

30 015 41332

**OXY USA**  
**Eddy County**  
**AYFU #19**  
**Surveys: 443MD - 4867MD**  
**UWI No. 30-015-41332**

# **National Oilwell Varco Survey Report**

**NM OIL CONSERVATION**  
ARTESIA DISTRICT

**JUL 07 2014**

**14 April 2014**

**RECEIVED**

UWI No. 30-015-41332

Surface Coordinates: 662727.60 N, 546015.20 E (32° 49' 18.6093" N, 104° 11' 00.7560" W)  
Grid Coordinate System: NAD27 New Mexico State Planes, Eastern Zone, US Foot

Surface Coordinates relative to Map Coordinates: 662727.60 N, 546015.20 E (Grid)  
Surface Coordinates relative to Map Coordinates: 662727.60 N, 546015.20 E (Grid)

Kelly Bushing Elevation: 3644.10ft above Mean Sea Level  
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Kelly Bushing Elevation: 14.00ft above Ground Level  
Ground Level: 3630.10ft

Survey Ref: svy47

Survey Depth (ft)	Incl. (°)	(Grid) Azim. (°)	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
443.00	2.300	248.068	442.88	3.32 S	8.25 W	7.36	0.519
503.00	2.200	250.308	502.83	4.16 S	10.45 W	9.33	0.222
595.00	1.770	255.628	594.78	5.11 S	13.49 W	12.10	0.508
685.00	1.620	255.028	684.74	5.78 S	16.06 W	14.47	0.168
776.00	1.520	260.888	775.71	6.30 S	18.50 W	16.74	0.208
927.00	1.270	270.148	926.66	6.62 S	22.15 W	20.25	0.222
1117.00	0.800	272.668	1116.63	6.55 S	25.58 W	23.61	0.248
1290.00	0.750	257.908	1289.61	6.73 S	27.89 W	25.83	0.119
1463.00	0.660	295.788	1462.60	6.53 S	29.90 W	27.84	0.269
1895.00	0.770	262.288	1894.57	5.84 S	35.01 W	32.98	0.098
2024.00	0.300	281.528	2023.56	5.89 S	36.20 W	34.14	0.385
2326.00	0.570	297.498	2325.56	5.04 S	38.31 W	36.38	0.097
2629.00	0.740	285.338	2628.54	3.82 S	41.53 W	39.78	0.072
2931.00	0.680	302.138	2930.51	2.36 S	44.93 W	43.41	0.071
3190.00	0.460	297.478	3189.50	1.06 S	47.16 W	45.86	0.087
3449.00	0.560	291.348	3448.49	0.12 S	49.26 W	48.12	0.044
3622.00	0.670	348.198	3621.48	1.18 N	50.25 W	49.36	0.343
3881.00	0.530	338.608	3880.47	3.78 N	51.00 W	50.64	0.066
4183.00	0.410	335.188	4182.46	6.06 N	51.96 W	52.07	0.041
4428.00	0.550	318.728	4427.45	7.74 N	53.10 W	53.54	0.080
4867.00	0.810	333.628	4866.42	12.10 N	55.87 W	57.17	0.071

All data is in Feet (US Survey) unless otherwise stated. Directions and coordinates are relative to Grid North. Vertical depths are relative to AYFU #19. Northings and Eastings are relative to AYFU #19.

The dogleg severity is in Degrees per 100 feet (US Survey). Vertical Section is from AYFU #19 calculated along an azimuth of 282.222° (Grid).

Based upon minimum curvature calculations, at a measured depth of 4867.00ft, the bottom hole displacement is 57.17ft, in the direction of 282.222° (Grid).

The along-hole displacement is 65.88ft. The total accumulated dogleg is 7.569°. The measured tortuosity is 0.159°/100ft. The directional difficulty index is 2.2.

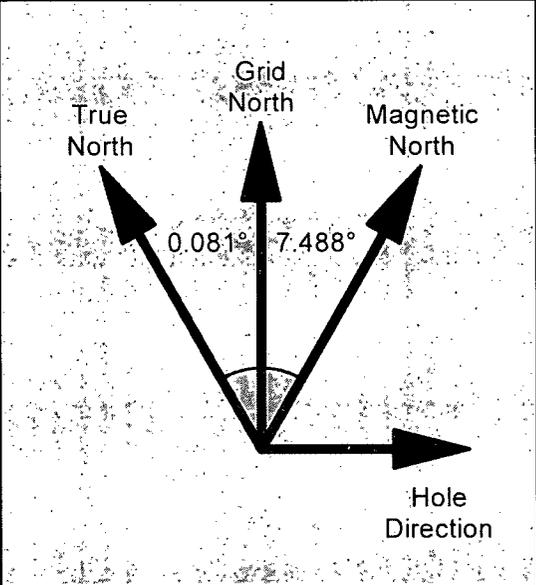
## Survey Tool Program for AYFU #19, Surveys: 443MD - 4867MD

Measured Depth (ft)	From		To		Survey Tool Description
	Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	
0.00	0.00	4867.00	4866.42	FloSurvey TiltOnlyMEM	

REFERENCE DATA			
Ellipsoid	Clarke - 1866	Unit System	Feet (Us Survey)
Coord. System	NAD27 New Mexico State Planes, Eastern Zone, US Foc	North Ref.	Grid North
Mag. Model	igrf2010.dat	Vertical Ref.	Mean Sea Level
Calc. Date	09 Apr, 2014		

LOCATION DATA			
RKB Elevation	3644.10ft above MSL	Total Field	48624.4 nT
Map North	662727.60 N	Magnetic Dip	60.565°
Map East	546015.20 E	Declination	7.569°
Latitude	32° 49' 18.6093" N	Convergence	0.081°
Longitude	104° 11' 00.7560" W		

NORTH REFERENCE DATA	
Magnetic Model	igrf2010.dat
Calculation Date	Wednesday, April 09, 2014
Declination	7.569°
Inclination/Dip	60.565°
Horizontal Component	23896.0 nT
Northerly Component	23688.5 nT
Easterly Component	3147.1 nT
Vertical Component	42347.5 nT
Total Field Strength	48624.4 nT
Grid North is 0.081 degrees East of True North (Grid Convergence)	
Magnetic North is 7.569 degrees East of True North (Magnetic Declination)	
Magnetic North is 7.488 degrees East of Grid North (Magnetic Convergence)	
To convert a True Direction to a Grid Direction, Subtract 0.081 degrees.	
To convert a Magnetic Direction to a True Direction, Add 7.569 degrees.	
To convert a Magnetic Direction to a Grid Direction, Add 7.488 degrees.	



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National Oilwell Varco are not responsible for any actions (or lack thereof) taken as a result of relying on or in any way using information contained in this document and in no event shall be liable for any damages resulting from reliance on or use of this information.



**FloSurvey - Real Time Survey Tool**

1200 Cypress Creek Road  
Cedar Park, TX 78613  
Phone: (512)340-5000  
Fax: (512)340-5441

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April 14, 2014

Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

CLIENT: OXY USA  
WELL: AYFU #19  
FIELD: N/A  
RIG: Savanna 415  
COUNTY: Eddy  
API NO: 30-015-41332

We hereby certify that the enclosed field survey data performed on the referenced well by National Oilwell Varco, contained in this report represents to the best of our knowledge, a true and accurate survey of the surveyed section of the well at the time the survey was run.

Other information required by your office is as follows.

<u>Name &amp; Title of Surveyor</u>	<u>Drainhole Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Mickey Henderson Field Service Technician	AYFU #19 Original Hole	443 Ft to 4867 Ft	April 9, 2014 to April 13, 2014	FloSurvey

If any other information is required, please contact the undersigned at the above letterhead and phone number.  
Sincerely,

Tyler Andreason  
Field Service Manager

CC: OXY USA  
Enclosures: [2]  
County of Eddy  
State of New Mexico

Attn: Linsay Earle  
5 Greenway Plaza, Suite 110  
Houston, Texas 77046

Attn: Ryan Yeatman  
5 Greenway Plaza, Suite 110  
Houston, Texas 77046

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I, Mickey Henderson certify that; I am employed by National Oilwell Varco, L.P.; that the surveys taken on the day(s) of April 09, 2014 through April 13, 2014, from a depth of 443 Ft feet to a depth of 4867 Ft feet; are to the best of my knowledge, the data is true, correct, complete and within the limitations of the tool as set forth by National Oilwell Varco, L.P.; that I am authorized and qualified to make this report; that this survey was conducted at the request of OXY USA for the AYFU #19 Well (Original Hole) API No. 30-015-41332 in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principals and procedures as set forth by National Oilwell Varco, L.P.

Signature



Mickey Henderson  
Field Service Technician