FloSurvey - Real Time Survey Tool
1200 Cypress Creek Road
Cedar Park, TX 78613
Phone: (512)340-5000
Fax: (512)340-5441

30-015-41335

April 26, 2014

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

CLIENT: OXY
WELL: AYFU #20
FIELD: N/A
RIG: Savanna #415
COUNTY: Eddy
API NO: 30-015-41335

We hereby certify that the enclosed field survey data performed on the referenced well by National Oilwel 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.

Name & Title of Surveyor	Drainhole Number	Surveyed Depths		Dates Performed		Type of Survey
Jose Olivas Field Service Technician	AYFU #20 Original Hole	434.00 Ft 4881.00 Ft	to	April 20, 2014 April 23, 2014	to	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: Linsay 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
1200 Cypress Creek Road
Cedar Park, TX 78613
Phone: (512) 340-5000
Fax: (512) 340-5441

I, Jose Olivas certify that; I am employed by National Oilwell Varco, L.P.; that the surveys taken on the day(s) of April 20, 2014 through April 23, 2014, from a depth of 434.00 Ft feet to a depth of 4881 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 #20 Well (Original Hole) API No. 30-015-41335 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

OXY USA
Eddy County
AYFU #20
Surveys: 434`MD - 4881`MD
UWI No. 30-015-41335

National Oilwell Varco
Survey Report

26 April 2014

UWI No. 30-015-41335

Surface Coordinates: 663655.10 N, 547880.50 E (32° 49' 27.7606" N, 104° 10' 38.8809" W)
Grid Coordinate System: NAD27 New Mexico State Planes, Eastern Zone, US Foot

Surface Coordinates relative to Map Coordinates: 663655.10 N, 547880.50 E (Grid)
Surface Coordinates relative to Map Coordinates: 663655.10 N, 547880.50 E (Grid)

Kelly Bushing Elevation: 3622.10ft above Mean Sea Level
Kelly Bushing Elevation: 3622.10ft above Mean Sea Level

Kelly Bushing Elevation: 14.00ft above Ground Level
Ground Level: 3608.10ft

Survey Ref: svy54

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	
434.00	1.520	237.730	433.95	3.07 S	4.87 W	5.70	0.350
648.00	1.070	238.880	647.89	5.62 S	8.98 W	10.49	0.211
835.00	0.910	218.110	834.87	7.69 S	11.39 W	13.66	0.209
1037.00	0.440	222.620	1036.85	9.53 S	12.90 W	16.00	0.234
1334.00	0.130	263.490	1333.85	10.40 S	14.01 W	17.42	0.119
1462.00	0.320	305.810	1461.85	10.21 S	14.45 W	17.62	0.188
1681.00	0.390	302.130	1680.84	9.46 S	15.57 W	18.00	0.034
1894.00	0.290	296.420	1893.84	8.83 S	16.67 W	18.43	0.050
2024.00	0.630	252.320	2023.84	8.90 S	17.64 W	19.22	0.360
2247.00	0.520	259.520	2246.82	9.46 S	19.81 W	21.24	0.059
2463.00	0.410	247.170	2462.82	9.94 S	21.48 W	22.82	0.069
2765.00	1.140	211.550	2764.79	12.91 S	24.05 W	26.71	0.279
3022.00	1.340	223.240	3021.73	17.28 S	27.45 W	32.12	0.125
3243.00	1.040	214.250	3242.68	20.82 S	30.35 W	36.62	0.159
3455.00	0.790	225.390	3454.65	23.44 S	32.47 W	39.93	0.144
3839.00	0.450	219.500	3838.63	26.46 S	35.31 W	44.05	0.090
4280.00	0.420	201.210	4279.62	29.31 S	37.00 W	47.18	0.032
4496.00	0.570	197.880	4495.61	31.07 S	37.62 W	48.78	0.071
4669.00	0.570	216.650	4668.60	32.58 S	38.39 W	50.35	0.107
4881.00	0.530	251.300	4880.59	33.74 S	39.95 W	52.29	0.156

All data is in Feet (US Survey) unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to AYFU #20. Northings and Eastings are relative to AYFU #20.

The dogleg severity is in Degrees per 100 feet (US Survey).
Vertical Section is from AYFU #20 calculated along an azimuth of 229.822° (Grid).

Based upon minimum curvature calculations, at a measured depth of 4881.00ft,
the bottom hole displacement is 52.29ft, in the direction of 229.822° (Grid).

The along-hole displacement is 56.13ft. The total accumulated dogleg is 6.750°.
The measured tortuosity is 0.142°/100ft. The directional difficulty index is 2.1.

Survey Tool Program for AYFU #20, Surveys: 434`MD - 4881`MD

From		To		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Survey Tool Description
0.00	0.00	4881.00	4880.59	FloSurvey TiltOnlyMEM

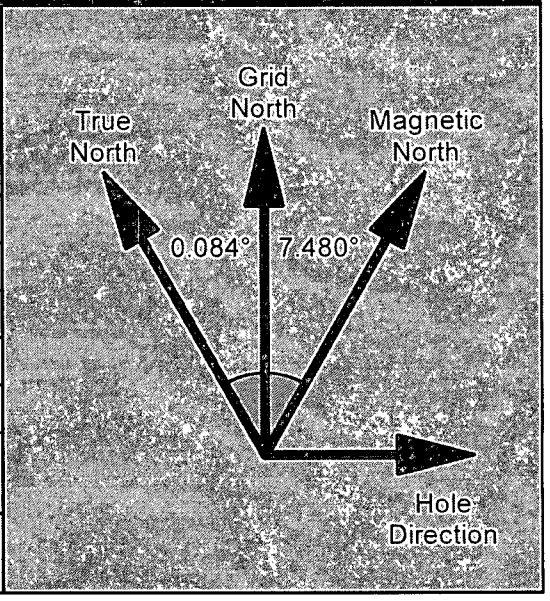
REFERENCE DATA			
Ellipsoid	Clarke - 1866	Unit System	Feet (Us Survey)
Coord. System	NAD27 New Mexico State Planes, Eastern Zone, US Foc	North Ref.	Grid North
Mag. Model	igrf2010.dat	Vertical Ref.	Mean Sea Level
Calc. Date	15 Apr, 2014		

LOCATION DATA			
RKB Elevation	3622.10ft above MSL	Total Field	48625.1 nT
Map North	663655.10 N	Magnetic Dip	60.568°
Map East	547880.50 E	Declination	7.565°
Latitude	32° 49' 27.7606" N	Convergence	0.084°
Longitude	104° 10' 38.8809" W		

NORTH REFERENCE DATA	
Magnetic Model	igrf2010.dat
Calculation Date	Tuesday, April 15, 2014
Declination	7.565°
Inclination/Dip	60.568°
Horizontal Component	23894.2 nT
Northerly Component	23686.9 nT
Easterly Component	3144.9 nT
Vertical Component	42349.4 nT
Total Field Strength	48625.1 nT

Grid North is 0.084 degrees East of True North (Grid Convergence)
Magnetic North is 7.565 degrees East of True North (Magnetic Declination)
Magnetic North is 7.480 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 7.565 degrees.
To convert a Magnetic Direction to a Grid Direction, Add 7.480 degrees.



Disclaimer Notice