

Form 3160-5  
(June 2015)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.****SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		5. Lease Serial No. N0G13121857
2. Name of Operator ENDURING RESOURCES LLC		6. If Indian, Allottee or Tribe Name EASTERN NAVAJO
Contact: LACEY GRANILLO E-Mail: lgranillo@enduringresources.com		7. If Unit or CA/Agreement, Name and/or No. NMNM135216A
3a. Address 1050 17TH STREET SUITE 2500 DENVER, CO 80265	3b. Phone No. (include area code) Ph: 505-636-9743	8. Well Name and No. W LYBROOK UNIT 720 <b>H</b>
4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  Sec 23 T23N R9W NWSE 2587FSL 2062FEL 36.212273 N Lat, 107.756203 W Lon		9. API Well No. <del>30-045-35818</del> -00-X1 <b>30-045-38260</b>
		10. Field and Pool or Exploratory Area LYBROOK MANCOS W
		11. County or Parish, State SAN JUAN COUNTY, NM

## 12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION				
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off	
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity	
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other	
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original A	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> 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.

Enduring Resources is requesting the following changes:

## Casing program-

As part of the casing program change, Enduring proposes setting a larger surface casing. Installing a larger surface casing will require a new SHL because the existing surface casing has already been installed.

## Attachments:

Updated C102 (SHL moved 35?; POE and BHL did not change)

Updated directional drilling plan (updated to reflect new SHL)

Updated drilling procedure (to reflect updated SHL, updated directional drilling plan, & updated casing program)

14. I hereby certify that the foregoing is true and correct.	
<b>Electronic Submission #504513 verified by the BLM Well Information System</b> <b>For ENDURING RESOURCES LLC, sent to the Farmington</b> <b>Committed to AFMSS for processing by JOE KILLINS on 03/04/2020 (20JK0144SE)</b>	
Name (Printed/Typed) LACEY GRANILLO	Title PERMITTING SPECIALIST
Signature (Electronic Submission)	Date 02/25/2020

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved By <u>JOE KILLINS</u>	Title <u>PETROLEUM ENGINEER</u>	Date <u>03/04/2020</u>
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 <u>Farmington</u>

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 \*\***

**Additional data for EC transaction #504513 that would not fit on the form**

**32. Additional remarks, continued**

Requesting a new API # for new SHL, awaiting NMOCD approval and distribution of new #.

**Revisions to Operator-Submitted EC Data for Sundry Notice #504513**

	<b>Operator Submitted</b>	<b>BLM Revised (AFMSS)</b>
Sundry Type:	APDCH NOI	APDCH NOI
Lease:	N0G13121857	N0G13121857
Agreement:	NMNM135216A	NMNM135216A (NMNM135216A)
Operator:	ENDURING RESOURCES IV LLC 200 ENERGY CT FARMINGTON, NM 87401 Ph: 505-636-9743	ENDURING RESOURCES LLC 1050 17TH STREET SUITE 2500 DENVER, CO 80265 Ph: 5053868205
Admin Contact:	LACEY GRANILLO PERMITTING SPECIALIST E-Mail: lgranillo@enduringresources.com  Ph: 505-636-9743	LACEY GRANILLO PERMITTING SPECIALIST E-Mail: lgranillo@enduringresources.com  Ph: 505-636-9743
Tech Contact:	LACEY GRANILLO PERMITTING SPECIALIST E-Mail: lgranillo@enduringresources.com  Ph: 505-636-9743	LACEY GRANILLO PERMITTING SPECIALIST E-Mail: lgranillo@enduringresources.com  Ph: 505-636-9743
Location: State: County:	NM SAN JUAN	NM SAN JUAN
Field/Pool:	LYBROOK MANCOS W	LYBROOK MANCOS W
Well/Facility:	W LYBROOK UNIT 720H Sec 23 T23N R9W Mer NMP NWSE 2565FSL 2089FEL 36.212211 N Lat, 107.756293 W Lon	W LYBROOK UNIT 720Y Sec 23 T23N R9W NWSE 2587FSL 2062FEL 36.212273 N Lat, 107.756203 W Lon

District I  
1625 N. French Drive, Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720

District II  
811 S. First Street, Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720

District III  
1000 Rio Brazos Road, Aztec, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170

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

State of New Mexico  
Energy, Minerals & Natural Resources Department

Form C-102  
Revised August 1, 2011

Submit one copy to  
Appropriate District Office

OIL CONSERVATION DIVISION  
1220 South St. Francis Drive  
Santa Fe, NM 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-045-38260		*Pool Code 98157	*Pool Name LYBROOK MANCOS W
*Property Code 321259	*Property Name W LYBROOK UNIT		*Well Number 720H
*GRID No. 372286	*Operator Name ENDURING RESOURCES, LLC		*Elevation 6719'

<sup>10</sup> Surface Location

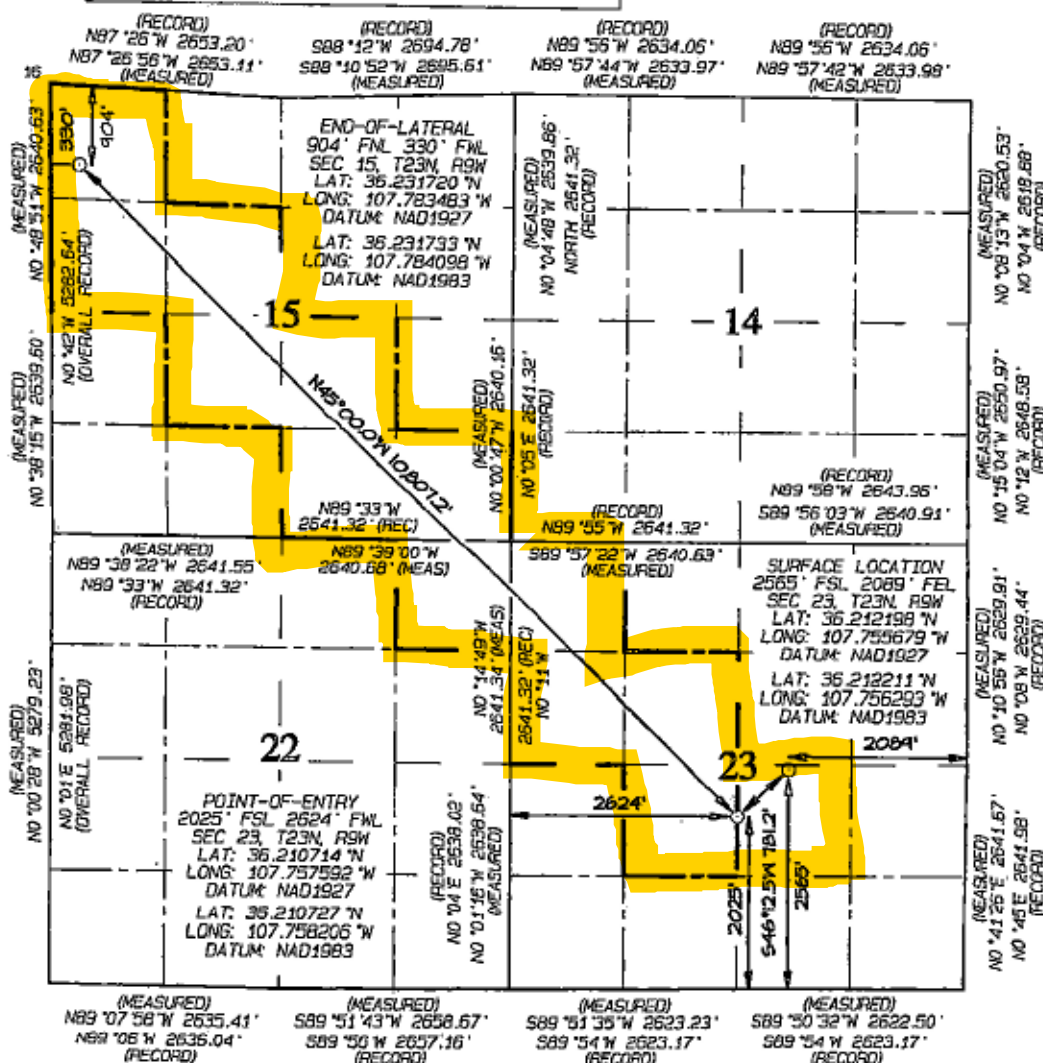
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
J	23	23N	9W		2565	SOUTH	2089	EAST	SAN JUAN

<sup>11</sup> Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	15	23N	9W		904	NORTH	330	WEST	SAN JUAN

*Dedicated Acres 480.00	W/2 NW/4, SE/4 NW/4 NE/4 SW/4, W/2 NE/4 SE/4 SE/4 - Section 15 NE/4 NE/4 - Section 22 W/2 NW/4, SE/4 NW/4 NE/4 SW/4 - Section 23	*Joint or Infill	*Consolidation Code	*Order No. R-14051 - 12,807.24 Acres
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NO ALLOWABLE WILL BE ASSIGNED  
TO THIS COMPLETION UNTIL ALL  
INTERESTS HAVE BEEN CONSOLIDATED  
OR A NON-STANDARD UNIT HAS  
BEEN APPROVED BY THE DIVISION



<sup>17</sup> 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 unless 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 or a compulsory pooling order heretofore entered by the division.

Signature: *[Signature]* Date: 2/21/20  
Printed Name: *[Name]*  
Address: *[Address]*

<sup>18</sup> 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 Revised: FEBRUARY 20, 2020  
Survey Date: OCTOBER 19, 2015

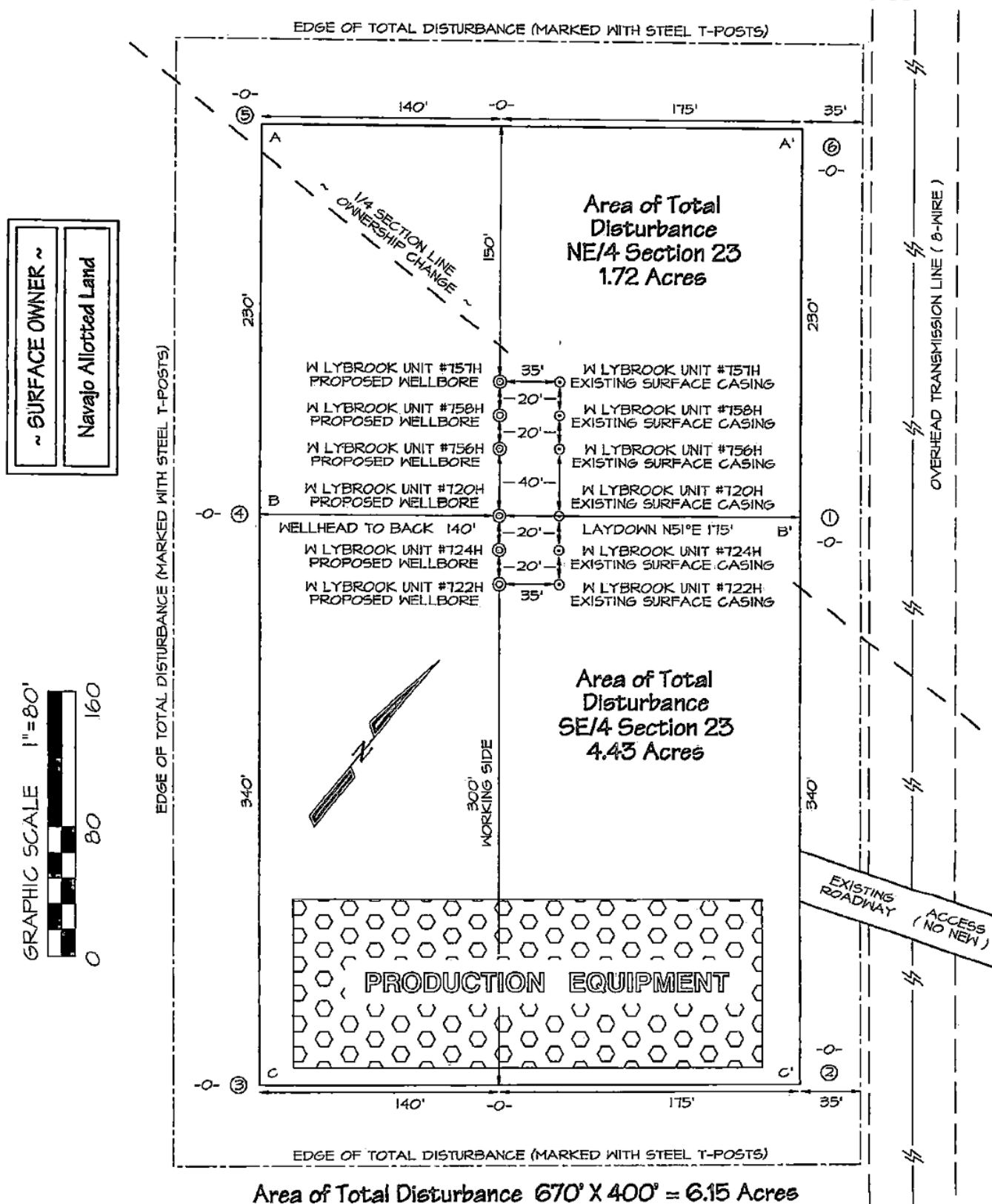
Signature and Seal of Professional Surveyor



JASON C. EDWARDS

Certificate Number 15269

**ENDURING RESOURCES, LLC W LYBROOK UNIT #720H**  
**2565' FSL & 2089' FEL, SECTION 23, T23N, R9W, NMPM**  
**SAN JUAN COUNTY, NEW MEXICO ELEVATION: 6719'**  
**LAT: 36.212211°N LONG: 107.756293°W DATUM: NAD1983**



Steel T-Posts have been set to define Edge of Disturbance limits which are 50' offset from edge of wellpad, unless otherwise noted, more specifically as being 35' wide on East side of proposed wellpad as shown.





Enduring Resources LLC

Directional Drilling Plan  
Plan View & Section View

W Lybrook Unit 720H

San Juan County, New Mexico

T23N - R09W - Sec.23

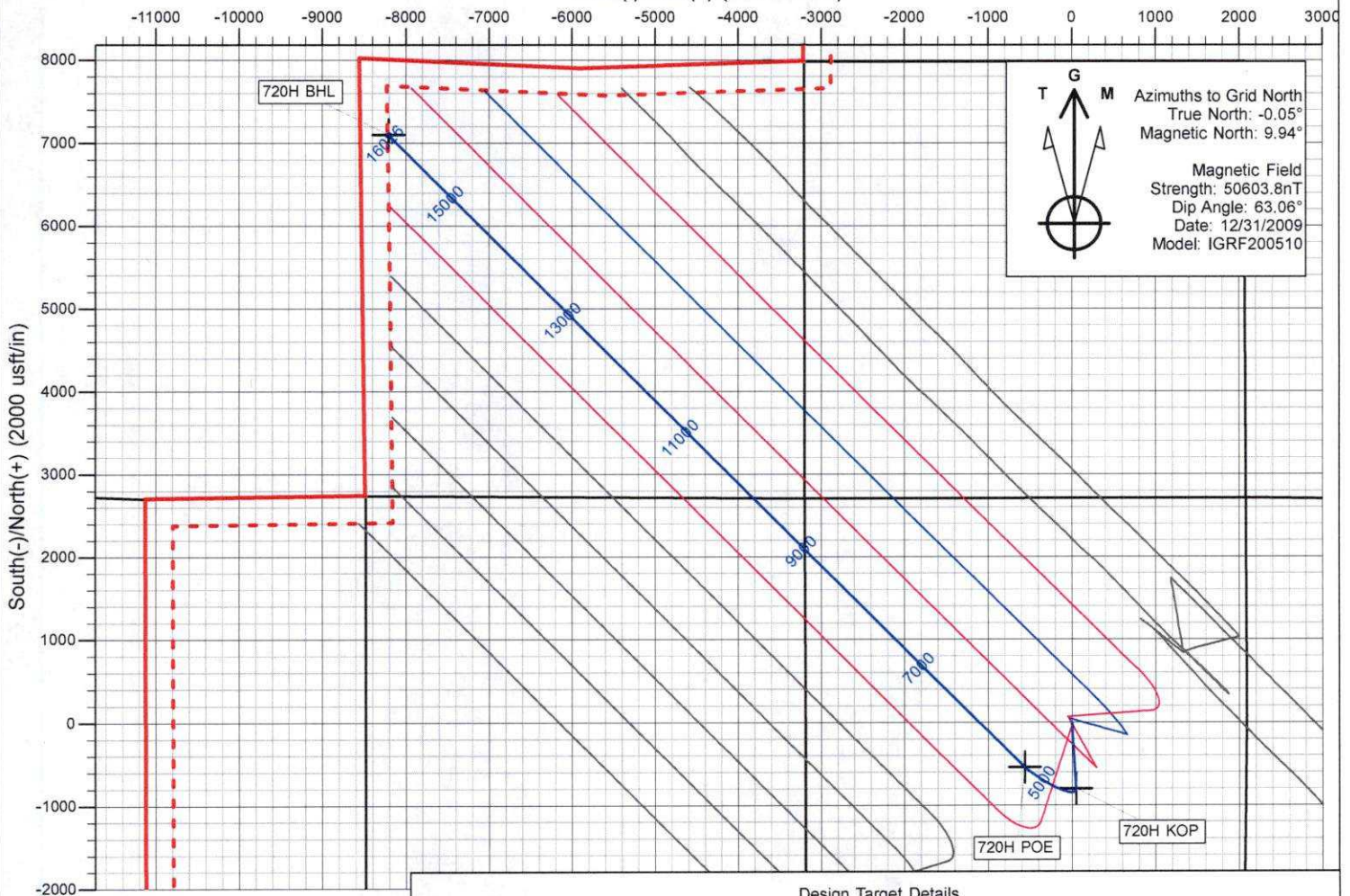
Surface Latitude: 36.212211°N

Surface Longitude: 107.756293°W

Ground Level: 6719.0

Reference Elevation: KB @ 6744.0usft (Original Well Elev)

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

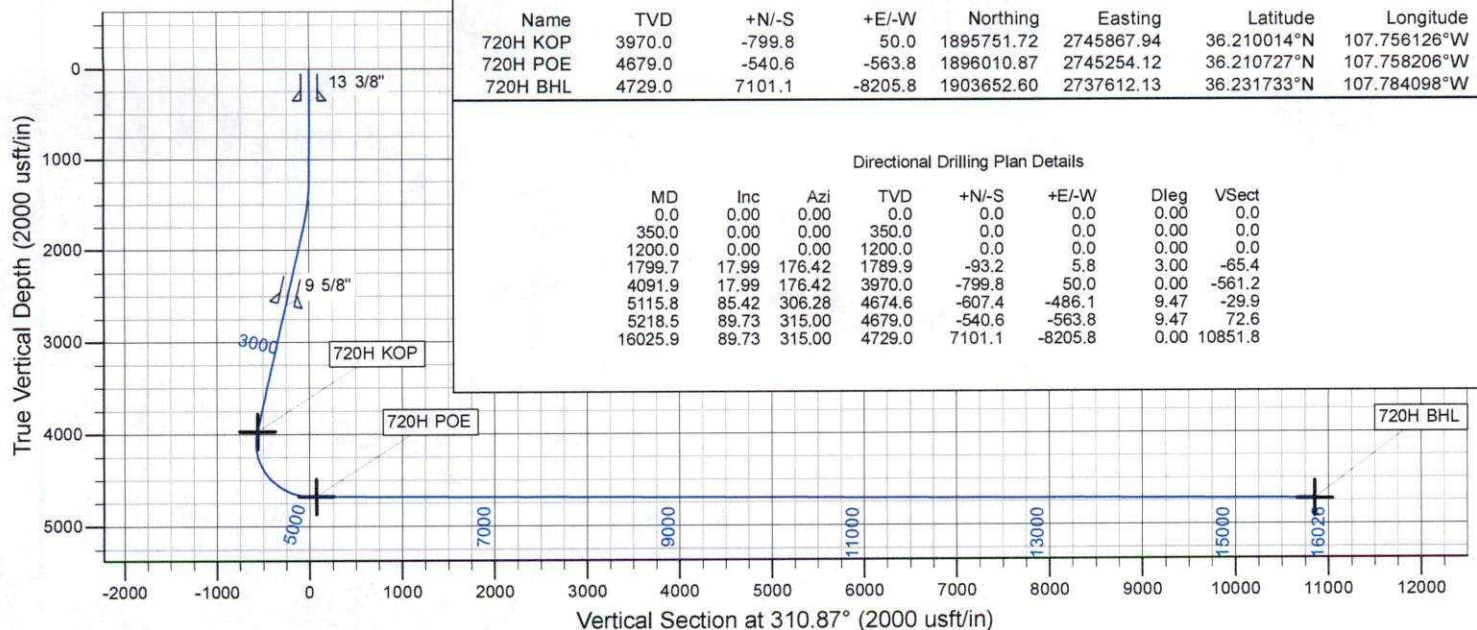


Design Target Details

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
720H KOP	3970.0	-799.8	50.0	1895751.72	2745867.94	36.210014°N	107.756126°W
720H POE	4679.0	-540.6	-563.8	1896010.87	2745254.12	36.210727°N	107.758206°W
720H BHL	4729.0	7101.1	-8205.8	1903652.60	2737612.13	36.231733°N	107.784098°W

Directional Drilling Plan Details

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Vsect
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.0
350.0	0.00	0.00	350.0	0.0	0.0	0.00	0.0
1200.0	0.00	0.00	1200.0	0.0	0.0	0.00	0.0
1799.7	17.99	176.42	1789.9	-93.2	5.8	3.00	-65.4
4091.9	17.99	176.42	3970.0	-799.8	50.0	0.00	-561.2
5115.8	85.42	306.28	4674.6	-607.4	-486.1	9.47	-29.9
5218.5	89.73	315.00	4679.0	-540.6	-563.8	9.47	72.6
16025.9	89.73	315.00	4729.0	7101.1	-8205.8	0.00	10851.8





## **Enduring Resources LLC**

**San Juan Basin - W Lybrook Unit**

**720H Pad**

**720H**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**24 February, 2020**





## Planning Report

<b>Database:</b>	EDM	<b>Local Co-ordinate Reference:</b>	Well 720H
<b>Company:</b>	Enduring Resources LLC	<b>TVD Reference:</b>	KB @ 6744.0usft (Original Well Elev)
<b>Project:</b>	San Juan Basin - W Lybrook Unit	<b>MD Reference:</b>	KB @ 6744.0usft (Original Well Elev)
<b>Site:</b>	720H Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	720H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<b>Project</b>	San Juan Basin - W Lybrook Unit, San Juan County, New Mexico		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	New Mexico Western Zone		

<b>Site</b>	720H Pad, San Juan County, New Mexico				
<b>Site Position:</b>		<b>Northing:</b>	1,896,551.52 usft	<b>Latitude:</b>	36.212211°N
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,745,817.94 usft	<b>Longitude:</b>	107.756294°W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	0.05 "

Well	720H					
Well Position	+N/-S	0.0 usft	Northing:	1,896,551.52 usft	Latitude:	36.212211°N
	+E/-W	0.0 usft	Easting:	2,745,817.94 usft	Longitude:	107.756294°W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	6,719.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	12/31/2009	9.99	63.06	50,603.84860220

<b>Design</b>	Design #1				
<b>Audit Notes:</b>					
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0	
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	310.87	

<b>Plan Survey Tool Program</b>	<b>Date</b>	2/24/2020			
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>	
1	0.0	16,025.9	Design #1 (Wellbore #1)	MWD	
				OWSG MWD - Standard	

<b>Plan Sections</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	<b>TFO (°)</b>	<b>Target</b>
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
350.0	0.00	0.00	350.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,799.7	17.99	176.42	1,789.9	-93.2	5.8	3.00	3.00	0.00	176.42	
4,091.9	17.99	176.42	3,970.0	-799.8	50.0	0.00	0.00	0.00	0.00	720H KOP
5,115.8	85.42	306.28	4,674.6	-607.4	-486.1	9.47	6.59	12.68	129.56	
5,218.5	89.73	315.00	4,679.0	-540.6	-563.8	9.47	4.20	8.49	63.88	720H POE
16,025.9	89.73	315.00	4,729.0	7,101.1	-8,205.8	0.00	0.00	0.00	0.00	720H BHL





## Planning Report

<b>Database:</b>	EDM	<b>Local Co-ordinate Reference:</b>	Well 720H
<b>Company:</b>	Enduring Resources LLC	<b>TVD Reference:</b>	KB @ 6744.0usft (Original Well Elev)
<b>Project:</b>	San Juan Basin - W Lybrook Unit	<b>MD Reference:</b>	KB @ 6744.0usft (Original Well Elev)
<b>Site:</b>	720H Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	720H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
350.0	0.00	0.00	350.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>13 3/8"</b>									
376.0	0.00	0.00	376.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Ojo Alamo</b>									
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
474.0	0.00	0.00	474.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Kirtland</b>									
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Fruitland</b>									
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,044.0	0.00	0.00	1,044.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Pictured Cliffs</b>									
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,259.0	1.77	176.42	1,259.0	-0.9	0.1	-0.6	3.00	3.00	0.00
<b>Lewis</b>									
1,300.0	3.00	176.42	1,300.0	-2.6	0.2	-1.8	3.00	3.00	0.00
1,400.0	6.00	176.42	1,399.6	-10.4	0.7	-7.3	3.00	3.00	0.00
1,414.5	6.43	176.42	1,414.0	-12.0	0.8	-8.4	3.00	3.00	0.00
<b>Chacra</b>									
1,500.0	9.00	176.42	1,498.8	-23.5	1.5	-16.5	3.00	3.00	0.00
1,600.0	12.00	176.42	1,597.1	-41.7	2.6	-29.2	3.00	3.00	0.00
1,700.0	15.00	176.42	1,694.3	-65.0	4.1	-45.6	3.00	3.00	0.00
1,799.7	17.99	176.42	1,789.9	-93.2	5.8	-65.4	3.00	3.00	0.00
1,800.0	17.99	176.42	1,790.2	-93.3	5.8	-65.5	0.00	0.00	0.00
1,900.0	17.99	176.42	1,885.3	-124.1	7.8	-87.1	0.00	0.00	0.00
2,000.0	17.99	176.42	1,980.4	-154.9	9.7	-108.7	0.00	0.00	0.00
2,100.0	17.99	176.42	2,075.5	-185.8	11.6	-130.3	0.00	0.00	0.00
2,200.0	17.99	176.42	2,170.6	-216.6	13.5	-152.0	0.00	0.00	0.00
2,300.0	17.99	176.42	2,265.7	-247.4	15.5	-173.6	0.00	0.00	0.00
2,400.0	17.99	176.42	2,360.8	-278.3	17.4	-195.2	0.00	0.00	0.00
2,500.0	17.99	176.42	2,456.0	-309.1	19.3	-216.9	0.00	0.00	0.00
2,527.4	17.99	176.42	2,482.0	-317.5	19.8	-222.8	0.00	0.00	0.00
<b>Cliff House</b>									
2,540.0	17.99	176.42	2,494.0	-321.4	20.1	-225.5	0.00	0.00	0.00
<b>Menefee</b>									
2,600.0	17.99	176.42	2,551.1	-339.9	21.2	-238.5	0.00	0.00	0.00
2,645.1	17.99	176.42	2,594.0	-353.8	22.1	-248.3	0.00	0.00	0.00
<b>9 5/8"</b>									
2,700.0	17.99	176.42	2,646.2	-370.7	23.2	-260.1	0.00	0.00	0.00
2,800.0	17.99	176.42	2,741.3	-401.6	25.1	-281.8	0.00	0.00	0.00
2,900.0	17.99	176.42	2,836.4	-432.4	27.0	-303.4	0.00	0.00	0.00
3,000.0	17.99	176.42	2,931.5	-463.2	29.0	-325.0	0.00	0.00	0.00
3,100.0	17.99	176.42	3,026.6	-494.0	30.9	-346.6	0.00	0.00	0.00





## Planning Report

<b>Database:</b>	EDM	<b>Local Co-ordinate Reference:</b>	Well 720H
<b>Company:</b>	Enduring Resources LLC	<b>TVD Reference:</b>	KB @ 6744.0usft (Original Well Elev)
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<b>Site:</b>	720H Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	720H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

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)	
3,200.0	17.99	176.42	3,121.7	-524.9	32.8	-368.3	0.00	0.00	0.00	
3,300.0	17.99	176.42	3,216.8	-555.7	34.7	-389.9	0.00	0.00	0.00	
3,400.0	17.99	176.42	3,311.9	-586.5	36.7	-411.5	0.00	0.00	0.00	
3,500.0	17.99	176.42	3,407.1	-617.3	38.6	-433.2	0.00	0.00	0.00	
3,559.9	17.99	176.42	3,464.0	-635.8	39.7	-446.1	0.00	0.00	0.00	
<b>Point Lookout</b>										
3,600.0	17.99	176.42	3,502.2	-648.2	40.5	-454.8	0.00	0.00	0.00	
3,700.0	17.99	176.42	3,597.3	-679.0	42.4	-476.4	0.00	0.00	0.00	
3,800.0	17.99	176.42	3,692.4	-709.8	44.4	-498.0	0.00	0.00	0.00	
3,812.2	17.99	176.42	3,704.0	-713.6	44.6	-500.7	0.00	0.00	0.00	
<b>Mancos</b>										
3,900.0	17.99	176.42	3,787.5	-740.7	46.3	-519.7	0.00	0.00	0.00	
4,000.0	17.99	176.42	3,882.6	-771.5	48.2	-541.3	0.00	0.00	0.00	
4,056.1	17.99	176.42	3,936.0	-788.8	49.3	-553.4	0.00	0.00	0.00	
<b>Gallup (MNCS_A)</b>										
4,091.9	17.99	176.42	3,970.0	-799.8	50.0	-561.2	0.00	0.00	0.00	
4,100.0	17.51	178.39	3,977.7	-802.3	50.1	-562.9	9.47	-5.91	24.27	
4,158.5	14.77	195.85	4,034.0	-818.3	48.3	-572.0	9.47	-4.69	29.82	
<b>MNCS_B</b>										
4,200.0	13.85	211.34	4,074.2	-827.6	44.3	-575.0	9.47	-2.21	37.38	
4,297.9	15.80	247.38	4,169.0	-842.8	25.9	-571.0	9.47	2.00	36.82	
<b>MNCS_C - MNCS_Cms</b>										
4,300.0	15.90	248.02	4,171.0	-843.0	25.3	-570.8	9.47	4.64	30.22	
4,400.0	22.13	270.33	4,265.7	-848.0	-6.3	-550.2	9.47	6.23	22.31	
4,436.4	24.89	275.50	4,299.0	-847.2	-20.8	-538.7	9.47	7.59	14.23	
<b>MNCS_D</b>										
4,500.0	30.04	282.32	4,355.5	-842.5	-49.7	-513.8	9.47	8.09	10.71	
4,592.4	37.94	289.07	4,432.0	-828.3	-99.2	-467.0	9.47	8.55	7.31	
<b>MNCS_E</b>										
4,600.0	38.61	289.52	4,438.0	-826.7	-103.7	-462.6	9.47	8.74	5.88	
4,682.5	45.91	293.66	4,499.0	-806.2	-155.1	-410.3	9.47	8.85	5.02	
<b>MNCS_F</b>										
4,700.0	47.48	294.41	4,511.0	-801.0	-166.8	-398.1	9.47	8.95	4.26	
4,784.8	55.12	297.56	4,564.0	-772.0	-226.1	-334.2	9.47	9.02	3.72	
<b>MNCS_G</b>										
4,800.0	56.50	298.06	4,572.6	-766.1	-237.3	-321.9	9.47	9.07	3.30	
4,872.5	63.10	300.26	4,609.0	-735.6	-291.9	-260.6	9.47	9.10	3.03	
<b>MNCS_H</b>										
4,900.0	65.61	301.02	4,620.9	-722.9	-313.3	-236.2	9.47	9.13	2.78	
4,997.2	74.51	303.51	4,654.0	-674.2	-390.4	-146.0	9.47	9.16	2.56	
<b>MNCS_I</b>										
5,000.0	74.78	303.58	4,654.8	-672.7	-392.7	-143.2	9.47	9.18	2.43	
5,100.0	83.96	305.92	4,673.2	-616.7	-473.3	-45.6	9.47	9.19	2.34	
5,115.8	85.42	306.28	4,674.6	-607.4	-486.1	-29.9	9.47	9.20	2.27	
5,200.0	88.95	313.43	4,678.8	-553.6	-550.6	54.1	9.47	4.20	8.50	
5,218.5	89.73	315.00	4,679.0	-540.6	-563.8	72.6	9.47	4.22	8.48	
<b>MNCS_I (TARGET)</b>										
5,300.0	89.73	315.00	4,679.4	-483.0	-621.4	153.8	0.00	0.00	0.00	
5,400.0	89.73	315.00	4,679.8	-412.3	-692.1	253.6	0.00	0.00	0.00	
5,500.0	89.73	315.00	4,680.3	-341.6	-762.9	353.3	0.00	0.00	0.00	
5,600.0	89.73	315.00	4,680.8	-270.9	-833.6	453.0	0.00	0.00	0.00	
5,700.0	89.73	315.00	4,681.2	-200.2	-904.3	552.8	0.00	0.00	0.00	





## Planning Report

<b>Database:</b>	EDM	<b>Local Co-ordinate Reference:</b>	Well 720H
<b>Company:</b>	Enduring Resources LLC	<b>TVD Reference:</b>	KB @ 6744.0usft (Original Well Elev)
<b>Project:</b>	San Juan Basin - W Lybrook Unit	<b>MD Reference:</b>	KB @ 6744.0usft (Original Well Elev)
<b>Site:</b>	720H Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	720H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

## 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)
5,800.0	89.73	315.00	4,681.7	-129.5	-975.0	652.5	0.00	0.00	0.00
5,900.0	89.73	315.00	4,682.2	-58.8	-1,045.7	752.3	0.00	0.00	0.00
6,000.0	89.73	315.00	4,682.6	11.9	-1,116.4	852.0	0.00	0.00	0.00
6,100.0	89.73	315.00	4,683.1	82.6	-1,187.1	951.7	0.00	0.00	0.00
6,200.0	89.73	315.00	4,683.5	153.3	-1,257.8	1,051.5	0.00	0.00	0.00
6,300.0	89.73	315.00	4,684.0	224.1	-1,328.5	1,151.2	0.00	0.00	0.00
6,400.0	89.73	315.00	4,684.5	294.8	-1,399.3	1,251.0	0.00	0.00	0.00
6,500.0	89.73	315.00	4,684.9	365.5	-1,470.0	1,350.7	0.00	0.00	0.00
6,600.0	89.73	315.00	4,685.4	436.2	-1,540.7	1,450.4	0.00	0.00	0.00
6,700.0	89.73	315.00	4,685.9	506.9	-1,611.4	1,550.2	0.00	0.00	0.00
6,800.0	89.73	315.00	4,686.3	577.6	-1,682.1	1,649.9	0.00	0.00	0.00
6,900.0	89.73	315.00	4,686.8	648.3	-1,752.8	1,749.7	0.00	0.00	0.00
7,000.0	89.73	315.00	4,687.2	719.0	-1,823.5	1,849.4	0.00	0.00	0.00
7,100.0	89.73	315.00	4,687.7	789.7	-1,894.2	1,949.1	0.00	0.00	0.00
7,200.0	89.73	315.00	4,688.2	860.4	-1,964.9	2,048.9	0.00	0.00	0.00
7,300.0	89.73	315.00	4,688.6	931.1	-2,035.7	2,148.6	0.00	0.00	0.00
7,400.0	89.73	315.00	4,689.1	1,001.8	-2,106.4	2,248.4	0.00	0.00	0.00
7,500.0	89.73	315.00	4,689.6	1,072.6	-2,177.1	2,348.1	0.00	0.00	0.00
7,600.0	89.73	315.00	4,690.0	1,143.3	-2,247.8	2,447.8	0.00	0.00	0.00
7,700.0	89.73	315.00	4,690.5	1,214.0	-2,318.5	2,547.6	0.00	0.00	0.00
7,800.0	89.73	315.00	4,690.9	1,284.7	-2,389.2	2,647.3	0.00	0.00	0.00
7,900.0	89.73	315.00	4,691.4	1,355.4	-2,459.9	2,747.1	0.00	0.00	0.00
8,000.0	89.73	315.00	4,691.9	1,426.1	-2,530.6	2,846.8	0.00	0.00	0.00
8,100.0	89.73	315.00	4,692.3	1,496.8	-2,601.3	2,946.5	0.00	0.00	0.00
8,200.0	89.73	315.00	4,692.8	1,567.5	-2,672.1	3,046.3	0.00	0.00	0.00
8,300.0	89.73	315.00	4,693.3	1,638.2	-2,742.8	3,146.0	0.00	0.00	0.00
8,400.0	89.73	315.00	4,693.7	1,708.9	-2,813.5	3,245.8	0.00	0.00	0.00
8,500.0	89.73	315.00	4,694.2	1,779.6	-2,884.2	3,345.5	0.00	0.00	0.00
8,600.0	89.73	315.00	4,694.6	1,850.4	-2,954.9	3,445.2	0.00	0.00	0.00
8,700.0	89.73	315.00	4,695.1	1,921.1	-3,025.6	3,545.0	0.00	0.00	0.00
8,800.0	89.73	315.00	4,695.6	1,991.8	-3,096.3	3,644.7	0.00	0.00	0.00
8,900.0	89.73	315.00	4,696.0	2,062.5	-3,167.0	3,744.5	0.00	0.00	0.00
9,000.0	89.73	315.00	4,696.5	2,133.2	-3,237.7	3,844.2	0.00	0.00	0.00
9,100.0	89.73	315.00	4,697.0	2,203.9	-3,308.5	3,943.9	0.00	0.00	0.00
9,200.0	89.73	315.00	4,697.4	2,274.6	-3,379.2	4,043.7	0.00	0.00	0.00
9,300.0	89.73	315.00	4,697.9	2,345.3	-3,449.9	4,143.4	0.00	0.00	0.00
9,400.0	89.73	315.00	4,698.3	2,416.0	-3,520.6	4,243.2	0.00	0.00	0.00
9,500.0	89.73	315.00	4,698.8	2,486.7	-3,591.3	4,342.9	0.00	0.00	0.00
9,600.0	89.73	315.00	4,699.3	2,557.4	-3,662.0	4,442.6	0.00	0.00	0.00
9,700.0	89.73	315.00	4,699.7	2,628.1	-3,732.7	4,542.4	0.00	0.00	0.00
9,800.0	89.73	315.00	4,700.2	2,698.9	-3,803.4	4,642.1	0.00	0.00	0.00
9,900.0	89.73	315.00	4,700.7	2,769.6	-3,874.1	4,741.9	0.00	0.00	0.00
10,000.0	89.73	315.00	4,701.1	2,840.3	-3,944.9	4,841.6	0.00	0.00	0.00
10,100.0	89.73	315.00	4,701.6	2,911.0	-4,015.6	4,941.3	0.00	0.00	0.00
10,200.0	89.73	315.00	4,702.0	2,981.7	-4,086.3	5,041.1	0.00	0.00	0.00
10,300.0	89.73	315.00	4,702.5	3,052.4	-4,157.0	5,140.8	0.00	0.00	0.00
10,400.0	89.73	315.00	4,703.0	3,123.1	-4,227.7	5,240.6	0.00	0.00	0.00
10,500.0	89.73	315.00	4,703.4	3,193.8	-4,298.4	5,340.3	0.00	0.00	0.00
10,600.0	89.73	315.00	4,703.9	3,264.5	-4,369.1	5,440.0	0.00	0.00	0.00
10,700.0	89.73	315.00	4,704.4	3,335.2	-4,439.8	5,539.8	0.00	0.00	0.00
10,800.0	89.73	315.00	4,704.8	3,405.9	-4,510.5	5,639.5	0.00	0.00	0.00
10,900.0	89.73	315.00	4,705.3	3,476.7	-4,581.3	5,739.2	0.00	0.00	0.00
11,000.0	89.73	315.00	4,705.7	3,547.4	-4,652.0	5,839.0	0.00	0.00	0.00
11,100.0	89.73	315.00	4,706.2	3,618.1	-4,722.7	5,938.7	0.00	0.00	0.00





## Planning Report

**Database:** EDM  
**Company:** Enduring Resources LLC  
**Project:** San Juan Basin - W Lybrook Unit  
**Site:** 720H Pad  
**Well:** 720H  
**Wellbore:** Wellbore #1  
**Design:** Design #1

**Local Co-ordinate Reference:** Well 720H  
**TVD Reference:** KB @ 6744.0usft (Original Well Elev)  
**MD Reference:** KB @ 6744.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

## 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)
11,200.0	89.73	315.00	4,706.7	3,688.8	-4,793.4	6,038.5	0.00	0.00	0.00
11,300.0	89.73	315.00	4,707.1	3,759.5	-4,864.1	6,138.2	0.00	0.00	0.00
11,400.0	89.73	315.00	4,707.6	3,830.2	-4,934.8	6,237.9	0.00	0.00	0.00
11,500.0	89.73	315.00	4,708.1	3,900.9	-5,005.5	6,337.7	0.00	0.00	0.00
11,600.0	89.73	315.00	4,708.5	3,971.6	-5,076.2	6,437.4	0.00	0.00	0.00
11,700.0	89.73	315.00	4,709.0	4,042.3	-5,146.9	6,537.2	0.00	0.00	0.00
11,800.0	89.73	315.00	4,709.4	4,113.0	-5,217.7	6,636.9	0.00	0.00	0.00
11,900.0	89.73	315.00	4,709.9	4,183.7	-5,288.4	6,736.6	0.00	0.00	0.00
12,000.0	89.73	315.00	4,710.4	4,254.5	-5,359.1	6,836.4	0.00	0.00	0.00
12,100.0	89.73	315.00	4,710.8	4,325.2	-5,429.8	6,936.1	0.00	0.00	0.00
12,200.0	89.73	315.00	4,711.3	4,395.9	-5,500.5	7,035.9	0.00	0.00	0.00
12,300.0	89.73	315.00	4,711.8	4,466.6	-5,571.2	7,135.6	0.00	0.00	0.00
12,400.0	89.73	315.00	4,712.2	4,537.3	-5,641.9	7,235.3	0.00	0.00	0.00
12,500.0	89.73	315.00	4,712.7	4,608.0	-5,712.6	7,335.1	0.00	0.00	0.00
12,600.0	89.73	315.00	4,713.2	4,678.7	-5,783.3	7,434.8	0.00	0.00	0.00
12,700.0	89.73	315.00	4,713.6	4,749.4	-5,854.1	7,534.6	0.00	0.00	0.00
12,800.0	89.73	315.00	4,714.1	4,820.1	-5,924.8	7,634.3	0.00	0.00	0.00
12,900.0	89.73	315.00	4,714.5	4,890.8	-5,995.5	7,734.0	0.00	0.00	0.00
13,000.0	89.73	315.00	4,715.0	4,961.5	-6,066.2	7,833.8	0.00	0.00	0.00
13,100.0	89.73	315.00	4,715.5	5,032.2	-6,136.9	7,933.5	0.00	0.00	0.00
13,200.0	89.73	315.00	4,715.9	5,103.0	-6,207.6	8,033.3	0.00	0.00	0.00
13,300.0	89.73	315.00	4,716.4	5,173.7	-6,278.3	8,133.0	0.00	0.00	0.00
13,400.0	89.73	315.00	4,716.9	5,244.4	-6,349.0	8,232.7	0.00	0.00	0.00
13,500.0	89.73	315.00	4,717.3	5,315.1	-6,419.7	8,332.5	0.00	0.00	0.00
13,600.0	89.73	315.00	4,717.8	5,385.8	-6,490.5	8,432.2	0.00	0.00	0.00
13,700.0	89.73	315.00	4,718.2	5,456.5	-6,561.2	8,532.0	0.00	0.00	0.00
13,800.0	89.73	315.00	4,718.7	5,527.2	-6,631.9	8,631.7	0.00	0.00	0.00
13,900.0	89.73	315.00	4,719.2	5,597.9	-6,702.6	8,731.4	0.00	0.00	0.00
14,000.0	89.73	315.00	4,719.6	5,668.6	-6,773.3	8,831.2	0.00	0.00	0.00
14,100.0	89.73	315.00	4,720.1	5,739.3	-6,844.0	8,930.9	0.00	0.00	0.00
14,200.0	89.73	315.00	4,720.6	5,810.0	-6,914.7	9,030.7	0.00	0.00	0.00
14,300.0	89.73	315.00	4,721.0	5,880.8	-6,985.4	9,130.4	0.00	0.00	0.00
14,400.0	89.73	315.00	4,721.5	5,951.5	-7,056.1	9,230.1	0.00	0.00	0.00
14,500.0	89.73	315.00	4,721.9	6,022.2	-7,126.9	9,329.9	0.00	0.00	0.00
14,600.0	89.73	315.00	4,722.4	6,092.9	-7,197.6	9,429.6	0.00	0.00	0.00
14,700.0	89.73	315.00	4,722.9	6,163.6	-7,268.3	9,529.4	0.00	0.00	0.00
14,800.0	89.73	315.00	4,723.3	6,234.3	-7,339.0	9,629.1	0.00	0.00	0.00
14,900.0	89.73	315.00	4,723.8	6,305.0	-7,409.7	9,728.8	0.00	0.00	0.00
15,000.0	89.73	315.00	4,724.3	6,375.7	-7,480.4	9,828.6	0.00	0.00	0.00
15,100.0	89.73	315.00	4,724.7	6,446.4	-7,551.1	9,928.3	0.00	0.00	0.00
15,200.0	89.73	315.00	4,725.2	6,517.1	-7,621.8	10,028.1	0.00	0.00	0.00
15,300.0	89.73	315.00	4,725.6	6,587.8	-7,692.5	10,127.8	0.00	0.00	0.00
15,400.0	89.73	315.00	4,726.1	6,658.5	-7,763.3	10,227.5	0.00	0.00	0.00
15,500.0	89.73	315.00	4,726.6	6,729.3	-7,834.0	10,327.3	0.00	0.00	0.00
15,600.0	89.73	315.00	4,727.0	6,800.0	-7,904.7	10,427.0	0.00	0.00	0.00
15,700.0	89.73	315.00	4,727.5	6,870.7	-7,975.4	10,526.8	0.00	0.00	0.00
15,800.0	89.73	315.00	4,728.0	6,941.4	-8,046.1	10,626.5	0.00	0.00	0.00
15,900.0	89.73	315.00	4,728.4	7,012.1	-8,116.8	10,726.2	0.00	0.00	0.00
16,000.0	89.73	315.00	4,728.9	7,082.8	-8,187.5	10,826.0	0.00	0.00	0.00
16,025.9	89.73	315.00	4,729.0	7,101.1	-8,205.8	10,851.8	0.00	0.00	0.00





## Planning Report

<b>Database:</b>	EDM	<b>Local Co-ordinate Reference:</b>	Well 720H
<b>Company:</b>	Enduring Resources LLC	<b>TVD Reference:</b>	KB @ 6744.0usft (Original Well Elev)
<b>Project:</b>	San Juan Basin - W Lybrook Unit	<b>MD Reference:</b>	KB @ 6744.0usft (Original Well Elev)
<b>Site:</b>	720H Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	720H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
720H KOP - plan hits target center - Point	0.00	0.00	3,970.0	-799.8	50.0	1,895,751.72	2,745,867.94	36.210014°N	107.756126°W
720H POE - plan hits target center - Point	0.00	0.00	4,679.0	-540.6	-563.8	1,896,010.88	2,745,254.12	36.210727°N	107.758206°W
720H BHL - plan hits target center - Point	0.00	0.00	4,729.0	7,101.1	-8,205.8	1,903,652.61	2,737,612.13	36.231733°N	107.784098°W

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
350.0	350.0	13 3/8"	13-3/8	17-1/2
2,645.1	2,594.0	9 5/8"	9-5/8	12-1/4

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
376.0	376.0	Ojo Alamo		0.00	
474.0	474.0	Kirtland		0.00	
680.0	680.0	Fruitland		0.00	
1,044.0	1,044.0	Pictured Cliffs		0.00	
1,259.0	1,259.0	Lewis		0.00	
1,414.5	1,414.0	Chacra		0.00	
2,527.4	2,482.0	Cliff House		0.00	
2,540.0	2,494.0	Menefee		0.00	
3,559.9	3,464.0	Point Lookout		0.00	
3,812.2	3,704.0	Mancos		0.00	
4,056.1	3,936.0	Gallup (MNCS_A)		0.00	
4,158.5	4,034.0	MNCS_B		0.00	
4,297.9	4,169.0	MNCS_C		0.00	
4,297.9	4,169.0	MNCS_Cms		0.00	
4,436.4	4,299.0	MNCS_D		0.00	
4,592.4	4,432.0	MNCS_E		0.00	
4,682.5	4,499.0	MNCS_F		0.00	
4,784.8	4,564.0	MNCS_G		0.00	
4,872.5	4,609.0	MNCS_H		0.00	
4,997.2	4,654.0	MNCS_I		0.00	
5,218.5	4,679.0	MNCS_I (TARGET)		0.00	





**ENDURING RESOURCES IV, LLC**  
**1050 SEVENTEENTH STREET, SUITE 2500**  
**DENVER, COLORADO 80265**

**DRILLING PLAN:** *Drill, complete, and equip single lateral in the Mancos-I formation*

**WELL INFORMATION:**

**Name:** W LYBROOK UNIT 720H

**API Number:** 720Y: 30-045-35818, 720H: not yet assigned

**AFE Number:** not yet assigned

**ER Well Number:** not yet assigned

**State:** New Mexico

**County:** San Juan

**Surface Elevation:** 6,719 ft ASL (GL)

6,744 ft ASL (KB)

**Surface Location:** 23-23N-09W Sec-Twn-Rng

2,565 ft FSL

2,089 ft FEL

36.212211 ° N latitude

107.756293 ° W longitude

(NAD 83)

**BH Location:** 15-23N-09W Sec-Twn-Rng

904 ft FNL

330 ft FWL

36.231733 ° N latitude

107.784098 ° W longitude

(NAD 83)

**Driving Directions:** FROM THE INTERSECTION OF US HWY 550 & US HWY 64 IN BLOOMFIELD, NM:

South on US Hwy 550 for 38.3 miles to MM 113.4, Right (Southwest) on CR #7890 for 0.8 miles to fork, Left (South) remaining on CR #7890 for 1.3 miles to 4-way intersection, Left (Southeast) remaining on CR #7890 for 0.6 miles to fork, Right (Southwest) on CR #7890 for 0.5 miles to fork, Right (West) exiting CR #7890 for 0.6 miles to fork, Right (Northwest) for 0.6 mile to W Lybrook Unit 720H Pad

**GEOLOGIC AND RESERVOIR INFORMATION:**

<i>Prognosis:</i>	Formation Tops	TVD (ft ASL)	TVD (ft KB)	MD (ft KB)	O / G / W	Pressure
	Ojo Alamo	6,368	376	376	W	normal
	Kirtland	6,270	474	474	W	normal
	Fruitland	6,064	680	680	G, W	sub
	Pictured Cliffs	5,700	1,044	1,044	G, W	sub
	Lewis	5,485	1,259	1,259	G, W	normal
	Chacra	5,330	1,414	1,415	G, W	normal
	Cliff House	4,262	2,482	2,527	G, W	sub
	Menefee	4,250	2,494	2,540	G, W	normal
	Point Lookout	3,280	3,464	3,560	G, W	normal
	Mancos	3,040	3,704	3,812	O,G	sub (~0.38)
	Gallup (MNCS_A)	2,808	3,936	4,056	O,G	sub (~0.38)
	MNCS_B	2,710	4,034	4,159	O,G	sub (~0.38)
	MNCS_C	2,575	4,169	4,298	O,G	sub (~0.38)
	MNCS_Cms	2,575	4,169	4,298	O,G	sub (~0.38)
	MNCS_D	2,445	4,299	4,436	O,G	sub (~0.38)
	MNCS_E	2,312	4,432	4,592	O,G	sub (~0.38)
	MNCS_F	2,245	4,499	4,683	O,G	sub (~0.38)
	MNCS_G	2,180	4,564	4,785	O,G	sub (~0.38)
	MNCS_H	2,135	4,609	4,873	O,G	sub (~0.38)
	MNCS_I	2,090	4,654	4,997	O,G	sub (~0.38)
	P.O.E. TARGET	2,065	4,679	5,219	O,G	sub (~0.38)
	PROJECTED TD	2,015	4,729	16,026	O,G	sub (~0.38)

**Surface:** Nacimiento

**Oil & Gas Zones:** Several gas bearing zones will be encountered; target formation is the Gallup

**Pressure:** Normal (0.43 psi/ft) or sub-normal pressure gradients anticipated in all formations



Max. pressure gradient:	0.43	psi/ft	Evacuated hole gradient:	0.22	psi/ft
Maximum anticipated BH pressure, assuming maximum pressure gradient:				2,040	psi
Maximum anticipated surface pressure, assuming partially evacuated hole:				1,000	psi

Temperature: Maximum anticipated BHT is 125° F or less

## H<sub>2</sub>S INFORMATION:

**H<sub>2</sub>S Zones:** Encountering hydrogen-sulfide bearing zones is **NOT** anticipated.

**Safety:** Sensors and alarms will be placed in the substructure, on the rig floor, above the pits, and at the shakers.

## LOGGING, CORING, AND TESTING:

**Mud Logs:** None planned; remote geo-steering from drill out of 9-5/8" casing to TD; gas detection from drillout of 13-3/8" casing to TD.

**MWD / LWD:** Gamma Ray from drillout of 13-3/8" casing to TD

**Open Hole Logs:** None planned

**Testing:** None planned

**Coring:** None planned

**Cased Hole Logs:** CBL on 5-1/2" casing from deepest free-fall depth to surface

## DRILLING RIG INFORMATION:

**Contractor:** Aztec

**Rig No.:** 1000

**Draw Works:** E80 AC 1,500 hp

**Mast:** Hyduke Triple (136 ft, 600,000 lbs, 10 lines)

**Top Drive:** NOV IDS-350PE (350 ton)

**Prime Movers:** 4 - GE Jenbacher Natural Gas Generator

**Pumps:** 2 - RS F-1600 (7,500 psi)

**BOPE 1:** Cameron single & double gate rams (13-5/8", 3,000 psi)

**BOPE 2:** Cameron annular (13-5/8", 5,000 psi)

**Choke:** Cameron (4", 10,000 psi)

**KB-GL (ft):** 25

**NOTE:** A different rig may be used to drill the well depending on rig availability

## BOPE REQUIREMENTS:

*See attached diagram for details regarding BOPE specifications and configuration.*

- 1) Rig will be equipped with upper and lower kelly cocks with handles available.
- 2) Inside BOP and TIW valves will be available to use on all sizes and threads of drill pipe used while drilling the well.
- 2) BOP accumulator will have enough capacity to open the HCR valve, close all rams and annular preventer, and retain minimum of 200 psi above precharge on the closing manifold without the use of closing pumps. The fluid reservoir capacity shall be at least double the usable fluid volume of the accumulator system capacity, and the fluid level shall be maintained at manufacturer's recommendation. There will be two additional sources of power for the closing pumps (electric and air). Sufficient nitrogen bottles will be available and will be recharged when pressure falls below manufacturer's recommended minimum.
- 3) BOP testing shall be conducted (a) when initially installed, (b) whenever any seal is broken or repaired, (c) if the time since the previous test exceeds 30 days. Tests will be conducted using a test plug. BOP ram preventers will be tested to 3,000 psig for 10 minutes, and the annular preventer will be tested to 1,500 psi for 10 minutes. Ram and annular preventers will be tested to 250 psi for 5 minutes. Additionally, BOP and casing strings will be tested to .22 psi/ft or 1,500 psi, whichever is greater but not exceeding 70% of yield strength of the casing, for 30 minutes, prior to drilling out 13-3/8" and 9-5/8" casing. Rams and hydraulically operated remote choke line valve will be function tested daily at a minimum.
- 4) Remote valve for BOP rams, HCR, and choke shall be placed in a location that is readily available to the driller. The remote BOP valve shall be capable of closing and opening the rams.
- 5) Manual locking devices (hand wheels) shall be installed on rams. A valve will be installed on the annular preventer's closing line as close as possible to the preventer to act as a locking device. The valve will be maintained in the open position and shall only be closed when there is no power to the accumulator.



**FLUIDS AND SOLIDS CONTROL PROGRAM:**

- Fluid Measurement:** Pumps shall be equipped with stroke counters with displays in the dog-house. Slow pump speed shall be recorded daily and after mudding up, at a minimum, on the drilling report. A Pit Volume Totalizer will be installed and the readout will be displayed in the dog-house. Gas-detecting equipment will be installed at the shakers, and readouts will be available in the dog-house and the in the geologist's work-station (if geologist or mud-logger is on-site).
- Closed-Loop System:** A fully, closed-loop system will be utilized. The system will consist of above-ground piping and above-ground storage tanks and bins. The system will not entail any earthen pits, below-grade storage, or drying pads. All equipment will be disassembled and removed from the site when drilling operations cease. The system will be capable of storing all fluids and generated cuttings and of preventing uncontrolled releases of the same. The system will be operated in an efficient manner to allow the recycling and reuse of as much fluid as possible and to minimize the amount of fluids and solids that require disposal.
- Fluid Disposal:** Fluids that cannot be reused, recycled, or returned to the supplier will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.).
- Solids Disposal:** Drilling solids will be stored (until haul-off) on-site in separate containers with no other waste, debris, or garbage products. Waste solids will be hauled to and disposed of at an approved disposal site (Industrial Ecosystem, Inc. or Envirotech, Inc.).
- Fluid Program:** See "Detailed Drilling Plan" section for specifics.

**DETAILED DRILLING PLAN:**

**SURFACE:** *Drill vertically to casing setting depth (plus necessary rathole), run casing, cement casing to surface.*

0 ft (MD)	to	350 ft (MD)	Hole Section Length:	350 ft
0 ft (TVD)	to	350 ft (TVD)	Casing Required:	350 ft

**Note:** *Surface hole may be drilled, cased, and cemented with a smaller rig in advance of the drilling rig.*

Fluid:	Type	MW (ppg)	FL (mL/30 min)	PV (cp)	YP (lb/100 sqft)	pH	Comments
	Fresh Water	8.4	N/C	2 - 8	2 - 12	9.0	Spud mud

**Hole Size:** 17-1/2"

**Bit / Motor:** Mill Tooth or PDC, no motor

**MWD / Survey:** No MWD, deviation survey

**Logging:** None

Casing Specs:		Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	Tens. Body (lbs)	Tens. Conn (lbs)
Specs	13.375	54.5	J-55	BTC	1,130	2,730	853,000	909,000
Loading					153	565	116,634	116,634
Min. S.F.					7.39	4.83	7.31	7.79

**Assumptions:** Collapse: fully evacuated casing with 8.4 ppg equivalent external pressure gradient

Burst: maximum anticipated surface pressure with 9.5 ppg fluid inside casing while drilling intermediate hole and 8.4 ppg equivalent external pressure gradient

Tension: buoyed weight in 8.4 ppg fluid with 100,000 lbs over-pull

**MU Torque (ft lbs):** Minimum: N/A Optimum: N/A Maximum: N/A

Make-up as per API Buttress Connection running procedure.

**Casing Summary:** Float shoe, 1 jt casing, float collar, casing to surface

**Centralizers:** 2 centralizers per jt stop-banded 10' from each collar on bottom 3 jts, 1 centralizer per 2 jts to surface

Cement:	Type	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	Hole Cap. (cuft/ft)	% Excess	Planned TOC (ft MD)	Total Cmt (sx)
	Class G	15.8	1.174	5.15	0.6946	100%	0	414

Calculated cement volumes assume gauge hole and the excess noted in table

Halliburton HALCEM surface cementing blend



Notify NMOCD & BLM if cement is not circulated to surface. Cement must achieve 500 psi compressive strength before drilling out.

**INTERMEDIATE:** Drill as per directional plan to casing setting depth, run casing, cement casing to surface.

350 ft (MD)	to	2,645 ft (MD)	Hole Section Length:	2,295 ft
350 ft (TVD)	to	2,594 ft (TVD)	Casing Required:	2,645 ft

Fluid:	Type	MW (ppg)	FL (mL/30 min)	PV (cp)	YP (lb/100 sqft)	pH	Comments
	LSND (KCI)	8.8 - 9.5	20	8 - 14	8 - 14	9.0 - 9.5	

Hole Size: 12-1/4"

Bit / Motor: PDC w/mud motor

MWD / Survey: MWD Survey with inclination and azimuth survey (every 100' at a minimum), GR optional

Logging: None

Pressure Test: NU BOPE and test (as noted above); pressure test 13-3/8" casing to 1,500 psi for 30 minutes.

Casing Specs:	Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	Tens. Body (lbs)	Tens. Conn (lbs)
Specs	9.625	36.0	J-55	LTC	2,020	3,520	564,000
Loading					1,133	1,148	183,036
Min. S.F.					1.78	3.07	3.08

Assumptions: Collapse: fully evacuated casing with 8.4 ppg equivalent external pressure gradient

Burst: maximum anticipated surface pressure with 9.5 ppg fluid inside casing while drilling production hole and 8.4 ppg equivalent external pressure gradient

Tension: buoyed weight in 8.4 ppg fluid with 100,000 lbs over-pull

MU Torque (ft lbs): Minimum: 3,400 Optimum: 4,530 Maximum: 5,660

Casing Summary: Float shoe, 1 jt casing, float collar, casing to surface

Centralizers: 2 centralizers per jt stop-banded 10' from each collar on bottom 3 jts, 1 centralizer per 2 jts to surface

Cement:	Type	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	% Excess	Planned TOC (ft MD)	Total Cmt (sx)
Lead	G:POZ Blend	12.3	1.987	10.16	70%	0	590
Tail	Class G	15.8	1.148	4.98	20%	2,145	164

Annular Capacity 0.3627 cuft/ft 9-5/8" casing x 13-3/8" casing annulus

0.3132 cuft/ft 9-5/8" casing x 12-1/4" hole annulus

Calculated cement volumes assume gauge hole and the excess noted in table

Halliburton ECONOCHEM & HALCEM cementing blend

Notify NMOCD & BLM if cement is not circulated to surface. Cement must achieve 500 psi compressive strength before drilling out.

**PRODUCTION:** Drill to TD following directional plan, run casing, cement casing to surface.

2,645 ft (MD)	to	16,026 ft (MD)	Hole Section Length:	13,381 ft
2,594 ft (TVD)	to	4,729 ft (TVD)	Casing Required:	16,026 ft

Estimated KOP:	4,092 ft (MD)	3,970 ft (TVD)
Estimated Landing Point (P.O.E.):	5,219 ft (MD)	4,679 ft (TVD)
Estimated Lateral Length:	10,807 ft (MD)	

Fluid:	Type	MW (ppg)	FL (mL/30')	PV (cp)	YP (lb/100 sqft)	pH	Comments
	LSND (FW)	8.8 - 9.5	20	8 - 14	8 - 14	9.0 - 9.5	OBM as contingency

Hole Size: 8-1/2"

Bit / Motor: PDC w/mud motor



**MWD / Survey:** MWD with GR, inclination, and azimuth (survey every joint from KOP to Landing Point and survey every 100' minimum before KOP and after Landing Point)

**Logging:** GR MWD for entire section, no mud-log or cuttings sampling, no OH WL logs

**Pressure Test:** NU BOPE and test (as noted above); pressure test 9-5/8" casing to **1,500** psi for 30 minutes.

<b>Casing Specs:</b>	Size (in)	Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	Tens. Body (lbs)	Tens. Conn (lbs)
<b>Specs</b>	5.500	17.0	P-110	LTC	7,460	10,640	546,000	445,000
<b>Loading</b>					2,336	8,943	335,093	335,093
<b>Min. S.F.</b>					<b>3.19</b>	<b>1.19</b>	<b>1.63</b>	<b>1.33</b>

**Assumptions:** Collapse: fully evacuated casing with 9.5 ppg fluid in the annulus (floating casing during running)

Burst: 8,500 psi maximum surface treating pressure with 10.2 ppg equivalent mud weight sand laden fluid with 8.4 ppg equivalent external pressure gradient

Tension: buoyed weight in 9.0 ppg fluid with 100,000 lbs over-pull

**MU Torque (ft lbs):** Minimum: 3,470 Optimum: 4,620 Maximum: 5,780

**Casing Summary:** Float shoe, 1 jt casing, float collar, 1 jt casing, float collar, 1 jt casing, toe-initiation sleeve, 20' marker joint, toe-initiation sleeve, casing to KOP with 20' marker joints spaced evenly in lateral every 2,000', floatation sub, casing to surface. **The toe-initiation sleeves must be positioned INSIDE the 330' unit setback.**

**Centralizers:** Centralizer count and placement may be adjusted based on well conditions and as-drilled surveys.

Lateral: 1 centralizer per joint

Curve: 1 centralizer per joint from landing point to KOP

KOP to surf: 1 centralizer per 2 joints

<b>Cement:</b>	Type	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	% Excess	Planned TOC (ft MD)	Total Cmt (sx)
<b>Lead</b>	G:POZ blend	12.4	1.907	9.981	50%	0	814
<b>Tail</b>	G:POZ blend	13.3	1.360	5.999	10%	4,056	2,218

**Annular Capacity** 0.2691 cuft/ft 5-1/2" casing x 9-5/8" casing annulus

0.2291 cuft/ft 5-1/2" casing x 8-1/2" hole annulus

Calculated cement volumes assume gauge hole and the excess noted in table

Halliburton ECONOCER & EXTENDACER cementing blend

**Notify NMOCD & BLM if cement is not circulated to surface.**

**Note:** The lateral may be drilled outside the applicable unit setback to maximize the length of the completed interval and to maximize resource recovery. If the well is drilled outside the setback, the toe initiation sleeve(s) and all perforations will be placed inside the setback. An unorthodox location application is not required because the completed interval will be entirely within the setback as defined and allowed by NMAC 19.15.16.7B(1), NMAC 19.15.16.14B(2), NMAC 19.15.16.15B(2) . W Lybrook Unit Order Number is R-14051.

**FINISH WELL:** ND BOP, cap well, RDMO.

#### COMPLETION AND PRODUCTION PLAN:

**Frac:** 60 plug-and-perf stages with 360,000 bbls slickwater fluid and 17,000,000 lbs of proppant (estimated)

**Flowback:** Flow back through production tubing as pressures allow (ESP may be used for load recovery assistance)

**Production:** Produce through production tubing via gas-lift into permanent production and storage facilities

#### ESTIMATED START DATES:

**Drilling:** TBD

**Completion:** TBD

**Production:** TBD

**Prepared by:** Alec Bridge 2/17/2020



**WELL NAME: W LYBROOK UNIT 720H****OBJECTIVE:** Drill, complete, and equip single lateral in the Mancos-I formation**API Number:** 720Y: 30-045-35818, 720H: not yet assigned**AFE Number:** not yet assigned**ER Well Number:** not yet assigned**State:** New Mexico**County:** San Juan**Surface Elev.:** 6,719 ft ASL (GL) 6,744 ft ASL (KB)**Surface Location:** 23-23N-09W Sec-Twn- Rng 2,565 ft FSL 2,089 ft FEL**BH Location:** 15-23N-09W Sec-Twn- Rng 904 ft FNL 330 ft FWL**Driving Directions:** FROM THE INTERSECTION OF US HWY 550 & US HWY 64 IN BLOOMFIELD, NM:

South on US Hwy 550 for 38.3 miles to MM 113.4, Right (Southwest) on CR #7890 for 0.8 miles to fork, Left (South) remaining on CR #7890 for 1.3 miles to 4-way intersection, Left (Southeast) remaining on CR #7890 for 0.6 miles to fork, Right (Southwest) on CR #7890 for 0.5 miles to fork, Right (West) exiting CR #7890 for 0.6 miles to fork, Right (Northwest) for 0.6 mile to W Lybrook Unit 720H Pad

QUICK REFERENCE	
Sur TD (MD)	350 ft
Int TD (MD)	2,645 ft
KOP (MD)	4,092 ft
KOP (TVD)	3,970 ft
Target (TVD)	4,679 ft
Curve BUR	10 °/100 ft
POE (MD)	5,219 ft
TD (MD)	16,026 ft
Lat Len (ft)	10,807 ft

**WELL CONSTRUCTION SUMMARY:**

	Hole (in)	TD MD (ft)	Csg (in)	Csg (lb/ft)	Csg (grade)	Csg (conn)	Csg Top (ft)	Csg Bot (ft)
Surface	17.500	350	13.375	54.5	J-55	BTC	0	350
Intermediate	12.250	2,645	9.625	36.0	J-55	LTC	0	2,645
Production	8.500	16,026	5.500	17.0	P-110	LTC	0	16,026

**CEMENT PROPERTIES SUMMARY:**

	Type	Wt (ppg)	Yd (cuft/sk)	Wtr (gal/sk)	Hole Cap. (cuft/ft)	% Excess	TOC (ft MD)	Total (sx)
Surface	Class G	15.8	1.174	5.15	0.6946	100%	0	414
Inter. (Lead)	G:POZ Blend	12.3	1.987	10.16	0.3627	70%	0	590
Inter. (Tail)	Class G	15.8	1.148	4.98	0.3132	20%	2,145	164
Prod. (Lead)	G:POZ blend	12.4	1.907	9.981	0.2691	50%	0	814
Prod. (Tail)	G:POZ blend	13.3	1.360	5.999	0.2291	10%	4,056	2,218

**COMPLETION / PRODUCTION SUMMARY:****Frac:** 60 plug-and-perf stages with 360,000 bbls slickwater fluid and 17,000,000 lbs of proppant (estimated)**Flowback:** Flow back through production tubing as pressures allow (ESP may be used for load recovery assistance)**Production:** Produce through production tubing via gas-lift into permanent production and storage facilities

Tops	TVD (ft KB)	MD (ft KB)
Ojo Alamo	376	376
Kirtland	474	474
Fruitland	680	680
Pictured Cliffs	1,044	1,044
Lewis	1,259	1,259
Chacra	1,414	1,415
Cliff House	2,482	2,527
Menefee	2,494	2,540
Point Lookout	3,464	3,560
Mancos	3,704	3,812
Gallup (MNCS_A)	3,936	4,056
MNCS_B	4,034	4,159
MNCS_C	4,169	4,298
MNCS_Cms	4,169	4,298
MNCS_D	4,299	4,436
MNCS_E	4,432	4,592
MNCS_F	4,499	4,683
MNCS_G	4,564	4,785
MNCS_H	4,609	4,873
MNCS_I	4,654	4,997
P.O.E. TARGET	4,679	5,219
PROJECTED TD	4,729	16,026

**District I**  
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**District IV**  
1220 S. St Francis Dr., Santa Fe, NM 87505  
Phone:(505) 476-3470 Fax:(505) 476-3462

**State of New Mexico**  
**Energy, Minerals and Natural Resources**  
**Oil Conservation Division**  
**1220 S. St Francis Dr.**  
**Santa Fe, NM 87505**

COMMENTS

Action 24936

COMMENTS

Operator: ENDURING RESOURCES, LLC 1050 17TH STREET, SUITE 2500 DENVER, CO 80265	OGRID: 372286
	Action Number: 24936
	Action Type: [C-103] NOI Change of Plans (C-103A)

COMMENTS

Created By	Comment	Comment Date
kpickford	KP GEO Review 4/22/2021	4/23/2021



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1220 S. St Francis Dr.  
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CONDITIONS  
  
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CONDITIONS

Created By	Condition	Condition Date
ahvermersch	File a NGMP	6/22/2021