

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

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

**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*

5. Lease Serial No.  
NOG13121826

6. If Indian, Allottee or Tribe Name  
EASTERN NAVAJO

7. If Unit or CA/Agreement, Name and/or No.  
NMNM130812A

8. Well Name and No.  
S ESCAVADA UNIT 349H

9. API Well No.  
30-043-21322-00-X1

10. Field and Pool or Exploratory Area  
BASIN MANCOS  
RUSTY GALLUP

11. County or Parish, State  
SANDOVAL COUNTY, NM

**SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well  
 Oil Well  Gas Well  Other

2. Name of Operator  
ENDURING RESOURCES LLC  
Contact: LACEY GRANILLO  
E-Mail: lgranillo@enduringresources.com

3a. Address  
1050 17TH STREET SUITE 2500  
DENVER, CO 80265

3b. Phone No. (include area code)  
Ph: 505-636-9743

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
Sec 27 T22N R7W SWSE 190FSL 1813FEL  
36.103313 N Lat, 107.560524 W Lon

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"/> Subsequent Report	<input type="checkbox"/> Deepen
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Hydraulic Fracturing
	<input type="checkbox"/> Production (Start/Resume)
	<input type="checkbox"/> Reclamation
	<input type="checkbox"/> Recomplete
	<input type="checkbox"/> Temporarily Abandon
	<input type="checkbox"/> Water Shut-Off
	<input type="checkbox"/> Well Integrity
	<input checked="" type="checkbox"/> Other
	Change to Original APD
	<input type="checkbox"/> Convert to Injection
	<input type="checkbox"/> Plug and Abandon
	<input type="checkbox"/> Plug Back
	<input type="checkbox"/> Water Disposal

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**

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 27 to section 27  
Moved POE from section 27 to section 27  
Drilling Program  
Directional plan updated based on new POE and BHL  
Casing program change  
Surface: 9-5/8" to 13-3/8"  
Intermediate: 7" to 9-5/8"

**NMOCD**  
**FEB 26 2020**  
**ADHERE TO PREVIOUS NMOCD**  
**DISTRICT III**  
**CONDITIONS OF APPROVAL**  
**NO NSL**

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

**Electronic Submission #501372 verified by the BLM Well Information System For ENDURING RESOURCES LLC, sent to the Farmington Committed to AFMSS for processing by JOE KILLINS on 02/24/2020 (20JK0130SE)**

Name (Printed/Typed) LACEY GRANILLO Title PERMITTING SPECIALIST

Signature (Electronic Submission) Date 01/29/2020

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

Approved By JOE KILLINS Title PETROLEUM ENGINEER Date 02/24/2020

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 \*\***

**NMOCD**

17

**Additional data for EC transaction #501372 that would not fit on the form**

**32. Additional remarks, continued**

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 bbls to 180,000 bbls (estimated)

Sand weight: increase from 5.2 million lbs to 8.5 million lbs (estimated)

District I  
1625 N. French Drive, Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0/20

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 <b>30-043-21322</b>		*Pool Code 52860	*Pool Name RUSTY GALLUP OIL POOL
*Property Code 322151	*Property Name S ESCAVADA UNIT		*Well Number 349H
*GRID No. 372286	*Operator Name ENDURING RESOURCES, LLC		*Elevation 6732'

<sup>10</sup> Surface Location

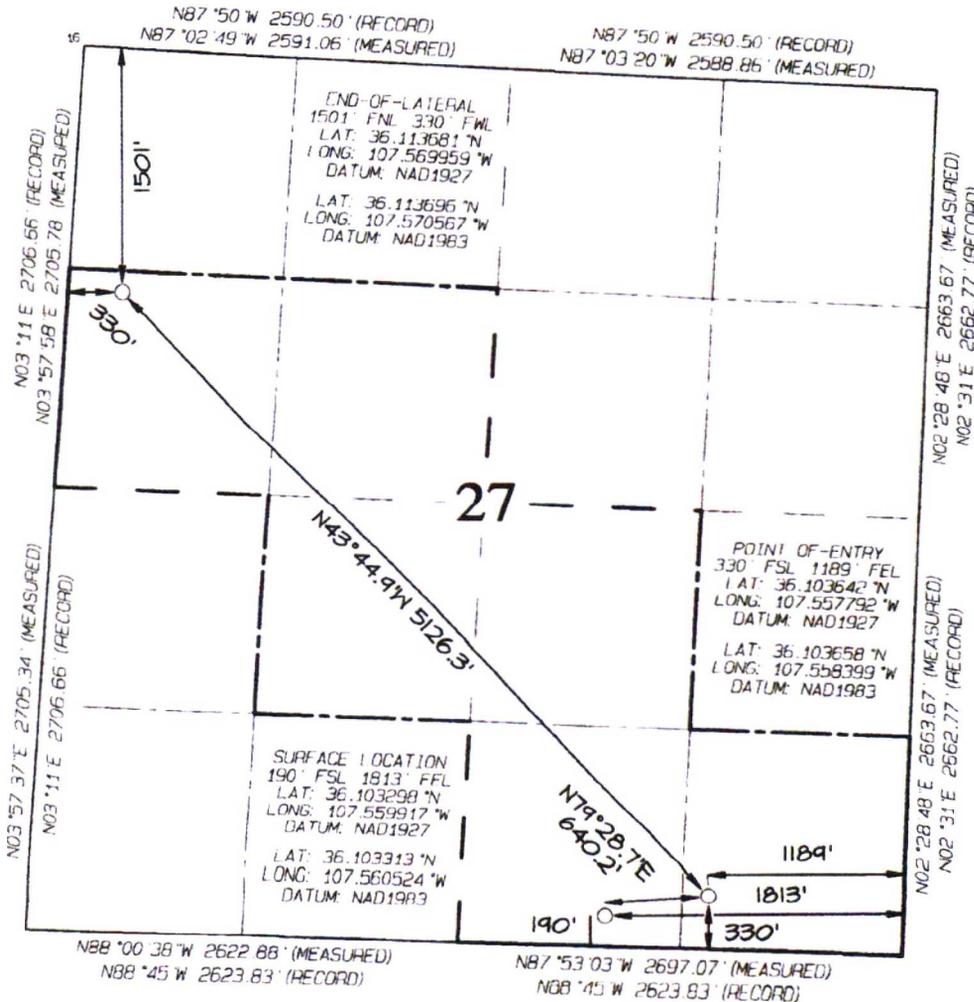
U. or lot no.	Section	Township	Range	Lot Ion	Feet from the	North/South line	Feet from the	East/West line	County
0	27	22N	7W		190	SOUTH	1813	EAST	SANDOVAL

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

U. or lot no.	Section	Township	Range	Lot Ion	Feet from the	North/South line	Feet from the	East/West line	County
E	27	22N	7W		1501	NORTH	330	WEST	SANDOVAL

*Dedicated Acres 240.00	S/2 NW/4, NE/4 SW/4 NW/4 SE/4, S/2 SE/4	*Joint or Infill	*Consolidation Code	*Order No. R-14347
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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 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 or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature: *Jason C. Edwards* Date: 1/28/20  
Printed Name: Jason C. Edwards

<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: JANUARY 23, 2020  
Date of Survey: MAY 30, 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-H formation*

**WELL INFORMATION:**

**Name:** S ESCAVADA UNIT 349H

**API Number:** 30-043-21322

**AFE Number:** not yet assigned

**ER Well Number:** not yet assigned

**State:** New Mexico

**County:** Sandoval

**Surface Elevation:** 6,732 ft ASL (GL) 6,757 ft ASL (KB)  
**Surface Location:** 27-22N-07W Sec-Twn-Rng 190 ft FSL 1,813 ft FEL  
 36.103313 ° N latitude 107.560524 ° W longitude (NAD 83)  
**BH Location:** 27-22N-07W Sec-Twn-Rng 1,501 ft FNL 330 ft FWL  
 36.113696 ° N latitude 107.570567 ° 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 48.9 miles to MM 103; Right (South) on Atkins Road for 3.2 miles to fork; Left (South) continuing on Atkins Road for 1.1 miles to 4-way intersection; Straight (south) for 1.6 miles to 4-way intersection; Straight (South) for 1.9 miles to fork; Left (South) for 0.4 miles to fork; Right (South) for 0.3 miles to S Escavada Unit 350H access road; Left (South) along 350H access road for 0.7 miles; straight (South) for 0.4 miles to S Escavada Unit 348H Pad (Wells: 348H & 349H).

**GEOLOGIC AND RESERVOIR INFORMATION:**

<i>Prognosis:</i>	Formation Tops	TVD (ft ASL)	TVD (ft KB)	MD (ft KB)	O / G / W	Pressure
	Ojo Alamo	6,310	447	447	W	normal
	Kirtland	6,200	557	557	W	normal
	Fruitland	6,075	682	682	G, W	sub
	Pictured Cliffs	5,725	1,032	1,032	G, W	sub
	Lewis	5,630	1,127	1,127	G, W	normal
	Chacra	5,355	1,402	1,405	G, W	normal
	Cliff House	4,310	2,447	2,561	G, W	sub
	Menefee	4,290	2,467	2,584	G, W	normal
	Point Lookout	3,350	3,407	3,638	G, W	normal
	Mancos	3,165	3,592	3,829	O,G	sub (~0.38)
	Gallup (MNCS_A)	2,890	3,867	4,106	O,G	sub (~0.38)
	MNCS_B	2,780	3,977	4,216	O,G	sub (~0.38)
	MNCS_C	2,685	4,072	4,311	O,G	sub (~0.38)
	MNCS_Cms	2,655	4,102	4,342	O,G	sub (~0.38)
	MNCS_D	2,510	4,247	4,492	O,G	sub (~0.38)
	MNCS_E	2,370	4,387	4,655	O,G	sub (~0.38)
	MNCS_F	2,330	4,427	4,708	O,G	sub (~0.38)
	MNCS_G	2,255	4,502	4,823	O,G	sub (~0.38)
	MNCS_H	2,190	4,567	4,959	O,G	sub (~0.38)
	<b>P.O.E. TARGET</b>	<b>2,147</b>	<b>4,610</b>	<b>5,192</b>	<b>O,G</b>	<b>sub (~0.38)</b>
	<b>PROJECTED TD</b>	<b>2,125</b>	<b>4,632</b>	<b>10,318</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: 2,000 psi**  
**Maximum anticipated surface pressure, assuming partially evacuated hole: 990 psi**

**Temperature:** Maximum anticipated BHT is 130° 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 double & single 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
Loading					153	559	116,634
Min. S.F.					7.39	4.88	7.31

*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	2,675 ft (MD)	Hole Section Length:	2,325 ft
350 ft (TVD)	to	2,567 ft (TVD)	Casing Required:	2,675 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					1,121	1,137	183,978
Min. S.F.					1.80	3.10	3.07

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	598
Tail	Class G	15.8	1.148	4.98	20%	2,175	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 & 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.**

2,675 ft (MD)	to	10,318 ft (MD)	Hole Section Length:	7,643 ft
2,567 ft (TVD)	to	4,632 ft (TVD)	Casing Required:	10,318 ft

Estimated KOP:	4,259 ft (MD)	4,020 ft (TVD)
Estimated Landing Point (P.O.E.):	5,192 ft (MD)	4,610 ft (TVD)
Estimated Lateral Length:	5,126 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.

Casing Specs:	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					2,288	8,934	251,359	251,359
Min. S.F.					3.26	1.19	2.17	1.77

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

Cement:	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	824
Tail	G:POZ blend	13.3	1.360	5.999	10%	4,106	1,151

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). S Escavada Unit Order Number is R-14347.

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

**COMPLETION AND PRODUCTION PLAN:**

**Frac:** 30 plug-and-perf stages with 180,000 bbls slickwater fluid and 8,500,000 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 1/28/2020

**WELL NAME: S ESCAVADA UNIT 349H**

**OBJECTIVE:** Drill, complete, and equip single lateral in the Mancos-H formation

**API Number:** 30-043-21322

**AFE Number:** not yet assigned

**ER Well Number:** not yet assigned

**State:** New Mexico

**County:** Sandoval

**Surface Elev.:** 6,732 ft ASL (GL) 6,757 ft ASL (KB)

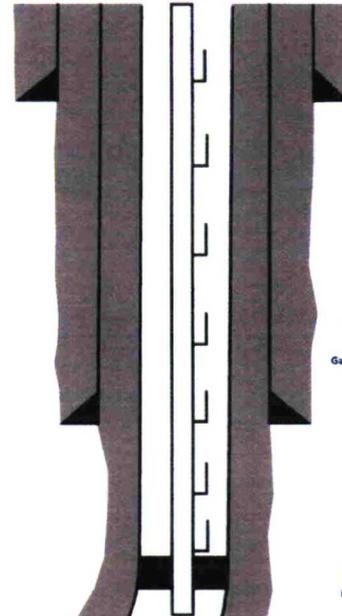
**Surface Location:** 27-22N-07W Sec-Twn-Rng 190 ft FSL 1,813 ft FEL

**BH Location:** 27-22N-07W Sec-Twn-Rng 1501 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 48.9 miles to MM 103; Right (South) on Atkins Road for 3.2 miles to fork; Left (South) continuing on Atkins Road for 1.1 miles to 4-way intersection; Straight (south) for 1.6 miles to 4-way intersection; Straight (South) for 1.9 miles to fork; Left (South) for 0.4 miles to fork; Right (South) for 0.3 miles to S Escavada Unit 350H access road; Left (South) along 350H access road for 0.7 miles; straight (South) for 0.4 miles to S Escavada Unit 348H Pad (Wells: 348H & 349H)

QUICK REFERENCE	
Sur TD (MD)	350 ft
Int TD (MD)	2,675 ft
KOP (MD)	4,259 ft
KOP (TVD)	4,020 ft
Target (TVD)	4,610 ft
Curve BUR	10 °/100 ft
POE (MD)	5,192 ft
TD (MD)	10,318 ft
Lat Len (ft)	5,126 ft



Tops	TVD (ft KB)	MD (ft KB)
Ojo Alamo	447	447
Kirtland	557	557
Fruitland	682	682
Pictured Cliffs	1,032	1,032
Lewis	1,127	1,127
Chacra	1,402	1,405
Cliff House	2,447	2,561
Menefee	2,467	2,584
Point Lookout	3,407	3,638
Mancos	3,592	3,829
Gallup (MNCS_A)	3,867	4,106
MNCS_B	3,977	4,216
MNCS_C	4,072	4,311
MNCS_Cms	4,102	4,342
MNCS_D	4,247	4,492
MNCS_E	4,387	4,655
MNCS_F	4,427	4,708
MNCS_G	4,502	4,823
MNCS_H	4,567	4,959
P.O.E. TARGET	4,610	5,192
PROJECTED TD	4,632	10,318

**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	2,675	9.625	36.0	J-55	LTC	0	2,675
Production	8.500	10,318	5.500	17.0	P-110	LTC	0	10,318

**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	598
Inter. (Tail)	Class G	15.8	1.148	4.98	0.3132	20%	2,175	164
Prod. (Lead)	G:POZ blend	12.4	1.907	9.981	0.2691	50%	0	824
Prod. (Tail)	G:POZ blend	13.3	1.360	5.999	0.2291	10%	4,106	1,151

**COMPLETION / PRODUCTION SUMMARY:**

**Frac:** 30 plug-and-perf stages with 180,000 bbls slickwater fluid and 8,500,000 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

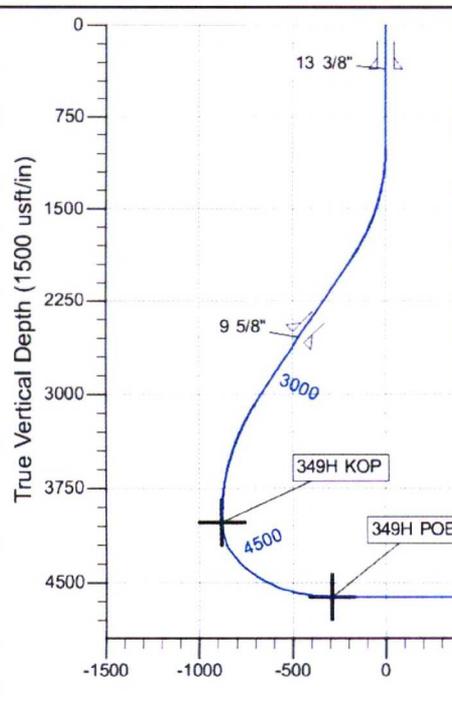
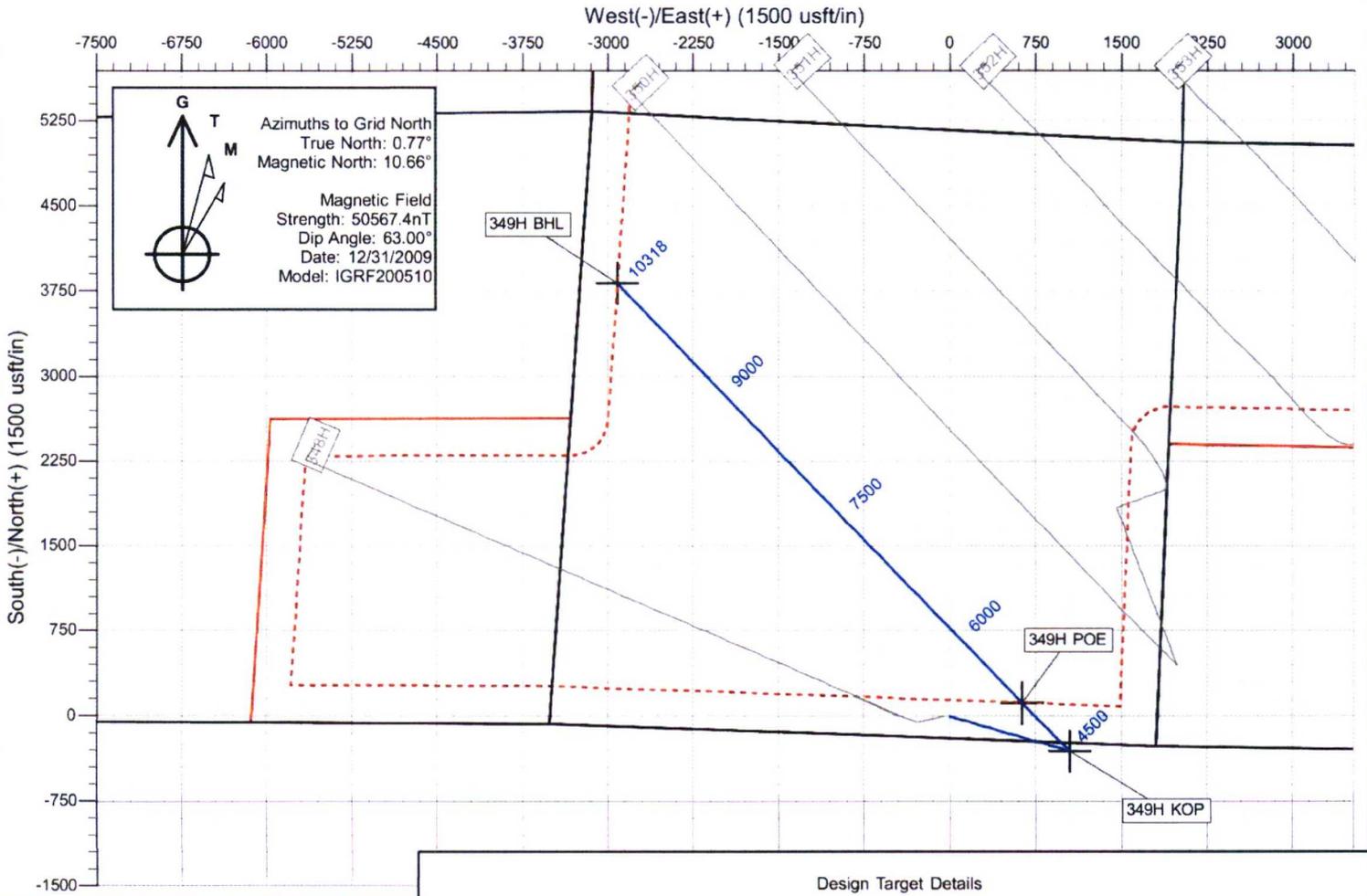


Enduring Resources LLC

Directional Drilling Plan  
Plan View & Section View

S Escavada Unit 349H

Sandoval County, New Mexico  
T22N - R07W - Sec.27 - Lot O  
Surface Latitude: 36.103313°N  
Surface Longitude: 107.560524°W  
Ground Level: 6732.0  
Reference Elevation: KB @ 6757.0usft (Original Well Elev)



Design Target Details							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
349H KOP	4020.0	-305.0	1050.0	1859174.90	1254332.48	36.102514°N	107.556957°W
349H POE	4610.0	117.1	629.5	1859597.04	1253911.94	36.103658°N	107.558399°W
349H BHL	4632.0	3820.0	-2915.6	1863299.86	1250366.92	36.113696°N	107.570567°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
1000.0	0.00	0.00	1000.0	0.0	0.0	0.00	0.0
1959.7	28.79	106.20	1919.8	-65.9	226.7	3.00	-189.9
3249.5	28.79	106.20	3050.2	-239.1	823.3	0.00	-689.6
4209.2	0.00	0.00	3970.0	-305.0	1050.0	3.00	-879.5
4259.2	0.00	0.00	4020.0	-305.0	1050.0	0.00	-879.5
5179.3	89.36	315.10	4608.9	108.2	638.2	9.71	-301.2
5191.8	89.75	316.25	4610.0	117.1	629.5	9.71	-288.8
10318.1	89.75	316.25	4632.0	3820.0	-2915.6	0.00	4805.5



# **Enduring Resources LLC**

**San Juan Basin - S Escavada Unit & Terra Wash CA**

**348H Pad**

**349H**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**28 January, 2020**



## Planning Report

<b>Database:</b>	EDM	<b>Local Co-ordinate Reference:</b>	Well 349H
<b>Company:</b>	Enduring Resources LLC	<b>TVD Reference:</b>	KB @ 6757.0usft (Original Well Elev)
<b>Project:</b>	San Juan Basin - S Escavada Unit & Terra Wash CA	<b>MD Reference:</b>	KB @ 6757.0usft (Original Well Elev)
<b>Site:</b>	348H Pad	<b>North Reference:</b>	Grid
<b>Well:</b>	349H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<b>Project</b>	San Juan Basin - S Escavada Unit & Terra Wash CA		
<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 Central Zone		

<b>Site</b>	348H Pad, Sandoval County, New Mexico				
<b>Site Position:</b>		<b>Northing:</b>	1,859,481.54 usft	<b>Latitude:</b>	36 103316°N
<b>From:</b>	Lat/Long	<b>Easting:</b>	1,253,242.61 usft	<b>Longitude:</b>	107.560659°W
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b>	-0.77 °

<b>Well</b>	349H					
<b>Well Position</b>	+N/-S	-1.6 usft	<b>Northing:</b>	1,859,479.91 usft	<b>Latitude:</b>	36 103313°N
	+E/-W	39.9 usft	<b>Easting:</b>	1,253,282.48 usft	<b>Longitude:</b>	107.560524°W
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	6.732.0 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	9.89	63.00	50,567.42788574

<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	322.65	

<b>Plan Survey Tool Program</b>	<b>Date</b>	1/28/2020			
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>	
1	0.0	10,318.1	Design #1 (Wellbore #1)	MWD	
				OWSG MWD - Standard	



## Planning Report

**Database:** EDM  
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**Project:** San Juan Basin - S Escavada Unit & Terra Wash CA  
**Site:** 348H Pad  
**Well:** 349H  
**Wellbore:** Wellbore #1  
**Design:** Design #1

**Local Co-ordinate Reference:** Well 349H  
**TVD Reference:** KB @ 6757.0usft (Original Well Elev)  
**MD Reference:** KB @ 6757.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

### 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	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,959.7	28.79	106.20	1,919.8	-65.9	226.7	3.00	3.00	0.00	106.20	
3,249.5	28.79	106.20	3,050.2	-239.1	823.3	0.00	0.00	0.00	0.00	
4,209.2	0.00	0.00	3,970.0	-305.0	1,050.0	3.00	-3.00	0.00	180.00	
4,259.2	0.00	0.00	4,020.0	-305.0	1,050.0	0.00	0.00	0.00	0.00	349H KOP
5,179.3	89.36	315.10	4,609.9	108.2	638.2	9.71	9.71	0.00	315.10	
5,191.8	89.75	316.25	4,610.0	117.1	629.5	9.71	3.16	9.19	71.04	349H POE
10,318.1	89.75	316.25	4,632.0	3,820.0	-2,915.6	0.00	0.00	0.00	0.00	349H BHL



## Planning Report

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**Design:** Design #1

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**MD Reference:** KB @ 6757.0usft (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)
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>									
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
447.0	0.00	0.00	447.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Ojo Alamo</b>									
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
557.0	0.00	0.00	557.0	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
682.0	0.00	0.00	682.0	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
1,032.0	0.96	106.20	1,032.0	-0.1	0.3	-0.2	3.00	3.00	0.00
<b>Pictured Cliffs</b>									
1,100.0	3.00	106.20	1,100.0	-0.7	2.5	-2.1	3.00	3.00	0.00
1,127.1	3.81	106.20	1,127.0	-1.2	4.1	-3.4	3.00	3.00	0.00
<b>Lewis</b>									
1,200.0	6.00	106.20	1,199.6	-2.9	10.0	-8.4	3.00	3.00	0.00
1,300.0	9.00	106.20	1,298.8	-6.6	22.6	-18.9	3.00	3.00	0.00
1,400.0	12.00	106.20	1,397.1	-11.6	40.1	-33.6	3.00	3.00	0.00
1,405.0	12.15	106.20	1,402.0	-11.9	41.1	-34.4	3.00	3.00	0.00
<b>Chacra</b>									
1,500.0	15.00	106.20	1,494.3	-18.2	62.5	-52.3	3.00	3.00	0.00
1,600.0	18.00	106.20	1,590.2	-26.1	89.8	-75.2	3.00	3.00	0.00
1,700.0	21.00	106.20	1,684.4	-35.4	121.8	-102.0	3.00	3.00	0.00
1,800.0	24.00	106.20	1,776.8	-46.1	158.6	-132.8	3.00	3.00	0.00
1,900.0	27.00	106.20	1,867.1	-58.1	199.9	-167.4	3.00	3.00	0.00
1,959.7	28.79	106.20	1,919.8	-65.9	226.7	-189.9	3.00	3.00	0.00
2,000.0	28.79	106.20	1,955.1	-71.3	245.4	-205.5	0.00	0.00	0.00
2,100.0	28.79	106.20	2,042.8	-84.7	291.6	-244.3	0.00	0.00	0.00
2,200.0	28.79	106.20	2,130.4	-98.1	337.9	-283.0	0.00	0.00	0.00
2,300.0	28.79	106.20	2,218.0	-111.6	384.1	-321.7	0.00	0.00	0.00
2,400.0	28.79	106.20	2,305.7	-125.0	430.4	-360.5	0.00	0.00	0.00
2,500.0	28.79	106.20	2,393.3	-138.4	476.6	-399.2	0.00	0.00	0.00
2,561.2	28.79	106.20	2,447.0	-146.7	504.9	-423.0	0.00	0.00	0.00
<b>Menefee</b>									
2,584.1	28.79	106.20	2,467.0	-149.7	515.5	-431.8	0.00	0.00	0.00
<b>Cliff House</b>									
2,600.0	28.79	106.20	2,481.0	-151.9	522.9	-438.0	0.00	0.00	0.00
2,675.4	28.79	106.20	2,547.0	-162.0	557.7	-467.2	0.00	0.00	0.00
<b>9 5/8"</b>									
2,700.0	28.79	106.20	2,568.6	-165.3	569.1	-476.7	0.00	0.00	0.00
2,800.0	28.79	106.20	2,656.2	-178.8	615.4	-515.4	0.00	0.00	0.00
2,900.0	28.79	106.20	2,743.9	-192.2	661.6	-554.2	0.00	0.00	0.00
3,000.0	28.79	106.20	2,831.5	-205.6	707.9	-592.9	0.00	0.00	0.00



## Planning Report

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**Wellbore:** Wellbore #1  
**Design:** Design #1

**Local Co-ordinate Reference:** Well 349H  
**TVD Reference:** KB @ 6757 0usft (Original Well Elev)  
**MD Reference:** KB @ 6757 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)	
3.100 0	28.79	106.20	2.919 1	-219.1	754.1	-631.7	0.00	0.00	0.00	
3.200 0	28.79	106.20	3.006 8	-232.5	800.4	-670.4	0.00	0.00	0.00	
3.249 5	28.79	106.20	3.050 2	-239.1	823.3	-689.6	0.00	0.00	0.00	
3.300 0	27.28	106.20	3.094 7	-245.8	846.1	-708.7	3.00	-3.00	0.00	
3.400 0	24.28	106.20	3.184 8	-257.9	887.8	-743.7	3.00	-3.00	0.00	
3.500 0	21.28	106.20	3.277 0	-268.7	925.0	-774.8	3.00	-3.00	0.00	
3.600 0	18.28	106.20	3.371 1	-278.1	957.5	-802.0	3.00	-3.00	0.00	
3.637 7	17.14	106.20	3.407 0	-281.3	968.5	-811.2	3.00	-3.00	0.00	
<b>Point Lookout</b>										
3.700 0	15.28	106.20	3.466 8	-286.2	985.2	-825.2	3.00	-3.00	0.00	
3.800 0	12.28	106.20	3.563 9	-292.8	1.008 1	-844.4	3.00	-3.00	0.00	
3.828 7	11.42	106.20	3.592 0	-294.5	1.013 7	-849.1	3.00	-3.00	0.00	
<b>Mancos</b>										
3.900 0	9.28	106.20	3.662 1	-298.0	1.026 0	-859.4	3.00	-3.00	0.00	
4.000 0	6.28	106.20	3.761 2	-301.8	1.039 0	-870.3	3.00	-3.00	0.00	
4.100 0	3.28	106.20	3.860 8	-304.1	1.047 0	-877.0	3.00	-3.00	0.00	
4.106 2	3.09	106.20	3.867 0	-304.2	1.047 3	-877.3	3.00	-3.00	0.00	
<b>Gallup (MNCS A)</b>										
4.200 0	0.28	106.20	3.960 8	-305.0	1.050 0	-879.5	3.00	-3.00	0.00	
4.209 2	0.00	0.00	3.970 0	-305.0	1.050 0	-879.5	3.00	-3.00	0.00	
4.216 2	0.00	0.00	3.977 0	-305.0	1.050 0	-879.5	0.00	0.00	0.00	
<b>MNCS_B</b>										
4.259 2	0.00	0.00	4.020 0	-305.0	1.050 0	-879.5	0.00	0.00	0.00	
4.300 0	3.96	315.10	4.060 8	-304.0	1.049 0	-878.1	9.71	9.71	0.00	
4.311 3	5.06	315.10	4.072 0	-303.4	1.048 4	-877.2	9.71	9.71	0.00	
<b>MNCS_C</b>										
4.341 5	7.99	315.10	4.102 0	-300.9	1.046 0	-873.8	9.71	9.71	0.00	
<b>MNCS_Cms</b>										
4.400 0	13.67	315.10	4.159 5	-293.2	1.038 2	-862.9	9.71	9.71	0.00	
4.492 2	22.63	315.10	4.247 0	-272.8	1.017 9	-834.5	9.71	9.71	0.00	
<b>MNCS_D</b>										
4.500 0	23.39	315.10	4.254 2	-270.7	1.015 8	-831.5	9.71	9.71	0.00	
4.600 0	33.10	315.10	4.342 1	-237.2	982.4	-784.6	9.71	9.71	0.00	
4.655.3	38.47	315.10	4.387.0	-214.3	959.6	-752.6	9.71	9.71	0.00	
<b>MNCS_E</b>										
4.700 0	42.81	315.10	4.420 9	-193.7	939.1	-723.7	9.71	9.71	0.00	
4.708 4	43.62	315.10	4.427 0	-189.6	935.0	-718.0	9.71	9.71	0.00	
<b>MNCS_F</b>										
4.800 0	52.52	315.10	4.488 2	-141.4	886.9	-650.5	9.71	9.71	0.00	
4.823 3	54.79	315.10	4.502 0	-128.1	873.7	-631.9	9.71	9.71	0.00	
<b>MNCS_G</b>										
4.900 0	62.23	315.10	4.542 0	-81.8	827.6	-567.1	9.71	9.71	0.00	
4.959 4	68.00	315.10	4.567 0	-43.6	789.5	-513.7	9.71	9.71	0.00	
<b>MNCS_H</b>										
5.000 0	71.95	315.10	4.580 9	-16.6	762.6	-475.9	9.71	9.71	0.00	
5.100 0	81.66	315.10	4.603 7	52.2	694.0	-379.5	9.71	9.71	0.00	
5.179 3	89.36	315.10	4.609 9	108.2	638.2	-301.2	9.71	9.71	0.00	
5.191 8	89.75	316.25	4.610 0	117.1	629.5	-288.8	9.71	3.16	9.19	
5.200 0	89.75	316.25	4.610 0	123.0	623.8	-280.7	0.00	0.00	0.00	
5.300 0	89.75	316.25	4.610 5	195.3	554.6	-181.3	0.00	0.00	0.00	
5.400 0	89.75	316.25	4.610 9	267.5	485.5	-81.9	0.00	0.00	0.00	
5.500 0	89.75	316.25	4.611 3	339.7	416.3	17.5	0.00	0.00	0.00	



Planning Report

**Database:** EDM  
**Company:** Enduring Resources LLC  
**Project:** San Juan Basin - S Escavada Unit & Terra Wash CA  
**Site:** 348H Pad  
**Well:** 349H  
**Wellbore:** Wellbore #1  
**Design:** Design #1

**Local Co-ordinate Reference:** Well 349H  
**TVD Reference:** KB @ 6757 0usft (Original Well Elev)  
**MD Reference:** KB @ 6757 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)
5.600 0	89.75	316.25	4.611 8	412.0	347.2	116.8	0.00	0.00	0.00
5.700 0	89.75	316.25	4.612 2	484.2	278.0	216.2	0.00	0.00	0.00
5.800 0	89.75	316.25	4.612 6	556.4	208.9	315.6	0.00	0.00	0.00
5.900 0	89.75	316.25	4.613 0	628.7	139.7	415.0	0.00	0.00	0.00
6.000 0	89.75	316.25	4.613 5	700.9	70.6	514.3	0.00	0.00	0.00
6.100 0	89.75	316.25	4.613 9	773.1	1.4	613.7	0.00	0.00	0.00
6.200 0	89.75	316.25	4.614 3	845.4	-67.7	713.1	0.00	0.00	0.00
6.300 0	89.75	316.25	4.614 8	917.6	-136.9	812.5	0.00	0.00	0.00
6.400 0	89.75	316.25	4.615 2	989.8	-206.0	911.9	0.00	0.00	0.00
6.500 0	89.75	316.25	4.615 6	1,062.1	-275.2	1,011.2	0.00	0.00	0.00
6.600 0	89.75	316.25	4.616 0	1,134.3	-344.4	1,110.6	0.00	0.00	0.00
6.700 0	89.75	316.25	4.616 5	1,206.5	-413.5	1,210.0	0.00	0.00	0.00
6.800 0	89.75	316.25	4.616 9	1,278.8	-482.7	1,309.4	0.00	0.00	0.00
6.900 0	89.75	316.25	4.617 3	1,351.0	-551.8	1,408.7	0.00	0.00	0.00
7.000 0	89.75	316.25	4.617 8	1,423.2	-621.0	1,508.1	0.00	0.00	0.00
7.100 0	89.75	316.25	4.618 2	1,495.5	-690.1	1,607.5	0.00	0.00	0.00
7.200 0	89.75	316.25	4.618 6	1,567.7	-759.3	1,706.9	0.00	0.00	0.00
7.300 0	89.75	316.25	4.619 0	1,639.9	-828.4	1,806.2	0.00	0.00	0.00
7.400 0	89.75	316.25	4.619 5	1,712.2	-897.6	1,905.6	0.00	0.00	0.00
7.500 0	89.75	316.25	4.619 9	1,784.4	-966.7	2,005.0	0.00	0.00	0.00
7.600 0	89.75	316.25	4.620 3	1,856.6	-1,035.9	2,104.4	0.00	0.00	0.00
7.700 0	89.75	316.25	4.620 8	1,928.9	-1,105.1	2,203.7	0.00	0.00	0.00
7.800 0	89.75	316.25	4.621 2	2,001.1	-1,174.2	2,303.1	0.00	0.00	0.00
7.900 0	89.75	316.25	4.621 6	2,073.3	-1,243.4	2,402.5	0.00	0.00	0.00
8.000 0	89.75	316.25	4.622 1	2,145.6	-1,312.5	2,501.9	0.00	0.00	0.00
8.100 0	89.75	316.25	4.622 5	2,217.8	-1,381.7	2,601.2	0.00	0.00	0.00
8.200 0	89.75	316.25	4.622 9	2,290.0	-1,450.8	2,700.6	0.00	0.00	0.00
8.300 0	89.75	316.25	4.623 3	2,362.3	-1,520.0	2,800.0	0.00	0.00	0.00
8.400 0	89.75	316.25	4.623 8	2,434.5	-1,589.1	2,899.4	0.00	0.00	0.00
8.500 0	89.75	316.25	4.624 2	2,506.7	-1,658.3	2,998.7	0.00	0.00	0.00
8.600 0	89.75	316.25	4.624 6	2,578.9	-1,727.4	3,098.1	0.00	0.00	0.00
8.700 0	89.75	316.25	4.625 1	2,651.2	-1,796.6	3,197.5	0.00	0.00	0.00
8.800 0	89.75	316.25	4.625 5	2,723.4	-1,865.7	3,296.9	0.00	0.00	0.00
8.900 0	89.75	316.25	4.625 9	2,795.6	-1,934.9	3,396.2	0.00	0.00	0.00
9.000 0	89.75	316.25	4.626 3	2,867.9	-2,004.1	3,495.6	0.00	0.00	0.00
9.100 0	89.75	316.25	4.626 8	2,940.1	-2,073.2	3,595.0	0.00	0.00	0.00
9.200 0	89.75	316.25	4.627 2	3,012.3	-2,142.4	3,694.4	0.00	0.00	0.00
9.300 0	89.75	316.25	4.627 6	3,084.6	-2,211.5	3,793.8	0.00	0.00	0.00
9.400 0	89.75	316.25	4.628 1	3,156.8	-2,280.7	3,893.1	0.00	0.00	0.00
9.500 0	89.75	316.25	4.628 5	3,229.0	-2,349.8	3,992.5	0.00	0.00	0.00
9.600 0	89.75	316.25	4.628 9	3,301.3	-2,419.0	4,091.9	0.00	0.00	0.00
9.700 0	89.75	316.25	4.629 3	3,373.5	-2,488.1	4,191.3	0.00	0.00	0.00
9.800 0	89.75	316.25	4.629 8	3,445.7	-2,557.3	4,290.6	0.00	0.00	0.00
9.900 0	89.75	316.25	4.630 2	3,518.0	-2,626.4	4,390.0	0.00	0.00	0.00
10.000 0	89.75	316.25	4.630 6	3,590.2	-2,695.6	4,489.4	0.00	0.00	0.00
10.100 0	89.75	316.25	4.631 1	3,662.4	-2,764.8	4,588.8	0.00	0.00	0.00
10.200 0	89.75	316.25	4.631 5	3,734.7	-2,833.9	4,688.1	0.00	0.00	0.00
10.300 0	89.75	316.25	4.631 9	3,806.9	-2,903.1	4,787.5	0.00	0.00	0.00
10.318.1	89.75	316.25	4.632 0	3,820.0	-2,915.6	4,805.5	0.00	0.00	0.00



## Planning Report

**Database:** EDM  
**Company:** Enduring Resources LLC  
**Project:** San Juan Basin - S Escavada Unit & Terra Wash CA  
**Site:** 348H Pad  
**Well:** 349H  
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**Design:** Design #1

**Local Co-ordinate Reference:** Well 349H  
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**MD Reference:** KB @ 6757.0usft (Original Well Elev)  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature

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
349H KOP - plan hits target center - Point	0 00	360 00	4 020 0	-305 0	1 050 0	1 859 174 91	1 254 332 48	36 102514°N	107 556957°W
349H POE - plan hits target center - Point	0 00	0 00	4 610 0	117 1	629 5	1 859 597 04	1 253 911 93	36 103658°N	107 558399°W
349H BHL - plan hits target center - Point	0 00	0 00	4 632 0	3 820 0	-2 915 6	1 863 299 86	1 250 366 92	36 113696°N	107 570567°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
2 675 4	2 547 0	9 5/8"		9-5/8	12-1/4

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
447 0	447 0	Ojo Alamo		0 00		
557 0	557 0	Kirtland		0 00		
682 0	682 0	Fruitland		0 00		
1 032 0	1 032 0	Pictured Cliffs		0 00		
1 127 1	1 127 0	Lewis		0 00		
1 405 0	1 402 0	Chacra		0 00		
2 561 2	2 447 0	Menefee		0 00		
2 584 1	2 467 0	Cliff House		0 00		
3 637 7	3 407 0	Point Lookout		0 00		
3 826 7	3 592 0	Mancos		0 00		
4 106 2	3 867 0	Gallup (MNCS A)		0 00		
4 216 2	3 977 0	MNCS_B		0 00		
4 311 3	4 072 0	MNCS_C		0 00		
4 341 5	4 102 0	MNCS_Cms		0 00		
4 492 2	4 247 0	MNCS_D		0 00		
4 655 3	4 387 0	MNCS_E		0 00		
4 708 4	4 427 0	MNCS_F		0 00		
4 823 3	4 502 0	MNCS_G		0 00		
4 959 4	4 567 0	MNCS_H		0 00		