ray and Directional) behind an 8 1/2 inch PDC bit and rotary steerable assembly from 11115 to 21642 feet MD (11018 to 11572 feet TVD).
- Depth measurements were obtained from a depth control system not supplied or operated by Baker Hughes. Due to a lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified and the unverified depths as supplied to Baker Hughes are being used to present logging data.

## Remarks

Number	Depth (ft)	Hole Section (in)	Run No.	Remark
1	21629.00	8.500	1	The interval from 21629 to 21642 feet MD (11572 to 11572 feet TVD) was not logged due to sensor to bit offset at well TD.

## Curve Mnemonics

Presented Curves	Description	Units
ROP_AVG	Rate of Penetration of bit, Average	ft/h
TVD	True Vertical Depth	ft
WOB_AVG	Weight On Bit, Average	klb
GRAM	Gamma Ray - Apparent - Memory 3 ft Average	API
GRIM	Gamma Ray - Data Point Indicator - Memory	unitless
TCDM	Downhole Temperature - Memory	degF
API/DP/XY/CE/MA	XY/CE/MA	unitless