

RECEIVED

NOV 20 2019

Form 3160-4
(August 2007)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB No. 1004-0137
Expires: July 31, 2010WELL COMPLETION OR RECOMPLETION REPORT AND NOTES
DISTRICT OFFICE SIAO.C.D.

1a. Type of Well ☒ Oil Well ☐ Gas Well ☐ Dry ☐ Other		5. Lease Serial No. NMNM107384	
b. Type of Completion ☒ New Well ☐ Work Over ☐ Deepen ☐ Plug Back ☐ Diff. Resvr. Other _____		6. If Indian, Allottee or Tribe Name	
2. Name of Operator MURCHISON OIL & GAS LLC E-Mail: ccottrell@jdmii.com		7. Unit or CA Agreement Name and No.	
3. Address LEGACY TOWER ONE 7250 DALLAS PKY, STE 1400 PLANO, TX 75024-5002		8. Lease Name and Well No. ROCK RIDGE FEDERAL BSS 4H	
3a. Phone No. (include area code) Ph: 972.931.0700		9. API Well No. 30-015-45730-00-S1	
4. Location of Well (Report location clearly and in accordance with Federal requirements)* At surface NENE 350FNL 300FEL 32.194809 N Lat, 104.016159 W Lon At top prod interval reported below NENE 350FNL 300FEL At total depth Lot 1 361FNL 331FWL		10. Field and Pool, or Exploratory PIERCE CROSSING-BONE SPRING	
14. Date Spudded 03/25/2019		11. Sec., T., R., M., or Block and Survey or Area Sec 30 T24S R29E Mer NMP	
15. Date T.D. Reached 04/09/2019		12. County or Parish EDDY	
16. Date Completed ☐ D & A ☒ Ready to Prod. 07/16/2019		13. State NM	
17. Elevations (DF, KB, RT, GL)* 2916 GL			
18. Total Depth: MD TVD 13070 13065 8406		19. Plug Back T.D.: MD TVD	
20. Depth Bridge Plug Set: MD TVD			
21. Type Electric & Other Mechanical Logs Run (Submit copy of each) GAMMARAY		22. Was well cored? ☒ No ☐ Yes (Submit analysis) Was DST run? ☒ No ☐ Yes (Submit analysis) Directional Survey? ☐ No ☒ Yes (Submit analysis)	

23. Casing and Liner Record (Report all strings set in well)

Hole Size	Size/Grade	Wt. (#/ft.)	Top (MD)	Bottom (MD)	Stage Cementer Depth	No. of Sk. & Type of Cement	Slurry Vol. (BBL)	Cement Top*	Amount Pulled
16.000	13.375 J55	48.0	0	376		250	59	0	
12.250	9.625 P110	36.0	0	2779		960	289	0	
8.500	5.500 P110	20.0	0	13055		1730	565	4390	

24. Tubing Record

Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)	Size	Depth Set (MD)	Packer Depth (MD)
2.375	8487							

25. Producing Intervals

Formation	Top	Bottom	Perforated Interval	Size	No. Holes	Perf. Status
A) BONE SPRING	8495	12999	8495 TO 12999	0.420	1056	OPEN
B)						
C)						
D)						

26. Perforation Record

Depth Interval	Amount and Type of Material
8495 TO 12999	9,284,780# SD; 1,956 BBLs 15% HCL ACID; 236,039 BBLs TOTAL WATER VOLUME

28. Production - Interval A

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
07/18/2019	09/14/2019	24	→	1256.0	1533.0	1211.0	48.6		GAS LIFT
Choke Size	Tbg. Press. Flwg.	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	
41/64	SI	2000.0	→	1256	1533	1211	1221	POW	

28a. Production - Interval B

Date First Produced	Test Date	Hours Tested	Test Production	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
			→						
Choke Size	Tbg. Press. Flwg.	Csg. Press.	24 Hr. Rate	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	
	SI		→						

(See Instructions and spaces for additional data on reverse side)

ELECTRONIC SUBMISSION #488266 VERIFIED BY THE BLM WELL INFORMATION SYSTEM

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **

28b. Production - Interval C

Date First Produced	Test Date	Hours Tested	Test Production →	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate →	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	

28c. Production - Interval D

Date First Produced	Test Date	Hours Tested	Test Production →	Oil BBL	Gas MCF	Water BBL	Oil Gravity Corr. API	Gas Gravity	Production Method
Choke Size	Tbg. Press. Flwg. SI	Csg. Press.	24 Hr. Rate →	Oil BBL	Gas MCF	Water BBL	Gas:Oil Ratio	Well Status	

29. Disposition of Gas(Sold, used for fuel, vented, etc.)
SOLD

30. Summary of Porous Zones (Include Aquifers):

Show all important zones of porosity and contents thereof: Cored intervals and all drill-stem tests, including depth interval tested, cushion used, time tool open, flowing and shut-in pressures and recoveries.

31. Formation (Log) Markers

Formation	Top	Bottom	Descriptions, Contents, etc.	Name	Top Meas. Depth
BONE SPRING 1ST BONE SPRING 2ND	7491 8292	8292	OIL & GAS OIL & GAS	DELAWARE CHERRY CANYON BRUSHY CANYON AVALON SAND BONE SPRING 1ST BONE SPRING 2ND	2765 3688 5135 6592 7491 8292

32. Additional remarks (include plugging procedure):

33. Circle enclosed attachments:

- | | | | |
|---|--------------------|---------------|-----------------------|
| 1. Electrical/Mechanical Logs (1 full set req'd.) | 2. Geologic Report | 3. DST Report | 4. Directional Survey |
| 5. Sundry Notice for plugging and cement verification | 6. Core Analysis | 7 Other: | |

34. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records (see attached instructions):

Electronic Submission #488266 Verified by the BLM Well Information System.
For MURCHISON OIL & GAS LLC, sent to the Carlsbad
Committed to AFMSS for processing by DINAH NEGRETE on 11/16/2019 (20DCN0024SE)

Name (please print) CINDY COTTRELLTitle REGULATORY COORDINATOR

Signature _____ (Electronic Submission)

Date 10/15/2019

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 or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

**** REVISED ** REVISED ** REVISED ** REVISED ** REVISED ** REVISED ** REVISED ****

Revisions to Operator-Submitted EC Data for Well Completion #488266

	Operator Submitted	BLM Revised (AFMSS)
Lease:	NMNM107384	NMNM107384
Agreement:		
Operator:	MURCHISON OIL & GAS LLC 7250 DALLAS PARKWAY STE 1400 PLANO, TX 75024 Ph: 972-931-0700	MURCHISON OIL & GAS LLC LEGACY TOWER ONE 7250 DALLAS PKY, STE 1400 PLANO, TX 75024-5002 Ph: 972.931.0700
Admin Contact:	CINDY COTTRELL REPORT PREPARER E-Mail: ccottrell@jdmii.com Ph: 972-931-0700 Ext: 113	CINDY COTTRELL REGULATORY COORDINATOR E-Mail: ccottrell@jdmii.com Ph: 972.931.0700
Tech Contact:	CINDY COTTRELL REPORT PREPARER E-Mail: ccottrell@jdmii.com Ph: 972-931-0700 Ext: 113	CINDY COTTRELL REGULATORY COORDINATOR E-Mail: ccottrell@jdmii.com Ph: 972.931.0700
Well Name: Number:	ROCK RIDGE FEDERAL BSS 4H	ROCK RIDGE FEDERAL BSS 4H
Location: State: County: S/T/R: Surf Loc:	NM EDDY Sec 30 T24S R29E Mer NMP NENE Lot A 350FNL 300FEL	NM EDDY Sec 30 T24S R29E Mer NMP NENE 350FNL 300FEL 32.194809 N Lat, 104.016159 W Lon
Field/Pool:	PIERCE CROSSING BS SOUTH	PIERCE CROSSING-BONE SPRING 
Logs Run:	GAMMA RAY	GAMMARAY
Producing Intervals - Formations:	BONE SPRING	BONE SPRING
Porous Zones:	1ST BONE SPRING 2ND BONE SPRING	BONE SPRING 1ST BONE SPRING 2ND
Markers:	DELAWARE CHERRY CANYON BRUSHY CANYON AVALON SHALE 1ST BONE SPRING SAND 2ND BONE SPRING SAND	DELAWARE CHERRY CANYON BRUSHY CANYON AVALON SAND BONE SPRING 1ST BONE SPRING 2ND

OCT 28 2019

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Murchison Oil and Gas, LLC

Eddy County, New Mexico (NAD 83)

Rock Ridge Federal 1-4

Rock Ridge Federal BSS 4H

Wellbore #1

Design: Surveys

Standard Survey Report

10 April, 2019

MS *Directional*

Company:	Murchison Oil and Gas, LLC	Local Co-ordinate Reference:	Well Rock Ridge Federal BSS 4H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 2940.50usft (Latshaw7)
Site:	Rock Ridge Federal 1-4	MD Reference:	WELL @ 2940.50usft (Latshaw7)
Well:	Rock Ridge Federal BSS 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Project	Eddy County, New Mexico (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Rock Ridge Federal 1-4		
Site Position:		Northing:	0.00 usft
From:	Map	Easting:	0.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	30° 59' 18.404 N
		Longitude:	106° 3' 38.987 W

Well	Rock Ridge Federal BSS 4H		
Well Position	+N/-S	0.00 usft	Northing: 434,749.18 usft
	+E/-W	0.00 usft	Easting: 639,449.26 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
Grid Convergence:	0.169 °	Ground Level:	2,915.50 usft
		Latitude:	32° 11' 41.298 N
		Longitude:	104° 0' 58.176 W

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	User Defined	4/3/2019	7.039
			Dip Angle (°)
			59.874
			Field Strength (nT)
			47,737.34

Design	Surveys		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°)
			269.82

Survey Program	Date 4/10/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
137.00	13,060.00	MS MWD (Wellbore #1)	MWD
			Description
			OWSG MWD - Standard

Survey										
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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
137.00	1.30	320.60	136.99	1.20	-0.99	0.98	0.95	0.95	0.00	
227.00	1.30	157.60	226.98	1.05	-1.25	1.24	2.86	0.00	-181.11	
257.00	1.20	158.70	256.97	0.44	-1.00	1.00	0.34	-0.33	3.67	
337.00	0.80	139.90	336.96	-0.77	-0.34	0.34	0.64	-0.50	-23.50	
435.00	0.80	122.70	434.95	-1.66	0.68	-0.67	0.24	0.00	-17.55	
525.00	0.60	130.70	524.94	-2.31	1.56	-1.56	0.25	-0.22	8.89	
614.00	1.00	130.40	613.94	-3.12	2.51	-2.50	0.45	0.45	-0.34	
703.00	0.80	125.30	702.92	-3.98	3.61	-3.60	0.24	-0.22	-5.73	
793.00	1.10	120.00	792.91	-4.77	4.87	-4.85	0.35	0.33	-5.89	

Company:	Murchison Oil and Gas, LLC	Local Co-ordinate Reference:	Well Rock Ridge Federal BSS 4H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 2940.50usft (Latshaw7)
Site:	Rock Ridge Federal 1-4	MD Reference:	WELL @ 2940.50usft (Latshaw7)
Well:	Rock Ridge Federal BSS 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Survey									
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)
883.00	1.00	113.90	882.90	-5.52	6.34	-6.32	0.17	-0.11	-6.78
973.00	0.90	122.50	972.89	-6.22	7.65	-7.63	0.19	-0.11	9.56
1,067.00	1.00	109.50	1,066.87	-6.89	9.05	-9.02	0.25	0.11	-13.83
1,161.00	0.50	197.50	1,160.87	-7.56	9.69	-9.67	1.17	-0.53	93.62
1,254.00	1.10	221.60	1,253.86	-8.61	8.98	-8.95	0.73	0.65	25.91
1,349.00	1.10	214.00	1,348.84	-10.05	7.86	-7.83	0.15	0.00	-8.00
1,444.00	2.80	142.60	1,443.79	-12.65	8.76	-8.72	2.80	1.79	-75.16
1,538.00	3.60	140.60	1,537.64	-16.75	12.03	-11.98	0.86	0.85	-2.13
1,633.00	2.50	131.70	1,632.51	-20.44	15.47	-15.41	1.26	-1.16	-9.37
1,725.00	2.60	122.80	1,724.42	-22.90	18.72	-18.65	0.44	0.11	-9.67
1,820.00	2.80	131.70	1,819.31	-25.61	22.27	-22.19	0.49	0.21	9.37
1,915.00	3.10	135.50	1,914.19	-28.99	25.80	-25.71	0.38	0.32	4.00
2,009.00	3.50	117.30	2,008.03	-32.12	30.13	-30.03	1.19	0.43	-19.36
2,103.00	4.30	113.60	2,101.81	-34.84	35.91	-35.80	0.89	0.85	-3.94
2,198.00	3.70	118.90	2,196.58	-37.75	41.86	-41.74	0.74	-0.63	5.58
2,291.00	3.70	124.00	2,289.39	-40.88	46.97	-46.84	0.35	0.00	5.48
2,386.00	4.00	127.50	2,384.18	-44.61	52.14	-52.00	0.40	0.32	3.68
2,480.00	4.00	122.50	2,477.95	-48.37	57.51	-57.36	0.37	0.00	-5.32
2,574.00	3.00	112.60	2,571.77	-51.08	62.55	-62.39	1.24	-1.06	-10.53
2,667.00	2.80	102.30	2,664.65	-52.49	67.01	-66.85	0.60	-0.22	-11.08
2,728.00	3.10	104.20	2,725.57	-53.22	70.07	-69.90	0.52	0.49	3.11
2,832.00	3.00	105.80	2,829.42	-54.65	75.41	-75.24	0.13	-0.10	1.54
2,927.00	3.10	110.80	2,924.29	-56.24	80.21	-80.03	0.30	0.11	5.26
3,021.00	3.10	108.00	3,018.15	-57.92	85.00	-84.82	0.16	0.00	-2.98
3,115.00	3.20	111.70	3,112.01	-59.68	89.85	-89.67	0.24	0.11	3.94
3,209.00	3.20	109.10	3,205.86	-61.51	94.77	-94.58	0.15	0.00	-2.77
3,303.00	3.10	109.50	3,299.72	-63.22	99.65	-99.45	0.11	-0.11	0.43
3,398.00	3.30	112.40	3,394.57	-65.11	104.59	-104.39	0.27	0.21	3.05
3,493.00	3.20	109.30	3,489.42	-67.03	109.63	-109.41	0.21	-0.11	-3.26
3,585.00	3.20	108.10	3,581.28	-68.68	114.49	-114.27	0.07	0.00	-1.30
3,680.00	3.00	107.70	3,676.14	-70.26	119.38	-119.16	0.21	-0.21	-0.42
3,774.00	3.90	127.50	3,769.97	-72.95	124.26	-124.03	1.57	0.96	21.06
3,868.00	4.00	128.80	3,863.75	-76.95	129.35	-129.11	0.14	0.11	1.38
3,963.00	4.10	131.50	3,958.51	-81.28	134.47	-134.22	0.23	0.11	2.84
4,057.00	3.30	108.40	4,052.32	-84.36	139.56	-139.29	1.78	-0.85	-24.57
4,152.00	3.30	105.00	4,147.16	-85.93	144.79	-144.52	0.21	0.00	-3.58
4,246.00	3.10	103.80	4,241.01	-87.24	149.88	-149.60	0.22	-0.21	-1.28
4,341.00	2.90	104.30	4,335.88	-88.44	154.70	-154.42	0.21	-0.21	0.53
4,435.00	3.40	120.30	4,429.74	-90.44	159.41	-159.13	1.07	0.53	17.02
4,529.00	3.50	124.80	4,523.57	-93.48	164.17	-163.88	0.31	0.11	4.79
4,623.00	3.50	124.50	4,617.40	-96.74	168.89	-168.59	0.02	0.00	-0.32
4,718.00	3.40	121.90	4,712.23	-99.88	173.68	-173.36	0.20	-0.11	-2.74
4,812.00	3.40	124.50	4,806.06	-102.93	178.34	-178.02	0.16	0.00	2.77

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Survey										
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)	
4,905.00	2.90	122.30	4,898.92	-105.75	182.60	-182.27	0.55	-0.54	-2.37	
5,000.00	2.40	128.20	4,993.82	-108.26	186.20	-185.85	0.60	-0.53	6.21	
5,094.00	3.50	122.60	5,087.69	-111.02	190.16	-189.81	1.21	1.17	-5.96	
5,188.00	3.70	126.30	5,181.51	-114.37	195.02	-194.66	0.33	0.21	3.94	
5,282.00	3.40	121.90	5,275.33	-117.63	199.83	-199.46	0.43	-0.32	-4.68	
5,376.00	3.00	118.80	5,369.18	-120.29	204.35	-203.97	0.46	-0.43	-3.30	
5,471.00	3.80	114.70	5,464.01	-122.81	209.39	-209.01	0.88	0.84	-4.32	
5,565.00	4.00	115.20	5,557.79	-125.50	215.19	-214.79	0.22	0.21	0.53	
5,660.00	3.80	114.00	5,652.57	-128.19	221.06	-220.66	0.23	-0.21	-1.26	
5,754.00	3.70	116.20	5,746.37	-130.80	226.63	-226.22	0.19	-0.11	2.34	
5,848.00	3.50	111.40	5,840.19	-133.19	232.02	-231.60	0.38	-0.21	-5.11	
5,942.00	3.50	113.10	5,934.01	-135.36	237.33	-236.91	0.11	0.00	1.81	
6,036.00	2.30	118.80	6,027.89	-137.39	241.63	-241.19	1.31	-1.28	6.06	
6,130.00	2.40	111.00	6,121.81	-139.01	245.12	-244.68	0.36	0.11	-8.30	
6,225.00	0.70	121.50	6,216.77	-140.02	247.47	-247.03	1.81	-1.79	11.05	
6,318.00	0.90	130.50	6,309.76	-140.79	248.51	-248.06	0.25	0.22	9.68	
6,413.00	0.70	135.40	6,404.76	-141.69	249.48	-249.04	0.22	-0.21	5.16	
6,507.00	1.00	113.70	6,498.75	-142.43	250.64	-250.19	0.46	0.32	-23.09	
6,601.00	0.50	100.60	6,592.74	-142.84	251.79	-251.34	0.56	-0.53	-13.94	
6,696.00	0.30	130.40	6,687.73	-143.07	252.39	-251.94	0.30	-0.21	31.37	
6,791.00	0.40	102.10	6,782.73	-143.30	252.90	-252.45	0.21	0.11	-29.79	
6,885.00	0.10	214.10	6,876.73	-143.44	253.18	-252.72	0.48	-0.32	119.15	
6,979.00	0.70	318.70	6,970.73	-143.08	252.75	-252.30	0.78	0.64	111.28	
7,073.00	1.00	302.10	7,064.72	-142.21	251.68	-251.23	0.41	0.32	-17.66	
7,166.00	1.40	300.20	7,157.70	-141.21	250.01	-249.56	0.43	0.43	-2.04	
7,261.00	1.30	302.20	7,252.67	-140.05	248.09	-247.65	0.12	-0.11	2.11	
7,356.00	0.60	282.20	7,347.66	-139.37	246.69	-246.26	0.80	-0.74	-21.05	
7,451.00	0.50	249.80	7,442.65	-139.41	245.82	-245.38	0.34	-0.11	-34.11	
7,545.00	0.60	240.50	7,536.65	-139.79	245.01	-244.57	0.14	0.11	-9.89	
7,639.00	0.80	256.30	7,630.64	-140.19	243.94	-243.50	0.29	0.21	16.81	
7,734.00	1.00	267.90	7,725.63	-140.38	242.47	-242.03	0.28	0.21	12.21	
7,828.00	1.30	269.70	7,819.61	-140.41	240.58	-240.14	0.32	0.32	1.91	
7,900.00	2.40	289.30	7,891.58	-139.92	238.34	-237.90	1.74	1.53	27.22	
7,948.00	8.90	294.70	7,939.32	-138.03	234.02	-233.58	13.57	13.54	11.25	
7,996.00	15.20	300.20	7,986.24	-133.31	225.19	-224.77	13.33	13.13	11.46	
8,043.00	19.40	301.00	8,031.10	-126.19	213.17	-212.78	8.95	8.94	1.70	
8,090.00	23.90	298.80	8,074.77	-117.58	198.13	-197.76	9.73	9.57	-4.68	
8,138.00	28.20	295.90	8,117.89	-107.93	179.40	-179.06	9.34	8.96	-6.04	
8,185.00	31.90	294.90	8,158.57	-97.85	158.14	-157.83	7.94	7.87	-2.13	
8,232.00	35.90	293.10	8,197.57	-87.21	134.19	-133.91	8.77	8.51	-3.83	
8,279.00	40.00	289.00	8,234.63	-76.88	107.22	-106.97	10.24	8.72	-8.72	
8,326.00	44.30	285.00	8,269.47	-67.71	77.06	-76.85	10.78	9.15	-8.51	
8,373.00	48.20	283.70	8,301.97	-59.31	44.17	-43.99	8.53	8.30	-2.77	

Company:	Murchison Oil and Gas, LLC	Local Co-ordinate Reference:	Well Rock Ridge Federal BSS 4H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 2940.50usft (Latshaw7)
Site:	Rock Ridge Federal 1-4	MD Reference:	WELL @ 2940.50usft (Latshaw7)
Well:	Rock Ridge Federal BSS 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Survey									
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)
8,421.00	52.60	285.50	8,332.56	-49.97	8.40	-8.24	9.61	9.17	3.75
8,468.00	57.20	285.70	8,359.58	-39.63	-28.63	28.75	9.79	9.79	0.43
8,469.50	57.32	285.64	8,360.39	-39.29	-29.84	29.97	8.42	7.68	-4.11
HL Crossing - 8469.50' MD									
8,516.00	60.90	283.80	8,384.26	-29.17	-68.43	68.52	8.42	7.71	-3.95
8,562.00	64.30	280.00	8,405.43	-20.77	-108.38	108.45	10.41	7.39	-8.26
8,610.00	68.20	276.60	8,424.76	-14.45	-151.84	151.89	10.39	8.13	-7.08
8,657.00	72.80	274.40	8,440.45	-10.22	-195.93	195.96	10.74	9.79	-4.68
8,705.00	78.40	272.50	8,452.38	-7.43	-242.31	242.34	12.28	11.67	-3.96
8,751.00	82.20	271.60	8,460.13	-5.81	-287.62	287.64	8.48	8.26	-1.96
8,798.00	85.60	270.50	8,465.13	-4.95	-334.34	334.35	7.60	7.23	-2.34
8,845.00	86.00	270.30	8,468.57	-4.63	-381.21	381.22	0.95	0.85	-0.43
8,940.00	89.70	269.40	8,472.13	-4.88	-476.13	476.14	4.01	3.89	-0.95
9,033.00	90.70	268.90	8,471.81	-6.26	-569.11	569.13	1.20	1.08	-0.54
9,127.00	91.70	267.90	8,469.84	-8.88	-663.05	663.08	1.50	1.06	-1.06
9,221.00	90.30	267.00	8,468.20	-13.06	-756.94	756.98	1.77	-1.49	-0.96
9,314.00	89.90	268.10	8,468.04	-17.04	-849.86	849.91	1.26	-0.43	1.18
9,408.00	90.70	267.60	8,467.55	-20.56	-943.79	943.85	1.00	0.85	-0.53
9,503.00	89.70	268.30	8,467.21	-23.96	-1,038.72	1,038.79	1.28	-1.05	0.74
9,597.00	89.00	270.20	8,468.28	-25.19	-1,132.71	1,132.78	2.15	-0.74	2.02
9,691.00	89.80	270.70	8,469.26	-24.45	-1,226.70	1,226.77	1.00	0.85	0.53
9,785.00	90.60	270.30	8,468.94	-23.63	-1,320.69	1,320.76	0.95	0.85	-0.43
9,878.00	91.50	270.10	8,467.23	-23.31	-1,413.67	1,413.74	0.99	0.97	-0.22
9,973.00	90.10	270.00	8,465.91	-23.23	-1,508.66	1,508.73	1.48	-1.47	-0.11
10,067.00	90.70	270.20	8,465.25	-23.06	-1,602.66	1,602.72	0.67	0.64	0.21
10,161.00	91.70	270.30	8,463.28	-22.65	-1,696.64	1,696.70	1.07	1.06	0.11
10,255.00	91.40	270.00	8,460.74	-22.41	-1,790.60	1,790.66	0.45	-0.32	-0.32
10,349.00	92.20	269.70	8,457.79	-22.65	-1,884.55	1,884.62	0.91	0.85	-0.32
10,444.00	90.40	269.70	8,455.63	-23.15	-1,979.52	1,979.59	1.89	-1.89	0.00
10,537.00	90.70	269.80	8,454.74	-23.55	-2,072.52	2,072.58	0.34	0.32	0.11
10,631.00	91.40	269.70	8,453.02	-23.96	-2,166.50	2,166.57	0.75	0.74	-0.11
10,725.00	89.70	271.00	8,452.11	-23.39	-2,260.49	2,260.55	2.28	-1.81	1.38
10,819.00	90.00	271.20	8,452.36	-21.59	-2,354.47	2,354.53	0.38	0.32	0.21
10,913.00	90.90	271.10	8,451.62	-19.70	-2,448.45	2,448.50	0.96	0.96	-0.11
11,006.00	91.90	271.30	8,449.35	-17.75	-2,541.40	2,541.44	1.10	1.08	0.22
11,100.00	91.10	269.80	8,446.89	-16.85	-2,635.36	2,635.40	1.81	-0.85	-1.60
11,193.00	91.40	269.40	8,444.86	-17.50	-2,728.34	2,728.38	0.54	0.32	-0.43
11,288.00	92.40	269.50	8,441.71	-18.41	-2,823.28	2,823.32	1.06	1.05	0.11
11,383.00	92.00	268.30	8,438.06	-20.23	-2,918.19	2,918.24	1.33	-0.42	-1.26
11,477.00	91.20	269.80	8,435.44	-21.79	-3,012.14	3,012.19	1.81	-0.85	1.60
11,572.00	90.80	270.00	8,433.78	-21.96	-3,107.12	3,107.17	0.47	-0.42	0.21
11,667.00	91.40	269.40	8,431.96	-22.45	-3,202.10	3,202.16	0.89	0.63	-0.63
11,761.00	90.00	268.80	8,430.81	-23.93	-3,296.08	3,296.14	1.62	-1.49	-0.64
11,855.00	90.50	268.90	8,430.40	-25.82	-3,390.06	3,390.12	0.54	0.53	0.11

Company:	Murchison Oil and Gas, LLC	Local Co-ordinate Reference:	Well Rock Ridge Federal BSS 4H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 2940.50usft (Latshaw7)
Site:	Rock Ridge Federal 1-4	MD Reference:	WELL @ 2940.50usft (Latshaw7)
Well:	Rock Ridge Federal BSS 4H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Surveys	Database:	EDM 5000.1 Conroe DB

Survey										
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)	
11,949.00	91.40	268.60	8,428.84	-27.87	-3,484.02	3,484.09	1.01	0.96	-0.32	
12,043.00	90.00	268.30	8,427.69	-30.41	-3,577.98	3,578.06	1.52	-1.49	-0.32	
12,138.00	89.40	269.90	8,428.19	-31.90	-3,672.96	3,673.05	1.80	-0.63	1.68	
12,232.00	90.30	270.00	8,428.43	-31.98	-3,766.96	3,767.04	0.96	0.96	0.11	
12,327.00	91.20	269.70	8,427.19	-32.23	-3,861.95	3,862.03	1.00	0.95	-0.32	
12,421.00	90.30	270.50	8,425.96	-32.07	-3,955.94	3,956.02	1.28	-0.96	0.85	
12,515.00	90.90	270.40	8,424.98	-31.33	-4,049.93	4,050.01	0.65	0.64	-0.11	
12,610.00	91.90	270.10	8,422.65	-30.92	-4,144.90	4,144.98	1.10	1.05	-0.32	
12,704.00	90.70	271.50	8,420.52	-29.60	-4,238.87	4,238.94	1.96	-1.28	1.49	
12,799.00	91.50	271.10	8,418.70	-27.45	-4,333.82	4,333.89	0.94	0.84	-0.42	
12,894.00	92.50	270.80	8,415.38	-25.87	-4,428.75	4,428.81	1.10	1.05	-0.32	
12,987.00	93.50	270.00	8,410.52	-25.23	-4,521.62	4,521.68	1.38	1.08	-0.86	
13,060.00	93.50	270.00	8,406.06	-25.23	-4,594.48	4,594.54	0.00	0.00	0.00	
Projection to TD-13060.00' MD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
8,469.50	8,360.39	-39.29	-29.84	HL Crossing - 8469.50' MD	
13,060.00	8,406.06	-25.23	-4,594.48	Projection to TD-13060.00' MD	

Company: Murchison Oil and Gas, LLC
Well: Rock Ridge Federal BSS 4H
County: Eddy County, New Mexico (NAD 83)
Rig: Latshaw7
Wellbore: Wellbore #1
Design: Design #5
Created By: SRA
Date: 9:58, April 10 2019

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

To convert a Magnetic Direction to a Grid Direction, Add 6.870°
To convert a Magnetic Direction to a True Direction, Add 7.039° East
To convert a True Direction to a Grid Direction, Subtract 0.169°



Azimuths to Grid North
True North: -0.17°
Magnetic North: 6.87°

Magnetic Field
Strength: 47737.3nT
Dip Angle: 59.87°
Date: 4/3/2019
Model: USER DEFINED

Projection to TD
13060.00' MD 8406.06' TVD
360.75' FNL 330.07' FWL

SURVEY PROGRAM

Depth From	Depth To	Survey/Plan	Tool
137.00	1725.00	MS MWD (Wellbore #1)	MWD
1725.00	13107.84	Design #5 (Wellbore #1)	MWD

CASING DETAILS

TVD	MD	Name	Size
600.00	600.06	13 3/8"	13-3/8
2800.00	2802.23	9 5/8"	9-5/8

Name	TVD	+N/-S	+E/-W	North	East	Latitude	Longitude
VP v4 - Rock Ridge Federal BSS 4H	6340.05	-144.75	250.71	434749.18	639449.25	32° 11' 11.298 N	104° 0' 58.176 W
PBHL v3 - Rock Ridge Federal BSS 4H	8415.57	-14.47	-4594.71	434734.71	634854.54	32° 11' 41.286 N	104° 1' 51.649 W

DESIGN TARGET DETAILS

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
1725.00	2.60	122.80	1724.42	-22.90	18.72	0.00	0.000	-18.65	Last Survey-1725.00' MD
2000.00	2.60	122.80	1999.13	-29.66	29.21	0.00	0.000	-29.12	Begin 2.00°/100' Build & Turn
2040.41	3.36	117.44	2039.49	-30.70	31.03	2.00	-22.852	-30.94	Hold 3.36° Inc, 117.44° Azm
6180.21	3.36	117.44	6172.17	-142.48	246.34	0.00	0.000	-245.89	Begin 2.00°/100' Drop
6348.18	0.00	0.00	6340.05	-144.75	250.71	2.00	180.000	-250.25	Begin Vertical Hold
7911.70	0.00	0.00	7903.57	-144.75	250.71	0.00	0.005	-250.25	Begin 10.00°/100' Build
8511.70	60.00	288.80	8399.77	-52.43	-20.48	10.00	288.800	20.65	Begin 10.00°/100' Build & Turn
8870.63	91.00	269.82	8489.32	-1.21	-358.16	10.00	-33.687	358.16	Begin 91.00° Lateral
13107.84	91.00	269.82	8415.57	-14.47	-4594.71	0.00	0.000	4594.73	PBHL

