



NATIONAL OILWELL VARCO

FloSurvey - Real Time Survey Tool

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

May 14, 2014

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

CLIENT: OXY USA
WELL: AYFU #23
FIELD: N/A
RIG: Savanna 415
COUNTY: Eddy
API NO: 30-015-41334

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>
Mickey Henderson Field Service Technician	AYFU #23 Original Hole	444 Ft to 4849 Ft	May 9, 2014 to May 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

FloSurvey - Real Time Survey Tool

1200 Cypress Creek Road

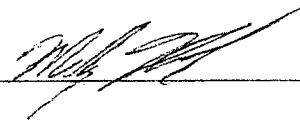
Cedar Park, TX 78613

Phone: (512) 340-5000

Fax: (512) 340-5441

I, Mickey Henderson certify that; I am employed by National Oilwell Varco, L.P.; that the surveys taken on the day(s) of May 09, 2014 through May 13, 2014, from a depth of 444 Ft feet to a depth of 4849 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 A YFU #23 Well (Original Hole) API No. 30-015-41334 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

OXY USA
Eddy County
AYFU #23
Surveys: 444`MD - 4849`MD
UWI No. 30-015-41334

National Oilwell Varco

Survey Report

02 June 2014

UWI No. 30-015-41334

Surface Coordinates: 663603.90 N, 543451.90 E (32° 49' 27.3156" N, 104° 11' 30.7810" W)
Grid Coordinate System: NAD27 New Mexico State Planes, Eastern Zone, US Foot.

Surface Coordinates relative to Map Coordinates: 663603.90 N, 543451.90 E (Grid)
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Kelly Bushing Elevation: 3628.70ft above Mean Sea Level
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Kelly Bushing Elevation: 14.00ft above Ground Level
Ground Level: 3614.70ft

Survey Ref: svy63

Survey Depth (ft)	Incl. (°)	(Grid) Azim. (°)	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (%/100ft)
402.00	0.000	0.000	402.00	0.00 N	0.00 E	0.00	
444.00	2.050	332.690	443.99	0.67 N	0.34 W	0.54	4.881
591.00	1.550	321.460	590.92	4.56 N	2.79 W	4.13	0.415
844.00	0.910	316.730	843.86	8.70 N	6.30 W	8.80	0.256
1194.00	0.740	284.720	1193.82	11.30 N	10.39 W	13.52	0.138
1712.00	0.860	260.550	1711.78	11.51 N	17.46 W	20.27	0.069
1971.00	0.790	253.840	1970.75	10.69 N	21.09 W	23.43	0.046
2230.00	0.400	237.810	2229.73	9.71 N	23.57 W	25.45	0.162
2489.00	0.080	259.500	2488.73	9.20 N	24.51 W	26.18	0.126
2774.00	0.140	344.780	2773.73	9.50 N	24.80 W	26.55	0.055
3076.00	0.180	12.270	3075.73	10.32 N	24.80 W	26.81	0.028
3499.00	0.160	251.200	3498.73	10.78 N	25.22 W	27.36	0.070
3871.00	0.480	252.550	3870.72	10.14 N	27.19 W	29.02	0.086
4201.00	0.480	284.520	4200.71	10.07 N	29.85 W	31.50	0.080
4357.00	0.580	288.700	4356.71	10.49 N	31.23 W	32.94	0.069
4849.00	0.740	295.610	4848.67	12.66 N	36.46 W	38.59	0.036

All data is in Feet (US Survey) unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to AYFU #23. Northings and Eastings are relative to AYFU #23.

The dogleg severity is in Degrees per 100 feet (US Survey).
Vertical Section is from AYFU #23 calculated along an azimuth of 289.155° (Grid).

Based upon minimum curvature calculations, at a measured depth of 4849.00ft,
the bottom hole displacement is 38.59ft, in the direction of 289.155° (Grid).

The along-hole displacement is 44.29ft. The total accumulated dogleg is 5.964°.
The measured tortuosity is 0.129°/100ft. The directional difficulty index is 1.9.

Survey Tool Program for AYFU #23, Surveys:444`MD - 4849`MD

From Measured Depth (ft)	Vertical Depth (ft)	To Measured Depth (ft)	Vertical Depth (ft)	Survey Tool Description
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402.00	402.00	4849.00	4848.67	FloSurvey TiltOnlyMEM
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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	09 May, 2014		

LOCATION DATA			
RKB Elevation	3628.70ft above MSL	Total Field	48617.1 nT
Map North	663603.90 N	Magnetic Dip	60.564°
Map East	543451.90 E	Declination	7.564°
Latitude	32° 49' 27.3156" N	Convergence	0.077°
Longitude	104° 11' 30.7810" W		

NORTH REFERENCE DATA	
Magnetic Model	igrf2010.dat
Calculation Date	Friday, May 09, 2014
Declination	7.564°
Inclination/Dip	60.564°
Horizontal Component	23893.3 nT
Northerly Component	23686.1 nT
Easterly Component	3144.4 nT
Vertical Component	42340.7 nT
Total Field Strength	48617.1 nT
Grid North is 0.077 degrees East of True North (Grid Convergence)	
Magnetic North is 7.564 degrees East of True North (Magnetic Declination)	
Magnetic North is 7.487 degrees East of Grid North (Magnetic Convergence)	
To convert a True Direction to a Grid Direction, Subtract 0.077 degrees.	
To convert a Magnetic Direction to a True Direction, Add 7.564 degrees.	
To convert a Magnetic Direction to a Grid Direction, Add 7.487 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. Grid North is an arrow pointing slightly east of True North, with an angle of 0.077° indicated between them. Magnetic North is an arrow pointing further east, with an angle of 7.487° indicated between Grid North and Magnetic North. A horizontal arrow pointing to the right is labeled 'Hole Direction'.

Disclaimer Notice

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

Well: Artesia Yeso Federal Unit #23

API: 30-015-41334

State: New Mexico

County: Eddy

T17S R28E, Sec 20

929' FNL & 974' FEL

Field: Empire

TD: 4,900'

PBTD: 4,861'

KB: 3,629' ASL

Casing Size:

Grade/Weight:

Depth:

Cement:

8-5/8"

J-55 / 24#

402'

200 sx, 42sx circ'd to surf

5-1/2"

L-80 BTC / 17#

4,900'

800 sx, 145sx circ'd to surf

Surf Csg: 8-5/8" 24# J-55
Cement: 200 sx, 42sx circ'd to surf

Surf Csg @ 402'

Perforation Intervals

Stage #	Depth
3	3980-3982
	4030-4032
	4086-4090
2	4170-4172
	4192-4194
	4306-4307
	4318-4319
	4357-4358
	4375-4377
1	4550-4554
	4590-4594
	4640-4642
	4706-4707

Top Glorieta @ 3.333'

Top Paddock @ 3.424'

Paddock Base @ 3.677'

Top Blinebry @ 3.814'

PBTD @ 4,861'

Prod Csg: 5-1/2" 17# L-80 BTC
Cement: 800 sx, 145sx circ'd to surf

Prod Csg @ 4,900'

TD @ 4,900'

