

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 21 2014

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National Oilwell Varco - Certification Sheet



NATIONAL OILWELL VARCO

FloSurvey - Real Time Survey Tool

1200 Cypress Creek Road

Cedar Park, TX 78613

Phone: (512)340-5000

Fax: (512)340-5441

30-015-41328

May 8, 2014

Oil Conservation Division

1220 South St. Francis Dr.

Santa Fe, NM 87505

CLIENT: OXY
WELL: AYFU #22
FIELD: N/A
RIG: Savanna 415
COUNTY: Eddy
API NO: 30-015-41328

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 & Title of Surveyor</u>	<u>Drainhole Number</u>	<u>Surveyed Depths</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
Jose Olivas Field Service Technician	AYFU #22 Original Hole	401.00 Ft to 4854.00 Ft	May-5-2014 to May-7-2014	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
Enclosures: [2]
County of Eddy
State of New Mexico

Attn: Lindsay Earle
5 Greenway Plaza, Suite 110
Houston, Texas 77406

Attn: Ryan Yeatman
5 Greenway Plaza, Suite 110
Houston, Texas 77406

FloSurvey - Real Time Survey Tool

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I, Jose Olivas certify that; I am employed by National Oilwell Varco, L.P.; that the surveys taken on the day(s) of May-5-2014 through May-7-2014, from a depth of 401.00 Ft feet to a depth of 4854 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 for the AYFU #22 Well (Original Hole) API No. 30-015-41328 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



Jose Olivas

Field Service Technician

NM OIL CONSERVATION
ARTESIA DISTRICT

AUG 21 2014

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OXY USA
Eddy County
AYFU #22
Surveys: 401`MD - 4854`MD
UWI No. 30-015-41328

National Oilwell Varco

Survey Report

02 June 2014

UWI No. 30-015-41328

Surface Coordinates: 663082.60 N, 547576.50 E (32° 49' 22.0999" N, 104° 10' 42.4534" W)
Grid Coordinate System: NAD27 New Mexico State Planes, Eastern Zone, US Foot

Surface Coordinates relative to Map Coordinates: 663082.60 N, 547576.50 E (Grid)
Surface Coordinates relative to Map Coordinates: 663082.60 N, 547576.50 E (Grid)

Kelly Bushing Elevation: 3634.10ft above Mean Sea Level
Kelly Bushing Elevation: 3634.10ft above Mean Sea Level

Kelly Bushing Elevation: 14.00ft above Ground Level
Ground Level: 3620.10ft

Survey Ref: svy61

Survey Depth (ft)	Incl. (°)	(Grid) Azim. (°)	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
401.00	0.000	0.000	401.00	0.00 N	0.00 E	0.00	
482.00	0.690	148.460	482.00	0.42 S	0.26 E	0.17	0.852
754.00	0.730	170.390	753.98	3.52 S	1.40 E	1.88	0.100
948.00	0.340	185.670	947.97	5.31 S	1.55 E	3.19	0.212
1255.00	0.340	198.090	1254.96	7.08 S	1.18 E	4.81	0.024
1438.00	0.670	221.890	1437.96	8.40 S	0.29 E	6.38	0.210
1656.00	0.580	223.300	1655.94	10.15 S	1.31 W	8.75	0.042
1965.00	0.440	225.160	1964.93	12.12 S	3.23 W	11.49	0.046
2267.00	0.460	228.780	2266.92	13.74 S	4.96 W	13.84	0.012
2466.00	0.310	239.150	2465.92	14.54 S	6.02 W	15.13	0.083
2818.00	0.180	275.850	2817.91	14.97 S	7.39 W	16.32	0.056
3034.00	0.360	264.090	3033.91	15.01 S	8.40 W	16.98	0.087
3120.00	0.370	247.100	3119.91	15.14 S	8.93 W	17.41	0.126
3294.00	0.110	255.530	3293.91	15.41 S	9.61 W	18.04	0.150
3469.00	0.290	270.310	3468.91	15.44 S	10.21 W	18.44	0.106
3551.00	0.340	256.130	3550.91	15.50 S	10.66 W	18.76	0.112
3728.00	0.220	213.950	3727.90	15.91 S	11.36 W	19.52	0.130
3977.00	0.380	222.920	3976.90	16.91 S	12.19 W	20.82	0.067
4115.00	0.160	270.530	4114.90	17.24 S	12.69 W	21.39	0.215
4323.00	0.160	246.550	4322.90	17.36 S	13.25 W	21.83	0.032
4495.00	0.150	214.690	4494.90	17.64 S	13.60 W	22.27	0.050
4669.00	0.470	232.470	4668.89	18.26 S	14.29 W	23.19	0.190
4802.00	0.430	221.790	4801.89	18.96 S	15.06 W	24.21	0.070
4854.00	0.490	227.680	4853.89	19.26 S	15.35 W	24.63	0.147

All data is in Feet (US Survey) unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to AYFU #22. Northings and Eastings are relative to AYFU #22.

The dogleg severity is in Degrees per 100 feet (US Survey).
Vertical Section is from AYFU #22 calculated along an azimuth of 218.557° (Grid).

Based upon minimum curvature calculations, at a measured depth of 4854.00ft,
the bottom hole displacement is 24.63ft, in the direction of 218.557° (Grid).

The along-hole displacement is 28.79ft. The total accumulated dogleg is 4.126°.
The measured tortuosity is 0.090°/100ft. The directional difficulty index is 1.6.

Survey Tool Program for AYFU #22, Surveys: 401`MD - 4854`MD

From Measured Depth (ft)	Vertical Depth (ft)	To Measured Depth (ft)	Vertical Depth (ft)	Survey Tool Description
401.00	401.00	4854.00	4853.89	FloSurvey TiltOnlyMEM

REFERENCE DATA			
Ellipsoid	Clarke - 1866	Unit System	Feet (Us Survey)
Coord. System	NAD27 New Mexico State Planes, Eastern Zone, US Foot	North Ref.	Grid North
Mag. Model	igrf2010.dat	Vertical Ref.	Mean Sea Level
Calc. Date	02 May, 2014		

LOCATION DATA			
RKB Elevation	3634.10ft above MSL	Total Field	48619.3 nT
Map North	663082.60 N	Magnetic Dip	60.565°
Map East	547576.50 E	Declination	7.559°
Latitude	32° 49' 22.0999" N	Convergence	0.084°
Longitude	104° 10' 42.4534" W		

NORTH REFERENCE DATA	
Magnetic Model	igrf2010.dat
Calculation Date	Friday, May 02, 2014
Declination	7.559°
Inclination/Dip	60.565°
Horizontal Component	23893.4 nT
Northerly Component	23686.4 nT
Easterly Component	3142.6 nT
Vertical Component	42343.2 nT
Total Field Strength	48619.3 nT
Grid North is 0.084 degrees East of True North (Grid Convergence)	
Magnetic North is 7.559 degrees East of True North (Magnetic Declination)	
Magnetic North is 7.475 degrees East of Grid North (Magnetic Convergence)	
To convert a True Direction to a Grid Direction, Subtract 0.084 degrees.	
To convert a Magnetic Direction to a True Direction, Add 7.559 degrees.	
To convert a Magnetic Direction to a Grid Direction, Add 7.475 degrees.	

The diagram illustrates the angular relationships between three types of North: True North, Grid North, and Magnetic North. True North is represented by a vertical arrow pointing upwards. Grid North is an arrow pointing slightly to the right of True North, with an angle of 0.084° indicated between them. Magnetic North is an arrow pointing further to the right, with an angle of 7.559° indicated between True North and Magnetic North. The angle between Grid North and Magnetic North is labeled as 7.475°. A horizontal arrow pointing to the right is labeled 'Hole Direction'.

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Occidental Oil & Gas Corp – Permian Primary – North NM/Terrell RMT

Well: Artesia Yeso Federal Unit #22

API: 30-015-41328

State: New Mexico

County: Eddy

T17S R28E, Sec 21

514' FNL & 1716' FEL

Field: Empire

TD: 4,897'

PBTD: 4,853'

KB: 3,634' ASL

Casing Size:

Grade/Weight:

Depth:

Cement:

8-5/8"

J-55 / 24#

400'

200 sx, 53sx circ'd to surf

5-1/2"

L-80.BTC / 17#

4,897'

800 sx, 148sx circ'd to surf

Surf Csg: 8-5/8" 24# J-55
Cement: 200 sx, 53sx circ'd to surf

Surf Csg @ 400'

Perforation Intervals

Stage #	Depth
3	4067-4069
	4092-4094
	4120-4121
	4206-4208
2	4261-4262
	4278-4280
	4300-4302
	4325-4326
	4356-4359
	4406-4408
1	4610-4611
	4646-4648
	4730-4731
	4794-4798

Top Glorieta @ 3,381'

Top Paddock @ 3,496'

Paddock Base @ 3,728'

Top Blinebry @ 3,900'

PBTD @ 4,853'

Prod Csg: 5-1/2" 17# L-80 BTC
Cement: 800 sx, 148sx circ'd to surf

Prod Csg @ 4,897'

TD @ 4,897'