

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
Do not use this form for proposals to drill or to re-enter an
abandoned well. Use form 3160-3 (APD) for such proposals.5. Lease Serial No.
NMNM107384

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

7. If Unit or CA/Agreement, Name and/or No.

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other8. Well Name and No.
ROCK RIDGE FEDERAL WCXY 5H2. Name of Operator
MURCHISON OIL & GAS LLCContact: CINDY COTTRELL
E-Mail: ccottrell@jdmii.com9. API Well No.
30-015-45872-00-X13a. Address
LEGACY TOWER ONE 7250 DALLAS PKY, STE 1400
PLANO, TX 75024-50023b. Phone No. (include area code)
Ph: 972.931.070010. Field and Pool or Exploratory Area
PURPLE SAGE-WOLFCAMP (GAS)

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 30 T24S R29E NENE 745FNL 250FEL
32.193718 N Lat, 104.015999 W Lon

11. County or Parish, State

EDDY COUNTY, NM

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)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	PD

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Murchison Oil and Gas, LLC respectfully requests permission to change the producing formation and bottom hole location as described in the attached drilling program, directional survey and plats. Additionally we would like to reflect the formation change in the well name by changing it from ?Rock Ridge Federal WCB 5H? to ?Rock Ridge Federal WCXY 5H?.

RECEIVED

Carlsbad Field Office
OCD Artesia

JUL 23 2019

DISTRICT/ARTESIAO.C.D.

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #469881 verified by the BLM Well Information System

For MURCHISON OIL & GAS LLC, sent to the Carlsbad

Committed to AFMSS for processing by PRISCILLA PEREZ on 06/21/2019 (19PP2534SE)

Name (Printed/Typed) LUKE PUMPHREY

Title OPERATIONS ENGINEER

Signature (Electronic Submission)

Date 06/20/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By LONG VO

Title PETROLEUM ENGINEER

Date 06/24/2019

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office Carlsbad

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.

(Instructions on page 2)

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

RW10-29-19

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Murchison Oil and Gas Incorporated
LEASE NO.:	NMNM107384
WELL NAME & NO.:	Rock Ridge Federal WCXY 5H
SURFACE HOLE FOOTAGE:	745'/N & 250'/E
BOTTOM HOLE FOOTAGE:	990'/N & 330'/W
LOCATION:	Section 30, T.24 S., R.29 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

H2S	☐ Yes	☒ No	
Potash	☒ None	☐ Secretary	☐ R-111-P
Cave/Karst Potential	☐ Low	☒ Medium	☐ High
Variance	☐ None	☒ Flex Hose	☐ Other
Wellhead	☒ Conventional	☐ Multibowl	☐ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☒ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☐ COM	☐ Unit

All Previous COAs Still Apply

A. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **350 feet** (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

2. The minimum required fill of cement behind the 9-5/8 inch intermediate casing is:

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
 - b. Second stage above DV tool:
 - Cement to surface. If cement does not circulate, contact the appropriate BLM office.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
- ❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

Production casing must be kept fluid filled to meet BLM minimum collapse requirement.

3. The minimum required fill of cement behind the 5-1/2 inch production casing is:
- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

B. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.
3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** inch intermediate casing shoe shall be **5000 (5M)** psi.

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ Chaves and Roosevelt Counties

Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.

During office hours call (575) 627-0272.

After office hours call (575)

☒ Eddy County

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,
(575) 361-2822

☒ Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)
393-3612

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
 - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
 - b. When the operator proposes to set surface casing with Spudder Rig
 - Notify the BLM when moving in and removing the Spudder Rig.
 - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the

plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.
- c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. The results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

ROCK RIDGE FEDERAL WXY 5H – REVISED CASING, CEMENT & MUD PROGRAMS

Casing Program:

Hole Size	Casing Size	Grade	Weight	Thread	SF Collapse	SF Burst	SF Tension	MW	Set Depth MD	Set Depth TVD
16	13 3/8	J55	48#	STC	4.78	7.56	25.77	8.5	350	
12.25	9 5/8	P110 HC	40#	LTC	1.36	4.98	2.67	10	0-6,500	
12.25	9 5/8	P110 HC	43.5#	LTC	1.33	10.5	11.29	9.2-9.5	6,500-9,000	
8.5	5 1/2	P110	17#	BTC	1.33	1.33	2.31	11	14,440	9,826

Casing Design Criteria and Loading Assumptions:

Collapse: 1.2 Design Factor with full internal evacuation.

Burst: 1.125 Design with a surface pressure equal to fracture gradient at depth set minus gas gradient

Production: Design with 1.25 factor of max pressure of stimulation

Tension: 2 Design Factor without effects of buoyancy

Cement Program:

		STAGE TOOL	TOP MD	BTM MD	SX	YIELD	DEN	CU FT	% EX	CL	ADDITIVES
SURF	LEAD		0	350	282	1.34	12.8	378	100	C	Lcm, Gel Salt
INT	LEAD	3000	0	2500	796	1.69	12.5	1345	80	C	Salt, LCM, Gel, Extender
INT	TAIL		2500	3000	177	1.33	14.8	235	50	C	Retarder
INT	LEAD	3000	3000	8500	1211	2.6	11.5	3149	80	C	Gel, Retarder, Defoamer
INT	TAIL		8500	9000	144	1.63	13.2	235	50	H	Retarder, Fluid Loss, Dispersant, Defoamer
PROD	LEAD		5000	9300	451	2.47	12.5	1114	30	TXI	Gel, Defoamer, Retarder, Fluid Loss
PROD	TAIL		9300	14440	933	1.64	14.8	1530	30	TXI	Retarder, Defoamer, Dispersant

Mud Program:

	Mud	MW	Depth
Surface	Fresh Water	8.3-8.6	600'
Intermediate	Saturated Brine	10	2,800'
intermediate	Water Based/Cut Brine	9.2-9.5	9,000'
Production	High Performance Water Based	10.0-11.0	TD

Bottom Hole Pressure: 4,377

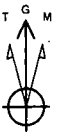
Anticipated Surface Pressure: 2,214

Bottom Hole Temperature: 150

Company: Murchison Oil and Gas, LLC
Well: Rock Ridge Federal WCXY 5H
County: Eddy County, New Mexico (NAD 83)
Rig: Latshaw 7
Wellbore: Wellbore #1
Design: Design #3
Created By: DLD
Date: 13:39, June 19 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 6.814°
To convert a Magnetic Direction to a True Direction, Add 6.983° East
To convert a True Direction to a Grid Direction, Subtract 0.169°



Azimuths to Grid North
True North: -0.17°
Magnetic North: 6.81°

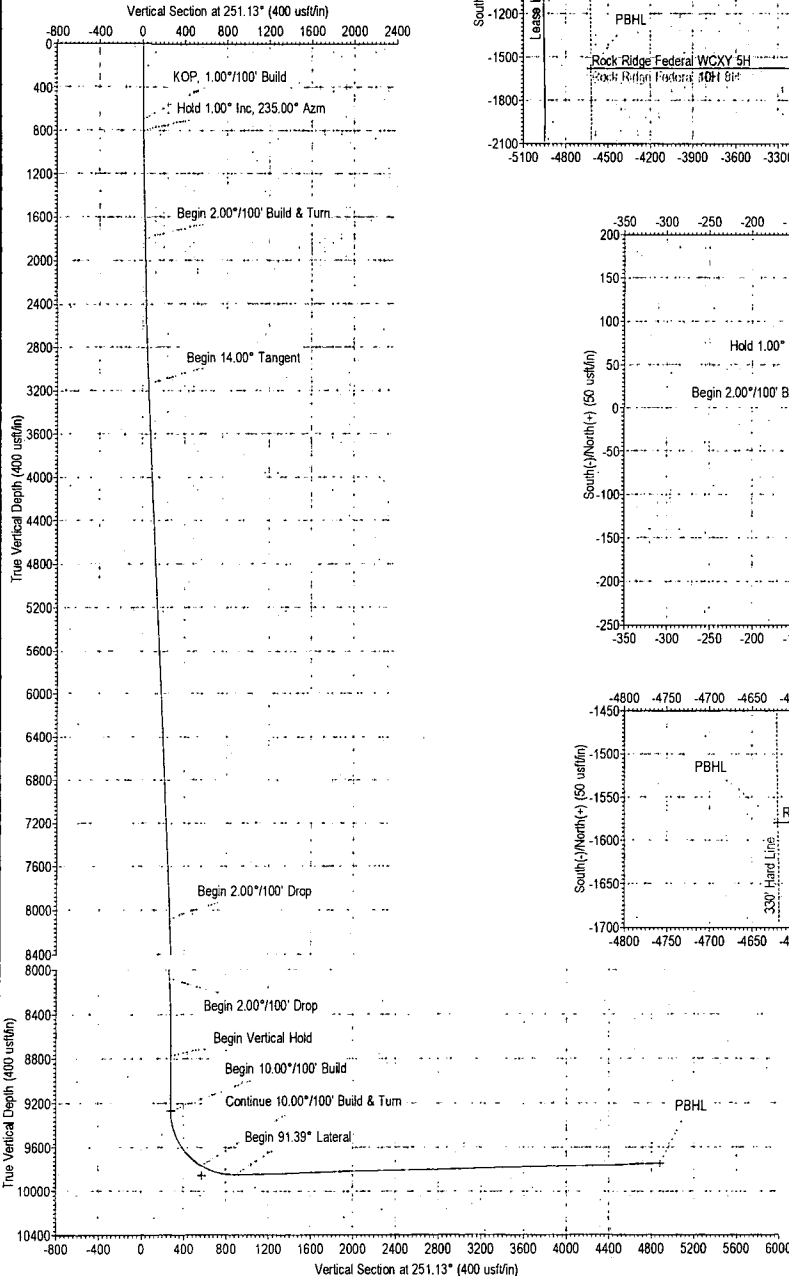
Magnetic Field
Strength: 47881.0nT
Dip Angle: 59.92°
Date: 7/17/2019
Model: HDGM2019

SURVEY PROGRAM

Depth From: 0.00
Depth To: 14604.84
Survey/Plan: Design #3 (Wellbore #1)
Tool: MWD+HRGM

CASING DETAILS

TVD	MD	Name	Size
350.00	350.00	13 3/8"	13-3/8
9000.00	9172.05	9 5/8"	9-5/8



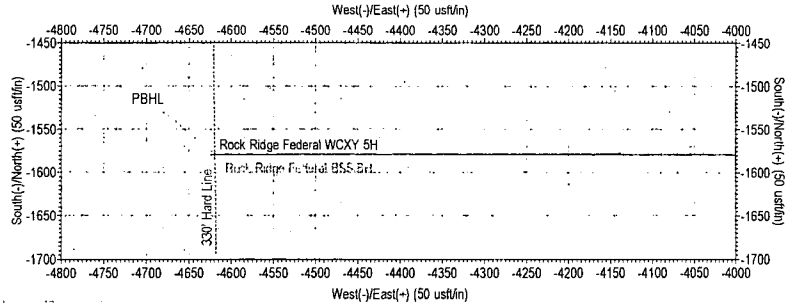
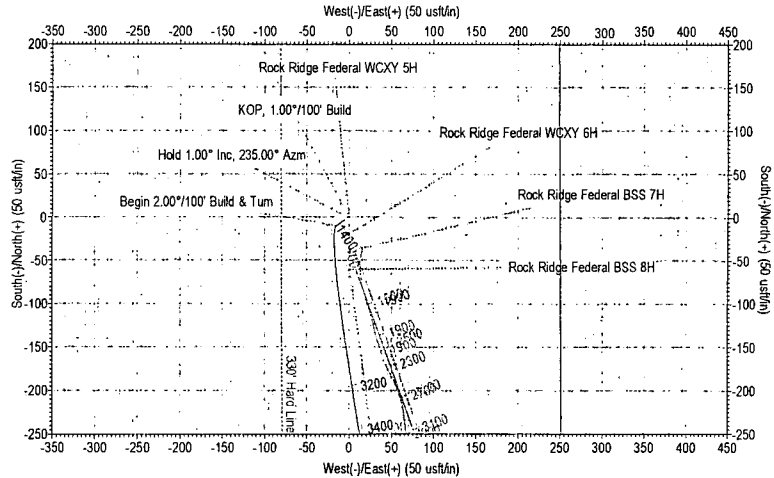
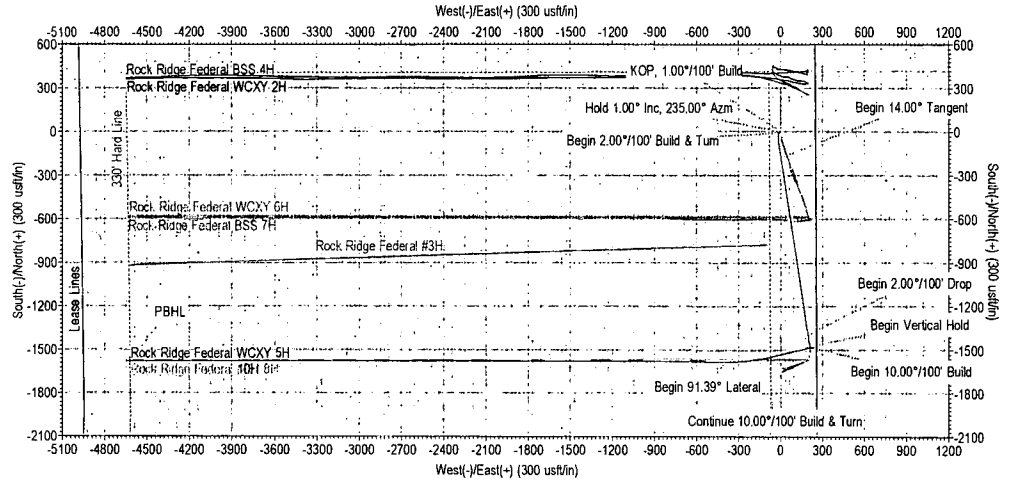
GL @ 2914.20
Northing: 434354.45
Easting: 639501.24
Latitude: 32° 11' 37.391 N
Longitude: 104° 0' 57.584 W

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Vert v3 - Rock Ridge Federal WCB 5H	9266.50	-1479.11	207.32	432875.34	639708.56	32° 11' 22.747 N	104° 0' 55.222 W
PBHL v3 - Rock Ridge Federal WCB 5H	9743.00	-1579.11	-4619.34	432775.34	634881.90	32° 11' 21.895 N	104° 1' 51.394 W
FTP v3 - Rock Ridge Federal WCB 5H	9853.00	-1564.89	-72.20	432789.56	639429.04	32° 11' 21.907 N	104° 0' 58.478 W

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	KOP, 1.00°/100' Build
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.000	0.00	Hold 1.00° Inc, 235.00° Azm
800.00	1.00	235.00	799.99	-0.50	-0.71	1.00	235.000	0.84	Begin 2.00°/100' Build & Turn
1800.00	1.00	235.00	1799.84	-10.51	-15.01	0.00	0.000	17.60	Begin 2.00°/100' Drop
3158.85	14.00	170.98	3144.72	-180.41	1.12	1.00	-67.740	57.30	Begin 14.00° Tangent
8243.68	14.00	170.98	8078.58	-1395.10	193.98	0.00	0.000	267.72	Begin 2.00°/100' Drop
8943.55	0.00	0.00	8771.50	-1479.11	207.32	2.00	180.000	282.27	Begin Vertical Hold
9438.55	0.00	0.00	9266.50	-1479.11	207.32	0.00	0.000	282.27	Begin 10.00°/100' Build
10038.55	60.00	256.75	9762.70	-1544.77	-71.53	10.00	256.750	567.37	Continue 10.00°/100' Build & Turn
10376.97	91.39	270.00	9845.62	-1579.36	-392.72	10.00	24.302	882.48	Begin 91.39° Lateral
14604.84	91.39	270.00	9743.00	-1579.11	-4619.34	0.00	0.000	4881.79	PBHL



Murchison Oil and Gas, LLC

Eddy County, New Mexico (NAD 83)

Rock Ridge Federal 5-8

Rock Ridge Federal WCXY 5H

Wellbore #1

Plan: Design #3

Standard Planning Report

19 June, 2019



Database:	EDM 5000.15 Conroe DB	Local Co-ordinate Reference:	Well Rock Ridge Federal WCXY 5H
Company:	Murchison Oil and Gas, LLC	TVD Reference:	WELL @ 2939.20usft (Latshaw 7)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2939.20usft (Latshaw 7)
Site:	Rock Ridge Federal 5-8	North Reference:	Grid
Well:	Rock Ridge Federal WCXY 5H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

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 5-8		
Site Position:		Northing:	434,354.45 usft
From:	Lat/Long	Easting:	639,501.24 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 11' 37.391 N
		Longitude:	104° 0' 57.584 W

Well:	Rock Ridge Federal WCXY 5H					
Well Position	+N/-S	0.00 usft	Northing:	434,354.45 usft	Latitude:	32° 11' 37.391 N
	+E/-W	0.00 usft	Easting:	639,501.24 usft	Longitude:	104° 0' 57.584 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	~ usft	Ground Level:	2,914.20 usft
Grid Convergence:		0.169 °				

Wellbore:	Wellbore #1		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2019	7/17/2019	6.983	59.917	47,881.00

Design:	Design #3		
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Audit Notes:					
Version:		Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	251.13	

Plan Survey Tool Program		Date 6/19/2019		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	14,604.84	Design #3 (Wellbore #1)	MWD+HRGM OWSG MWD + HRGM

Database:	EDM 5000.15 Conroe DB	Local Co-ordinate Reference:	Well Rock Ridge Federal WCXY 5H
Company:	Murchison Oil and Gas, LLC	TVD Reference:	WELL @ 2939.20usft (Latshaw 7)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2939.20usft (Latshaw 7)
Site:	Rock Ridge Federal 5-8	North Reference:	Grid
Well:	Rock Ridge Federal WCXY 5H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.000	
800.00	1.00	235.00	799.99	-0.50	-0.71	1.00	1.00	0.00	235.000	
1,800.00	1.00	235.00	1,799.84	-10.51	-15.01	0.00	0.00	0.00	0.000	
3,158.85	14.00	170.98	3,144.72	-180.41	1.12	1.00	0.96	-4.71	-67.740	
8,243.68	14.00	170.98	8,078.58	-1,395.10	193.98	0.00	0.00	0.00	0.000	
8,943.55	0.00	0.00	8,771.50	-1,479.11	207.32	2.00	-2.00	0.00	180.000	
9,438.55	0.00	0.00	9,266.50	-1,479.11	207.32	0.00	0.00	0.00	0.000	Vert v3 - Rock Ridg
10,038.55	60.00	256.75	9,762.70	-1,544.77	-71.53	10.00	10.00	0.00	256.750	
10,376.97	91.39	270.00	9,845.62	-1,579.36	-392.72	10.00	9.28	3.92	24.302	
14,604.84	91.39	270.00	9,743.00	-1,579.11	-4,619.34	0.00	0.00	0.00	0.000	PBHL v3 - Rock Ric

Database:	EDM 5000.15 Conroe DB	Local Co-ordinate Reference:	Well Rock Ridge Federal WCXY 5H
Company:	Murchison Oil and Gas, LLC	TVD Reference:	WELL @ 2939.20usft (Latshaw 7)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2939.20usft (Latshaw 7)
Site:	Rock Ridge Federal 5-8	North Reference:	Grid
Well:	Rock Ridge Federal WCXY 5H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

Planned 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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
350.00	0.00	0.00	350.00	0.00	0.00	0.00	0.00	0.00	0.00
13 3/8"									
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 1.00°/100' Build									
800.00	1.00	235.00	799.99	-0.50	-0.71	0.84	1.00	1.00	0.00
Hold 1.00° Inc, 235.00° Azm									
900.00	1.00	235.00	899.98	-1.50	-2.14	2.51	0.00	0.00	0.00
1,000.00	1.00	235.00	999.96	-2.50	-3.57	4.19	0.00	0.00	0.00
1,100.00	1.00	235.00	1,099.95	-3.50	-5.00	5.87	0.00	0.00	0.00
1,200.00	1.00	235.00	1,199.93	-4.50	-6.43	7.54	0.00	0.00	0.00
1,300.00	1.00	235.00	1,299.92	-5.51	-7.86	9.22	0.00	0.00	0.00
1,400.00	1.00	235.00	1,399.90	-6.51	-9.29	10.90	0.00	0.00	0.00
1,500.00	1.00	235.00	1,499.89	-7.51	-10.72	12.57	0.00	0.00	0.00
1,600.00	1.00	235.00	1,599.87	-8.51	-12.15	14.25	0.00	0.00	0.00
1,700.00	1.00	235.00	1,699.86	-9.51	-13.58	15.93	0.00	0.00	0.00
1,800.00	1.00	235.00	1,799.84	-10.51	-15.01	17.60	0.00	0.00	0.00
Begin 2.00°/100' Build & Turn									
1,900.00	1.66	201.13	1,899.82	-12.36	-16.25	19.37	1.00	0.66	-33.87
2,000.00	2.55	188.51	1,999.75	-15.92	-17.10	21.33	1.00	0.89	-12.62
2,100.00	3.50	182.56	2,099.61	-21.17	-17.57	23.47	1.00	0.95	-5.95
2,200.00	4.48	179.17	2,199.36	-28.12	-17.65	25.79	1.00	0.97	-3.39
2,300.00	5.46	177.00	2,298.99	-36.77	-17.34	28.30	1.00	0.98	-2.18
2,400.00	6.45	175.48	2,398.45	-47.12	-16.65	31.00	1.00	0.99	-1.51
2,500.00	7.44	174.37	2,497.71	-59.16	-15.57	33.87	1.00	0.99	-1.11
2,600.00	8.43	173.52	2,596.76	-72.88	-14.11	36.93	1.00	0.99	-0.85
2,700.00	9.42	172.85	2,695.54	-88.28	-12.26	40.16	1.00	0.99	-0.67
2,800.00	10.42	172.30	2,794.05	-105.37	-10.03	43.58	1.00	1.00	-0.55
2,900.00	11.42	171.85	2,892.24	-124.13	-7.42	47.17	1.00	1.00	-0.45
3,000.00	12.41	171.47	2,990.08	-144.55	-4.42	50.94	1.00	1.00	-0.38
3,100.00	13.41	171.15	3,087.55	-166.64	-1.04	54.89	1.00	1.00	-0.32
3,158.85	14.00	170.98	3,144.72	-180.41	1.12	57.30	1.00	1.00	-0.29
Begin 14.00° Tangent									
3,200.00	14.00	170.98	3,184.65	-190.24	2.68	59.00	0.00	0.00	0.00
3,300.00	14.00	170.98	3,281.68	-214.13	6.48	63.14	0.00	0.00	0.00
3,400.00	14.00	170.98	3,378.71	-238.02	10.27	67.28	0.00	0.00	0.00
3,500.00	14.00	170.98	3,475.74	-261.91	14.06	71.41	0.00	0.00	0.00
3,600.00	14.00	170.98	3,572.78	-285.80	17.85	75.55	0.00	0.00	0.00
3,700.00	14.00	170.98	3,669.81	-309.69	21.65	79.69	0.00	0.00	0.00
3,800.00	14.00	170.98	3,766.84	-333.57	25.44	83.83	0.00	0.00	0.00
3,900.00	14.00	170.98	3,863.87	-357.46	29.23	87.97	0.00	0.00	0.00
4,000.00	14.00	170.98	3,960.90	-381.35	33.03	92.11	0.00	0.00	0.00
4,100.00	14.00	170.98	4,057.93	-405.24	36.82	96.24	0.00	0.00	0.00
4,200.00	14.00	170.98	4,154.96	-429.13	40.61	100.38	0.00	0.00	0.00
4,300.00	14.00	170.98	4,251.99	-453.02	44.40	104.52	0.00	0.00	0.00
4,400.00	14.00	170.98	4,349.02	-476.90	48.20	108.66	0.00	0.00	0.00
4,500.00	14.00	170.98	4,446.05	-500.79	51.99	112.80	0.00	0.00	0.00
4,600.00	14.00	170.98	4,543.08	-524.68	55.78	116.93	0.00	0.00	0.00

Database:	EDM 5000.15 Conroe DB	Local Co-ordinate Reference:	Well Rock Ridge Federal WCXY 5H
Company:	Murchison Oil and Gas, LLC	TVD Reference:	WELL @ 2939.20usft (Latshaw 7)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2939.20usft (Latshaw 7)
Site:	Rock Ridge Federal 5-8	North Reference:	Grid
Well:	Rock Ridge Federal WCXY 5H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

Planned 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)
4,700.00	14.00	170.98	4,640.11	-548.57	59.58	121.07	0.00	0.00	0.00
4,800.00	14.00	170.98	4,737.14	-572.46	63.37	125.21	0.00	0.00	0.00
4,900.00	14.00	170.98	4,834.17	-596.35	67.16	129.35	0.00	0.00	0.00
5,000.00	14.00	170.98	4,931.21	-620.23	70.95	133.49	0.00	0.00	0.00
5,100.00	14.00	170.98	5,028.24	-644.12	74.75	137.63	0.00	0.00	0.00
5,200.00	14.00	170.98	5,125.27	-668.01	78.54	141.76	0.00	0.00	0.00
5,300.00	14.00	170.98	5,222.30	-691.90	82.33	145.90	0.00	0.00	0.00
5,400.00	14.00	170.98	5,319.33	-715.79	86.13	150.04	0.00	0.00	0.00
5,500.00	14.00	170.98	5,416.36	-739.68	89.92	154.18	0.00	0.00	0.00
5,600.00	14.00	170.98	5,513.39	-763.57	93.71	158.32	0.00	0.00	0.00
5,700.00	14.00	170.98	5,610.42	-787.45	97.50	162.45	0.00	0.00	0.00
5,800.00	14.00	170.98	5,707.45	-811.34	101.30	166.59	0.00	0.00	0.00
5,900.00	14.00	170.98	5,804.48	-835.23	105.09	170.73	0.00	0.00	0.00
6,000.00	14.00	170.98	5,901.51	-859.12	108.88	174.87	0.00	0.00	0.00
6,100.00	14.00	170.98	5,998.54	-883.01	112.68	179.01	0.00	0.00	0.00
6,200.00	14.00	170.98	6,095.57	-906.90	116.47	183.15	0.00	0.00	0.00
6,300.00	14.00	170.98	6,192.60	-930.78	120.26	187.28	0.00	0.00	0.00
6,400.00	14.00	170.98	6,289.64	-954.67	124.05	191.42	0.00	0.00	0.00
6,500.00	14.00	170.98	6,386.67	-978.56	127.85	195.56	0.00	0.00	0.00
6,600.00	14.00	170.98	6,483.70	-1,002.45	131.64	199.70	0.00	0.00	0.00
6,700.00	14.00	170.98	6,580.73	-1,026.34	135.43	203.84	0.00	0.00	0.00
6,800.00	14.00	170.98	6,677.76	-1,050.23	139.23	207.97	0.00	0.00	0.00
6,900.00	14.00	170.98	6,774.79	-1,074.11	143.02	212.11	0.00	0.00	0.00
7,000.00	14.00	170.98	6,871.82	-1,098.00	146.81	216.25	0.00	0.00	0.00
7,100.00	14.00	170.98	6,968.85	-1,121.89	150.61	220.39	0.00	0.00	0.00
7,200.00	14.00	170.98	7,065.88	-1,145.78	154.40	224.53	0.00	0.00	0.00
7,300.00	14.00	170.98	7,162.91	-1,169.67	158.19	228.67	0.00	0.00	0.00
7,400.00	14.00	170.98	7,259.94	-1,193.56	161.98	232.80	0.00	0.00	0.00
7,500.00	14.00	170.98	7,356.97	-1,217.44	165.78	236.94	0.00	0.00	0.00
7,600.00	14.00	170.98	7,454.00	-1,241.33	169.57	241.08	0.00	0.00	0.00
7,700.00	14.00	170.98	7,551.03	-1,265.22	173.36	245.22	0.00	0.00	0.00
7,800.00	14.00	170.98	7,648.07	-1,289.11	177.16	249.36	0.00	0.00	0.00
7,900.00	14.00	170.98	7,745.10	-1,313.00	180.95	253.49	0.00	0.00	0.00
8,000.00	14.00	170.98	7,842.13	-1,336.89	184.74	257.63	0.00	0.00	0.00
8,100.00	14.00	170.98	7,939.16	-1,360.78	188.53	261.77	0.00	0.00	0.00
8,200.00	14.00	170.98	8,036.19	-1,384.66	192.33	265.91	0.00	0.00	0.00
8,243.68	14.00	170.98	8,078.58	-1,395.10	193.98	267.72	0.00	0.00	0.00
Begin 2.00°/100' Drop									
8,300.00	12.87	170.98	8,133.35	-1,408.02	196.04	269.95	2.00	-2.00	0.00
8,400.00	10.87	170.98	8,231.21	-1,428.34	199.26	273.47	2.00	-2.00	0.00
8,500.00	8.87	170.98	8,329.72	-1,445.27	201.95	276.41	2.00	-2.00	0.00
8,600.00	6.87	170.98	8,428.77	-1,458.79	204.10	278.75	2.00	-2.00	0.00
8,700.00	4.87	170.98	8,528.24	-1,468.89	205.70	280.50	2.00	-2.00	0.00
8,800.00	2.87	170.98	8,628.01	-1,475.56	206.76	281.65	2.00	-2.00	0.00
8,900.00	0.87	170.98	8,727.95	-1,478.78	207.27	282.21	2.00	-2.00	0.00
8,943.55	0.00	0.00	8,771.50	-1,479.11	207.32	282.27	2.00	-2.00	0.00
Begin Vertical Hold									
9,000.00	0.00	0.00	8,827.95	-1,479.11	207.32	282.27	0.00	0.00	0.00
9,100.00	0.00	0.00	8,927.95	-1,479.11	207.32	282.27	0.00	0.00	0.00
9,172.05	0.00	0.00	9,000.00	-1,479.11	207.32	282.27	0.00	0.00	0.00
9 5/8"									
9,200.00	0.00	0.00	9,027.95	-1,479.11	207.32	282.27	0.00	0.00	0.00
9,300.00	0.00	0.00	9,127.95	-1,479.11	207.32	282.27	0.00	0.00	0.00

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Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 2939.20usft (Latshaw 7)
Site:	Rock Ridge Federal 5-8	North Reference:	Grid
Well:	Rock Ridge Federal WCXY 5H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

Planned 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)	
9,400.00	0.00	0.00	9,227.95	-1,479.11	207.32	282.27	0.00	0.00	0.00	
9,438.55	0.00	0.00	9,266.50	-1,479.11	207.32	282.27	0.00	0.00	0.00	
Begin 10.00°/100' Build										
9,500.00	6.15	256.75	9,327.83	-1,479.87	204.12	285.55	10.00	10.00	0.00	
9,600.00	16.15	256.75	9,425.82	-1,484.29	185.33	304.76	10.00	10.00	0.00	
9,700.00	26.15	256.75	9,518.97	-1,492.55	150.26	340.61	10.00	10.00	0.00	
9,800.00	36.15	256.75	9,604.45	-1,504.39	99.98	392.02	10.00	10.00	0.00	
9,900.00	46.15	256.75	9,679.66	-1,519.45	36.02	457.42	10.00	10.00	0.00	
10,000.00	56.15	256.75	9,742.31	-1,537.27	-39.69	534.82	10.00	10.00	0.00	
10,038.55	60.00	256.75	9,762.70	-1,544.77	-71.53	567.37	10.00	10.00	0.00	
Continue 10.00°/100' Build & Turn										
10,100.00	65.63	259.52	9,790.76	-1,555.97	-125.00	621.59	10.00	9.16	4.51	
10,200.00	74.88	263.56	9,824.52	-1,569.70	-217.99	714.02	10.00	9.25	4.04	
10,300.00	84.20	267.25	9,842.66	-1,577.52	-315.89	809.19	10.00	9.32	3.69	
10,376.97	91.39	270.00	9,845.62	-1,579.36	-392.72	882.48	10.00	9.34	3.57	
Begin 91.39° Lateral										
10,400.00	91.39	270.00	9,845.06	-1,579.36	-415.74	904.27	0.00	0.00	0.00	
10,500.00	91.39	270.00	9,842.63	-1,579.35	-515.72	998.86	0.00	0.00	0.00	
10,600.00	91.39	270.00	9,840.21	-1,579.35	-615.69	1,093.46	0.00	0.00	0.00	
10,700.00	91.39	270.00	9,837.78	-1,579.34	-715.66	1,188.05	0.00	0.00	0.00	
10,800.00	91.39	270.00	9,835.35	-1,579.34	-815.63	1,282.64	0.00	0.00	0.00	
10,900.00	91.39	270.00	9,832.92	-1,579.33	-915.60	1,377.24	0.00	0.00	0.00	
11,000.00	91.39	270.00	9,830.50	-1,579.32	-1,015.57	1,471.83	0.00	0.00	0.00	
11,100.00	91.39	270.00	9,828.07	-1,579.32	-1,115.54	1,566.43	0.00	0.00	0.00	
11,200.00	91.39	270.00	9,825.64	-1,579.31	-1,215.51	1,661.02	0.00	0.00	0.00	
11,300.00	91.39	270.00	9,823.22	-1,579.31	-1,315.48	1,755.61	0.00	0.00	0.00	
11,400.00	91.39	270.00	9,820.79	-1,579.30	-1,415.45	1,850.21	0.00	0.00	0.00	
11,500.00	91.39	270.00	9,818.36	-1,579.29	-1,515.42	1,944.80	0.00	0.00	0.00	
11,600.00	91.39	270.00	9,815.93	-1,579.29	-1,615.39	2,039.40	0.00	0.00	0.00	
11,700.00	91.39	270.00	9,813.51	-1,579.28	-1,715.36	2,133.99	0.00	0.00	0.00	
11,800.00	91.39	270.00	9,811.08	-1,579.28	-1,815.33	2,228.59	0.00	0.00	0.00	
11,900.00	91.39	270.00	9,808.65	-1,579.27	-1,915.30	2,323.18	0.00	0.00	0.00	
12,000.00	91.39	270.00	9,806.23	-1,579.26	-2,015.27	2,417.77	0.00	0.00	0.00	
12,100.00	91.39	270.00	9,803.80	-1,579.26	-2,115.24	2,512.37	0.00	0.00	0.00	
12,200.00	91.39	270.00	9,801.37	-1,579.25	-2,215.21	2,606.96	0.00	0.00	0.00	
12,300.00	91.39	270.00	9,798.94	-1,579.25	-2,315.19	2,701.56	0.00	0.00	0.00	
12,400.00	91.39	270.00	9,796.52	-1,579.24	-2,415.16	2,796.15	0.00	0.00	0.00	
12,500.00	91.39	270.00	9,794.09	-1,579.23	-2,515.13	2,890.74	0.00	0.00	0.00	
12,600.00	91.39	270.00	9,791.66	-1,579.23	-2,615.10	2,985.34	0.00	0.00	0.00	
12,700.00	91.39	270.00	9,789.23	-1,579.22	-2,715.07	3,079.93	0.00	0.00	0.00	
12,800.00	91.39	270.00	9,786.81	-1,579.22	-2,815.04	3,174.53	0.00	0.00	0.00	
12,900.00	91.39	270.00	9,784.38	-1,579.21	-2,915.01	3,269.12	0.00	0.00	0.00	
13,000.00	91.39	270.00	9,781.95	-1,579.21	-3,014.98	3,363.71	0.00	0.00	0.00	
13,100.00	91.39	270.00	9,779.53	-1,579.20	-3,114.95	3,458.31	0.00	0.00	0.00	
13,200.00	91.39	270.00	9,777.10	-1,579.19	-3,214.92	3,552.90	0.00	0.00	0.00	
13,300.00	91.39	270.00	9,774.67	-1,579.19	-3,314.89	3,647.50	0.00	0.00	0.00	
13,400.00	91.39	270.00	9,772.24	-1,579.18	-3,414.86	3,742.09	0.00	0.00	0.00	
13,500.00	91.39	270.00	9,769.82	-1,579.18	-3,514.83	3,836.68	0.00	0.00	0.00	
13,600.00	91.39	270.00	9,767.39	-1,579.17	-3,614.80	3,931.28	0.00	0.00	0.00	
13,700.00	91.39	270.00	9,764.96	-1,579.16	-3,714.77	4,025.87	0.00	0.00	0.00	
13,800.00	91.39	270.00	9,762.54	-1,579.16	-3,814.74	4,120.47	0.00	0.00	0.00	
13,900.00	91.39	270.00	9,760.11	-1,579.15	-3,914.71	4,215.06	0.00	0.00	0.00	
14,000.00	91.39	270.00	9,757.68	-1,579.15	-4,014.68	4,309.65	0.00	0.00	0.00	

Database	EDM 5000.15 Conroe DB	Local Co-ordinate Reference	Well Rock Ridge Federal WCXY 5H
Company	Murchison Oil and Gas, LLC	TVD Reference	WELL @ 2939.20usft (Latshaw 7)
Project	Eddy County, New Mexico (NAD 83)	MD Reference	WELL @ 2939.20usft (Latshaw 7)
Site	Rock Ridge Federal 5-8	North Reference	Grid
Well	Rock Ridge Federal WCXY 5H	Survey Calculation Method	Minimum Curvature
Wellbore	Wellbore #1		
Design	Design #3		

Planned 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)	
14,100.00	91.39	270.00	9,755.25	-1,579.14	-4,114.65	4,404.25	0.00	0.00	0.00	
14,200.00	91.39	270.00	9,752.83	-1,579.13	-4,214.63	4,498.84	0.00	0.00	0.00	
14,300.00	91.39	270.00	9,750.40	-1,579.13	-4,314.60	4,593.44	0.00	0.00	0.00	
14,400.00	91.39	270.00	9,747.97	-1,579.12	-4,414.57	4,688.03	0.00	0.00	0.00	
14,500.00	91.39	270.00	9,745.54	-1,579.12	-4,514.54	4,782.63	0.00	0.00	0.00	
14,600.00	91.39	270.00	9,743.12	-1,579.11	-4,614.51	4,877.22	0.00	0.00	0.00	
14,604.84	91.39	270.00	9,743.00	-1,579.11	-4,619.34	4,881.79	0.00	0.00	0.00	
PBHL										

Design Targets										
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Vert v3 - Rock Ridge I	- plan hits target center	0.00	0.00	9,266.50	-1,479.11	207.32	432,875.34	639,708.57	32° 11' 22.747 N	104° 0' 55.222 W
- Point										
PBHL v3 - Rock Ridge	- plan hits target center	0.00	0.00	9,743.00	-1,579.11	-4,619.34	432,775.34	634,881.90	32° 11' 21.895 N	104° 1' 51.394 W
- Point										
FTP v3 - Rock Ridge I	- plan misses target center by 79.93usft at 10084.09usft MD (9784.01 TVD, -1553.27 N, -110.85 E)	0.00	0.00	9,853.00	-1,564.89	-72.20	432,789.56	639,429.05	32° 11' 21.907 N	104° 0' 58.478 W
- Point										

Casing Points							Casing Diameter (")	Hole Diameter (")
Measured Depth (usft)	Vertical Depth (usft)	Name						
350.00	350.00	13 3/8"					13-3/8	17-1/2
9,172.05	9,000.00	9 5/8"					9-5/8	12-1/4

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment	
700.00	700.00	0.00	0.00	KOP, 1.00°/100' Build	
800.00	799.99	-0.50	-0.71	Hold 1.00° Inc, 235.00° Azm	
1,800.00	1,799.84	-10.51	-15.01	Begin 2.00°/100' Build & Turn	
3,158.85	3,144.72	-180.41	1.12	Begin 14.00° Tangent	
8,243.68	8,078.58	-1,395.10	193.98	Begin 2.00°/100' Drop	
8,943.55	8,771.50	-1,479.11	207.32	Begin Vertical Hold	
9,438.55	9,266.50	-1,479.11	207.32	Begin 10.00°/100' Build	
10,038.55	9,762.70	-1,544.77	-71.53	Continue 10.00°/100' Build & Turn	
10,376.97	9,845.62	-1,579.36	-392.72	Begin 91.39° Lateral	
14,604.84	9,743.00	-1,579.11	-4,619.34	PBHL	

RWP 10-29-19

Intent ☐ As Drilled ☐

API #

Operator Name:	Property Name:	Well Number
MURCHISON OIL AND GAS, LLC	ROCK RIDGE FEDERAL WCXY	5H

Kick Off Point (KOP)

UL A	Section 30	Township 24S	Range 29E	Lot	Feet 745	From N/S NORTH	Feet 250	From E/W EAST	County EDDY
Latitude 32.1937196					Longitude 104.0159956			NAD 83	

First Take Point (FTP)

UL H	Section 30	Township 24S	Range 29E	Lot	Feet 2310	From N/S NORTH	Feet 330	From E/W EAST	County EDDY
Latitude 32.1894185					Longitude 104.0162439			NAD 83	

Last Take Point (LTP)

UL	Section 30	Township 24S	Range 29E	Lot 2	Feet 2310	From N/S NORTH	Feet 330	From E/W WEST	County EDDY
Latitude 32.1894153					Longitude 104.0309429			NAD 83	

Is this well the defining well for the Horizontal Spacing Unit? ☐

Is this well an infill well? ☐

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

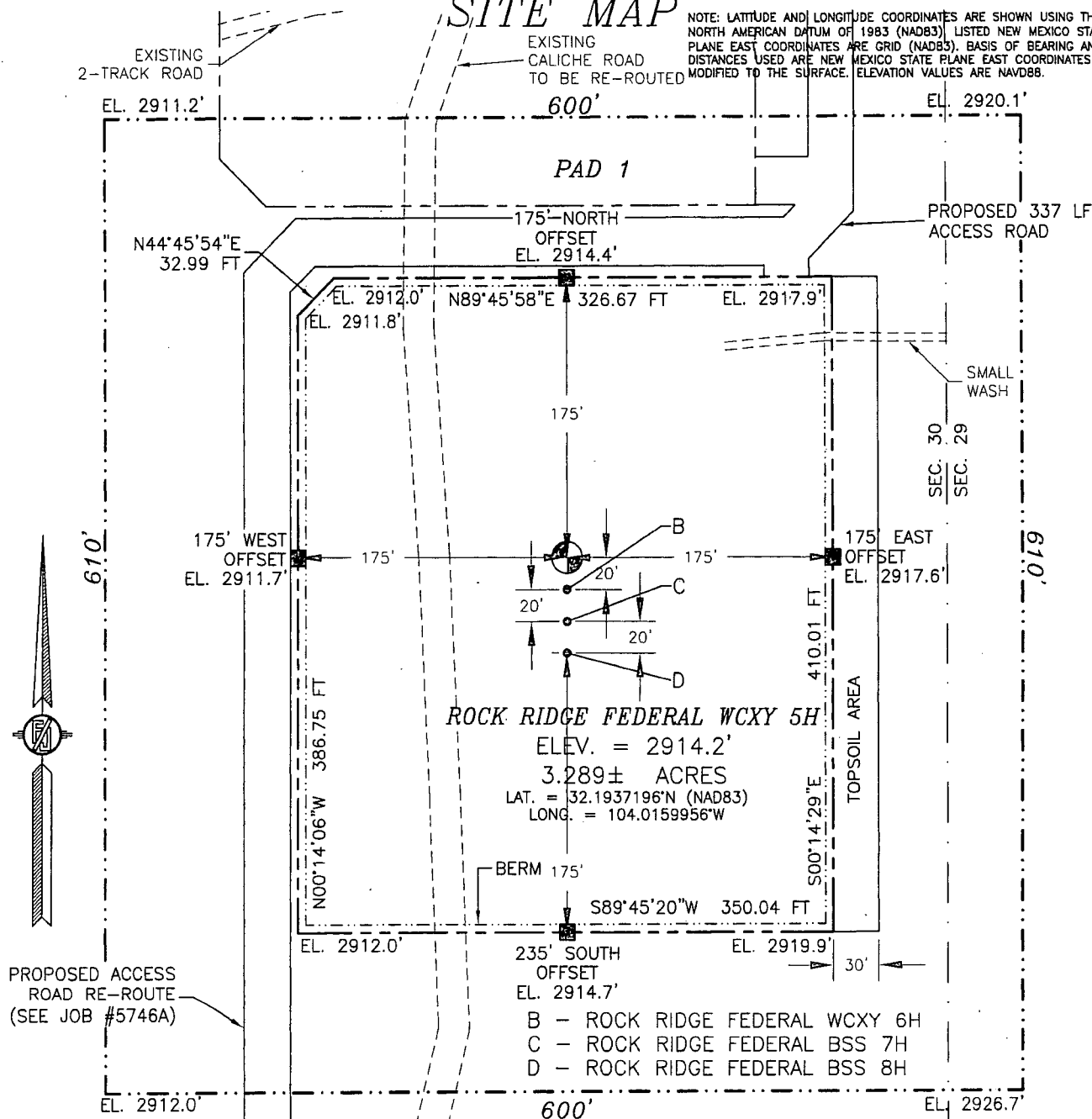
API #

Operator Name:	Property Name:	Well Number

KZ 06/29/2018

SITE MAP

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83) LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE. ELEVATION VALUES ARE NAVD88.

[illegible]

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM U.S. HIGHWAY 285 AND PAVED CR 720 (DUARTE) GO EAST ON CR 720 1.3 MILES, TURN RIGHT ON PAVED CR 746 (McDONALD) AND GO SOUTH THEN EAST A TOTAL OF 2.88 MILES, TURN RIGHT ON CALICHE ROAD AND GO SOUTH 0.62 OF A MILE, BEND RIGHT AND GO SOUTHWEST 340' TO EXISTING ROAD RE-ROUTE AND FOLLOW FLAGS SOUTH 337' TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

MURCHISON OIL AND GAS, LLC
ROCK RIDGE FEDERAL WCXY 5H
 LOCATED 745 FT. FROM THE NORTH LINE
 AND 250 FT. FROM THE EAST LINE OF
 SECTION 30, TOWNSHIP 24 SOUTH,
 RANGE 29 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO

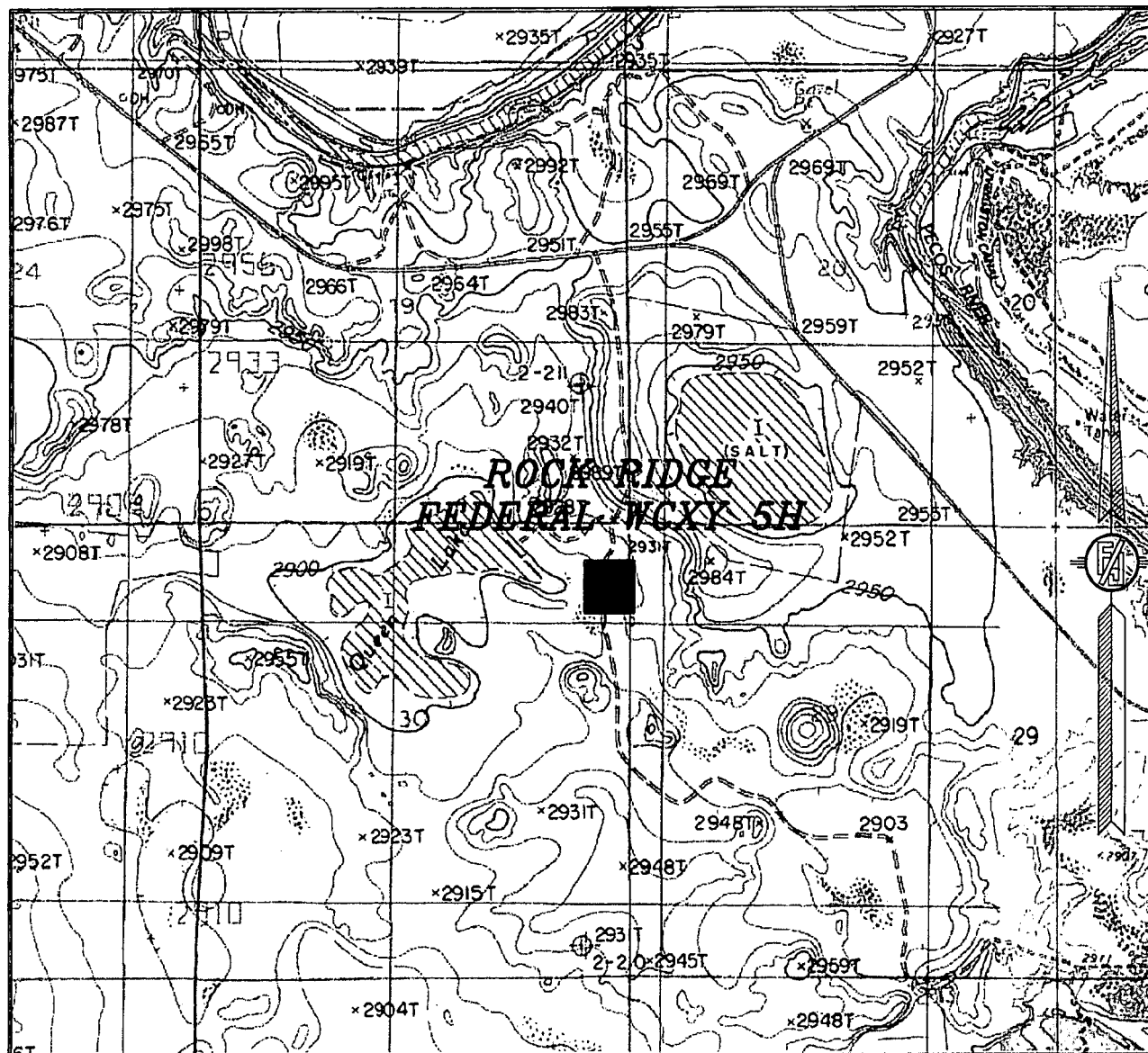
JUNE 19, 2019

SURVEY NO. 5510C

MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO
(575) 234-3341

301 SOUTH CANAL
(575) 234-3341

SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
LOCATION VERIFICATION MAP



USGS QUAD MAP:
MALAGA

NOT TO SCALE

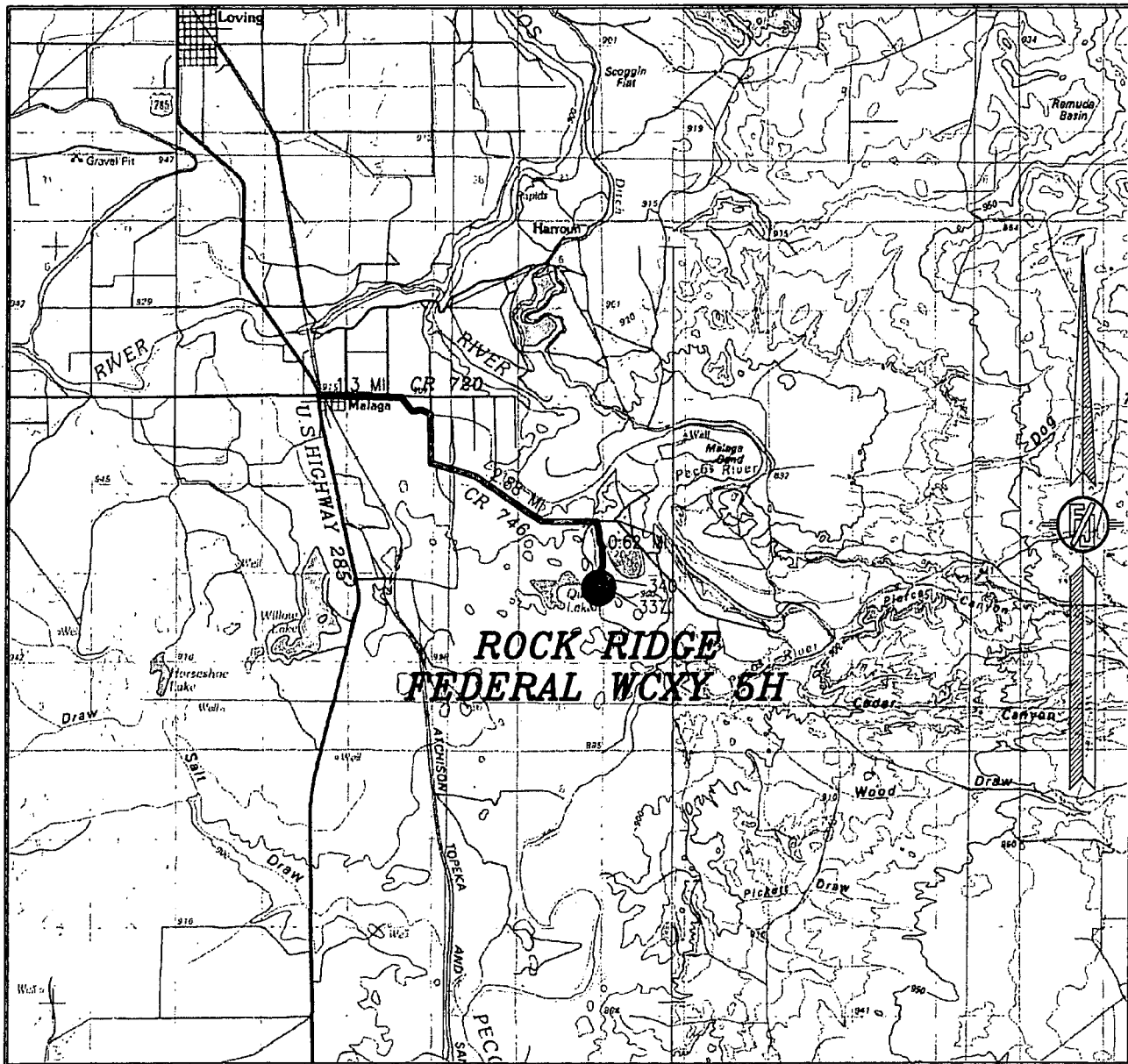
MURCHISON OIL AND GAS, LLC
ROCK RIDGE FEDERAL WCXY 5H
LOCATED 745 FT. FROM THE NORTH LINE
AND 250 FT. FROM THE EAST LINE OF
SECTION 30, TOWNSHIP 24 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JUNE 19, 2019

SURVEY NO. 5510C

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

DIRECTIONS TO LOCATION

FROM U.S. HIGHWAY 285 AND PAVED CR 720 (DUARTE) GO EAST ON CR 720 1.3 MILES, TURN RIGHT ON PAVED CR 746 (McDONALD) AND GO SOUTH THEN EAST A TOTAL OF 2.88 MILES, TURN RIGHT ON CALICHE ROAD AND GO SOUTH 0.62 OF A MILE, BEND RIGHT AND GO SOUTHWEST 340° TO EXISTING ROAD RE-ROUTE AND FOLLOW FLAGS SOUTH 337°, TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

MURCHISON OIL AND GAS, LLC
ROCK RIDGE FEDERAL WCXY 5H
LOCATED 745 FT. FROM THE NORTH LINE
AND 250 FT. FROM THE EAST LINE OF
SECTION 30, TOWNSHIP 24 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JUNE 19, 2019

SURVEY NO. 5510C

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEBRUARY 2017

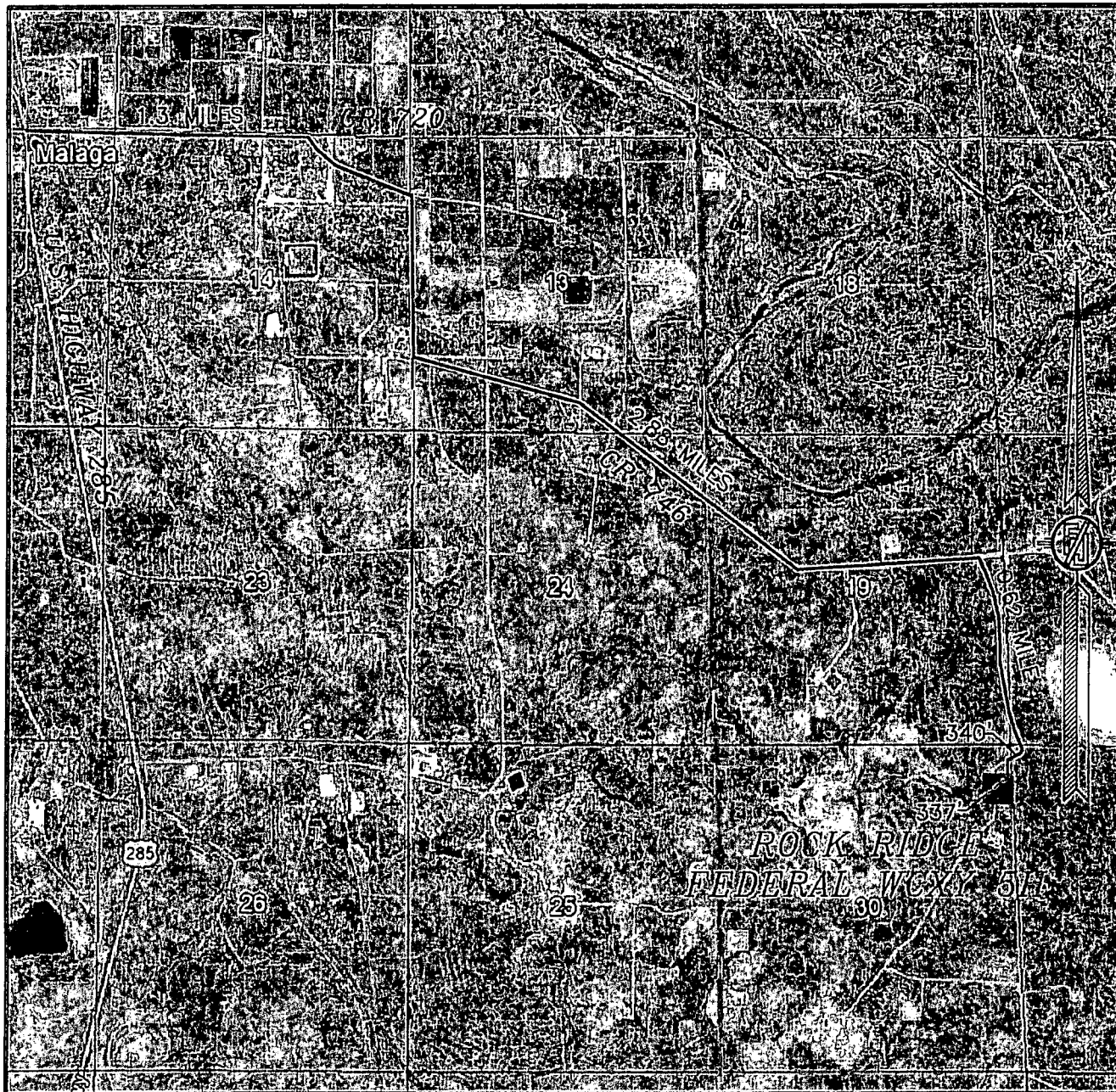
MURCHISON OIL AND GAS, LLC
ROCK RIDGE FEDERAL WCXY 5H
LOCATED 745 FT. FROM THE NORTH LINE
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SECTION 30, TOWNSHIP 24 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JUNE 19, 2019

SURVEY NO. 5510C

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
ACCESS AERIAL ROUTE MAP



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEBRUARY 2017

MURCHISON OIL AND GAS, LLC
ROCK RIDGE FEDERAL WCXY 5H
LOCATED 745 FT. FROM THE NORTH LINE
AND 250 FT. FROM THE EAST LINE OF
SECTION 30, TOWNSHIP 24 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

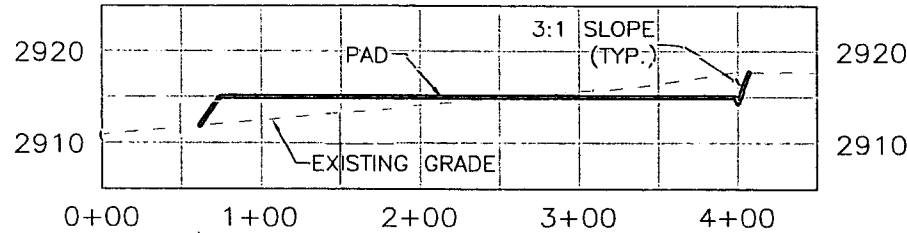
JUNE 19, 2019

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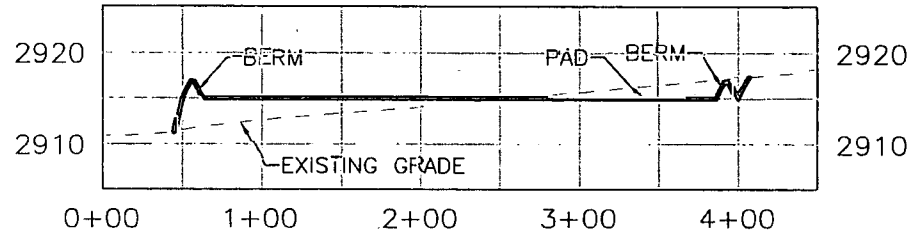
MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO
(575) 234-3341

CROSS SECTIONS

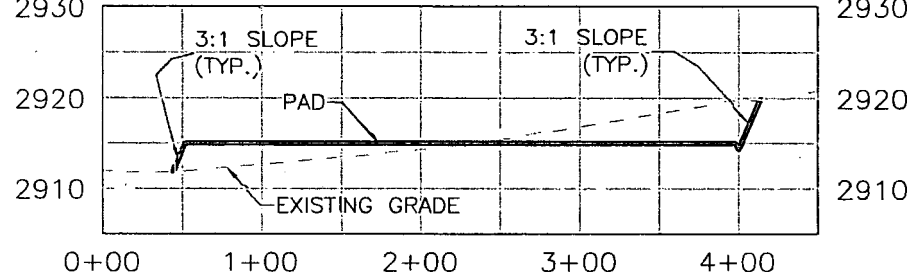
SECTION A-A



SECTION B-B



SECTION C-C



SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD,

NEW MEXICO, THIS 19 DAY OF JUNE, 2019

FILIMON F. JARAMILLO PLS. 12797

MURCHISON OIL AND GAS, LLC
GRADING PLAN AND CROSS SECTIONS
FOR ROCK RIDGE PAD 2
SECTION 30, TOWNSHIP 24 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JUNE 19, 2019

MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO

(575) 234-3341

012 60 120 240
SCALE 1" = 120' - 1" = 20' VER

CUT	FILL	NET
3265 CU. YD	5699 CU. YD	2434 CU. YD (FILL)

EARTHWORK QUANTITIES ARE ESTIMATED

SHEET 2-2
SURVEY NO. 5510C