

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

David Martin
Cabinet Secretary-Designate

Brett F. Woods, Ph.D.
Deputy Cabinet Secretary

Jami Bailey, Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-4 or 3160-5 form.

Operator Signature Date: December 20, 2013

Application Type:

☐ P&A ☒ Drilling/Casing Change ☐ Recomplete/DHC
☐ Location Change ☒ Other: Change to Horizontal well

Well information:

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf. Owner	UL	Sec	Twp	N/S	Rng
30-045-34754-00-00	NE HOGBACK UNIT	073	CHUZA OIL COMPANY	O	N	San Juan	N	B	10	30	N	16

Conditions of Approval:

Notify NMOCD 24hrs prior to beginning operations

Hold C-104 for "As Drilled Plat" and Directional Survey

Need sundry for name change to 73H

A handwritten signature in black ink, appearing to read "Wendy Hogg", is written over a horizontal line.

NMOCD Approved by Signature

12/30/13

Date

RECEIVED

In Lieu of Form 3160-5

DEC 20 2013

United States
Department of the Interior
Bureau of Land Management
SUNDRY NOTICES AND REPORTS ON WELLS

5. Lease Serial No.	NMNM077281
6. If Indian, Allottee or Tribe	
7. If Unit or CA Agreement	NM-78403A
8. Lease Name and Wel No.	NEHU #73H
9. API Well No.	#30-045-34754
10. Field and Pool, or Explor.	32870 Horseshoe Gallup
11. Sec, T.R.M or BLK and Surv.	RCVD DEC 30 '13 OIL CONS. DIV. DIST. 3

1. Type of Well: Oil	
2. Name of Operator Chuza Oil Company	3b. Phone No. (Include area code) 505-690-7803
3a. Address 1000 Cordova Place #376, Santa Fe NM 87505	
4. Location of Well(Footage, Sec., T.R.M, ect) 1215' FNL / 1960' FEL, Section 10, T30N, R16W, San Juan County, NM 36° 49'57.35256" N. (NAD 83) LONG: 108° 30'35.69145" W. (NAD 83) LAT: 36.83260° N. (NAD 27) LONG: 108.50991° W. (NAD 27)	

12. Check the appropriate box(es) to indicate nature of notice, report or other data

Type of Submission	Type of Action		
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production(Start/Resume)
☐ Subsequent Report	☐ Alter Casing	☐ Fracture Treat	☐ Recomplete
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Constuction	☐ Spud Well
	☒ Change Plans	☐ Plug and Abandon	☐ Other
	☐ Convert to Inject.	☐ Plug Back	

13. Describe Proposed or Completed Operation:

Chuza is currently permitted for a vertical well. Chuza hopes to drill a horizontal well with a ±3,000' lateral into the Lower Gallup Sandstone. Details included in the 8-Point Drilling Plan (attached). Chuza also requests the option of using a closed-loop drilling system during the construction of this well to alleviate possible spacing constraints associated with an in-ground reserve pit (as permitted).

CONDITIONS OF APPROVAL
Adhere to previously issued stipulations.

CONFIDENTIAL

BLM'S APPROVAL OR ACCEPTANCE OF THIS ACTION DOES NOT RELIEVE THE LESSEE AND OPERATOR FROM OBTAINING ANY OTHER AUTHORIZATION REQUIRED FOR OPERATIONS ON FEDERAL AND INDIAN LANDS

I hereby certify that the foregoing is true and correct.

14. Signature	Name (Typed/Printed) Patrick Padilla	Date 12/20/13
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Title President, Chuza Oil Company

Approved by (Signature)	Name (Typed/Printed) William Tambekou	Date 12/23/2013
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Title Petroleum Engineer	Office FFO
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Conditions of approval if any are attached. Approval of this notice does not warrant or certify that the applicant hold legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Title 18 U.S.C Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department to agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

NMOCDA

District IV
1220 S. St. Francis Drive, Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

17 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest or to a voluntary pooling agreement and a compulsory pooling order heretofore entered by the division.

Signature [Signature] Date 12/20/13

Printed Name PATRICK PADILLA

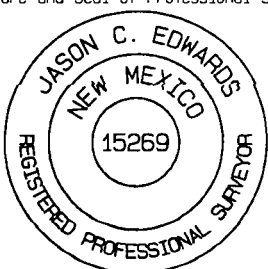
E-mail Address PLPADILLA@CNU.ORG

18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date Survey: DECEMBER 11, 2013

Signature and Seal of Professional Surveyor



JASON C. EDWARDS

Certificate Number 15269



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Project Management
Field Operations
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Chuza: 8-Point Drilling Plan

Northeast Hogback Unit (NEHU) Wells

WELL NAME: NEHU #073 / API: #30-045-34754

1.) GEOLOGY

1.1 Estimated Formation Tops

<u>Formation Name</u>	<u>Depth (TVD)</u>
Upper Mancos Shale	200'
Upper Gallup Top	1,478'
Upper Gallup Bottom	1,516'
Lower Gallup Top	1,576'
Lower Gallup Bottom	1,606'
TD (Pilot Hole)	1,750' TVD
TD (HZ)	±1,600' TVD / ±5,000' MD

1.2 Producing Zone

Lower Gallup Sandstone.

1.3 Water Zones

Water zones will be protected with casing, cement and weighted mud. Freshwater found while drilling will be recorded. Oil and gas shows will be tested for commercial potential based on the engineer's recommendations.

2.) Logging Plan

Logging will be done after finishing pilot hole. Open hole will be logged from ±1,750' to surface casing shoe at 200'. Entire well will be logged using quad-combo log, which includes:

- Gamma Ray Openhole.
- Sonic Scanner Dipole Shear.
- Neutron Density.
- Magnetic Resonance.

2.1 Record and Measure

Gauge any noticeable increases in gas flow. Record all gauges in tour book and in morning reports.

2.2 Mud Logging Program

Mud logger will be on location after setting surface casing to TD.

3.) DRILLING

3.1 Preparatory Work

- Build location with environmentally-friendly contractor.
 - Move in rig up (MIRU) drilling rig.
-



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3.2 Overview

3.2.1 Pilot Hole

- Drill to planned pilot hole depth ($\approx 1,750'$ TVD).
- Run quad-combo logs.
- Run an openhole whipstock.

3.2.2 Horizontal Section

- Kick off using openhole whipstock.
- Drill horizontal well with $\approx 3,000'$ lateral into the Lower Gallup.
- If required, stimulate lateral with multi-stage fracturing to improve drainage and ultimate recovery.

3.3 Drilling Fluid Program

A water-based 8.4 ppg to 9.0 ppg drilling fluid will be used in the vertical section, curve and the lateral. Treat for lost circulation as necessary. Notify engineering of any fluid losses.

4.) Blowout Preventers (BOP)

BOPs are planned to be installed after running and cementing the surface casing. Plans are to use:

- (1) Annular BOP, 11" Shaffer Spherical 3M
- (1) BOP Double Ram, 11" Hydraulic Shaffer LWS 3M

4.1 BOP Testing

- While the drillpipe is in use, the pipe rams and blind rams will be function-tested once each trip.
- The anticipated reservoir pressure is expected to be less than 1,000 psi so the BOPE will be tested to 250 psi (low) for five minutes and 1,500 psi (high) for 10 minutes.
- Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. All tests and inspections will be recorded in the tour book regarding time and results.

5.) Casing Program:

Casing type	Hole Size (in)	Depth (MD ft)	Casing Size (in)	Wt. & Grade	Burst (psi)	Collapse (psi)	Body Yi (ksi)	Joint (ksi)	Drift (in)
Surface	12- $\frac{1}{4}$ "	200'	9- $\frac{5}{8}$ "	J-55, 40.0#	3,950	2,570	630	BTC (714)	8.765 SD
Production	8- $\frac{3}{4}$ "	5,000'	5- $\frac{1}{2}$ "	N-80, 17.0#	7,740	6,280	397	W 521 (276)	4.767

6.) Cement Program

Below are details regarding proposed cement plan. Please note actual cement program might change depending on hole conditions and updated cement company recommendations.

6.1 Surface Casing

Spacer:

Total Spacer = 56.15 ft³ = 10.00 bbl

Primary Cement : (200.00 ft fill)



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40.00 ft * 0.7632 ft³/ft * 100 % = 61.05 ft³
160.00 ft * 0.3132 ft³/ft * 100 % = 100.22 ft³
Total Primary Cement = 161.27 ft³ = 28.72 bbl

Shoe Joint Volume: (40.00 ft fill)

40.00 ft * 0.4341 ft³/ft = 17.36 ft³ = 3.09 bbl

Primary plus shoe joint

= 161.27 ft³ + 17.36 ft³ = 178.64 ft³ = 31.82 bbl
Sacks of Cement = 152.68 sks ≈ 153 sks

Total Pipe Capacity:

200.00 ft * 0.4341 ft³/ft = 86.81 ft³ = 15.46 bbl

Displacement Volume to Shoe Joint:

Capacity of Pipe - Shoe Joint = 15.46 bbl - 3.09 bbl = 12.37 bbl

Fluid Instructions:

Fluid 1: Water Spacer

Fresh Water Fluid Density: 8.33 lbm/gal
Fluid Volume: 10 bbl

Fluid 2: Primary Cement

Premium Cement Fluid Weight 15.80 lbm/gal
94 lbm/sk Premium Cement (Cement) Slurry Yield: 1.17 ft³/sk
0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive) Total Mixing Fluid: 5.00 Gal/sk
2 % Calcium Chloride (Accelerator) Top of Fluid: 0 ft
Calculated Fill: 200 ft
Volume: 31.82 bbl
Calculated Sacks: 152.68 sks

Fluid 3: Water Spacer

Displacement Fluid Density: 8.33 lbm/gal
Fluid Volume: 12.37 bbl

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal (Approximate)	Water Requirements
1	Spacer	Fresh Water	8.3	10 bbls
2	Cement	Class G/ PREMIUM	15.8	19 bbls
3	Spacer	Displacement	8.3	13 bbls

6.2 Production Casing

Spacer:

Total Spacer = 112.29 ft³ = 20.00 bbl

Cement: (5000.00 ft fill)

200.00 ft * 0.2691 ft³/ft * 0 % = 53.82 ft³
4800.00 ft * 0.2526 ft³/ft * 50 % = 1818.72 ft³
Primary Cement = 1872.54 ft³ = 333.49 bbl



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Shoe Joint Volume: (0.00 ft fill)

= 0.00 bbl

(Note: DV Tool used)

Primary plus shoe joint

= 1872.54 ft³ = 333.49 bbl

Total Sacks of cement = ±1400.00 sks

Total Pipe Capacity:

5000.00 ft * 0.1305 ft³/ft = 652.5 ft³ = 116.20 bbl

Displacement Volume to Shoe Joint:

Capacity of Pipe - Shoe Joint = 116.20 bbl - 0.00 bbl = 116.0 bbl

Fluid Instructions:

Fluid 1: Water Based Spacer

Gel Spacer Fluid Density:

8.40 lbm/gal

0.2 gal/bbl LGC-36 UC (Gelling Agent) Fluid Volume:

20 bbl

Fluid 2: Primary Cement

50/50 Poz Premium Fluid Weight

13.50 lbm/gal

0.1 % CFR-3 (Dispersant) Slurry Yield:

1.34 ft³/sk

2 % Calcium Chloride (Accelerator) Total Mixing Fluid:

5.51 Gal/sk

5 lbm/sk Kol-Seal (Lost Circulation Additive) Top of Fluid:

0 ft

0.125 lbm/sk Poly-E-Flake (Lost Circulation Additive) Calculated Fill:

4800 ft

Volume:

333.49 bbl

Calculated Sacks:

±1400.00 sks

Fluid 3: Water Spacer

Displacement Fluid Density:

8.33 lbm/gal

Fluid Volume:

116.20 bbl

Fluid #	Fluid Type	Fluid Name	Surface Density lbm/gal (Approximate)	Water Requirements
1	Spacer	Gel Spacer	8.4	20 bbls
2	Cement	50/50 Poz Premium	13.5	32 bbls
3	Spacer	Displacement	8.3	21 bbls



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7.) Completion

Well will be completed in cemented casing.

7.1 Stimulation

If required, well will be fracture-stimulated using multi-stage fracturing.

7.2 Tubing

2-7/8", 6.5#, J-55, EUE Tubing will be run from surface to approximately 800'-1,000' MD.

8.) Directional Plan

Please see following pages.

Chuza Oil Company

San Juan County, NM

Sec. 10-T30N-R16W

NE Hogback Unit #73

Plan C (Lateral)

Plan: Rev C0 (Lateral)

Sperry Drilling Services Proposal Report

18 December, 2013

Well Coordinates: 2,123,088.43 N, 2,525,092.03 E (36° 49' 57.35" N, 108° 30' 35.68" W)
Ground Level: 5,562.20 usft

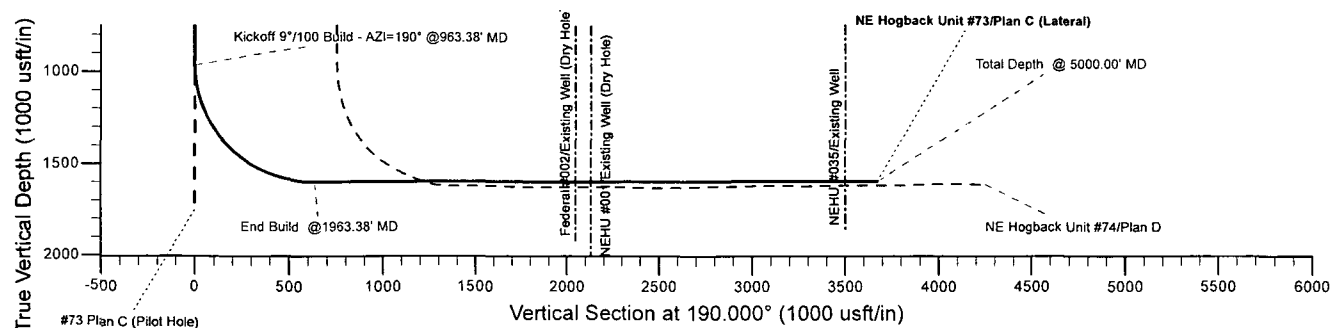
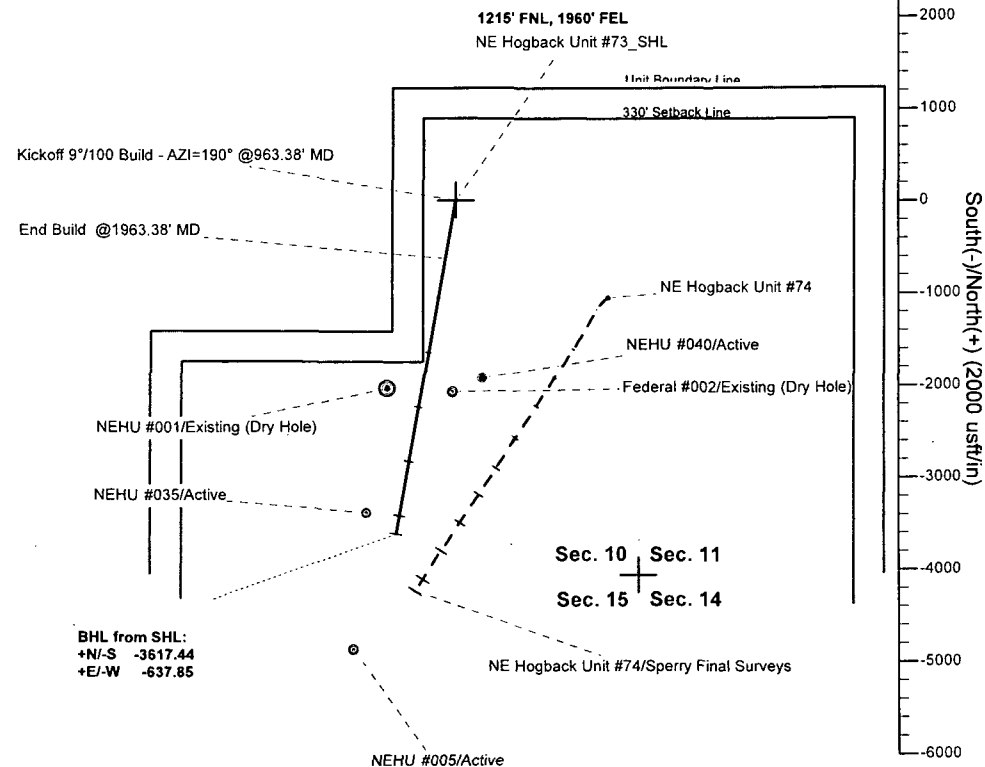
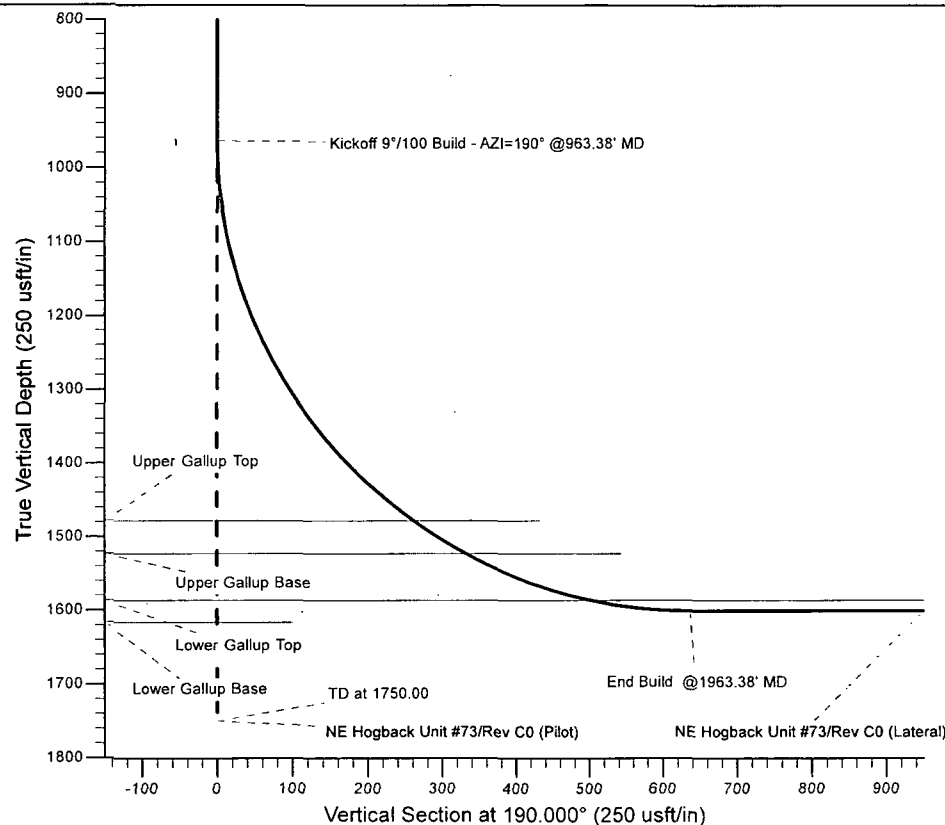
Local Coordinate Origin:	Centered on Well NE Hogback Unit #73
Viewing Datum:	RKB 14.5' @ 5577.20usft (Aztec 711)
TVDs to System:	N
North Reference:	True
Unit System:	API - US Survey Feet - Custom
Geodetic Scale Factor Applied	
Version: 5000.1 Build: 70	

HALLIBURTON

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	
2	963.38	0.00	0.000	963.38	0.00	0.00	0.00	0.00	0.00	
3	1963.38	90.00	190.000	1600.00	-626.95	-110.55	9.00	190.00	636.62	
4	5000.00	90.00	190.000	1600.00	-3617.44	-637.85	0.00	0.00	3673.24	

West(-)/East(+) (2000 usft/in)



WELL DETAILS: NE Hogback Unit #73

Ground Level:		5562.20	
RKB 14.5' @ 5577.20usft (Aztec 711)			
Northing	Easting	Latitude	Longitude
2123088.43	2525092.03	36.8325972	-108.5099106

Plan: Rev C0 (Lateral) (NE Hogback Unit #73/Plan C (Lateral))

Created By: Jerry Popp Date: 15:59, December 18 2013
Approved: Date:

HALLIBURTON**Plan Report for NE Hogback Unit #73 - Rev C0 (Lateral)**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.000	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.000	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.000	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.000	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.000	600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.000	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.000	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.000	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
963.38	0.00	0.000	963.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kickoff 9°/100 Build - AZI=190° @963.38' MD										
1,000.00	3.30	190.000	999.98	-1.04	-0.18	1.05	9.00	9.00	0.00	190.00
1,050.00	7.80	190.000	1,049.73	-5.79	-1.02	5.88	9.00	9.00	0.00	0.00
1,100.00	12.30	190.000	1,098.95	-14.38	-2.54	14.60	9.00	9.00	0.00	0.00
1,150.00	16.80	190.000	1,147.34	-26.75	-4.72	27.16	9.00	9.00	0.00	0.00
1,200.00	21.30	190.000	1,194.59	-42.81	-7.55	43.47	9.00	9.00	0.00	0.00
1,250.00	25.80	190.000	1,240.41	-62.47	-11.02	63.44	9.00	9.00	0.00	0.00
1,300.00	30.30	190.000	1,284.53	-85.62	-15.10	86.94	9.00	9.00	0.00	0.00
1,350.00	34.80	190.000	1,326.67	-112.10	-19.77	113.83	9.00	9.00	0.00	0.00
1,400.00	39.30	190.000	1,366.57	-141.76	-25.00	143.95	9.00	9.00	0.00	0.00
1,450.00	43.80	190.000	1,403.98	-174.41	-30.75	177.10	9.00	9.00	0.00	0.00
1,500.00	48.30	190.000	1,438.67	-209.85	-37.00	213.09	9.00	9.00	0.00	0.00
1,550.00	52.80	190.000	1,470.44	-247.86	-43.70	251.68	9.00	9.00	0.00	0.00
1,562.67	53.94	190.000	1,478.00	-257.87	-45.47	261.85	9.00	9.00	0.00	0.00
Upper Gallup Top										
1,600.00	57.30	190.000	1,499.08	-288.21	-50.82	292.65	9.00	9.00	0.00	0.00
1,647.02	61.53	190.000	1,523.00	-328.06	-57.85	333.12	9.00	9.00	0.00	0.00
Upper Gallup Base										
1,650.00	61.80	190.000	1,524.41	-330.64	-58.30	335.74	9.00	9.00	0.00	0.00
1,700.00	66.30	190.000	1,546.29	-374.91	-66.11	380.69	9.00	9.00	0.00	0.00
1,750.00	70.80	190.000	1,564.57	-420.72	-74.18	427.21	9.00	9.00	0.00	0.00
1,800.00	75.30	190.000	1,579.15	-467.81	-82.49	475.03	9.00	9.00	0.00	0.00
1,829.62	77.96	190.000	1,586.00	-496.19	-87.49	503.85	9.00	9.00	0.00	0.00
Lower Gallup Top										
1,850.00	79.80	190.000	1,589.93	-515.88	-90.96	523.84	9.00	9.00	0.00	0.00
1,900.00	84.30	190.000	1,596.85	-564.63	-99.56	573.34	9.00	9.00	0.00	0.00
1,950.00	88.80	190.000	1,599.86	-613.77	-108.22	623.24	9.00	9.00	0.00	0.00
1,963.38	90.00	190.000	1,600.00	-626.95	-110.55	636.62	9.00	9.00	0.00	0.00
End Build @1963.38' MD										
2,000.00	90.00	190.000	1,600.00	-663.01	-116.91	673.24	0.00	0.00	0.00	0.00
2,100.00	90.00	190.000	1,600.00	-761.49	-134.27	773.24	0.00	0.00	0.00	0.00
2,200.00	90.00	190.000	1,600.00	-859.97	-151.64	873.24	0.00	0.00	0.00	0.00
2,300.00	90.00	190.000	1,600.00	-958.45	-169.00	973.24	0.00	0.00	0.00	0.00
2,400.00	90.00	190.000	1,600.00	-1,056.93	-186.37	1,073.24	0.00	0.00	0.00	0.00
2,500.00	90.00	190.000	1,600.00	-1,155.42	-203.73	1,173.24	0.00	0.00	0.00	0.00
2,600.00	90.00	190.000	1,600.00	-1,253.90	-221.10	1,273.24	0.00	0.00	0.00	0.00
2,700.00	90.00	190.000	1,600.00	-1,352.38	-238.46	1,373.24	0.00	0.00	0.00	0.00
2,800.00	90.00	190.000	1,600.00	-1,450.86	-255.83	1,473.24	0.00	0.00	0.00	0.00
2,900.00	90.00	190.000	1,600.00	-1,549.34	-273.19	1,573.24	0.00	0.00	0.00	0.00
3,000.00	90.00	190.000	1,600.00	-1,647.82	-290.56	1,673.24	0.00	0.00	0.00	0.00
3,100.00	90.00	190.000	1,600.00	-1,746.30	-307.92	1,773.24	0.00	0.00	0.00	0.00
3,200.00	90.00	190.000	1,600.00	-1,844.78	-325.28	1,873.24	0.00	0.00	0.00	0.00
3,300.00	90.00	190.000	1,600.00	-1,943.26	-342.65	1,973.24	0.00	0.00	0.00	0.00
3,400.00	90.00	190.000	1,600.00	-2,041.74	-360.01	2,073.24	0.00	0.00	0.00	0.00
3,500.00	90.00	190.000	1,600.00	-2,140.22	-377.38	2,173.24	0.00	0.00	0.00	0.00
3,600.00	90.00	190.000	1,600.00	-2,238.70	-394.74	2,273.24	0.00	0.00	0.00	0.00
3,700.00	90.00	190.000	1,600.00	-2,337.18	-412.11	2,373.24	0.00	0.00	0.00	0.00

Plan Report for NE Hogback Unit #73 - Rev C0 (Lateral)

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
3,800.00	90.00	190.000	1,600.00	-2,435.67	-429.47	2,473.24	0.00	0.00	0.00	0.00
3,900.00	90.00	190.000	1,600.00	-2,534.15	-446.84	2,573.24	0.00	0.00	0.00	0.00
4,000.00	90.00	190.000	1,600.00	-2,632.63	-464.20	2,673.24	0.00	0.00	0.00	0.00
4,100.00	90.00	190.000	1,600.00	-2,731.11	-481.57	2,773.24	0.00	0.00	0.00	0.00
4,200.00	90.00	190.000	1,600.00	-2,829.59	-498.93	2,873.24	0.00	0.00	0.00	0.00
4,300.00	90.00	190.000	1,600.00	-2,928.07	-516.30	2,973.24	0.00	0.00	0.00	0.00
4,400.00	90.00	190.000	1,600.00	-3,026.55	-533.66	3,073.24	0.00	0.00	0.00	0.00
4,500.00	90.00	190.000	1,600.00	-3,125.03	-551.03	3,173.24	0.00	0.00	0.00	0.00
4,600.00	90.00	190.000	1,600.00	-3,223.51	-568.39	3,273.24	0.00	0.00	0.00	0.00
4,700.00	90.00	190.000	1,600.00	-3,321.99	-585.76	3,373.24	0.00	0.00	0.00	0.00
4,800.00	90.00	190.000	1,600.00	-3,420.47	-603.12	3,473.24	0.00	0.00	0.00	0.00
4,900.00	90.00	190.000	1,600.00	-3,518.95	-620.49	3,573.24	0.00	0.00	0.00	0.00
5,000.00	90.00	190.000	1,600.00	-3,617.44	-637.85	3,673.24	0.00	0.00	0.00	0.00
Total Depth @ 5000.00' MD										

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
963.38	963.38	0.00	0.00	Kickoff 9°/100 Build - AZI=190° @963.38' MD
1,963.38	1,600.00	-626.95	-110.55	End Build @1963.38' MD
5,000.00	1,600.00	-3,617.44	-637.85	Total Depth @ 5000.00' MD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
User	No Target (Freehand)	190.000	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	5,000.00	Rev C0 (Lateral)	MWD

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,562.67	1,478.00	Upper Gallup Top		0.00	
1,647.02	1,523.00	Upper Gallup Base		0.00	
1,829.62	1,586.00	Lower Gallup Top		0.00	

$$PBHL \left\{ \begin{array}{l} Y-P (5257.24 - 3617.44 - 1215)_{ft} = 424.8 \approx 425 ft/S \\ X-P (1960 + 637.85)_{ft} = 2597.85 \approx 2598 ft/E \end{array} \right.$$

William T.
12/23/2013

HALLIBURTON

Plan Report for NE Hogback Unit #73 - Rev C0 (Lateral)

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
NE Hogback Unit #73_Setback Lines	0.00	-4,063.23	1,949.39	Polygon
NE Hogback Unit #73_SHL	14.20	0.00	0.00	Point
NE Hogback Unit #73_Unit Bdy Lines	0.00	-4,063.23	1,949.39	Polygon

**North Reference Sheet for Sec. 10-T30N-R16W - NE Hogback Unit #73 - Plan C
(Lateral)**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to RKB 14.5' @ 5577.20usft (Aztec 711). Northing and Easting are relative to NE Hogback Unit #73

Coordinate System is US State Plane 1983, New Mexico Western Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Transverse Mercator (Gauss-Kruger)

Central Meridian is -107.83°, Longitude Origin:0.000000°, Latitude Origin:0.000000°

False Easting: 2,723,091.67usft, False Northing: 0.00usft, Scale Reduction: 0.99996152

Grid Coordinates of Well: 2,123,088.43 usft N, 2,525,092.03 usft E

Geographical Coordinates of Well: 36° 49' 57.35" N, 108° 30' 35.68" W

Grid Convergence at Surface is: -0.41°

Based upon Minimum Curvature type calculations, at a Measured Depth of 5,000.00usft
the Bottom Hole Displacement is 3,673.24usft in the Direction of 190.00° (True).

Magnetic Convergence at surface is: -10.36° (2 January 2014, , BGGM2013)

