

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 3160-4 or 3160-5 form.

Operator Signature Date: 7/3/2018 Well information:

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf_Owner	UL	Sec	Twp	N/S	Rng	W/E
30-043-21306-00-00	W ESCAVADA UNIT	303H	ENDURING RESOURCES, LLC	O	N	Sandoval	N	P	17	22	N	7	W

Application Type:

- P&A
 Drilling/Casing Change
 Location Change
 Recomplete/DHC (For hydraulic fracturing operations review EPA Underground injection control Guidance #84; Submit Gas Capture Plan form prior to spudding or initiating recompletion operations)
 Other:

Conditions of Approval:

- **Increase bottom depth of pilot hole plug to 4350'.**

Charlie T. Lerrin

NMOCD Approved by Signature

7/5/18
Date

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.
NO-G-1311-1807

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

Oil Well Gas Well Other

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

8. Well Name and No.
W Escavada Unit 303H

2. Name of Operator
Enduring Resources LLC

9. API Well No.
30-043-21306

3a. Address
332 Cr 2100 Aztec, NM 87410

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

10. Field and Pool or Exploratory Area
Escavada W; Mancos

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SHL: 235' FSL & 228' FEL, Sec 17, T22N, R7W
BHL: 2303' FSL & 2487' FEL, Sec 7 T22N, R7W

11. Country or Parish, State
Sandoval, 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 ShutOff
<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 Change in plans- Pilot Hole
	<input checked="" type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<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 detennined that the site is ready for final inspection.)

Enduring Resources LLC requests a change in plans to include the pilot-hole design on the W Escavada Unit #303H.

Attached are the updated:

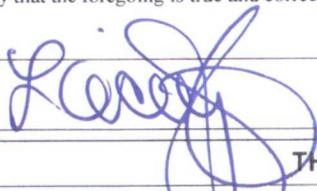
- C102
- Wellbore
- Ops plan
- Plan & Section view
- Well Plan for Pilot Hole
- Well Plan

NMOCD
JUL 03 2018
DISTRICT III

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)
Lacey Granillo

Title: **Permitting Specialist**

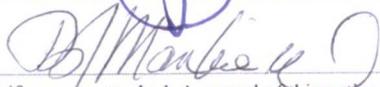
Signature



Date: 7/3/18

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by



Title

AFM

Date

7/3/2018

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

FFU

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.

NMOCD IV

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

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

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

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

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

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

AMENDED REPORT

NMOC

03 2018
DISTRICT III

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number 30-043-2130G		*Pool Code 98225	*Pool Name ESCAVADA W; MANCOS
*Property Code 321258	*Property Name W ESCAVADA UNIT		*Well Number 303H
*GRID No. 372286	*Operator Name ENDURING RESOURCES, LLC		*Elevation 6878'

¹⁰ Surface Location

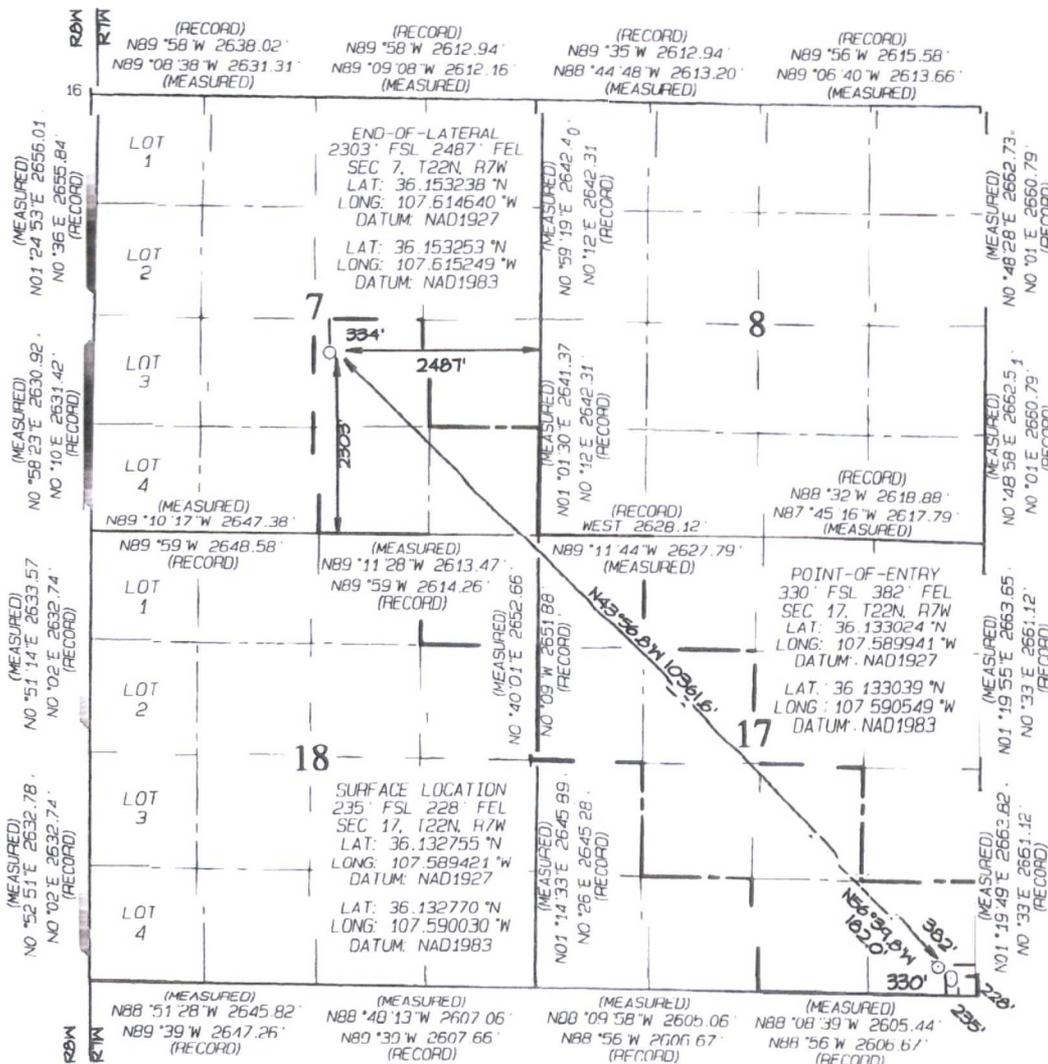
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	17	22N	7W		235	SOUTH	228	EAST	SANDOVAL

¹¹ 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
J	7	22N	7W		2303	SOUTH	2487	EAST	SANDOVAL

¹² Dedicated Acres 440.00	NE/4 NE/4 - Section 18 W/2 NW/4, SE/4 NW/4 NE/4 SW/4, W/2 SE/4 SE/4 SE/4 - Section 17 W/2 SE/4, SE/4 SE/4 - Section 7	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-14100
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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 or working interest, or to a voluntary pooling agreement or a compulsory pooling order hereinafter entered by the division.

Lacey Granillo 7/3/18
Signature Date
Lacey Granillo
Printed Name
lgranillo@enduringresources.com
E-mail Address

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: JANUARY 23, 2018
Date of Survey: MARCH 3, 2016

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
REGISTERED PROFESSIONAL SURVEYOR
15269

JASON C. EDWARDS
Certificate Number 15269

WELL NAME: W Escavada Unit 303H

OBJECTIVE: Drill pilot hole for OH logs; sidetrack; drill, complete, and equip single lateral in the Gallup formation

API Number: 30-043-21306

State: New Mexico

County: Sandoval

Surface Elev.: 6,878 ft ASL (GL) 6,900 ft ASL (KB)

Surface Location: 17-22N-07W Sec-Twn- Rng 235 ft FSL 228 ft FEL

BH Location: 7-22N-07W Sec-Twn- Rng 2303 ft FSL 2487 ft FEL

Driving Directions: From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM: south on 550 for 53.6 miles to MM 97.7, right (south) on Indian Service Route #474 for 4.9 miles, right (west) at fork continuing on #474 for 2.5 miles, right (west) at fork for 0.3 miles, right (west) for 1.0 miles to 4-way intersection, straight (west) for 1.2 miles to 4-way intersection, left (south) for 1.7 miles to 4-way intersection, right (west) for 1.9 miles to NEU 317H pad, left (southwest) for approximately 1.3 miles to location.

QUICK REFERENCE	
Sur TD (MD)	240 ft
Int TD (MD)	2,772 ft
KOP (MD)	4,150 ft
KOP (TVD)	4,115 ft
Target (TVD)	4,788 ft
Curve BUR	10 ^o /100 ft
LP (MD)	5,288 ft
TD (MD)	15,594 ft
Lat Len (ft)	10,306 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	240	13.375	54.5	J-55	STC	0	220
Intermediate	12.250	2,772	9.625	36.0	J-55	LTC	0	2,772
Production	8.500	15,594	5.500	17.0	P-110	LTC	0	15,594

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	284
Inter. (Lead)	G:POZ Blend	12.3	1.987	10.16	0.3132	40%	0	501
Inter. (Tail)	Class G	15.8	1.148	4.98	0.3132	10%	2,272	150
Prod. (Lead)	G:POZ blend	12.3	1.987	10.16	0.2691	40%	0	742
Prod. (Tail)	G:POZ blend	13.3	1.354	5.94	0.2291	10%	4,110	2,137

COMPLETION / PRODUCTION SUMMARY:

Frac: 50-stage (+/-) plug-and-perf frac with slick water and 18,000,000 lbs (+/-) proppant

Flowback: Flow up 5-1/2" casing or 2-7/8" tubing until returns are free of sand

Production: 2-7/8" tubing with packer set in 5-1/2" casing and gas-lift mandrels as needed

PILOT HOLE:

An 8-1/2" pilot hole will be drilled into the Juana Lopez to run OH logs. The pilot hole will NOT be cased, and it will NOT be completed. A cement plug will be spotted in the pilot from ~4,100 MD - 4,250' MD (to serve as pilot-hole isolation at Gallup top and a KO plug). Estimated KOP for the sidetrack production hole is ~4,150' MD.

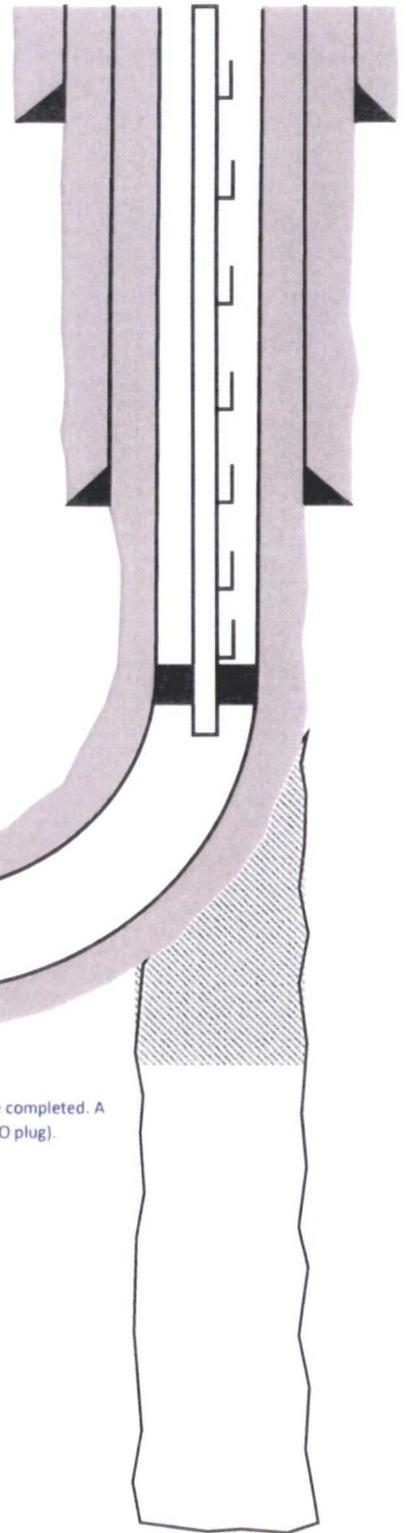
Estimated TD of pilot hole: 5,358 ft MD 5,320 ft TVD

PILOT HOLE TOPS:

Formation Tops	TVD (ft KB)	MD (ft KB)
Mancos	3,855	3,887
Gallup (MNCS. A)	4,075	4,110
MNCS_G	4,690	4,728
MNCS_H	4,750	4,788
MNCS_I	4,820	4,858
Basal Niob. Uncon.	4,880	4,918
GLLPM	4,935	4,973
GLLPL	5,010	5,048
Juana Lopez	5,170	5,208
TD	5,320	5,358

PILOT HOLE CEMENT PLUG:

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	1.148	4.98	0.3941	50%	4,100	77



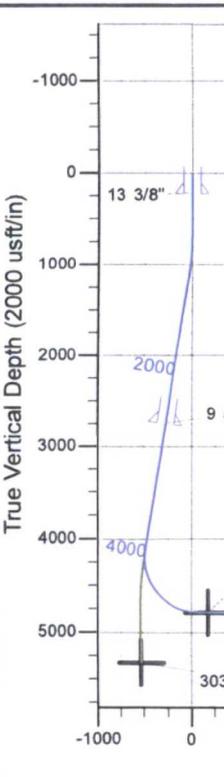
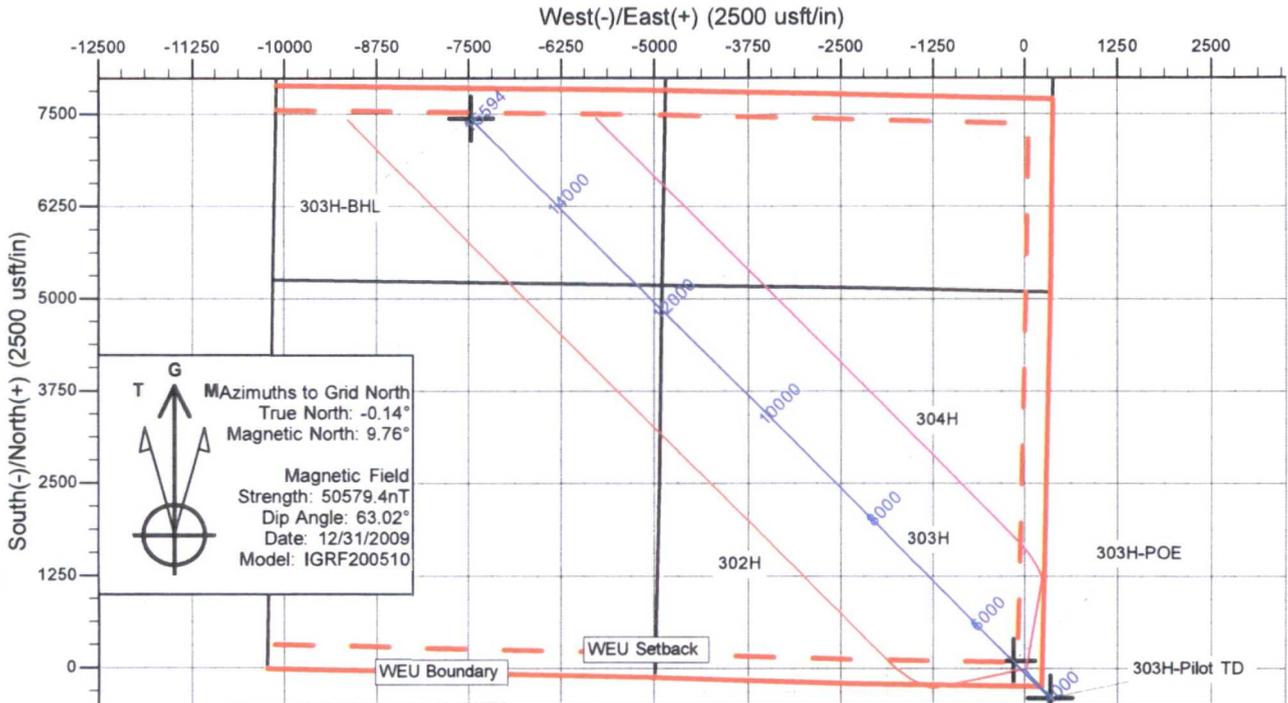


Enduring Resources LLC

Directional Drilling Plan
Plan View & Section View

W Escavada Unit 303H

Sandoval Co., New Mexico
T27N-R07W-Sec.17-Lot P
Surface Latitude: 36.132770°N
Surface Longitude: 107.590030°W
Ground Level: 6878.0
Reference Elevation: KB @ 6900.0usft (Original Well Elev)



Design Target Details - Pilot Hole

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
303H-Pilot TD	5320.0	-400.0	350.0	1867314.48	2795286.97	36.131669°N	107.588848°W

Design Target Details - Production Hole

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
303H-POE	4788.0	97.5	-153.5	1867812.02	2794783.46	36.133039°N	107.590549°W
303H-BHL	4813.0	7438.5	-7463.7	1875152.96	2787473.27	36.153253°N	107.615249°W

Directional Drilling Plan Details - Pilot Hole

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
220.0	0.00	0.00	220.0	0.0	0.0	0.00	0.0
700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.0
1126.6	8.53	138.81	1125.1	-23.9	20.9	2.00	31.7
4281.4	8.53	138.81	4244.9	-376.1	329.1	0.00	499.8
4708.1	0.00	0.00	4670.0	-400.0	350.0	2.00	531.5
5358.1	0.00	0.00	5320.0	-400.0	350.0	0.00	531.5

Directional Drilling Plan Details - Production Hole

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
4150.0	8.53	138.81	4115.0	-361.5	316.3	0.00	-479.2
5122.9	86.89	314.88	4784.9	19.3	-75.3	9.81	67.0
5233.6	89.86	315.12	4788.0	97.5	-153.5	2.69	177.6
15593.5	89.86	315.12	4813.0	7438.5	-7463.7	0.00	10537.4



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

DRILLING PLAN: *Drill pilot hole for OH logs; sidetrack; drill, complete, and equip single lateral in the Gallup formation*

WELL INFORMATION:

Name: W Escavada Unit 303H

API Number: 30-043-21306

State: New Mexico

County: Sandoval

Surface Elevation: 6,878 ft ASL (GL) 6,900 ft ASL (KB)
Surface Location: 17-22N-07W Sec-Twn-Rng 235 ft FSL 228 ft FEL
 36.13277 ° N latitude 107.59003 ° W longitude (NAD 83)
BH Location: 7-22N-07W Sec-Twn-Rng 2,303 ft FSL 2,487 ft FEL
 36.153253 ° N latitude 107.615249 ° W longitude (NAD 83)

Driving Directions: From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM: south on 550 for 53.6 miles to MM 97.7, right (south) on Indian Service Route #474 for 4.9 miles, right (west) at fork continuing on #474 for 2.5 miles, right (west) at fork for 0.3 miles, right (west) for 1.0 miles to 4-way intersection, straight (west) for 1.2 miles to 4-way intersection, left (south) for 1.7 miles to 4-way intersection, right (west) for 1.9 miles to NEU 317H pad, left (southwest) for approximately 1.3 miles to location.

GEOLOGIC AND RESERVOIR INFORMATION:

Pilot-Hole Prognosis:	Formation Tops	TVD (ft ASL)	TVD (ft KB)	MD (ft KB)	O / G / W	Pressure
	Ojo Alamo	6,290	610	610	W	normal
	Kirtland	6,070	830	830	W	normal
	Fruitland	5,975	925	925	G, W	normal
	Pictured Cliffs	5,675	1,225	1,228	G, W	normal
	Lewis	5,495	1,405	1,410	G, W	normal
	Chacra	5,330	1,570	1,577	G, W	normal
	Cliff House	4,950	1,950	1,961	G, W	normal
	Menefee	4,205	2,695	2,714	G, W	normal
	Point Lookout	3,300	3,600	3,629	G, W	normal
	Mancos	3,045	3,855	3,887	O,G	normal
	Gallup (MNCS. A)	2,825	4,075	4,110	O,G	normal
	MNCS_G	2,210	4,690	4,728	O,G	normal
	MNCS_H	2,150	4,750	4,788	O,G	normal
	MNCS_I	2,080	4,820	4,858	O,G	normal
	Basal Niob. Uncon.	2,020	4,880	4,918	O,G	normal
	GLLPM	1,965	4,935	4,973	O,G	normal
	GLLPL	1,890	5,010	5,048	O,G	normal
	Juana Lopez	1,730	5,170	5,208	O,G	normal
	TD	1,580	5,320	5,358	O,G	normal

Surface: Nacimiento

Oil & Gas Zones: Several gas bearing zones will be encountered; target formation is the Juana Lopez (Gallup)

Pressure: Normal pressure gradient (0.43 psi/ft) 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: 2,290 psi

Maximum anticipated surface pressure, assuming partially evacuated hole: 1,120 psi

Temperature: Maximum anticipated BHT is 180° F or less

Lateral Prognosis:	Formation Tops	TVD (ft ASL)	TVD (ft KB)	MD (ft KB)	O / G / W	Pressure
	Ojo Alamo	6,290	610	610	W	normal
	Kirtland	6,070	830	830	W	normal
	Fruitland	5,975	925	925	G, W	normal
	Pictured Cliffs	5,675	1,225	1,228	G, W	normal

Lewis	5,495	1,405	1,410	G, W	normal
Chacra	5,330	1,570	1,577	G, W	normal
Cliff House	4,950	1,950	1,961	G, W	normal
Menefee	4,205	2,695	2,714	G, W	normal
Point Lookout	3,300	3,600	3,629	G, W	normal
Mancos	3,045	3,855	3,887	O,G	normal
Gallup (MNCS. A)	2,825	4,075	4,110	O,G	normal
Gallup (Target Depth)	2,112	4,788	5,234	O,G	normal
PROJECTED WELL TD	2,087	4,813	15,594	O,G	normal

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

Pressure: Normal pressure gradient (0.43 psi/ft) 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: 2,060 psi

Maximum anticipated surface pressure, assuming partially evacuated hole: 1,010 psi

Temperature: Maximum anticipated BHT is 165° F or less

H₂S INFORMATION:

H₂S 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: Schlumberger CMR & ECS logs from TD of pilot hole to Mancos top, Schlumberger Quad-Combo log from TD of pilot hole to 9-5/8" casing shoe.

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 (11", 5,000 psi)

BOPE 2: Cameron annular (11", 5,000 psi)

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

KB-GL (ft): 22

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 5,000 psi for 10 minutes, and the annular preventer will be tested to 2,500 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	240 ft (MD)	Hole Section Length:	240 ft
0 ft (TVD)	to	240 ft (TVD)	Casing Required:	220 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 gyro 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	J-55	STC	1,130	2,730	853,000	514,000
Loading				105	590	111,406	111,406
Min. S.F.				10.78	4.63	7.66	4.61

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: 3,860 Optimum: 5,140 Maximum: 6,430

Casing Details: Guide shoe, single-valve float collar, 1 jt casing, double-valve float collar, landing 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	2,772 ft (MD)	Hole Section Length:	2,532 ft
240 ft (TVD)	to	2,745 ft (TVD)	Casing Required:	2,772 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.

Note: The intermediate hole section may be drilled with a 2,000 psi annular preventer only (no blind or pipe rams).

Maximum anticipated surface pressure while drilling intermediate hole section is 580 psi

Casing Specs:	Wt (lb/ft)	Grade	Conn.	Collapse (psi)	Burst (psi)	Tens. Body (lbs)	Tens. Conn (lbs)
Specs	9.625	J-55	LTC	2,020	3,520	564,000	453,000
Loading				1,199	1,167	187,023	187,023
Min. S.F.				1.68	3.02	3.02	2.42

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 Details: Guide shoe, single-valve float collar, 1 jt casing, double-valve float collar, landing collar, casing to surface, 11" 5K API-certified wellhead

Centralizers: 2 centralizers per jt stop-banded 10' from each collar on bottom 3 jts, 1 centralizer per 3 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	501
Tail	Class G	15.8	1.148	4.98	0.3132	10%	2,272	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.

PILOT HOLE: Drill pilot hole, run open-hole logs as directed by Geology, plug back

2,772 ft (MD)	to	5,358 ft (MD)	Hole Section Length:	2,586 ft
2,745 ft (TVD)	to	5,320 ft (TVD)	Casing Required:	N/A

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 every 100' at a minimum

Logging: GR MWD for entire section, OH WL logs as directed by Operations Geologist

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

Procedure: Drill to pilot hole TD following directional plan. Steer as needed to keep well on plan. At TD, circulate and condition hole for OH logs. TOH. Run OH logs from TD to 9-5/8" casing shoe. Spot cement balanced plug as noted below. Ensure sufficient WOC time before tagging plug and sidetracking.

Cement:	Type	Weight (ppg)	Yield (cuft/sk)	Water (gal/sk)	Hole Cap. (cuft/ft)	% Excess	Planned TOC (ft MD)	Total Cmt (sx)
Gallup (MNCS_A)	Class G	15.8	1.148	4.98	0.3941	50%	4,100	77

*Plug length: 150 ft with excess noted above

PRODUCTION: Perform sidetrack, drill to TD following directional plan, run casing, cement casing to surface.

4,150 ft (MD)	to	15,594 ft (MD)	Hole Section Length:	11,444 ft
4,115 ft (TVD)	to	4,813 ft (TVD)	Casing Required:	15,594 ft

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

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					2,378	8,950	328,756	328,756
Min. S.F.					3.14	1.19	1.66	1.35

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: Guide shoe, single-valve float collar, 1 jt casing, double-valve float collar, 1 jt casing, landing collar, toe-initiation sleeve x 2, casing to surface with 4 - 20' marker joints spaced evenly in lateral and 1 - 20' marker joint at KOP. The toe-initiation sleeves will be positioned inside the applicable unit setback.

Centralizers: Lateral: 1 centralizer every 2 joints at a minimum (will evaluate running additional centralizers based on surveys)

Curve: 1 centralizer every joint from landing point to KOP

Vertical: 1 centralizer every 2 joints from KOP to 9-5/8" shoe, 1 every 3 joints from 9-5/8" shoe 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	0.2691	40%	0	742
Tail	G:POZ blend	13.3	1.354	5.94	0.2291	10%	4,110	2,137

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 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). Order number for West Escavada Unit is R-14100-A.

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

COMPLETION AND PRODUCTION PLAN:

Frac: Lateral will be fracture-stimulated in approximately 50 plug-and-perf stages with approximately 325,000 bbls slickwater fluid and 18,000,000 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: 7/1/2017

Completion: 9/1/2017

Production: 10/15/2017

Prepared by: Alec Bridge 6/4/2018

Updated by: Alec Bridge 6/29/2018 - added procedure for drilling, logging, and abandoning 8-1/2" pilot hole



Enduring Resources LLC

San Juan Basin - West Escavada Unit

302

303H

Pilot Hole

Plan: Design #1

Standard Planning Report

02 July, 2018



Project	San Juan Basin - \ Escavada 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	302, Sandoval Co., New Mexico				
Site Position:		Northing:	1,867,714.17 usft	Latitude:	36.132769°N
From:	Lat/Long	Easting:	2,794,957.05 usft	Longitude:	107.589962°W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.14 °

Well	303H					
Well Position	+N/-S	0.3 usft	Northing:	1,867,714.48 usft	Latitude:	36.132770°N
	+E/-W	-20.1 usft	Easting:	2,794,936.97 usft	Longitude:	107.590030°W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	6,878.0 usft

Wellbore	Pilot Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.91	63.02	50,579.35776016

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	138.81

Plan Survey Tool Program	Date	7/2/2018			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.0	5,358.1	Design #1 (Pilot Hole)	MWD	
				OWSG MWD - Standard	

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	
220.0	0.00	0.00	220.0	0.0	0.0	0.00	0.00	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,126.6	8.53	138.81	1,125.1	-23.9	20.9	2.00	2.00	0.00	138.81	
4,281.4	8.53	138.81	4,244.9	-376.1	329.1	0.00	0.00	0.00	0.00	
4,708.1	0.00	0.00	4,670.0	-400.0	350.0	2.00	-2.00	0.00	180.00	
5,358.1	0.00	0.00	5,320.0	-400.0	350.0	0.00	0.00	0.00	0.00	303H-Pilot TD

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
220.0	0.00	0.00	220.0	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	2.00	138.81	800.0	-1.3	1.1	1.7	2.00	2.00	0.00
900.0	4.00	138.81	899.8	-5.3	4.6	7.0	2.00	2.00	0.00
1,000.0	6.00	138.81	999.5	-11.8	10.3	15.7	2.00	2.00	0.00
1,100.0	8.00	138.81	1,098.7	-21.0	18.4	27.9	2.00	2.00	0.00
1,126.6	8.53	138.81	1,125.1	-23.9	20.9	31.7	2.00	2.00	0.00
1,200.0	8.53	138.81	1,197.6	-32.1	28.0	42.6	0.00	0.00	0.00
1,300.0	8.53	138.81	1,296.5	-43.2	37.8	57.4	0.00	0.00	0.00
1,400.0	8.53	138.81	1,395.4	-54.4	47.6	72.3	0.00	0.00	0.00
1,500.0	8.53	138.81	1,494.3	-65.6	57.4	87.1	0.00	0.00	0.00
1,600.0	8.53	138.81	1,593.2	-76.7	67.1	101.9	0.00	0.00	0.00
1,700.0	8.53	138.81	1,692.1	-87.9	76.9	116.8	0.00	0.00	0.00
1,800.0	8.53	138.81	1,791.0	-99.1	86.7	131.6	0.00	0.00	0.00
1,900.0	8.53	138.81	1,889.9	-110.2	96.4	146.5	0.00	0.00	0.00
2,000.0	8.53	138.81	1,988.8	-121.4	106.2	161.3	0.00	0.00	0.00
2,100.0	8.53	138.81	2,087.7	-132.6	116.0	176.1	0.00	0.00	0.00
2,200.0	8.53	138.81	2,186.5	-143.7	125.8	191.0	0.00	0.00	0.00
2,300.0	8.53	138.81	2,285.4	-154.9	135.5	205.8	0.00	0.00	0.00
2,400.0	8.53	138.81	2,384.3	-166.1	145.3	220.6	0.00	0.00	0.00
2,500.0	8.53	138.81	2,483.2	-177.2	155.1	235.5	0.00	0.00	0.00
2,600.0	8.53	138.81	2,582.1	-188.4	164.8	250.3	0.00	0.00	0.00
2,700.0	8.53	138.81	2,681.0	-199.5	174.6	265.2	0.00	0.00	0.00
2,800.0	8.53	138.81	2,779.9	-210.7	184.4	280.0	0.00	0.00	0.00
2,900.0	8.53	138.81	2,878.8	-221.9	194.1	294.8	0.00	0.00	0.00
3,000.0	8.53	138.81	2,977.7	-233.0	203.9	309.7	0.00	0.00	0.00
3,100.0	8.53	138.81	3,076.6	-244.2	213.7	324.5	0.00	0.00	0.00
3,200.0	8.53	138.81	3,175.5	-255.4	223.5	339.3	0.00	0.00	0.00
3,300.0	8.53	138.81	3,274.4	-266.5	233.2	354.2	0.00	0.00	0.00
3,400.0	8.53	138.81	3,373.3	-277.7	243.0	369.0	0.00	0.00	0.00
3,500.0	8.53	138.81	3,472.2	-288.9	252.8	383.9	0.00	0.00	0.00
3,600.0	8.53	138.81	3,571.0	-300.0	262.5	398.7	0.00	0.00	0.00
3,700.0	8.53	138.81	3,669.9	-311.2	272.3	413.5	0.00	0.00	0.00
3,800.0	8.53	138.81	3,768.8	-322.4	282.1	428.4	0.00	0.00	0.00
3,900.0	8.53	138.81	3,867.7	-333.5	291.9	443.2	0.00	0.00	0.00
4,000.0	8.53	138.81	3,966.6	-344.7	301.6	458.0	0.00	0.00	0.00
4,100.0	8.53	138.81	4,065.5	-355.9	311.4	472.9	0.00	0.00	0.00
4,200.0	8.53	138.81	4,164.4	-367.0	321.2	487.7	0.00	0.00	0.00
4,281.4	8.53	138.81	4,244.9	-376.1	329.1	499.8	0.00	0.00	0.00
4,300.0	8.16	138.81	4,263.3	-378.2	330.9	502.5	2.00	-2.00	0.00
4,400.0	6.16	138.81	4,362.5	-387.5	339.1	515.0	2.00	-2.00	0.00
4,500.0	4.16	138.81	4,462.1	-394.3	345.0	524.0	2.00	-2.00	0.00
4,600.0	2.16	138.81	4,562.0	-398.5	348.7	529.5	2.00	-2.00	0.00
4,700.0	0.16	138.81	4,661.9	-400.0	350.0	531.5	2.00	-2.00	0.00
4,708.1	0.00	0.00	4,670.0	-400.0	350.0	531.5	2.00	-2.00	0.00
4,800.0	0.00	0.00	4,761.9	-400.0	350.0	531.5	0.00	0.00	0.00
4,900.0	0.00	0.00	4,861.9	-400.0	350.0	531.5	0.00	0.00	0.00
5,000.0	0.00	0.00	4,961.9	-400.0	350.0	531.5	0.00	0.00	0.00
5,100.0	0.00	0.00	5,061.9	-400.0	350.0	531.5	0.00	0.00	0.00
5,200.0	0.00	0.00	5,161.9	-400.0	350.0	531.5	0.00	0.00	0.00
5,300.0	0.00	0.00	5,261.9	-400.0	350.0	531.5	0.00	0.00	0.00
5,358.1	0.00	0.00	5,320.0	-400.0	350.0	531.5	0.00	0.00	0.00

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
303H-Pilot TD	0.00	0.00	5,320.0	-400.0	350.0	1,867,314.48	2,795,286.97	36.131669°N	107.588848°W
- plan hits target center									
- Point									

Casing Points					
Measured Depth	Vertical Depth	Name	Casing Diameter	Hole Diameter	
(usft)	(usft)		(")	(")	
220.0	220.0	13 3/8"	13-3/8	17-1/2	
2,764.7	2,745.0	9 5/8"	9-5/8	12-1/4	

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
610.0	610.0	Ojo Alamo		0.00		
830.0	830.0	Kirtland		0.00		
925.2	925.0	Fruitland		0.00		
1,227.7	1,225.0	Pictured Cliffs		0.00		
1,409.7	1,405.0	Lewis		0.00		
1,576.6	1,570.0	Chacra		0.00		
1,960.8	1,950.0	Cliff House		0.00		
2,714.1	2,695.0	Menefee		0.00		
3,629.3	3,600.0	Point Lookout		0.00		
3,887.1	3,855.0	Mancos		0.00		
4,109.6	4,075.0	Gallup (Mncs. A)		0.00		
4,728.1	4,690.0	MNCS_G		0.00		
4,788.1	4,750.0	MNCS_H		0.00		
4,826.1	4,788.0	Gallup (TARGET)		0.00		
4,858.1	4,820.0	MNCS_I		0.00		
4,918.1	4,880.0	Bas. Nio. Uncom.		0.00		
4,973.1	4,935.0	GLLPM		0.00		
5,048.1	5,010.0	GLLPL		0.00		
5,208.1	5,170.0	Juana Lopez		0.00		
5,358.1	5,320.0	TD		0.00		



Enduring Resources LLC

San Juan Basin - West Escavada Unit

302

303H

Wellbore #1

Plan: Design #1

Standard Planning Report

02 July, 2018

Project	San Juan Basin - West Escavada 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	302, Sandoval Co., New Mexico				
Site Position:		Northing:	1,867,714.17 usft	Latitude:	36.132769°N
From:	Lat/Long	Easting:	2,794,957.05 usft	Longitude:	107.589962°W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.14 °

Well	303H					
Well Position	+N/-S	0.3 usft	Northing:	1,867,714.48 usft	Latitude:	36.132770°N
	+E/-W	-20.1 usft	Easting:	2,794,936.97 usft	Longitude:	107.590030°W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	6,878.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/31/2009	9.91	63.02	50,579.35776016

Design	Design #1			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	4,150.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	314.90

Plan Survey Tool Program	Date	7/2/2018		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	4,150.0	15,593.5	Design #1 (Wellbore #1)	MWD OWSG MWD - Standard

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
4,150.0	8.53	138.81	4,115.0	-361.5	316.3	0.00	0.00	0.00	0.00	
5,122.9	86.89	314.88	4,784.9	19.3	-75.3	9.81	8.05	18.10	176.06	
5,233.6	89.86	315.12	4,788.0	97.5	-153.5	2.69	2.69	0.21	4.53	303H-POE
15,593.5	89.86	315.12	4,813.0	7,438.5	-7,463.7	0.00	0.00	0.00	0.00	303H-BHL

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,150.0	8.53	138.81	4,115.0	-361.5	316.3	-479.2	0.00	0.00	0.00
4,200.0	3.66	144.10	4,164.7	-365.5	319.7	-484.5	9.81	-9.75	10.57
4,300.0	6.22	309.55	4,264.5	-364.7	317.3	-482.2	9.81	2.57	165.45
4,400.0	16.01	312.88	4,362.5	-351.8	303.0	-463.0	9.81	9.79	3.33
4,500.0	25.81	313.71	4,455.8	-327.3	277.1	-427.3	9.81	9.80	0.83
4,600.0	35.62	314.10	4,541.7	-291.9	240.4	-376.3	9.81	9.80	0.39
4,700.0	45.42	314.34	4,617.6	-246.7	193.9	-311.4	9.81	9.80	0.24
4,800.0	55.23	314.51	4,681.4	-192.8	139.0	-234.6	9.81	9.80	0.17
4,900.0	65.03	314.64	4,731.1	-132.0	77.3	-148.0	9.81	9.81	0.13
5,000.0	74.84	314.76	4,765.4	-66.1	10.6	-54.1	9.81	9.81	0.11
5,100.0	84.64	314.86	4,783.2	3.2	-59.1	44.1	9.81	9.81	0.10
5,122.9	86.89	314.88	4,784.9	19.3	-75.3	67.0	9.81	9.81	0.10
5,200.0	88.96	315.05	4,787.7	73.8	-129.8	144.0	2.69	2.69	0.21
5,233.6	89.86	315.12	4,788.0	97.5	-153.5	177.6	2.69	2.69	0.21
5,300.0	89.86	315.12	4,788.2	144.6	-200.4	244.0	0.00	0.00	0.00
5,400.0	89.86	315.12	4,788.4	215.5	-270.9	344.0	0.00	0.00	0.00
5,500.0	89.86	315.12	4,788.6	286.3	-341.5	444.0	0.00	0.00	0.00
5,600.0	89.86	315.12	4,788.9	357.2	-412.1	544.0	0.00	0.00	0.00
5,700.0	89.86	315.12	4,789.1	428.0	-482.6	644.0	0.00	0.00	0.00
5,800.0	89.86	315.12	4,789.4	498.9	-553.2	744.0	0.00	0.00	0.00
5,900.0	89.86	315.12	4,789.6	569.8	-623.7	844.0	0.00	0.00	0.00
6,000.0	89.86	315.12	4,789.8	640.6	-694.3	944.0	0.00	0.00	0.00
6,100.0	89.86	315.12	4,790.1	711.5	-764.9	1,044.0	0.00	0.00	0.00
6,200.0	89.86	315.12	4,790.3	782.3	-835.4	1,144.0	0.00	0.00	0.00
6,300.0	89.86	315.12	4,790.6	853.2	-906.0	1,244.0	0.00	0.00	0.00
6,400.0	89.86	315.12	4,790.8	924.1	-976.6	1,344.0	0.00	0.00	0.00
6,500.0	89.86	315.12	4,791.1	994.9	-1,047.1	1,444.0	0.00	0.00	0.00
6,600.0	89.86	315.12	4,791.3	1,065.8	-1,117.7	1,544.0	0.00	0.00	0.00
6,700.0	89.86	315.12	4,791.5	1,136.6	-1,188.2	1,644.0	0.00	0.00	0.00
6,800.0	89.86	315.12	4,791.8	1,207.5	-1,258.8	1,744.0	0.00	0.00	0.00
6,900.0	89.86	315.12	4,792.0	1,278.4	-1,329.4	1,844.0	0.00	0.00	0.00
7,000.0	89.86	315.12	4,792.3	1,349.2	-1,399.9	1,944.0	0.00	0.00	0.00
7,100.0	89.86	315.12	4,792.5	1,420.1	-1,470.5	2,044.0	0.00	0.00	0.00
7,200.0	89.86	315.12	4,792.7	1,490.9	-1,541.1	2,144.0	0.00	0.00	0.00
7,300.0	89.86	315.12	4,793.0	1,561.8	-1,611.6	2,244.0	0.00	0.00	0.00
7,400.0	89.86	315.12	4,793.2	1,632.6	-1,682.2	2,344.0	0.00	0.00	0.00
7,500.0	89.86	315.12	4,793.5	1,703.5	-1,752.7	2,444.0	0.00	0.00	0.00
7,600.0	89.86	315.12	4,793.7	1,774.4	-1,823.3	2,544.0	0.00	0.00	0.00
7,700.0	89.86	315.12	4,794.0	1,845.2	-1,893.9	2,644.0	0.00	0.00	0.00
7,800.0	89.86	315.12	4,794.2	1,916.1	-1,964.4	2,744.0	0.00	0.00	0.00
7,900.0	89.86	315.12	4,794.4	1,986.9	-2,035.0	2,844.0	0.00	0.00	0.00
8,000.0	89.86	315.12	4,794.7	2,057.8	-2,105.5	2,944.0	0.00	0.00	0.00
8,100.0	89.86	315.12	4,794.9	2,128.7	-2,176.1	3,044.0	0.00	0.00	0.00
8,200.0	89.86	315.12	4,795.2	2,199.5	-2,246.7	3,144.0	0.00	0.00	0.00
8,300.0	89.86	315.12	4,795.4	2,270.4	-2,317.2	3,244.0	0.00	0.00	0.00
8,400.0	89.86	315.12	4,795.6	2,341.2	-2,387.8	3,344.0	0.00	0.00	0.00
8,500.0	89.86	315.12	4,795.9	2,412.1	-2,458.4	3,444.0	0.00	0.00	0.00
8,600.0	89.86	315.12	4,796.1	2,482.9	-2,528.9	3,544.0	0.00	0.00	0.00
8,700.0	89.86	315.12	4,796.4	2,553.8	-2,599.5	3,644.0	0.00	0.00	0.00
8,800.0	89.86	315.12	4,796.6	2,624.7	-2,670.0	3,744.0	0.00	0.00	0.00
8,900.0	89.86	315.12	4,796.8	2,695.5	-2,740.6	3,844.0	0.00	0.00	0.00
9,000.0	89.86	315.12	4,797.1	2,766.4	-2,811.2	3,944.0	0.00	0.00	0.00
9,100.0	89.86	315.12	4,797.3	2,837.2	-2,881.7	4,044.0	0.00	0.00	0.00
9,200.0	89.86	315.12	4,797.6	2,908.1	-2,952.3	4,144.0	0.00	0.00	0.00
9,300.0	89.86	315.12	4,797.8	2,979.0	-3,022.9	4,244.0	0.00	0.00	0.00
9,400.0	89.86	315.12	4,798.1	3,049.8	-3,093.4	4,344.0	0.00	0.00	0.00
9,500.0	89.86	315.12	4,798.3	3,120.7	-3,164.0	4,444.0	0.00	0.00	0.00
9,600.0	89.86	315.12	4,798.5	3,191.5	-3,234.5	4,544.0	0.00	0.00	0.00
9,700.0	89.86	315.12	4,798.8	3,262.4	-3,305.1	4,644.0	0.00	0.00	0.00
9,800.0	89.86	315.12	4,799.0	3,333.3	-3,375.7	4,744.0	0.00	0.00	0.00
9,900.0	89.86	315.12	4,799.3	3,404.1	-3,446.2	4,844.0	0.00	0.00	0.00
10,000.0	89.86	315.12	4,799.5	3,475.0	-3,516.8	4,944.0	0.00	0.00	0.00
10,100.0	89.86	315.12	4,799.7	3,545.8	-3,587.3	5,044.0	0.00	0.00	0.00
10,200.0	89.86	315.12	4,800.0	3,616.7	-3,657.9	5,144.0	0.00	0.00	0.00
10,300.0	89.86	315.12	4,800.2	3,687.5	-3,728.5	5,244.0	0.00	0.00	0.00
10,400.0	89.86	315.12	4,800.5	3,758.4	-3,799.0	5,344.0	0.00	0.00	0.00

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)	
10,500.0	89.86	315.12	4,800.7	3,829.3	-3,869.6	5,444.0	0.00	0.00	0.00	
10,600.0	89.86	315.12	4,800.9	3,900.1	-3,940.2	5,544.0	0.00	0.00	0.00	
10,700.0	89.86	315.12	4,801.2	3,971.0	-4,010.7	5,644.0	0.00	0.00	0.00	
10,800.0	89.86	315.12	4,801.4	4,041.8	-4,081.3	5,744.0	0.00	0.00	0.00	
10,900.0	89.86	315.12	4,801.7	4,112.7	-4,151.8	5,844.0	0.00	0.00	0.00	
11,000.0	89.86	315.12	4,801.9	4,183.6	-4,222.4	5,944.0	0.00	0.00	0.00	
11,100.0	89.86	315.12	4,802.2	4,254.4	-4,293.0	6,044.0	0.00	0.00	0.00	
11,200.0	89.86	315.12	4,802.4	4,325.3	-4,363.5	6,144.0	0.00	0.00	0.00	
11,300.0	89.86	315.12	4,802.6	4,396.1	-4,434.1	6,244.0	0.00	0.00	0.00	
11,400.0	89.86	315.12	4,802.9	4,467.0	-4,504.7	6,343.9	0.00	0.00	0.00	
11,500.0	89.86	315.12	4,803.1	4,537.9	-4,575.2	6,443.9	0.00	0.00	0.00	
11,600.0	89.86	315.12	4,803.4	4,608.7	-4,645.8	6,543.9	0.00	0.00	0.00	
11,700.0	89.86	315.12	4,803.6	4,679.6	-4,716.3	6,643.9	0.00	0.00	0.00	
11,800.0	89.86	315.12	4,803.8	4,750.4	-4,786.9	6,743.9	0.00	0.00	0.00	
11,900.0	89.86	315.12	4,804.1	4,821.3	-4,857.5	6,843.9	0.00	0.00	0.00	
12,000.0	89.86	315.12	4,804.3	4,892.1	-4,928.0	6,943.9	0.00	0.00	0.00	
12,100.0	89.86	315.12	4,804.6	4,963.0	-4,998.6	7,043.9	0.00	0.00	0.00	
12,200.0	89.86	315.12	4,804.8	5,033.9	-5,069.1	7,143.9	0.00	0.00	0.00	
12,300.0	89.86	315.12	4,805.1	5,104.7	-5,139.7	7,243.9	0.00	0.00	0.00	
12,400.0	89.86	315.12	4,805.3	5,175.6	-5,210.3	7,343.9	0.00	0.00	0.00	
12,500.0	89.86	315.12	4,805.5	5,246.4	-5,280.8	7,443.9	0.00	0.00	0.00	
12,600.0	89.86	315.12	4,805.8	5,317.3	-5,351.4	7,543.9	0.00	0.00	0.00	
12,700.0	89.86	315.12	4,806.0	5,388.2	-5,422.0	7,643.9	0.00	0.00	0.00	
12,800.0	89.86	315.12	4,806.3	5,459.0	-5,492.5	7,743.9	0.00	0.00	0.00	
12,900.0	89.86	315.12	4,806.5	5,529.9	-5,563.1	7,843.9	0.00	0.00	0.00	
13,000.0	89.86	315.12	4,806.7	5,600.7	-5,633.6	7,943.9	0.00	0.00	0.00	
13,100.0	89.86	315.12	4,807.0	5,671.6	-5,704.2	8,043.9	0.00	0.00	0.00	
13,200.0	89.86	315.12	4,807.2	5,742.5	-5,774.8	8,143.9	0.00	0.00	0.00	
13,300.0	89.86	315.12	4,807.5	5,813.3	-5,845.3	8,243.9	0.00	0.00	0.00	
13,400.0	89.86	315.12	4,807.7	5,884.2	-5,915.9	8,343.9	0.00	0.00	0.00	
13,500.0	89.86	315.12	4,807.9	5,955.0	-5,986.5	8,443.9	0.00	0.00	0.00	
13,600.0	89.86	315.12	4,808.2	6,025.9	-6,057.0	8,543.9	0.00	0.00	0.00	
13,700.0	89.86	315.12	4,808.4	6,096.7	-6,127.6	8,643.9	0.00	0.00	0.00	
13,800.0	89.86	315.12	4,808.7	6,167.6	-6,198.1	8,743.9	0.00	0.00	0.00	
13,900.0	89.86	315.12	4,808.9	6,238.5	-6,268.7	8,843.9	0.00	0.00	0.00	
14,000.0	89.86	315.12	4,809.2	6,309.3	-6,339.3	8,943.9	0.00	0.00	0.00	
14,100.0	89.86	315.12	4,809.4	6,380.2	-6,409.8	9,043.9	0.00	0.00	0.00	
14,200.0	89.86	315.12	4,809.6	6,451.0	-6,480.4	9,143.9	0.00	0.00	0.00	
14,300.0	89.86	315.12	4,809.9	6,521.9	-6,550.9	9,243.9	0.00	0.00	0.00	
14,400.0	89.86	315.12	4,810.1	6,592.8	-6,621.5	9,343.9	0.00	0.00	0.00	
14,500.0	89.86	315.12	4,810.4	6,663.6	-6,692.1	9,443.9	0.00	0.00	0.00	
14,600.0	89.86	315.12	4,810.6	6,734.5	-6,762.6	9,543.9	0.00	0.00	0.00	
14,700.0	89.86	315.12	4,810.8	6,805.3	-6,833.2	9,643.9	0.00	0.00	0.00	
14,800.0	89.86	315.12	4,811.1	6,876.2	-6,903.8	9,743.9	0.00	0.00	0.00	
14,900.0	89.86	315.12	4,811.3	6,947.0	-6,974.3	9,843.9	0.00	0.00	0.00	
15,000.0	89.86	315.12	4,811.6	7,017.9	-7,044.9	9,943.9	0.00	0.00	0.00	
15,100.0	89.86	315.12	4,811.8	7,088.8	-7,115.4	10,043.9	0.00	0.00	0.00	
15,200.0	89.86	315.12	4,812.1	7,159.6	-7,186.0	10,143.9	0.00	0.00	0.00	
15,300.0	89.86	315.12	4,812.3	7,230.5	-7,256.6	10,243.9	0.00	0.00	0.00	
15,400.0	89.86	315.12	4,812.5	7,301.3	-7,327.1	10,343.9	0.00	0.00	0.00	
15,500.0	89.86	315.12	4,812.8	7,372.2	-7,397.7	10,443.9	0.00	0.00	0.00	
15,593.5	89.86	315.12	4,813.0	7,438.5	-7,463.7	10,537.4	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	
303H-POE - hit/miss target - Shape	0.00	0.00	4,788.0	97.5	-153.5	1,867,812.02	2,794,783.47	36.133039°N	107.590549°W	
- plan hits target center - Point										
303H-BHL - plan hits target center - Point	0.00	0.00	4,813.0	7,438.5	-7,463.7	1,875,152.96	2,787,473.27	36.153253°N	107.615249°W	

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
220.0	220.0	13 3/8"	13-3/8	17-1/2
2,764.7	2,745.0	9 5/8"	9-5/8	12-1/4

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
610.0	610.0	Ojo Alamo		0.00	
830.0	830.0	Kirtland		0.00	
925.2	925.0	Fruitland		0.00	
1,227.7	1,225.0	Pictured Cliffs		0.00	
1,409.7	1,405.0	Lewis		0.00	
1,576.6	1,570.0	Chacra		0.00	
1,960.8	1,950.0	Cliff House		0.00	
2,714.1	2,695.0	Menefee		0.00	
3,629.3	3,600.0	Point Lookout		0.00	
3,887.1	3,855.0	Mancos		0.00	
4,109.6	4,075.0	Gallup (Mncs. A)		0.00	
5,233.6	4,788.0	Gallup (Target)		0.00	