

State of New Mexico  
Energy, Minerals and Natural Resources Department

**Susana Martinez**  
Governor

**Ken McQueen**  
Cabinet Secretary

**Matthias Sayer**  
Deputy Cabinet Secretary

**Heather Riley**, Division Director  
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

Operator Signature Date: 10/4/2018

Well information;

Operator Enduring, Well Name and Number W. Lybrook Unit 771H

API# 30-045-35894, Section 23 Township 23 N/S, Range 9 E/W

Conditions of Approval: (See the below checked and handwritten conditions)

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat
- ☐ Hold C-104 for NSL, NSP, DHC
- ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- ☐ Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
  - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
  - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
  - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- ☐ Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- ☐ Submit Gas Capture Plan form prior to spudding or initiating recompletion operations
- ☒ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- ☒ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- ☒ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore communication to be reported in accordance with 19.15.29.8.

*\*OBm may not be used as a contingency for the intermediate*

*Brad Bell*  
NMOCD Approved by Signature

12/19/18  
Date

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED  
OMB No. 1004-0137  
Expires: January 31, 2018

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NOG13121862
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name EASTERN NAVAJO
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input checked="" type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No. INITIAL MANCOS PA / NMNM135216A
2. Name of Operator ENDURING RESOURCES LLC		8. Lease Name and Well No. W LYBROOK UNIT 771H
3a. Address 1050 17TH ST STE 2500 DENVER CO 80265	3b. Phone No. (include area code) (505)386-8205	9. API Well No. 30-045-35894
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface SENE / 1864 FNL / 740 FEL / LAT 36.214537 / LONG -107.751721 At proposed prod. zone SENE / 2424 FNL / 330 FEL / LAT 36.198401 / LONG -107.73264		10. Field and Pool, or Exploratory BASIN MANCOS / MANCOS
11. Sec., T. R. M. or Blk. and Survey or Area SEC 23 / T23N / R9W / NMP		
14. Distance in miles and direction from nearest town or post office* 37 miles		12. County or Parish SAN JUAN
13. State NM		
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 20 feet	16. No of acres in lease 160	17. Spacing Unit dedicated to this well 360
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 740 feet	19. Proposed Depth 4699 feet / 13658 feet	20. BLM/BIA Bond No. in file IND: RLB0016899
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6737 feet	22. Approximate date work will start* 11/01/2018	23. Estimated duration 30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

- |  |   |
|--|---|
| 1. Well plat certified by a registered surveyor.   | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan.  | 5. Operator certification.  |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be requested by the BLM.            |

25. Signature (Electronic Submission)	Name (Printed/Typed) Lacey Granillo / Ph: (505)636-9743	Date 10/04/2018
Title Permitting Specialist		
Approved by (Signature) <i>[Signature]</i>	Name (Printed/Typed)	Date 11/20/2018
Title AFM	Office FARMINGTON	

Application approval 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.

Conditions of approval, if any, are attached.

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.

This action is subject to technical and procedural review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3165.4

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

DRILLING OPERATIONS AUTHORIZED ARE SUBJECT TO COMPLIANCE WITH ATTACHED "GENERAL REQUIREMENTS"

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

Submit one copy to  
Appropriate District Office

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

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

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

☐ AMENDED REPORT

## WELL LOCATION AND ACREAGE DEDICATION PLAT

'API Number 30-045-35894	'Pool Code 98157	'Pool Name LYBROOK MANCOS W
'Property Code 321259	'Property Name W LYBROOK UNIT	'Well Number 771H
'GRID No. 372286	'Operator Name ENDURING RESOURCES, LLC	'Elevation 6737'

<sup>10</sup> Surface Location

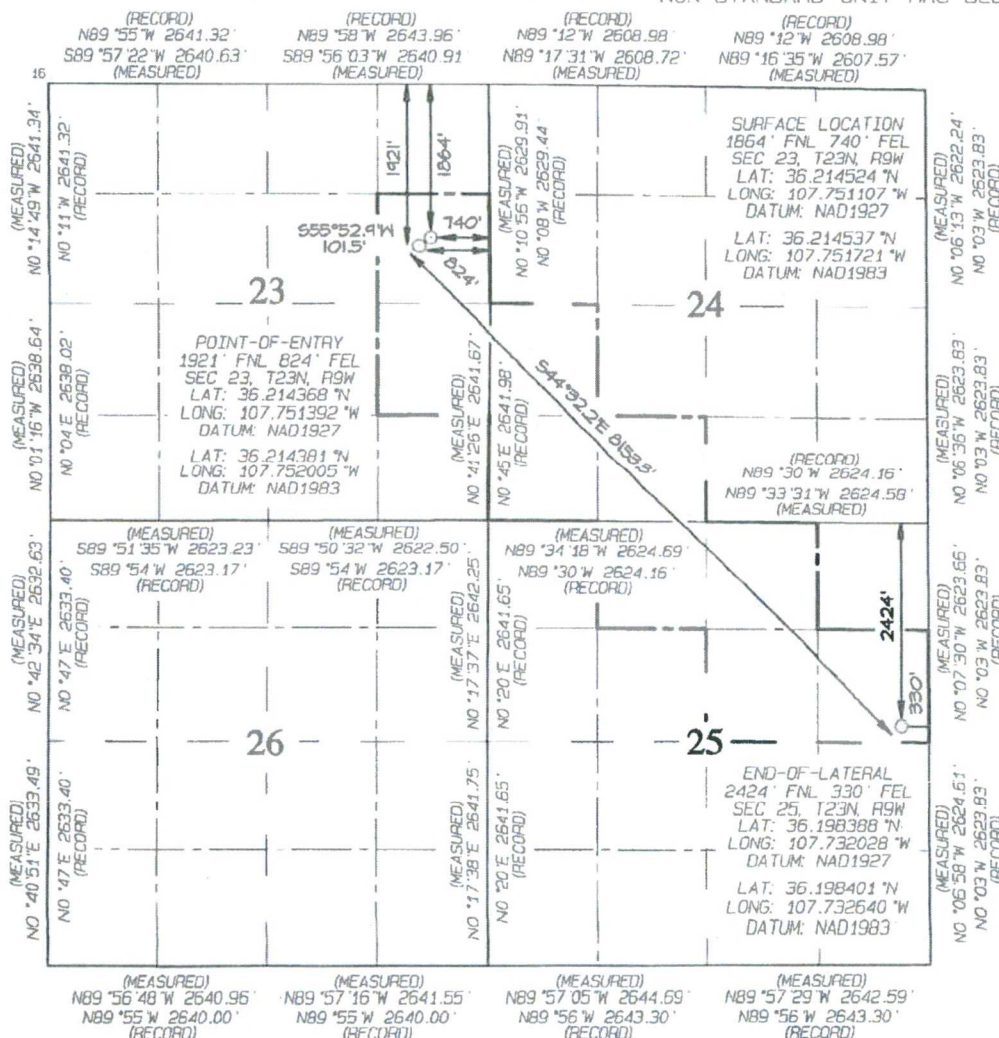
U. or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	23	23N	9W		1864	NORTH	740	EAST	SAN JUAN

<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
H	25	23N	9W		2424	NORTH	330	EAST	SAN JUAN

Dedicated Acres 360.0 NE/4 NW/4, NW/4 NE/4 S/2 NE/4 - Section 25 NW/4 SW/4, S/2 SW/4 - Section 24 SE/4 NE/4, NE/4 SE/4 - Section 23	13 Joint or Infill 14 Consolidation Code 15 Order No. R-14051 - 12,807.24 Acres	NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A
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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



17 OPERATOR CERTIFICATION

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

9/26/18

Signature \_\_\_\_\_ Date \_\_\_\_\_  
Lacey Granillo  
Printed Name \_\_\_\_\_  
lgranillo@enduringresources.com  
E-mail 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: SEPTEMBER 20, 2018  
Date of Survey: MAY 16, 2018

Signature and Seal of Professional Surveyor



**JASON C. EDWARDS**  
Certificate Number 15269



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 771H

**API Number:** 30-045- 35894

**State:** New Mexico

**County:** San Juan

**Surface Elevation:** 6,737 ft ASL (GL) 6,762 ft ASL (KB)

**Surface Location:** 23-23N-09W Sec-Twn-Rng 1,864 ft FNL 740 ft FEL

36.214537 ° N latitude 107.751721 ° W longitude (NAD 83)

**BH Location:** 25-23N-09W Sec-Twn-Rng 2,425 ft FNL 330 ft FEL

36.198401 ° N latitude 107.73264 ° W longitude (NAD 83)

**Driving Directions:** From the intersection of US HWY 550 and US HWY 64 in Bloomfield, NM: South on US HWY 550 for 38.3 miles to MM 113.4, right (southwest) at on CR #7890 for 0.8 miles to fork; left (south) staying on #7890 for 1.3 miles to 4-way intersection, left (southeast) staying on #7890 for 0.6 miles to fork, right (west) exiting from #7890 onto existing roadway for 0.6 miles to fork in road, right (northwest) for 0.6 miles to beginning of access road on the right, right approximately 0.2 miles to the W Lybrook Unit 768H pad.

**GEOLOGIC AND RESERVOIR INFORMATION:**

Prognosis:	Formation Tops	TVD (ft ASL)	TVD (ft KB)	MD (ft KB)	O / G / W	Pressure
	Ojo Alamo	6,354	408	408	W	normal
	Kirtland	6,245	517	517	W	normal
	Fruitland	6,047	715	715	G, W	sub
	Pictured Cliffs	5,670	1,092	1,092	G, W	sub
	Lewis	5,447	1,315	1,316	G, W	normal
	Chacra	5,305	1,457	1,459	G, W	normal
	Cliff House	4,230	2,532	2,584	G, W	sub
	Menefee	4,215	2,547	2,600	G, W	normal
	Point Lookout	3,248	3,514	3,623	G, W	normal
	Mancos	2,983	3,779	3,904	O,G	sub (~0.38)
	Gallup (MNCS_A)	2,762	4,000	4,138	O,G	sub (~0.38)
	<b>MNCS_I (TARGET)</b>	<b>2,031</b>	<b>4,731</b>	<b>5,505</b>	<b>O,G</b>	<b>sub (~0.38)</b>
	<b>PROJECTED WELL TD</b>	<b>2,063</b>	<b>4,699</b>	<b>13,658</b>	<b>O,G</b>	<b>sub (~0.38)</b>

**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 155° 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 chromatograph 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 double gate ram (13-5/8", 3,000 psi)

**BOPE 2:** Cameron annular (13-5/8", 2,500 psi)

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

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

#### 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 10 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	240 ft (MD)	Hole Section Length:	240 ft
0 ft (TVD)	to	240 ft (TVD)	Casing Required:	240 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, run deviation survey after drilling

**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					105	570	111,406	111,406
Min. S.F.					10.78	4.79	7.66	8.16

*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 Details:** 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	284

*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, install wellhead.

240 ft (MD)	to	2,706 ft (MD)	Hole Section Length:	2,466 ft
240 ft (TVD)	to	2,647 ft (TVD)	Casing Required:	2,706 ft

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

**Hole Size:** 12-1/4"

**Bit / Motor:** PDC w/mud motor

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

**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					1,156	1,151	184,952
Min. S.F.					1.75	3.06	3.05

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):** Minumum: 3,400 Optimum: 4,530 Maximum: 5,660

**Casing Details:** 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)
Lead	G:POZ Blend	12.3	1.987	10.16	0.3132	40%	0	487
Tail	Class G	15.8	1.148	4.98	0.3132	10%	2,206	150

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

Halliburton ECONOCEM & 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.

2,706 ft (MD)	to	13,658 ft (MD)	Hole Section Length:	10,952 ft
2,647 ft (TVD)	to	4,699 ft (TVD)	Casing Required:	13,658 ft

Estimated KOP:	4,138 ft (MD)	4,000 ft (TVD)
Estimated Landing Point (P.O.E.):	5,505 ft (MD)	4,731 ft (TVD)
Estimated Lateral Length:	8,153 ft (MD)	

Fluid:	Type	MW (ppg)	FL (mL/30')	PV (cp)	YP (lb/100 sqft)	pH	Comments
	WBM	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)
Specs	5.500	17.0	P-110	LTC	7,460	10,640	546,000	445,000
Loading					2,321	8,940	300,355	300,355
Min. S.F.					<b>3.21</b>	<b>1.19</b>	<b>1.82</b>	<b>1.48</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 Details:** Float shoe, float collar, 2 jts casing, float collar, 1 jt casing, toe-initiation sleeve, 1 jt casing, toe-initiation sleeve, casing to KOP with 20' marker joints spaced evenly in lateral every 2,000'. Place Floatation Sub at KOP (+/-). Continue running 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: estimated 1 centralizer per joints

Curve: estimated 1 centralizer per joint from landing point to KOP

Vertical: estimated 1 centralizer per 2 joints from KOP to 9-5/8" shoe, 1 per 3 joints from 9-5/8" shoe to surface

<b>Cement:</b>	<b>Type</b>	<b>Weight (ppg)</b>	<b>Yield (cuft/sk)</b>	<b>Water (gal/sk)</b>	<b>Hole Cap. (cuft/ft)</b>	<b>% Excess</b>	<b>Planned TOC (ft MD)</b>	<b>Total Cmt (sx)</b>
Lead	G:POZ blend	12.3	1.987	10.16	0.2691	40%	0	722
Tail	G:POZ blend	13.3	1.354	5.94	0.2291	10%	4,000	1,798

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 past applicable setback to maximize the length of the completed interval and to maximize resource recovery. If the well is drilled past the setback, the toe Initiation sleeve 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).

**FINISH WELL:** ND BOP, NU WH with BPV and cap, RDMO.

**COMPLETION AND PRODUCTION PLAN:**

**Frac:** Lateral will be fracture-stimulated in approximately 45 plug-and-perf stages with approximately 225,000 bbls slickwater fluid and 16,000,000 lbs of proppant.

**Flowback:** Depending on well pressures, flow back may be either up 5-1/2" casing or 2-7/8" production tubing. Well will be flowed back until proppant volumes are low enough that the well can safely be produced through permanent production facilities.

**Production:** Well will produce up production tubing via gas-lift into permanent production and storage facilities.

**ESTIMATED START DATES:**

**Drilling:** 12/1/2018

**Completion:** 1/31/2019

**Production:** 3/16/2019

**Prepared by:** Alec Bridge 9/14/2018



# **Enduring Resources LLC**

San Juan Basin - W Lybrook Unit

768H Pad

771H

Wellbore #1

Plan: Design #1

## **Standard Planning Report**

14 September, 2018





# Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well 771H
Company:	Enduring Resources LLC	TVD Reference:	KB @ 6762.0usft (Original Well Elev)
Project:	San Juan Basin - W Lybrook Unit	MD Reference:	KB @ 6762.0usft (Original Well Elev)
Site:	768H Pad	North Reference:	Grid
Well:	771H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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

Site	768H Pad, San Juan County, New Mexico		
Site Position:		Northing:	1,897,416.80 usft
From:	Lat/Long	Easting:	2,747,156.27 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	36.214585°N
		Longitude:	107.751754°W
		Grid Convergence:	0.05 °

Well	771H		
Well Position	+N/-S	-17.5 usft	Northing:
	+E/-W	9.7 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	
		Latitude:	36.214537°N
		Longitude:	107.751721°W
		Ground Level:	6,737.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF200510	12/31/2009	9.99
			Dip Angle (°)
			63.06
			Field Strength (nT)
			50,605.67835577

Design	Design #1		
Audit Notes:			
Version:	Phase:	PROTOTYPE	Tie On Depth:
			0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction (°)
			136.16

Plan Survey Tool Program	Date 9/14/2018		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name
1	0.0	13,658.7	Design #1 (Wellbore #1)
			MWD
			OWSG MWD - Standard
			Remarks

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
240.0	0.00	0.00	240.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,954.5	19.09	307.66	1,937.0	96.3	-124.7	2.00	2.00	0.00	307.66	
4,137.6	19.09	307.66	4,000.0	532.5	-690.0	0.00	0.00	0.00	0.00	771H - KOP
5,148.3	87.09	132.24	4,722.6	190.4	-341.3	10.50	6.73	-17.36	-175.25	
5,505.4	90.22	135.46	4,731.0	-56.9	-83.9	1.26	0.88	0.90	45.86	771H - POE2
13,658.7	90.22	135.46	4,699.0	-5,868.5	5,634.6	0.00	0.00	0.00	0.00	771H - BHL2



# Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well 771H
Company:	Enduring Resources LLC	TVD Reference:	KB @ 6762.0usft (Original Well Elev)
Project:	San Juan Basin - W Lybrook Unit	MD Reference:	KB @ 6762.0usft (Original Well Elev)
Site:	768H Pad	North Reference:	Grid
Well:	771H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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
240.0	0.00	0.00	240.0	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
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
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
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
1,100.0	2.00	307.66	1,100.0	1.1	-1.4	-1.7	2.00	2.00	0.00
1,200.0	4.00	307.66	1,199.8	4.3	-5.5	-6.9	2.00	2.00	0.00
1,300.0	6.00	307.66	1,299.5	9.6	-12.4	-15.5	2.00	2.00	0.00
1,400.0	8.00	307.66	1,398.7	17.0	-22.1	-27.6	2.00	2.00	0.00
1,500.0	10.00	307.66	1,497.5	26.6	-34.5	-43.0	2.00	2.00	0.00
1,600.0	12.00	307.66	1,595.6	38.3	-49.6	-61.9	2.00	2.00	0.00
1,700.0	14.00	307.66	1,693.1	52.0	-67.4	-84.2	2.00	2.00	0.00
1,800.0	16.00	307.66	1,789.6	67.8	-87.9	-109.8	2.00	2.00	0.00
1,900.0	18.00	307.66	1,885.3	85.7	-111.0	-138.7	2.00	2.00	0.00
1,954.5	19.09	307.66	1,937.0	96.3	-124.7	-155.8	2.00	2.00	0.00
2,000.0	19.09	307.66	1,979.9	105.4	-136.5	-170.5	0.00	0.00	0.00
2,100.0	19.09	307.66	2,074.4	125.3	-162.4	-202.9	0.00	0.00	0.00
2,200.0	19.09	307.66	2,168.9	145.3	-188.3	-235.2	0.00	0.00	0.00
2,300.0	19.09	307.66	2,263.4	165.3	-214.2	-267.6	0.00	0.00	0.00
2,400.0	19.09	307.66	2,357.9	185.3	-240.1	-299.9	0.00	0.00	0.00
2,500.0	19.09	307.66	2,452.4	205.3	-266.0	-332.3	0.00	0.00	0.00
2,600.0	19.09	307.66	2,546.9	225.3	-291.8	-364.6	0.00	0.00	0.00
2,700.0	19.09	307.66	2,641.4	245.2	-317.7	-397.0	0.00	0.00	0.00
2,800.0	19.09	307.66	2,735.9	265.2	-343.6	-429.3	0.00	0.00	0.00
2,900.0	19.09	307.66	2,830.4	285.2	-369.5	-461.7	0.00	0.00	0.00
3,000.0	19.09	307.66	2,924.9	305.2	-395.4	-494.0	0.00	0.00	0.00
3,100.0	19.09	307.66	3,019.4	325.2	-421.3	-526.3	0.00	0.00	0.00
3,200.0	19.09	307.66	3,113.9	345.2	-447.2	-558.7	0.00	0.00	0.00
3,300.0	19.09	307.66	3,208.4	365.1	-473.1	-591.0	0.00	0.00	0.00
3,400.0	19.09	307.66	3,302.9	385.1	-499.0	-623.4	0.00	0.00	0.00
3,500.0	19.09	307.66	3,397.4	405.1	-524.9	-655.7	0.00	0.00	0.00
3,600.0	19.09	307.66	3,491.9	425.1	-550.8	-688.1	0.00	0.00	0.00
3,700.0	19.09	307.66	3,586.4	445.1	-576.6	-720.4	0.00	0.00	0.00
3,800.0	19.09	307.66	3,680.9	465.1	-602.5	-752.8	0.00	0.00	0.00
3,900.0	19.09	307.66	3,775.4	485.0	-628.4	-785.1	0.00	0.00	0.00
4,000.0	19.09	307.66	3,869.9	505.0	-654.3	-817.5	0.00	0.00	0.00
4,100.0	19.09	307.66	3,964.4	525.0	-680.2	-849.8	0.00	0.00	0.00
4,137.6	19.09	307.66	4,000.0	532.5	-690.0	-862.0	0.00	0.00	0.00
4,200.0	12.58	305.17	4,060.0	542.7	-703.6	-878.8	10.50	-10.45	-3.99
4,300.0	2.52	274.07	4,159.0	549.1	-714.7	-891.1	10.50	-10.06	-31.11
4,400.0	8.66	142.41	4,258.7	543.3	-712.3	-885.2	10.50	6.14	-131.65
4,500.0	19.08	136.65	4,355.6	525.4	-696.5	-861.3	10.50	10.42	-5.76
4,600.0	29.56	134.90	4,446.6	496.0	-667.7	-820.2	10.50	10.48	-1.76
4,700.0	40.04	134.01	4,528.6	456.2	-627.0	-763.3	10.50	10.49	-0.89
4,800.0	50.54	133.44	4,598.9	407.1	-575.6	-692.4	10.50	10.49	-0.57
4,900.0	61.03	133.02	4,655.0	350.6	-515.5	-609.9	10.50	10.49	-0.42
5,000.0	71.53	132.68	4,695.2	288.4	-448.4	-518.6	10.50	10.50	-0.34



# Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well 771H
Company:	Enduring Resources LLC	TVD Reference:	KB @ 6762.0usft (Original Well Elev)
Project:	San Juan Basin - W Lybrook Unit	MD Reference:	KB @ 6762.0usft (Original Well Elev)
Site:	768H Pad	North Reference:	Grid
Well:	771H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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)
5,100.0	82.02	132.37	4,718.0	222.7	-376.8	-421.6	10.50	10.50	-0.30
5,148.3	87.09	132.24	4,722.6	190.4	-341.3	-373.7	10.50	10.50	-0.29
5,200.0	87.54	132.70	4,725.0	155.5	-303.1	-322.1	1.26	0.88	0.91
5,300.0	88.42	133.61	4,728.6	87.2	-230.2	-222.3	1.26	0.88	0.90
5,400.0	89.30	134.51	4,730.6	17.6	-158.4	-122.4	1.26	0.88	0.90
5,500.0	90.18	135.41	4,731.0	-53.0	-87.6	-22.4	1.26	0.88	0.90
5,505.4	90.22	135.46	4,731.0	-56.9	-83.9	-17.1	1.26	0.88	0.90
5,600.0	90.22	135.46	4,730.6	-124.3	-17.5	77.6	0.00	0.00	0.00
5,700.0	90.22	135.46	4,730.2	-195.6	52.6	177.5	0.00	0.00	0.00
5,800.0	90.22	135.46	4,729.8	-266.9	122.8	277.5	0.00	0.00	0.00
5,900.0	90.22	135.46	4,729.5	-338.1	192.9	377.5	0.00	0.00	0.00
6,000.0	90.22	135.46	4,729.1	-409.4	263.1	477.5	0.00	0.00	0.00
6,100.0	90.22	135.46	4,728.7	-480.7	333.2	577.5	0.00	0.00	0.00
6,200.0	90.22	135.46	4,728.3	-552.0	403.3	677.5	0.00	0.00	0.00
6,300.0	90.22	135.46	4,727.9	-623.3	473.5	777.5	0.00	0.00	0.00
6,400.0	90.22	135.46	4,727.5	-694.5	543.6	877.5	0.00	0.00	0.00
6,500.0	90.22	135.46	4,727.1	-765.8	613.7	977.5	0.00	0.00	0.00
6,600.0	90.22	135.46	4,726.7	-837.1	683.9	1,077.5	0.00	0.00	0.00
6,700.0	90.22	135.46	4,726.3	-908.4	754.0	1,177.5	0.00	0.00	0.00
6,800.0	90.22	135.46	4,725.9	-979.7	824.1	1,277.5	0.00	0.00	0.00
6,900.0	90.22	135.46	4,725.5	-1,050.9	894.3	1,377.4	0.00	0.00	0.00
7,000.0	90.22	135.46	4,725.1	-1,122.2	964.4	1,477.4	0.00	0.00	0.00
7,100.0	90.22	135.46	4,724.7	-1,193.5	1,034.6	1,577.4	0.00	0.00	0.00
7,200.0	90.22	135.46	4,724.3	-1,264.8	1,104.7	1,677.4	0.00	0.00	0.00
7,300.0	90.22	135.46	4,724.0	-1,336.1	1,174.8	1,777.4	0.00	0.00	0.00
7,400.0	90.22	135.46	4,723.6	-1,407.3	1,245.0	1,877.4	0.00	0.00	0.00
7,500.0	90.22	135.46	4,723.2	-1,478.6	1,315.1	1,977.4	0.00	0.00	0.00
7,600.0	90.22	135.46	4,722.8	-1,549.9	1,385.2	2,077.4	0.00	0.00	0.00
7,700.0	90.22	135.46	4,722.4	-1,621.2	1,455.4	2,177.4	0.00	0.00	0.00
7,800.0	90.22	135.46	4,722.0	-1,692.5	1,525.5	2,277.4	0.00	0.00	0.00
7,900.0	90.22	135.46	4,721.6	-1,763.7	1,595.6	2,377.4	0.00	0.00	0.00
8,000.0	90.22	135.46	4,721.2	-1,835.0	1,665.8	2,477.4	0.00	0.00	0.00
8,100.0	90.22	135.46	4,720.8	-1,906.3	1,735.9	2,577.3	0.00	0.00	0.00
8,200.0	90.22	135.46	4,720.4	-1,977.6	1,806.1	2,677.3	0.00	0.00	0.00
8,300.0	90.22	135.46	4,720.0	-2,048.8	1,876.2	2,777.3	0.00	0.00	0.00
8,400.0	90.22	135.46	4,719.6	-2,120.1	1,946.3	2,877.3	0.00	0.00	0.00
8,500.0	90.22	135.46	4,719.2	-2,191.4	2,016.5	2,977.3	0.00	0.00	0.00
8,600.0	90.22	135.46	4,718.9	-2,262.7	2,086.6	3,077.3	0.00	0.00	0.00
8,700.0	90.22	135.46	4,718.5	-2,334.0	2,156.7	3,177.3	0.00	0.00	0.00
8,800.0	90.22	135.46	4,718.1	-2,405.2	2,226.9	3,277.3	0.00	0.00	0.00
8,900.0	90.22	135.46	4,717.7	-2,476.5	2,297.0	3,377.3	0.00	0.00	0.00
9,000.0	90.22	135.46	4,717.3	-2,547.8	2,367.1	3,477.3	0.00	0.00	0.00
9,100.0	90.22	135.46	4,716.9	-2,619.1	2,437.3	3,577.3	0.00	0.00	0.00
9,200.0	90.22	135.46	4,716.5	-2,690.4	2,507.4	3,677.3	0.00	0.00	0.00
9,300.0	90.22	135.46	4,716.1	-2,761.6	2,577.6	3,777.2	0.00	0.00	0.00
9,400.0	90.22	135.46	4,715.7	-2,832.9	2,647.7	3,877.2	0.00	0.00	0.00
9,500.0	90.22	135.46	4,715.3	-2,904.2	2,717.8	3,977.2	0.00	0.00	0.00
9,600.0	90.22	135.46	4,714.9	-2,975.5	2,788.0	4,077.2	0.00	0.00	0.00
9,700.0	90.22	135.46	4,714.5	-3,046.8	2,858.1	4,177.2	0.00	0.00	0.00
9,800.0	90.22	135.46	4,714.1	-3,118.0	2,928.2	4,277.2	0.00	0.00	0.00
9,900.0	90.22	135.46	4,713.8	-3,189.3	2,998.4	4,377.2	0.00	0.00	0.00
10,000.0	90.22	135.46	4,713.4	-3,260.6	3,068.5	4,477.2	0.00	0.00	0.00
10,100.0	90.22	135.46	4,713.0	-3,331.9	3,138.6	4,577.2	0.00	0.00	0.00
10,200.0	90.22	135.46	4,712.6	-3,403.2	3,208.8	4,677.2	0.00	0.00	0.00



## Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well 771H
Company:	Enduring Resources LLC	TVD Reference:	KB @ 6762.0usft (Original Well Elev)
Project:	San Juan Basin - W Lybrook Unit	MD Reference:	KB @ 6762.0usft (Original Well Elev)
Site:	768H Pad	North Reference:	Grid
Well:	771H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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)
10,300.0	90.22	135.46	4,712.2	-3,474.4	3,278.9	4,777.2	0.00	0.00	0.00
10,400.0	90.22	135.46	4,711.8	-3,545.7	3,349.1	4,877.2	0.00	0.00	0.00
10,500.0	90.22	135.46	4,711.4	-3,617.0	3,419.2	4,977.1	0.00	0.00	0.00
10,600.0	90.22	135.46	4,711.0	-3,688.3	3,489.3	5,077.1	0.00	0.00	0.00
10,700.0	90.22	135.46	4,710.6	-3,759.5	3,559.5	5,177.1	0.00	0.00	0.00
10,800.0	90.22	135.46	4,710.2	-3,830.8	3,629.6	5,277.1	0.00	0.00	0.00
10,900.0	90.22	135.46	4,709.8	-3,902.1	3,699.7	5,377.1	0.00	0.00	0.00
11,000.0	90.22	135.46	4,709.4	-3,973.4	3,769.9	5,477.1	0.00	0.00	0.00
11,100.0	90.22	135.46	4,709.0	-4,044.7	3,840.0	5,577.1	0.00	0.00	0.00
11,200.0	90.22	135.46	4,708.6	-4,115.9	3,910.1	5,677.1	0.00	0.00	0.00
11,300.0	90.22	135.46	4,708.3	-4,187.2	3,980.3	5,777.1	0.00	0.00	0.00
11,400.0	90.22	135.46	4,707.9	-4,258.5	4,050.4	5,877.1	0.00	0.00	0.00
11,500.0	90.22	135.46	4,707.5	-4,329.8	4,120.6	5,977.1	0.00	0.00	0.00
11,600.0	90.22	135.46	4,707.1	-4,401.1	4,190.7	6,077.1	0.00	0.00	0.00
11,700.0	90.22	135.46	4,706.7	-4,472.3	4,260.8	6,177.0	0.00	0.00	0.00
11,800.0	90.22	135.46	4,706.3	-4,543.6	4,331.0	6,277.0	0.00	0.00	0.00
11,900.0	90.22	135.46	4,705.9	-4,614.9	4,401.1	6,377.0	0.00	0.00	0.00
12,000.0	90.22	135.46	4,705.5	-4,686.2	4,471.2	6,477.0	0.00	0.00	0.00
12,100.0	90.22	135.46	4,705.1	-4,757.5	4,541.4	6,577.0	0.00	0.00	0.00
12,200.0	90.22	135.46	4,704.7	-4,828.7	4,611.5	6,677.0	0.00	0.00	0.00
12,300.0	90.22	135.46	4,704.3	-4,900.0	4,681.6	6,777.0	0.00	0.00	0.00
12,400.0	90.22	135.46	4,703.9	-4,971.3	4,751.8	6,877.0	0.00	0.00	0.00
12,500.0	90.22	135.46	4,703.5	-5,042.6	4,821.9	6,977.0	0.00	0.00	0.00
12,600.0	90.22	135.46	4,703.2	-5,113.9	4,892.1	7,077.0	0.00	0.00	0.00
12,700.0	90.22	135.46	4,702.8	-5,185.1	4,962.2	7,177.0	0.00	0.00	0.00
12,800.0	90.22	135.46	4,702.4	-5,256.4	5,032.3	7,277.0	0.00	0.00	0.00
12,900.0	90.22	135.46	4,702.0	-5,327.7	5,102.5	7,376.9	0.00	0.00	0.00
13,000.0	90.22	135.46	4,701.6	-5,399.0	5,172.6	7,476.9	0.00	0.00	0.00
13,100.0	90.22	135.46	4,701.2	-5,470.3	5,242.7	7,576.9	0.00	0.00	0.00
13,200.0	90.22	135.46	4,700.8	-5,541.5	5,312.9	7,676.9	0.00	0.00	0.00
13,300.0	90.22	135.46	4,700.4	-5,612.8	5,383.0	7,776.9	0.00	0.00	0.00
13,400.0	90.22	135.46	4,700.0	-5,684.1	5,453.1	7,876.9	0.00	0.00	0.00
13,500.0	90.22	135.46	4,699.6	-5,755.4	5,523.3	7,976.9	0.00	0.00	0.00
13,600.0	90.22	135.46	4,699.2	-5,826.6	5,593.4	8,076.9	0.00	0.00	0.00
13,658.7	90.22	135.46	4,699.0	-5,868.5	5,634.6	8,135.6	0.00	0.00	0.00

### 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
771H - KOP - plan hits target center - Point	0.00	0.00	4,000.0	532.5	-690.0	1,897,931.88	2,746,476.06	36.216002°N	107.754059°W
771H - BHL2 - plan hits target center - Point	0.00	0.00	4,699.0	-5,868.5	5,634.6	1,891,530.84	2,752,800.62	36.198401°N	107.732641°W
771H - POE2 - plan hits target center - Point	0.00	0.00	4,731.0	-56.9	-83.9	1,897,342.48	2,747,082.16	36.214381°N	107.752006°W



## Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well 771H
Company:	Enduring Resources LLC	TVD Reference:	KB @ 6762.0usft (Original Well Elev)
Project:	San Juan Basin - W Lybrook Unit	MD Reference:	KB @ 6762.0usft (Original Well Elev)
Site:	768H Pad	North Reference:	Grid
Well:	771H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

### Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
240.0	240.0	13 3/8"	13-3/8	17-1/2
2,705.9	2,647.0	9 5/8"	9-5/8	12-1/4

### Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
408.0	408.0	Ojo Alamo		0.00	
517.0	517.0	Kirtland		0.00	
715.0	715.0	Fruitland		0.00	
1,092.0	1,092.0	Pictured Cliffs		0.00	
1,315.6	1,315.0	Lewis		0.00	
1,459.0	1,457.0	Chacra		0.00	
2,584.2	2,532.0	Cliff House		0.00	
2,600.1	2,547.0	Menefee		0.00	
3,623.3	3,514.0	Point Lookout		0.00	
3,903.8	3,779.0	Mancos		0.00	
4,137.6	4,000.0	Gallup (MNCS_A)		0.00	
4,240.7	4,100.0	MNCS_B		0.00	
4,373.1	4,232.0	MNCS_C		0.00	
4,378.1	4,237.0	MNCS_Cms		0.00	
4,496.2	4,352.0	MNCS_D		0.00	
4,644.0	4,484.0	MNCS_E		0.00	
4,717.7	4,542.0	MNCS_F		0.00	
4,822.8	4,613.0	MNCS_G		0.00	
4,914.8	4,662.0	MNCS_H		0.00	
5,050.6	4,709.0	MNCS_I		0.00	
5,505.4	4,731.0	MNCS_I (TARGET)		0.00	

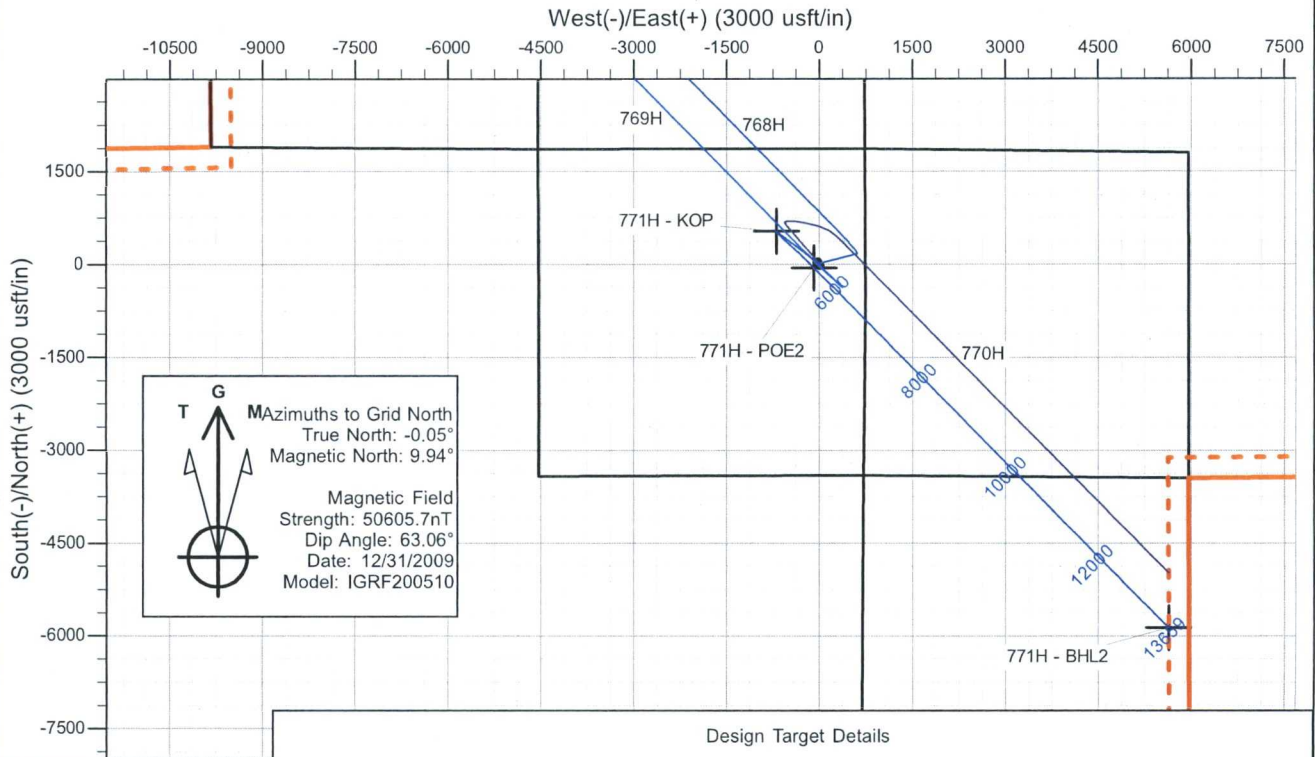


Enduring Resources LLC

Directional Drilling Plan  
Plan View & Section View

W Lybrook Unit 771H

San Juan County, New Mexico  
T23N-R09W-Sec.13  
Surface Latitude: 36.214537°N  
Surface Longitude: 107.751721°W  
Ground Level: 6737.0  
Reference Elevation: KB @ 6762.0usft (Original Well Elev)

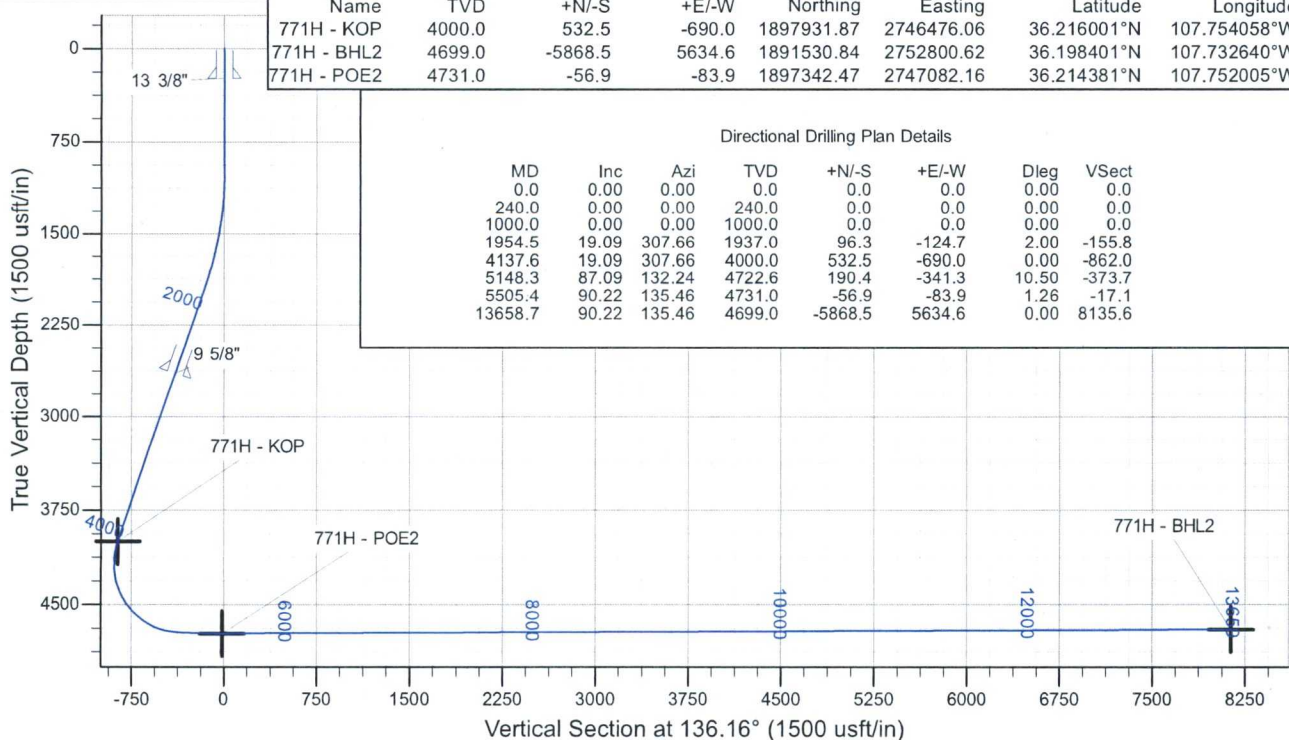


Design Target Details

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
771H - KOP	4000.0	532.5	-690.0	1897931.87	2746476.06	36.216001°N	107.754058°W
771H - BHL2	4699.0	-5868.5	5634.6	1891530.84	2752800.62	36.198401°N	107.732640°W
771H - POE2	4731.0	-56.9	-83.9	1897342.47	2747082.16	36.214381°N	107.752005°W

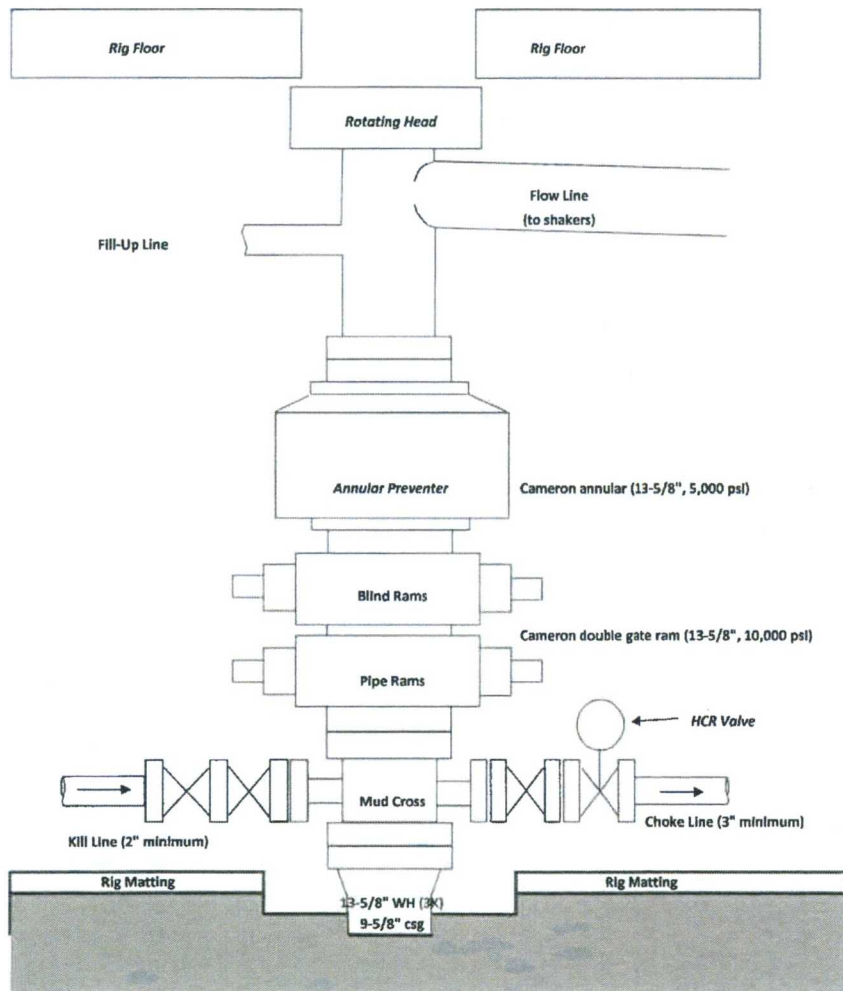
Directional Drilling Plan Details

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
240.0	0.00	0.00	240.0	0.0	0.0	0.00	0.0
1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.0
1954.5	19.09	307.66	1937.0	96.3	-124.7	2.00	-155.8
4137.6	19.09	307.66	4000.0	532.5	-690.0	0.00	-862.0
5148.3	87.09	132.24	4722.6	190.4	-341.3	10.50	-373.7
5505.4	90.22	135.46	4731.0	-56.9	-83.9	1.26	-17.1
13658.7	90.22	135.46	4699.0	-5868.5	5634.6	0.00	8135.6

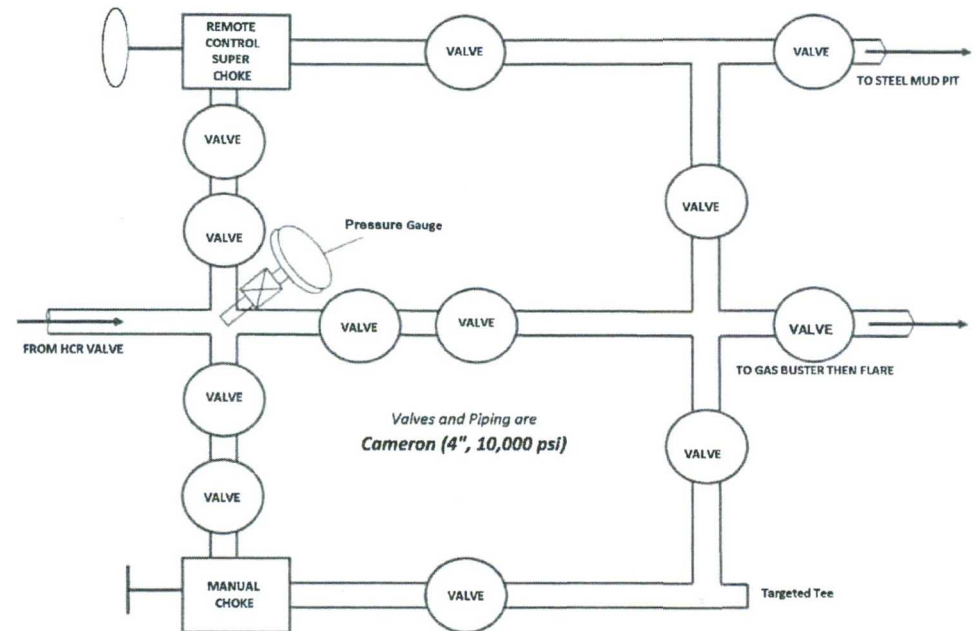


## BOPE & CHOKE MANIFOLD DIAGRAMS

### BOPE



### CHOKE MANIFOLD



**Directions from the Intersection of US Hwy 550 & US Hwy 64**

**in Bloomfield, NM to Enduring Resources, LLC W Lybrook Unit #771H**

**1864' FNL & 740' FEL, Section 23, T23N, R9W, N.M.P.M., San Juan County, NM**

**Latitude: 36.214537°N Longitude: 107.751721°W Datum: NAD1983**

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Southerly on US Hwy 550 for 38.3 miles to Mile Marker 113.4;

Go Right (South-westerly) on County Road #7890 for 0.8 miles to fork in roadway;

Go Left (Southerly) remaining on County Road #7890 for 1.3 miles to four-way intersection;

Go Left (South-easterly) remaining on County Road #7890 for 0.6 miles to fork in roadway;

Go Right (South-westerly) remaining on County Road #7890 for 0.6 miles to fork in roadway;

Go Right (Westerly) exiting County Road #7890 onto existing roadway for 0.6 miles to fork in roadway;

Go Right (North-westerly) for 0.6 miles to begin proposed access on right-hand side of existing roadway which continues for 1056.1' to staked Enduring W Lybrook Unit #771H location.