

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. N0G13121859
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. NMNM136328A
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. RODEO UNIT 512H
4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  Sec 25 T23N R9W SESW 191FSL 1345FWL 36.191177 N Lat, 107.744865 W Lon		9. API Well No. 30-045-35874-00-X1
		10. Field and Pool or Exploratory Area BASIN MANCOS
		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
BP	<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.

## CHANGE IN PLANS

Adhere to previous NMOCD  
Conditions of Approval

A summary of the requested changes to the approved APD is outlined below. Please reference the attachments for additional details.

C102  
Moved BHL from section 6 to section 6  
Moved POE from section 36 to section 36  
Drilling Program  
Directional plan updated based on new POE and BHL  
Casing program change  
Surface: 9-5/8 to 13-3/8

NMOCD  
REC'D 3/24/20

14. I hereby certify that the foregoing is true and correct.	
Electronic Submission #502801 verified by the BLM Well Information System For ENDURING RESOURCES LLC, sent to the Farmington Committed to AFMSS for processing by JOE KILLINS on 03/24/2020 (20JK0205SE)	
Name (Printed/Typed) LACEY GRANILLO	Title PERMITTING SPECIALIST
Signature (Electronic Submission)	Date 02/11/2020

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

Approved By JOE KILLINS	Title PETROLEUM ENGINEER	Date 03/24/2020
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 Farmington

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 \*\***

AV

**Additional data for EC transaction #502801 that would not fit on the form**

**32. Additional remarks, continued**

Intermediate: 7 to 9-5/8

Production: 4-1/2 liner to 5-1/2 long-string

Frac Program

Fluid type: change from nitrogen foam to slick-water

Water volume: increase from not provided to 300,000 bbls (estimated)

Sand weight: increase from 8.2 million lbs to 14 million lbs (estimated)

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 30-045-35874	*Pool Code 97232	*Pool Name BASIN MANCOS
*Property Code 321253	*Property Name RODEO UNIT	*Well Number 512H
*OGRID No. 372286	*Operator Name ENDURING RESOURCES, LLC	*Elevation 6798'

10 Surface Location

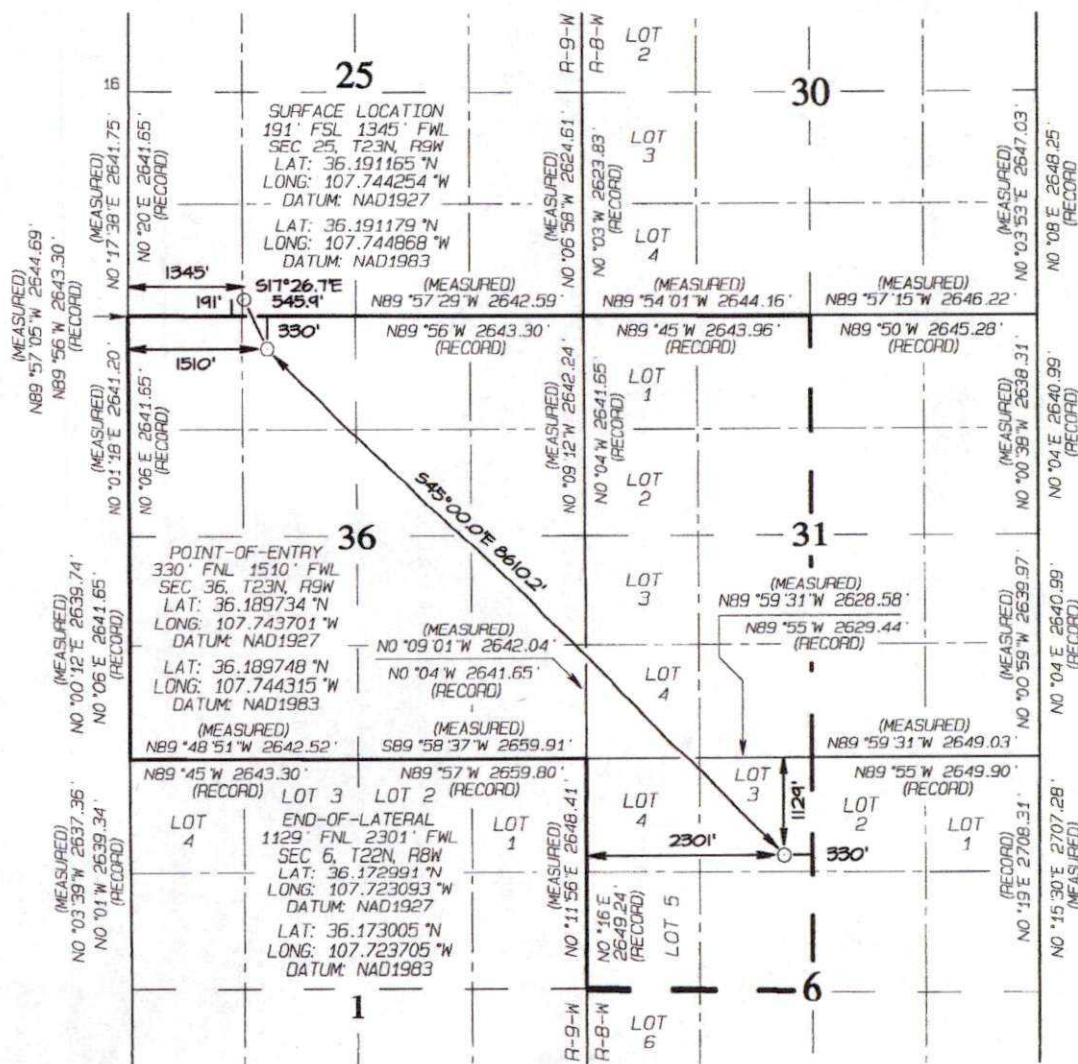
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
N	25	23N	9W		191	SOUTH	1345	WEST	SAN JUAN

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

UL or lot no.	Section	Township	Range	Lot 1st	Feet from the	North/South line	Feet from the	East/West line	County
C	6	22N	8W	3	1129	NORTH	2301	WEST	SAN JUAN

12	Dedicated Acres	W/2 - Section 31, T23N8W 1121.69 Entire Section 36, T23N9W NW/4 - Section 6, T22N8W	13 Joint or Infill	14 Consolidation Code	15 Order No. R-14313
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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 with an owner of such a mineral interest. I understand that such a mineral interest may be subject to a mineral pooling agreement or compulsory pooling order heretofore entered by the division.

Signature [Signature] Date 2/11/20

Printed Name: Isabella Mendonça

## 18 SURVEYOR CERTIFICATION

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

Date Revised: APRIL 2, 2019  
Survey Date: JANUARY 24, 2017

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:** **RODEO UNIT 512H**

**API Number:** 30-045-35874

**AFE Number:** not yet assigned

**ER Well Number:** not yet assigned

**State:** New Mexico

**County:** San Juan

**Surface Elevation:** 6,798 ft ASL (GL)

6,823 ft ASL (KB)

**Surface Location:** 25-23N-09W Sec-Twn-Rng

191 ft FSL

1,345 ft FWL

36.191179 ° N latitude

107.744868 ° W longitude

(NAD 83)

**BH Location:** 6-22N-08W Sec-Twn-Rng

1,129 ft FNL

2,301 ft FWL

36.176983 ° N latitude

107.722857 ° 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 37.8 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 1.5 miles to access road; Left on access road for 0.5 mile to Rodeo Unit 511H Pad (Wells: 511H, 512H, 513H, 530H, 531H).

**GEOLOGIC AND RESERVOIR INFORMATION:**

<b>Prognosis:</b>	<b>Formation Tops</b>	<b>TVD (ft ASL)</b>	<b>TVD (ft KB)</b>	<b>MD (ft KB)</b>	<b>O / G / W</b>	<b>Pressure</b>
	Ojo Alamo	6,436	387	387	W	normal
	Kirtland	6,309	514	514	W	normal
	Fruitland	6,108	715	715	G, W	sub
	Pictured Cliffs	5,759	1,064	1,064	G, W	sub
	Lewis	5,506	1,317	1,317	G, W	normal
	Chacra	5,376	1,447	1,447	G, W	normal
	Cliff House	4,297	2,526	2,529	G, W	sub
	Menefee	4,286	2,537	2,540	G, W	normal
	Point Lookout	3,311	3,512	3,525	G, W	normal
	Mancos	3,125	3,698	3,712	O,G	sub (~0.38)
	Gallup (MNCS_A)	2,892	3,931	3,947	O,G	sub (~0.38)
	MNCS_B	2,790	4,033	4,049	O,G	sub (~0.38)
	MNCS_Cms	2,657	4,166	4,182	O,G	sub (~0.38)
	MNCS_D	2,527	4,296	4,316	O,G	sub (~0.38)
	MNCS_E	2,389	4,434	4,471	O,G	sub (~0.38)
	MNCS_F	2,330	4,493	4,546	O,G	sub (~0.38)
	MNCS_G	2,267	4,556	4,638	O,G	sub (~0.38)
	MNCS_H	2,214	4,609	4,733	O,G	sub (~0.38)
	MNCS_I	2,165	4,658	4,858	O,G	sub (~0.38)
	<b>P.O.E. TARGET</b>	<b>2,140</b>	<b>4,683</b>	<b>5,032</b>	<b>O,G</b>	<b>sub (~0.38)</b>
	<b>PROJECTED TD</b>	<b>1,995</b>	<b>4,828</b>	<b>13,643</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:	2,080	psi
Maximum anticipated surface pressure, assuming partially evacuated hole:	1,020	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 intalled 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 the 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	574	116,634	116,634
Min. S.F.					7.39	4.76	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	2,641 ft (MD)	Hole Section Length:	2,291 ft
350 ft (TVD)	to	2,637 ft (TVD)	Casing Required:	2,641 ft

Fluid:	Type	MW (ppg)	FL (mL/30 min)	PV (cp)	YP (lb/100 sqft)	pH	Comments
	LSND (KCl)	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	453,000
Loading					1,152	1,171	182,911	182,911
Min. S.F.					1.75	3.01	3.08	2.48

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	589
Tail	Class G	15.8	1.148	4.98	20%	2,141	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 ECONOCEM &amp; 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.**

2,641 ft (MD)	to	13,643 ft (MD)	Hole Section Length:	11,002 ft
2,637 ft (TVD)	to	4,828 ft (TVD)	Casing Required:	13,643 ft

Estimated KOP:	4,091 ft (MD)	4,075 ft (TVD)
Estimated Landing Point (P.O.E.):	5,032 ft (MD)	4,683 ft (TVD)
Estimated Lateral Length:	8,611 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)
Specs	5.500	17.0	P-110	LTC	7,460	10,640	546,000	445,000
Loading					2,385	8,952	300,135	300,135
Min. S.F.					<b>3.13</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 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)
Lead	G:POZ blend	12.4	1.907	9.981	50%	0	794
Tail	G:POZ blend	13.3	1.360	5.999	10%	3,947	1,796

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 ECONOCEM & EXTENDACEM 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) . Rodeo Unit Order Number is R-14313.

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

#### COMPLETION AND PRODUCTION PLAN:

**Frac:** 50 plug-and-perf stages with 300,000 bbls slickwater fluid and 14,000,000 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 **2/7/2020**





# **Enduring Resources LLC**

**San Juan Basin - Rodeo Unit**

**511H Pad**

**512H**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**06 February, 2020**



## Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well 512H
Company:	Enduring Resources LLC	TVD Reference:	KB @ 6823.0usft (Original Well Elev)
Project:	San Juan Basin - Rodeo Unit	MD Reference:	KB @ 6823.0usft (Original Well Elev)
Site:	511H Pad	North Reference:	Grid
Well:	512H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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

Site	511H Pad, San Juan County, New Mexico				
Site Position:		Northing:	1,888,898.35 usft	Latitude:	36.191179°N
From:	Lat/Long	Easting:	2,749,215.36 usft	Longitude:	107.744800°W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.05 °

Well	512H					
Well Position	+N/-S	0.0 usft	Northing:	1,888,898.33 usft	Latitude:	36.191179°N
	+E/-W	-20.1 usft	Easting:	2,749,195.30 usft	Longitude:	107.744868°W
Position Uncertainty	0.0 usft		Wellhead Elevation:		Ground Level:	6,798.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.98	63.04	50,592.64092565

Design	Design #1				
Audit Notes:					
Version:	Phase:	PROTOTYPE		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	136.59	

Plan Survey Tool Program		Date 2/6/2020			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.0	13,642.5	Design #1 (Wellbore #1)	MWD	
				OWSG MWD - Standard	





## Planning Report

<b>Database:</b>	EDM	<b>Local Co-ordinate Reference:</b>	Well 512H
<b>Company:</b>	Enduring Resources LLC	<b>TVD Reference:</b>	KB @ 6823.0usft (Original Well Elev)
<b>Project:</b>	San Juan Basin - Rodeo Unit	<b>MD Reference:</b>	KB @ 6823.0usft (Original Well Elev)
<b>Site:</b>	511H Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	512H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

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	
350.0	0.00	0.00	350.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,260.8	7.82	248.20	2,260.0	-6.6	-16.5	3.00	3.00	0.00	248.20	
3,780.0	7.82	248.20	3,765.0	-83.4	-208.5	0.00	0.00	0.00	0.00	
4,040.8	0.00	0.00	4,025.0	-90.0	-225.0	3.00	-3.00	0.00	180.00	
4,090.8	0.00	0.00	4,075.0	-90.0	-225.0	0.00	0.00	0.00	0.00	512H KOP
4,119.7	2.88	232.66	4,103.9	-90.4	-225.6	9.95	9.95	0.00	232.66	
5,031.9	90.37	135.00	4,683.0	-520.8	163.7	9.95	9.59	-10.71	-97.64	512H POE
13,642.5	90.37	135.00	4,628.0	-6,609.3	6,252.1	0.00	0.00	0.00	0.00	512H BHL



## Planning Report

<b>Database:</b>	EDM	<b>Local Co-ordinate Reference:</b>	Well 512H
<b>Company:</b>	Enduring Resources LLC	<b>TVD Reference:</b>	KB @ 6823.0usft (Original Well Elev)
<b>Project:</b>	San Juan Basin - Rodeo Unit	<b>MD Reference:</b>	KB @ 6823.0usft (Original Well Elev)
<b>Site:</b>	511H Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	512H	<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>									
387.0	0.00	0.00	387.0	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
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
514.0	0.00	0.00	514.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Kirtland</b>									
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
715.0	0.00	0.00	715.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Fruitland</b>									
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
1,064.0	0.00	0.00	1,064.0	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
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,317.0	0.00	0.00	1,317.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Lewis</b>									
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,447.0	0.00	0.00	1,447.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Chacra</b>									
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	3.00	248.20	2,100.0	-1.0	-2.4	-1.0	3.00	3.00	0.00
2,200.0	6.00	248.20	2,199.6	-3.9	-9.7	-3.9	3.00	3.00	0.00
2,260.8	7.82	248.20	2,260.0	-6.6	-16.5	-6.5	3.00	3.00	0.00
2,300.0	7.82	248.20	2,298.8	-8.6	-21.5	-8.5	0.00	0.00	0.00
2,400.0	7.82	248.20	2,397.9	-13.6	-34.1	-13.5	0.00	0.00	0.00
2,500.0	7.82	248.20	2,497.0	-18.7	-46.7	-18.5	0.00	0.00	0.00
2,529.3	7.82	248.20	2,526.0	-20.2	-50.4	-20.0	0.00	0.00	0.00
<b>Cliff House</b>									
2,540.4	7.82	248.20	2,537.0	-20.7	-51.8	-20.6	0.00	0.00	0.00
<b>Menefee</b>									
2,600.0	7.82	248.20	2,596.0	-23.7	-59.4	-23.5	0.00	0.00	0.00
2,641.4	7.82	248.20	2,637.0	-25.8	-64.6	-25.6	0.00	0.00	0.00
<b>9 5/8"</b>									
2,700.0	7.82	248.20	2,695.1	-28.8	-72.0	-28.6	0.00	0.00	0.00
2,800.0	7.82	248.20	2,794.2	-33.9	-84.6	-33.6	0.00	0.00	0.00
2,900.0	7.82	248.20	2,893.2	-38.9	-97.3	-38.6	0.00	0.00	0.00
3,000.0	7.82	248.20	2,992.3	-44.0	-109.9	-43.6	0.00	0.00	0.00
3,100.0	7.82	248.20	3,091.4	-49.0	-122.6	-48.6	0.00	0.00	0.00





## Planning Report

<b>Database:</b>	EDM	<b>Local Co-ordinate Reference:</b>	Well 512H
<b>Company:</b>	Enduring Resources LLC	<b>TVD Reference:</b>	KB @ 6823.0usft (Original Well Elev)
<b>Project:</b>	San Juan Basin - Rodeo Unit	<b>MD Reference:</b>	KB @ 6823.0usft (Original Well Elev)
<b>Site:</b>	511H Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	512H	<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	7.82	248.20	3,190.4	-54.1	-135.2	-53.6	0.00	0.00	0.00
3,300.0	7.82	248.20	3,289.5	-59.1	-147.8	-58.6	0.00	0.00	0.00
3,400.0	7.82	248.20	3,388.6	-64.2	-160.5	-63.6	0.00	0.00	0.00
3,500.0	7.82	248.20	3,487.7	-69.2	-173.1	-68.7	0.00	0.00	0.00
3,524.6	7.82	248.20	3,512.0	-70.5	-176.2	-69.9	0.00	0.00	0.00
<b>Point Lookout</b>									
3,600.0	7.82	248.20	3,586.7	-74.3	-185.8	-73.7	0.00	0.00	0.00
3,700.0	7.82	248.20	3,685.8	-79.4	-198.4	-78.7	0.00	0.00	0.00
3,712.3	7.82	248.20	3,698.0	-80.0	-199.9	-79.3	0.00	0.00	0.00
<b>Mancos</b>									
3,780.0	7.82	248.20	3,765.0	-83.4	-208.5	-82.7	0.00	0.00	0.00
3,800.0	7.22	248.20	3,784.9	-84.4	-210.9	-83.7	3.00	-3.00	0.00
3,900.0	4.22	248.20	3,884.4	-88.1	-220.2	-87.3	3.00	-3.00	0.00
3,946.7	2.82	248.20	3,931.0	-89.1	-222.9	-88.4	3.00	-3.00	0.00
<b>Gallup (MNCS_A)</b>									
4,000.0	1.22	248.20	3,984.2	-89.8	-224.6	-89.1	3.00	-3.00	0.00
4,040.8	0.00	0.00	4,025.0	-90.0	-225.0	-89.2	3.00	-3.00	0.00
4,048.8	0.00	0.00	4,033.0	-90.0	-225.0	-89.2	0.00	0.00	0.00
<b>MNCS_B</b>									
4,090.8	0.00	0.00	4,075.0	-90.0	-225.0	-89.2	0.00	0.00	0.00
4,100.0	0.92	232.66	4,084.2	-90.0	-225.1	-89.2	9.95	9.95	0.00
4,119.7	2.88	232.66	4,103.9	-90.4	-225.6	-89.3	9.95	9.95	0.00
4,181.9	6.47	161.09	4,166.0	-94.7	-225.7	-86.3	9.95	5.77	-114.98
<b>MNCS_Cms</b>									
4,200.0	8.12	155.47	4,183.9	-96.8	-224.8	-84.2	9.95	9.14	-31.16
4,300.0	17.78	143.96	4,281.3	-115.7	-212.9	-62.3	9.95	9.66	-11.50
4,315.5	19.31	143.20	4,296.0	-119.6	-209.9	-57.4	9.95	9.83	-4.91
<b>MNCS_D</b>									
4,400.0	27.64	140.48	4,373.4	-146.0	-189.1	-23.9	9.95	9.87	-3.22
4,470.9	34.66	139.15	4,434.0	-173.9	-165.4	12.7	9.95	9.90	-1.87
<b>MNCS_E</b>									
4,500.0	37.54	138.74	4,457.5	-186.9	-154.1	29.8	9.95	9.91	-1.43
4,546.2	42.12	138.18	4,493.0	-209.0	-134.5	59.4	9.95	9.92	-1.21
<b>MNCS_F</b>									
4,600.0	47.47	137.64	4,531.2	-237.1	-109.1	97.3	9.95	9.92	-1.00
4,638.1	51.25	137.31	4,556.0	-258.4	-89.6	126.2	9.95	9.93	-0.86
<b>MNCS_G</b>									
4,700.0	57.39	136.85	4,592.1	-295.2	-55.3	176.4	9.95	9.93	-0.75
4,732.9	60.66	136.62	4,609.0	-315.8	-36.0	204.6	9.95	9.93	-0.67
<b>MNCS_H</b>									
4,800.0	67.33	136.21	4,638.4	-359.4	5.6	264.9	9.95	9.93	-0.61
4,857.9	73.08	135.89	4,658.0	-398.6	43.3	319.3	9.95	9.93	-0.56
<b>MNCS_I</b>									
4,900.0	77.26	135.66	4,668.8	-427.8	71.7	360.1	9.95	9.94	-0.53
5,000.0	87.20	135.16	4,682.3	-498.2	141.2	459.0	9.95	9.94	-0.51
5,031.9	90.37	135.00	4,683.0	-520.8	163.7	490.8	9.95	9.94	-0.50
5,100.0	90.37	135.00	4,682.6	-568.9	211.8	558.9	0.00	0.00	0.00
5,200.0	90.37	135.00	4,681.9	-639.6	282.5	658.8	0.00	0.00	0.00
5,300.0	90.37	135.00	4,681.3	-710.4	353.2	758.8	0.00	0.00	0.00
5,400.0	90.37	135.00	4,680.6	-781.1	423.9	858.8	0.00	0.00	0.00
5,500.0	90.37	135.00	4,680.0	-851.8	494.7	958.7	0.00	0.00	0.00
5,600.0	90.37	135.00	4,679.4	-922.5	565.4	1,058.7	0.00	0.00	0.00
5,700.0	90.37	135.00	4,678.7	-993.2	636.1	1,158.6	0.00	0.00	0.00





## Planning Report

<b>Database:</b>	EDM	<b>Local Co-ordinate Reference:</b>	Well 512H
<b>Company:</b>	Enduring Resources LLC	<b>TVD Reference:</b>	KB @ 6823.0usft (Original Well Elev)
<b>Project:</b>	San Juan Basin - Rodeo Unit	<b>MD Reference:</b>	KB @ 6823.0usft (Original Well Elev)
<b>Site:</b>	511H Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	512H	<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	90.37	135.00	4,678.1	-1,063.9	706.8	1,258.6	0.00	0.00	0.00
5,900.0	90.37	135.00	4,677.5	-1,134.6	777.5	1,358.5	0.00	0.00	0.00
6,000.0	90.37	135.00	4,676.8	-1,205.3	848.2	1,458.5	0.00	0.00	0.00
6,100.0	90.37	135.00	4,676.2	-1,276.0	918.9	1,558.5	0.00	0.00	0.00
6,200.0	90.37	135.00	4,675.5	-1,346.7	989.6	1,658.4	0.00	0.00	0.00
6,300.0	90.37	135.00	4,674.9	-1,417.5	1,060.3	1,758.4	0.00	0.00	0.00
6,400.0	90.37	135.00	4,674.3	-1,488.2	1,131.0	1,858.3	0.00	0.00	0.00
6,500.0	90.37	135.00	4,673.6	-1,558.9	1,201.7	1,958.3	0.00	0.00	0.00
6,600.0	90.37	135.00	4,673.0	-1,629.6	1,272.4	2,058.3	0.00	0.00	0.00
6,700.0	90.37	135.00	4,672.3	-1,700.3	1,343.2	2,158.2	0.00	0.00	0.00
6,800.0	90.37	135.00	4,671.7	-1,771.0	1,413.9	2,258.2	0.00	0.00	0.00
6,900.0	90.37	135.00	4,671.1	-1,841.7	1,484.6	2,358.1	0.00	0.00	0.00
7,000.0	90.37	135.00	4,670.4	-1,912.4	1,555.3	2,458.1	0.00	0.00	0.00
7,100.0	90.37	135.00	4,669.8	-1,983.1	1,626.0	2,558.1	0.00	0.00	0.00
7,200.0	90.37	135.00	4,669.2	-2,053.8	1,696.7	2,658.0	0.00	0.00	0.00
7,300.0	90.37	135.00	4,668.5	-2,124.6	1,767.4	2,758.0	0.00	0.00	0.00
7,400.0	90.37	135.00	4,667.9	-2,195.3	1,838.1	2,857.9	0.00	0.00	0.00
7,500.0	90.37	135.00	4,667.2	-2,266.0	1,908.8	2,957.9	0.00	0.00	0.00
7,600.0	90.37	135.00	4,666.6	-2,336.7	1,979.5	3,057.9	0.00	0.00	0.00
7,700.0	90.37	135.00	4,666.0	-2,407.4	2,050.2	3,157.8	0.00	0.00	0.00
7,800.0	90.37	135.00	4,665.3	-2,478.1	2,121.0	3,257.8	0.00	0.00	0.00
7,900.0	90.37	135.00	4,664.7	-2,548.8	2,191.7	3,357.7	0.00	0.00	0.00
8,000.0	90.37	135.00	4,664.0	-2,619.5	2,262.4	3,457.7	0.00	0.00	0.00
8,100.0	90.37	135.00	4,663.4	-2,690.2	2,333.1	3,557.7	0.00	0.00	0.00
8,200.0	90.37	135.00	4,662.8	-2,760.9	2,403.8	3,657.6	0.00	0.00	0.00
8,300.0	90.37	135.00	4,662.1	-2,831.6	2,474.5	3,757.6	0.00	0.00	0.00
8,400.0	90.37	135.00	4,661.5	-2,902.4	2,545.2	3,857.5	0.00	0.00	0.00
8,500.0	90.37	135.00	4,660.8	-2,973.1	2,615.9	3,957.5	0.00	0.00	0.00
8,600.0	90.37	135.00	4,660.2	-3,043.8	2,686.6	4,057.5	0.00	0.00	0.00
8,700.0	90.37	135.00	4,659.6	-3,114.5	2,757.3	4,157.4	0.00	0.00	0.00
8,800.0	90.37	135.00	4,658.9	-3,185.2	2,828.0	4,257.4	0.00	0.00	0.00
8,900.0	90.37	135.00	4,658.3	-3,255.9	2,898.7	4,357.3	0.00	0.00	0.00
9,000.0	90.37	135.00	4,657.7	-3,326.6	2,969.5	4,457.3	0.00	0.00	0.00
9,100.0	90.37	135.00	4,657.0	-3,397.3	3,040.2	4,557.3	0.00	0.00	0.00
9,200.0	90.37	135.00	4,656.4	-3,468.0	3,110.9	4,657.2	0.00	0.00	0.00
9,300.0	90.37	135.00	4,655.7	-3,538.7	3,181.6	4,757.2	0.00	0.00	0.00
9,400.0	90.37	135.00	4,655.1	-3,609.5	3,252.3	4,857.1	0.00	0.00	0.00
9,500.0	90.37	135.00	4,654.5	-3,680.2	3,323.0	4,957.1	0.00	0.00	0.00
9,600.0	90.37	135.00	4,653.8	-3,750.9	3,393.7	5,057.0	0.00	0.00	0.00
9,700.0	90.37	135.00	4,653.2	-3,821.6	3,464.4	5,157.0	0.00	0.00	0.00
9,800.0	90.37	135.00	4,652.5	-3,892.3	3,535.1	5,257.0	0.00	0.00	0.00
9,900.0	90.37	135.00	4,651.9	-3,963.0	3,605.8	5,356.9	0.00	0.00	0.00
10,000.0	90.37	135.00	4,651.3	-4,033.7	3,676.5	5,456.9	0.00	0.00	0.00
10,100.0	90.37	135.00	4,650.6	-4,104.4	3,747.2	5,556.8	0.00	0.00	0.00
10,200.0	90.37	135.00	4,650.0	-4,175.1	3,818.0	5,656.8	0.00	0.00	0.00
10,300.0	90.37	135.00	4,649.3	-4,245.8	3,888.7	5,756.8	0.00	0.00	0.00
10,400.0	90.37	135.00	4,648.7	-4,316.6	3,959.4	5,856.7	0.00	0.00	0.00
10,500.0	90.37	135.00	4,648.1	-4,387.3	4,030.1	5,956.7	0.00	0.00	0.00
10,600.0	90.37	135.00	4,647.4	-4,458.0	4,100.8	6,056.6	0.00	0.00	0.00
10,700.0	90.37	135.00	4,646.8	-4,528.7	4,171.5	6,156.6	0.00	0.00	0.00
10,800.0	90.37	135.00	4,646.2	-4,599.4	4,242.2	6,256.6	0.00	0.00	0.00
10,900.0	90.37	135.00	4,645.5	-4,670.1	4,312.9	6,356.5	0.00	0.00	0.00
11,000.0	90.37	135.00	4,644.9	-4,740.8	4,383.6	6,456.5	0.00	0.00	0.00
11,100.0	90.37	135.00	4,644.2	-4,811.5	4,454.3	6,556.4	0.00	0.00	0.00





## Planning Report

<b>Database:</b>	EDM	<b>Local Co-ordinate Reference:</b>	Well 512H
<b>Company:</b>	Enduring Resources LLC	<b>TVD Reference:</b>	KB @ 6823.0usft (Original Well Elev)
<b>Project:</b>	San Juan Basin - Rodeo Unit	<b>MD Reference:</b>	KB @ 6823.0usft (Original Well Elev)
<b>Site:</b>	511H Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	512H	<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)
11,200.0	90.37	135.00	4,643.6	-4,882.2	4,525.0	6,656.4	0.00	0.00	0.00
11,300.0	90.37	135.00	4,643.0	-4,952.9	4,595.8	6,756.4	0.00	0.00	0.00
11,400.0	90.37	135.00	4,642.3	-5,023.7	4,666.5	6,856.3	0.00	0.00	0.00
11,500.0	90.37	135.00	4,641.7	-5,094.4	4,737.2	6,956.3	0.00	0.00	0.00
11,600.0	90.37	135.00	4,641.0	-5,165.1	4,807.9	7,056.2	0.00	0.00	0.00
11,700.0	90.37	135.00	4,640.4	-5,235.8	4,878.6	7,156.2	0.00	0.00	0.00
11,800.0	90.37	135.00	4,639.8	-5,306.5	4,949.3	7,256.2	0.00	0.00	0.00
11,900.0	90.37	135.00	4,639.1	-5,377.2	5,020.0	7,356.1	0.00	0.00	0.00
12,000.0	90.37	135.00	4,638.5	-5,447.9	5,090.7	7,456.1	0.00	0.00	0.00
12,100.0	90.37	135.00	4,637.9	-5,518.6	5,161.4	7,556.0	0.00	0.00	0.00
12,200.0	90.37	135.00	4,637.2	-5,589.3	5,232.1	7,656.0	0.00	0.00	0.00
12,300.0	90.37	135.00	4,636.6	-5,660.0	5,302.8	7,756.0	0.00	0.00	0.00
12,400.0	90.37	135.00	4,635.9	-5,730.8	5,373.5	7,855.9	0.00	0.00	0.00
12,500.0	90.37	135.00	4,635.3	-5,801.5	5,444.3	7,955.9	0.00	0.00	0.00
12,600.0	90.37	135.00	4,634.7	-5,872.2	5,515.0	8,055.8	0.00	0.00	0.00
12,700.0	90.37	135.00	4,634.0	-5,942.9	5,585.7	8,155.8	0.00	0.00	0.00
12,800.0	90.37	135.00	4,633.4	-6,013.6	5,656.4	8,255.8	0.00	0.00	0.00
12,900.0	90.37	135.00	4,632.7	-6,084.3	5,727.1	8,355.7	0.00	0.00	0.00
13,000.0	90.37	135.00	4,632.1	-6,155.0	5,797.8	8,455.7	0.00	0.00	0.00
13,100.0	90.37	135.00	4,631.5	-6,225.7	5,868.5	8,555.6	0.00	0.00	0.00
13,200.0	90.37	135.00	4,630.8	-6,296.4	5,939.2	8,655.6	0.00	0.00	0.00
13,300.0	90.37	135.00	4,630.2	-6,367.1	6,009.9	8,755.5	0.00	0.00	0.00
13,400.0	90.37	135.00	4,629.5	-6,437.9	6,080.6	8,855.5	0.00	0.00	0.00
13,500.0	90.37	135.00	4,628.9	-6,508.6	6,151.3	8,955.5	0.00	0.00	0.00
13,600.0	90.37	135.00	4,628.3	-6,579.3	6,222.0	9,055.4	0.00	0.00	0.00
13,642.5	90.37	135.00	4,628.0	-6,609.3	6,252.1	9,097.9	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
512H KOP	0.00	0.01	4,075.0	-90.0	-225.0	1,888,808.33	2,748,970.30	36.190932°N	107.745631°W
- plan hits target center									
- Point									
512H BHL	0.00	0.00	4,628.0	-6,609.3	6,252.1	1,882,289.02	2,755,447.38	36.173005°N	107.723705°W
- plan hits target center									
- Point									
512H POE	0.00	0.00	4,683.0	-520.8	163.7	1,888,377.57	2,749,358.95	36.189748°N	107.744315°W
- plan hits target center									
- Point									

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	
2,641.4	2,637.0	9 5/8"	9-5/8	12-1/4	



## Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well 512H
Company:	Enduring Resources LLC	TVD Reference:	KB @ 6823.0usft (Original Well Elev)
Project:	San Juan Basin - Rodeo Unit	MD Reference:	KB @ 6823.0usft (Original Well Elev)
Site:	511H Pad	North Reference:	Grid
Well:	512H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
387.0	387.0	Ojo Alamo		0.00		
514.0	514.0	Kirtland		0.00		
715.0	715.0	Fruitland		0.00		
1,064.0	1,064.0	Pictured Cliffs		0.00		
1,317.0	1,317.0	Lewis		0.00		
1,447.0	1,447.0	Chacra		0.00		
2,529.3	2,526.0	Cliff House		0.00		
2,540.4	2,537.0	Menefee		0.00		
3,524.6	3,512.0	Point Lookout		0.00		
3,712.3	3,698.0	Mancos		0.00		
3,946.7	3,931.0	Gallup (MNCS_A)		0.00		
4,048.8	4,033.0	MNCS_B		0.00		
4,181.9	4,166.0	MNCS_Cms		0.00		
4,315.5	4,296.0	MNCS_D		0.00		
4,470.9	4,434.0	MNCS_E		0.00		
4,546.2	4,493.0	MNCS_F		0.00		
4,638.1	4,556.0	MNCS_G		0.00		
4,732.9	4,609.0	MNCS_H		0.00		
4,857.9	4,658.0	MNCS_I		0.00		



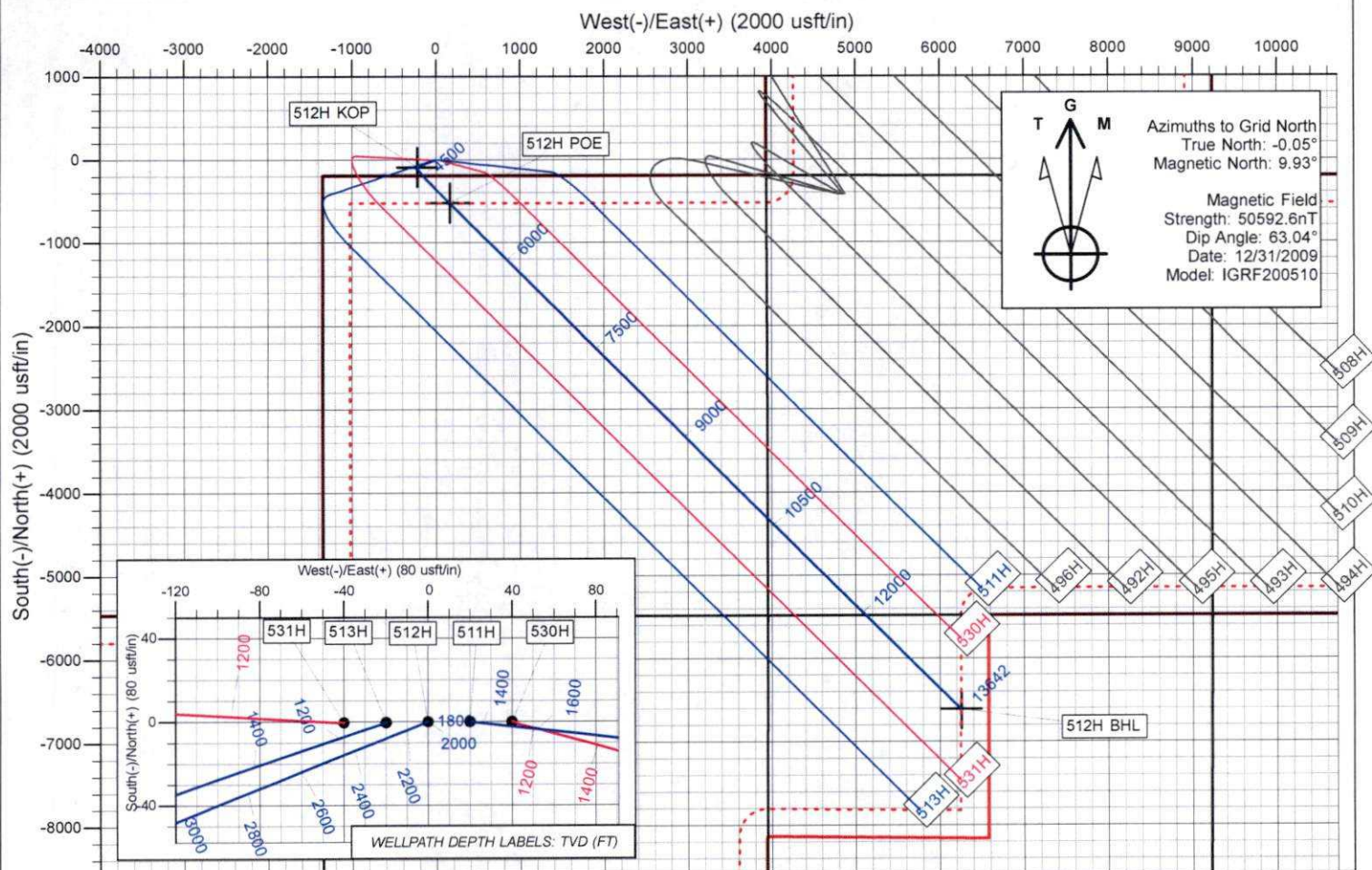


Enduring Resources LLC

Directional Drilling Plan  
Plan View & Section View

Rodeo Unit 512H

San Juan County, New Mexico  
T23N - R09W - Sec.25 - Lot M/N  
Surface Latitude: 36.191179°N  
Surface Longitude: 107.744868°W  
Ground Level: 6798.0  
Reference Elevation: KB @ 6823.0usft (Original Well Elev)





**WELL NAME: RODEO UNIT 512H****OBJECTIVE:** Drill, complete, and equip single lateral in the Mancos-I formation

API Number: 30-045-35874

AFE Number: not yet assigned

ER Well Number: not yet assigned

State: New Mexico

County: San Juan

Surface Elev.: 6,798 ft ASL (GL) 6,823 ft ASL (KB)

Surface Location: 25-23N-09W Sec-Twn- Rng 191 ft FSL 1,345 ft FWL

BH Location: 6-22N-08W Sec-Twn- Rng 1129 ft FNL 2301 ft FWL

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

South on US Hwy 550 for 37.8 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 1.5 miles to access road; Left on access road for 0.5 mile to Rodeo Unit 511H Pad (Wells: 511H, 512H, 513H, 530H, 531H).

**QUICK REFERENCE**

Sur TD (MD)	350 ft
Int TD (MD)	2,641 ft
KOP (MD)	4,091 ft
KOP (TVD)	4,075 ft
Target (TVD)	4,683 ft
Curve BUR	10 °/100 ft
POE (MD)	5,032 ft
TD (MD)	13,643 ft
Lat Len (ft)	8,611 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	2,641	9.625	36.0	J-55	LTC	0	2,641
Production	8.500	13,643	5.500	17.0	P-110	LTC	0	13,643

**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	589
Inter. (Tail)	Class G	15.8	1.148	4.98	0.3132	20%	2,141	164
Prod. (Lead)	G:POZ blend	12.4	1.907	9.981	0.2691	50%	0	794
Prod. (Tail)	G:POZ blend	13.3	1.360	5.999	0.2291	10%	3,947	1,796

**COMPLETION / PRODUCTION SUMMARY:**

Frac: 50 plug-and-perf stages with 300,000 bbls slickwater fluid and 14,000,000 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	387	387
Kirtland	514	514
Fruitland	715	715
Pictured Cliffs	1,064	1,064
Lewis	1,317	1,317
Chacra	1,447	1,447
Cliff House	2,526	2,529
Menefee	2,537	2,540
Point Lookout	3,512	3,525
Mancos	3,698	3,712
Gallup (MNCS_A)	3,931	3,947
MNCS_B	4,033	4,049
MNCS_Cms	4,166	4,182
MNCS_D	4,296	4,316
MNCS_E	4,434	4,471
MNCS_F	4,493	4,546
MNCS_G	4,556	4,638
MNCS_H	4,609	4,733
MNCS_I	4,658	4,858
P.O.E. TARGET	4,683	5,032
PROJECTED TD	4,828	13,643