# Received by OCD: 11/28/2023 6:30:37 AM

Acceived by OCD: 11/20/	2023 0	30.37 AW					ruge 1 oj	
Form 3160-5 (June 2019)	ne 2019) DEPARTMENT OF THE INTERIOR						RM APPROVED IB No. 1004-0137 es: October 31, 2021	
BUREAU OF LAND MANAGEMENT   5						5. Lease Serial No. NMNM90		
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.						llottee or T	fribe Name	
SOBWIT IN TRIFLICATE - Other Instructions on page 2						A/Agreem	ent, Name and/or No.	
1. Type of Well   Gas Well   8						and No.	MAZING 19 FED/502H	
2. Name of Operator EOG RE					9. API Well N	<sup>[0.</sup> 300255		
3a. Address 1111 BAGBY S			Phone No. (inc	lude area code			ploratory Area	
		(713	3) 651-7000		WC025 G0		61/TRIPLE X; BONE SPRING	
4. Location of Well <i>(Footage, Sec 19/T22S/R32E/NMP)</i>	Sec., T.,R.	,M., or Survey Description)			11. Country of LEA/NM	r Parish, St	ate	
	12. CHEC	CK THE APPROPRIATE BOX(E	ES) TO INDIC.	ATE NATURE	OF NOTICE, REPORT	OR OTHE	R DATA	
TYPE OF SUBMISSIO	N			TYI	PE OF ACTION			
✓ Notice of Intent		Acidize	Deepen Hydrauli	c Fracturing	Production (Start/R Reclamation	esume)	Water Shut-Off Well Integrity	
Subsequent Report		Casing Repair Change Plans	New Cor Plug and		Recomplete Temporarily Aband			
Final Abandonment Not	tice	Convert to Injection	Plug Bac		Water Disposal			
completion of the involved completed. Final Abandom is ready for final inspection	operation ment Not n.) ests an a	ns. If the operation results in a mu	ultiple comple equirements, in	ion or recomp cluding reclan	letion in a new interval, a	Form 316	be filed within 30 days following 0-4 must be filed once testing has been operator has detennined that the site	
Amazing 19 Fed 502H	API #: 3	30-025-52071						
•		2-E, Sec 30, 100' FSL, 1331' F )' FSL, 825' FEL, Lea Co., N.M		NM,				
Update casing and cer	nent pro	gram to current design.						
Update HSU to 640 ac	res.							
14. I hereby certify that the foregoing is true and correct. Name ( <i>Printed/Typed</i> ) STAR HARRELL / Ph: (432) 848-9161				Regulator le	y Specialist			
(Electronic Submission) Signature				te		11/01/202	3	
		THE SPACE FO	DR FEDER	AL OR ST	ATE OFICE USE			
Approved by								
KEITH P IMMATTY / Ph: (	575) 988	-4722 / Approved		ENG Title	INEER	Dat	11/21/2023 te	
Conditions of approval, if any, are attached. Approval of this notice does not warran certify that the applicant holds legal or equitable title to those rights in the subject le				Office CARLSBAD				

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)

which would entitle the applicant to conduct operations thereon.

Received by OCD: 11/28/2023 6:30:37 AM

DISTRICT I 1625 N. French Dr., Hobbs, NM 88240 Phone: (575) 393-6161 Fax: (575) 393-0720 DISTRICT II 811 S. Frist St., Artesia, NM 88210 Phone: (575) 748-1283 Fax: (575) 748-9720 DISTRICT III 1000 Rio Brazos Rd., Aztec, NM 87410 Phone: (505) 314-6178 Fax: (505) 314-6170 DISTRICT IV 2120 S. St. Francib Dr., Santa Fe, NM 87505 Phone: (505) 476-3460 Fax: (505) 476-3462

# State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION 1220 South St. Francis Dr. Santa Fe, New Mexico 87505

Page 2 of 51 Form C-102 Revised August 1, 2011 Submit one copy to appropriate District Office

□ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

A 30-025-52	PI Number 072			Pool Code 97366		<sup>Pool Name</sup> Bilbrey Basin; Bone Spring, South					
Property C	ode				Propert	ty Name		•	Well Nun	Well Number	
33311	5				AMAZIN	G 19 F	ED		502H	ł	
OGRID N	0.				Operate	or Name			Elevatio	on	
7377				EO	G RESOL	URCE	S, INC.		3652	2'	
	Surface Location										
UL or lot no.	Section	Township	Range	Lot Idn	Feet from	n the	North/South line	Feet from the	East/West line	County	
A	19	22 S	32 E		431		NORTH	EAST	LEA		
			Bott	om Hole I	Location I	f Diffe	rent From Surfac	e			
UL or lot no.	Section	Township	Range	Lot Idn	Feet from	1 the	North/South line	Feet from the	East/West line	County	
Р	30	22 S	32 E		100 SOUTH 825				EAST	LEA	
Dedicated Acres	Joint or	Infill	Consolidated Co								
640					LEASE WELL						

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.

SURFACE LOCATION NEW MEXICO EAST NAD 1983 X=733912' Y=503671' LAT=N32.383118° LONG=W103.709498° NAD 1927 X=692730' Y=503611' LAT=N32.382995° LONG=W103.709010° 431' FNL 1284' FEL KOP LOCATION		R 32	X = 732552' Y = 504087'		FTP 1.50° \(KOP 1.00° 18	X = 735193' Y = 504118' <b>17</b>	FIRST TAKE POINT NEW MEXICO EAST NAD 1983 X=734369' Y=504008' LAT=N32.384036° LONG=W103.708012° NAD 1927 X=693187' Y=503947' LAT=N32.383913° LONG=W103.707524° 100' FNL 825' FEL LOWER MOST PERF./
NEW MEXICO EAST NAD 1983 X=734369' Y=504058' LAT=N32.384173° LONG=W103.708012° NAD 1927 X=693186' Y=503997' LAT=N32.384050°		18 19 LOT 1		43 SHL AZ = 49.74 598.3	5231.4'	825' 825' 1284'	BOTTOM HOLE LOCATION NEW MEXICO EAST NAD 1983 X=734439' Y=493647' LAT=N32.355555° LONG=W103.707981° NAD 1927
LONG=W103.707524° 50' FNL 825' FEL		LOT 2		USA NMNM-00090	AZ = 179.61°,	X = 735211' Y = 501477' <sup>-</sup>	X=693256' Y=493587' LAT=N32.355433° LONG=W103.707494° 100' FSL 825' FEL
	24 25	LOT 4	X = 732588' Y = 498806'		_	x = 735229' Y = 498836' 20 29	
	     	LOT 1			62°, 5179.9′	7 330'	
		LOT 3			AZ = 179.62° SPACING I MIT		SUBVEVORS CEDTIELCATION
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 voluntary pooling amongoust for a set of the set of the set of the set of the owner and the set of the set of the set of the set of the set of the set of the set of the set of the set of the mineral or working interest, or to voluntary pooling amongoust for a set of the set	<u>25</u> 36	LOT 4 30 31	X = 732627 Y = 493534		H4	825' 1 <b>32</b> X = 735265'	SURVEYORS 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. SEPTEMBER 11, 2023 Date of Survey Signature and Seal of Professional Surveyor:
agreement or a compulsory pooling order heretofore entered by the division. <u>Star L Harrell</u> <u>11/1/23</u> <u>Signature</u> <u>Date</u> <u>Star L Harrell</u> <u>Print Name</u> <u>star_harrell@eogresources.com</u>						Y = 493553'     	PH B. CHUST PH B. CHUST 26264 PD 26264 PD 10/27/2023
E-mail Address				Tak N	In FOG P200		CHUSTZ IR NMPLS Certificate Number 26264

Released to Imaging: 12/27/2023 9:07:30 AM

# Seog resources Amazing 19 Fed 502H

### **Revised Permit Information 10/24/2023:**

Well Name: Amazing 19 Fed 502H

Location: SHL: 431' FNL & 1284' FEL, Section 19, T-22-S, R-32-E, Lea Co., N.M. BHL: 100' FSL & 825' FEL, Section 30, T-22-S, R-32-E, Lea Co., N.M.

### **Casing Program A:**

Hole	Interv	al MD	Interval TVD		Csg			
Size	From (ft)	To (ft)	From (ft)	To (ft)	OD	Weight	Grade	Conn
16"	0	940	0	940	13-3/8"	54.5#	J-55	STC
11"	0	5,177	0	5,140	9-5/8"	40#	J-55	LTC
6-3/4"	0	20,877	0	10,638	5-1/2"	17#	HCP-110	LTC

Variance is requested to waive the centralizer requirements for the 9-5/8" casing in the 11" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 11" hole interval to maximize cement bond and zonal isolation.

Variance is also requested to waive any centralizer requirements for the 5-1/2" casing in the 6-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 6-3/4" hole interval to maximize cement bond and zonal isolation.

EOG requests permission to allow deviation from the 0.422" annulus clearance requirement for the intermediate (salt) section from Onshore Order #2 under the following conditions:

- The variance is not applicable within the Potash Boundaries or Capitan Reef areas.
- Operator takes responsibility to get casing to set point in the event that the clearance causes stuck pipe issues.

	inting 1108	5		
Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
940' 13-3/8''	240	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	160	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 740')
5,140' 9-5/8''	470	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	100	14.8	1.32	Tail: Class C + 10% NaCL + 3% MagOx (TOC @ 4,110')
20,877' 5-1/2''	320	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 4,410')
	750	13.2	1.52	Tail: Class H + 5% NEX-020 + 0.2% NAC-102 + 0.15% NAS-725 + 0.5% NFL-549 + 0.2% NFP-703 + 1% NBE-737 + 0.3% NRT-241 (TOC @ 10200')

### **Cementing Program:**

Additive	Purpose
Bentonite Gel	Lightweight/Lost circulation prevention
Calcium Chloride	Accelerator
Cello-flake	Lost circulation prevention
Sodium Metasilicate	Accelerator
MagOx	Expansive agent
Pre-Mag-M	Expansive agent
Sodium Chloride	Accelerator
FL-62	Fluid loss control
Halad-344	Fluid loss control
Halad-9	Fluid loss control
HR-601	Retarder
Microbond	Expansive Agent

Note: Cement volumes based on bit size plus at least 25% excess in the open hole plus 10% excess in the cased-hole overlap section.

# Mud Program:

Depth (TVD)	Туре	Weight (ppg)	Viscosity	Water Loss
0 - 940'	Fresh - Gel	8.6-8.8	28-34	N/c
940' - 5,140'	Brine	8.6-8.8	28-34	N/c
5,140' - 20,877'	Oil Base	8.8-9.5	58-68	N/c - 6

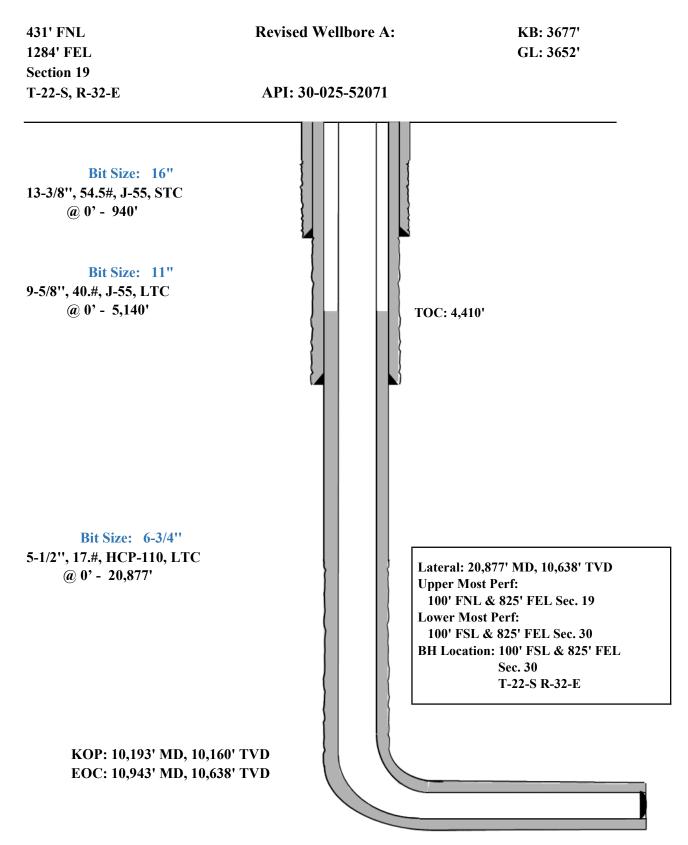
# **TUBING REQUIREMENTS**

EOG respectively requests an exception to the following NMOCD rule:

19.15.16.10 Casing AND TUBING RQUIREMENTS:
 J (3): "The operator shall set tubing as near the bottom as practical and tubing perforations shall not be more than 250 feet above top of pay zone."

With horizontal flowing and gas lifted wells an end of tubing depth placed at or slightly above KOP is a conservative way to ensure the tubing stays clean from debris, plugging, and allows for fewer well interventions post offset completion. The deeper the tubulars are run into the curve, the higher the probability is that the tubing will become stuck in sand and or well debris as the well produces over time. An additional consideration for EOT placement during artificial lift installations is avoiding the high dog leg severity and inclinations found in the curve section of the wellbore to help improve reliability and performance. Dog leg severity and inclinations tend not to hamper gas lifted or flowing wells, but they do effect other forms of artificial lift like rod pump or ESP (electric submersible pump). Keeping the EOT above KOP is an industry best practice for those respective forms of artificial lift.

# **Seog resources** Amazing 19 Fed 502H



# Seog resources Amazing 19 Fed 502H

# **Revised Permit Information 10/24/2023:**

Well Name: Amazing 19 Fed 502H

Location: SHL: 431' FNL & 1284' FEL, Section 19, T-22-S, R-32-E, Lea Co., N.M. BHL: 100' FSL & 825' FEL, Section 30, T-22-S, R-32-E, Lea Co., N.M.

# **Casing Program B:**

Hole	Interv	al MD	Interval TVD		Csg			
Size	From (ft)	To (ft)	From (ft)	To (ft)	OD	Weight	Grade	Conn
13-1/2"	0	940	0	940	10-3/4"	40.5#	J-55	STC
9-7/8"	0	5,177	0	5,140	8-5/8"	32#	J-55	BTC-SC
6-3/4"	0	20,877	0	10,638	5-1/2"	17#	HCP-110	LTC

# **Cementing Program:**

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
940' 10-3/4''	320	13.5		Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello- Flake (TOC @ Surface)
	110	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 740')
5,140' <sup>8-5/8''</sup>	410	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	650	14.8	1.32	Tail: Class C + 10% NaCL + 3% MagOx (TOC @ 4,110')
20,877' <sub>5-1/2''</sub>	510	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 4,410')
	1040	13.2	1.52	Tail: Class H + 5% NEX-020 + 0.2% NAC-102 + 0.15% NAS-725 + 0.5% NFL-549 + 0.2% NFP-703 + 1% NBE-737 + 0.3% NRT-241 (TOC @ 10200')

Variance is requested to waive the centralizer requirements for the 8-5/8" casing in the 9-7/8" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 9-7/8" hole interval to maximize cement bond and zonal isolation.

Variance is also requested to waive any centralizer requirements for the 5-1/2" casing in the 6-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 6-3/4" hole interval to maximize cement bond and zonal isolation.

EOG requests permission to allow deviation from the 0.422" annulus clearance requirement for the intermediate (salt) section from Onshore Order #2 under the following conditions:

- The variance is not applicable within the Potash Boundaries or Capitan Reef areas.
- Operator takes responsibility to get casing to set point in the event that the clearance causes stuck pipe issues.

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**Decog resources** Amazing 19 Fed 502H

431' 1284'	Revised Wellbore B:	KB: 3677' GL: 3652'
Section 19 T-22-S, R-32-E	API: 30-025-52071	
Bit Size: 13-1/2" 10-3/4", 40.5#, J-55, STC @ 0' - 940' Bit Size: 9-7/8" 8-5/8", 32.#, J-55, BTC-SC @ 0' - 5,140'		TOC: 4,640'
Bit Size: 6-3/4'' 5-1/2'', 17.#, HCP-110, LTC @ 0' - 20,877'		Lateral: 20,877' MD, 10,638' TVD Upper Most Perf: 100' FNL & 825' FEL Sec. 19 Lower Most Perf: 100' FSL & 825' FEL Sec. 30 BH Location: 100' FSL & 825' FEL Sec. 30 T-22-S R-32-E
KOP: 10,193' MD, 10,160' TV EOC: 10,943' MD, 10,638' TV		

# **GEOLOGIC NAME OF SURFACE FORMATION:**

Permian

# **ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:**

Rustler	831'
	912'
Tamarisk Anhydrite	
Top of Salt	1,168'
Base of Salt	4,808'
Lamar	5,044'
Bell Canyon	5,071'
Cherry Canyon	6,102'
Brushy Canyon	8,095'
Bone Spring Lime	9,240'
Leonard (Avalon) Shale	9,313'
1st Bone Spring Sand	10,191'
2nd Bone Spring Shale	10,355'
2nd Bone Spring Sand	10,727'
3rd Bone Spring Carb	11,164'
3rd Bone Spring Sand	11,814'
Wolfcamp	12,238'
Penn	14,391'

# ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:

Upper Permian Sands	0-400'	Fresh Water
Bell Canyon	5,071'	Oil
Cherry Canyon	6,102'	Oil
Brushy Canyon	8,095'	Oil
Leonard (Avalon) Shale	9,313'	Oil
1st Bone Spring Sand	10,191'	Oil
2nd Bone Spring Shale	10,355'	Oil
2nd Bone Spring Sand	10,727'	Oil



# Midland

Lea County, NM (NAD 83 NME) Amazing 19 Fed #502H

ОН

Plan: Plan #0.1 RT

# **Standard Planning Report**

31 October, 2023



Database: Company: Project: Site: Well: Wellbore: Design:	PEDM Midland Lea County, Amazing 19 I #502H OH Plan #0.1 RT		ME)	Local Co-ordin TVD Reference MD Reference: North Referenc Survey Calcula	: :e:	Well #502H kb=25' @ 3677.0u kb=25' @ 3677.0u Grid Minimum Curvatu	sft
Project	Lea County, N	NM (NAD 83 NN	1E)				
Map System: Geo Datum: Map Zone:	US State Plane North American New Mexico Ea	Datum 1983		System Datum:		Mean Sea Level	
Site	Amazing 19 F	ed					
Site Position: From: Position Uncertainty:	Map	0.0 usft	Northing: Easting: Slot Radius:	503,794.0 734,151.0 13-3/1	0 usft Longitu		32° 23' 0.425 N 103° 42' 31.400 W
Well	#502H						
Well Position	+N/-S +E/-W	0.0 usft 0.0 usft	Northing: Easting:	73	3,671.00 usft 3,912.00 usft	Latitude: Longitude:	32° 22' 59.221 N 103° 42' 34.195 W
Position Uncertainty Grid Convergence:		0.0 usft 0.33 °	Wellhead Ele	vation:	usft	Ground Level:	3,652.0 usfi
Wellbore	ОН						
Magnetics	Model Na	me	Sample Date	Declination (°)		Dip Angle (°)	Field Strength (nT)
	IGF	RF2020	10/31/2023		6.34	59.94	47,324.60778306
Design	Plan #0.1 RT						
Audit Notes: Version:			Phase:	PLAN	Tie On Dept	: <b>h:</b> 0.	0
Vertical Section:		(L	<b>rom (TVD)</b> <b>isft)</b> 0.0	<b>+N/-S</b> (usft) 0.0	+E/-W (usft) 0.0	Direc (° 176	)
				0.0	0.0	170	
Plan Survey Tool Pro	-	Date 10/31	/2023				
Depth From (usft)	Depth To (usft)	Survey (Wellb	ore)	Tool Name	Rema	rks	
1 0.0	20,876.6	Plan #0.1 RT (	OH)	EOG MWD+IFR1			

Database:	PEDM	Local Co-ordinate Reference:	Well #502H
Company:	Midland	TVD Reference:	kb=25' @ 3677.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb=25' @ 3677.0usft
Site:	Amazing 19 Fed	North Reference:	Grid
Well:	#502H	Survey Calculation Method:	Minimum Curvature
Wellbore:	ОН		
Design:	Plan #0.1 RT		

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	
1,356.0	0.00	0.00	1,356.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,671.0	6.30	49.74	1,670.3	11.2	13.2	2.00	2.00	0.00	49.74	
6,813.3	6.30	49.74	6,781.7	375.8	443.8	0.00	0.00	0.00	0.00	
7,128.3	0.00	0.00	7,096.0	387.0	457.0	2.00	-2.00	0.00	180.00	
10,192.8	0.00	0.00	10,160.5	387.0	457.0	0.00	0.00	0.00	0.00	KOP(Amazing 19 Fe
10,413.3	26.46	180.00	10,373.2	337.0	457.0	12.00	12.00	81.65	180.00	FTP(Amazing 19 Fe
10,942.8	90.00	179.61	10,637.9	-90.5	459.0	12.00	12.00	-0.07	-0.44	
20,876.6	90.00	179.61	10,638.0	-10,024.0	527.0	0.00	0.00	0.00	0.00	PBHL(Amazing 19 F



Database:	PEDM	Local Co-ordinate Reference:	Well #502H
Company:	Midland	TVD Reference:	kb=25' @ 3677.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb=25' @ 3677.0usft
Site:	Amazing 19 Fed	North Reference:	Grid
Well:	#502H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

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.		0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.		0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.		0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.		0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.		0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.		0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.		0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.		0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.		0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.		0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.		0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.		0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,356.		0.00	1,356.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.		49.74	1,400.0	0.2	0.3	-0.2	2.00	2.00	0.00
1,400.		49.74	1,400.0	2.3	0.3 2.8	-0.2	2.00	2.00	0.00
1,500.		49.74	1,499.9	2.3 6.7	2.0 7.9	-2.2	2.00	2.00	0.00
1,671.		49.74	1,670.3	11.2	13.2	-10.5	2.00	2.00	0.00
1,700.		49.74	1,699.2	13.2	15.6	-12.4	0.00	0.00	0.00
1,800.		49.74	1.798.6	20.3	24.0	-19.0	0.00	0.00	0.00
· · ·			,	20.3 27.4			0.00		0.00
1,900.		49.74	1,898.0		32.4	-25.7 -32.3	0.00	0.00	0.00
2,000.		49.74 49.74	1,997.4	34.5 41.6	40.8	-32.3 -39.0	0.00	0.00	0.00
2,100. 2,200.		49.74 49.74	2,096.8 2,196.2	41.6	49.1 57.5	-39.0 -45.6	0.00	0.00 0.00	0.00
-			,						
2,300.		49.74	2,295.6	55.8	65.9	-52.2	0.00	0.00	0.00
2,400.		49.74	2,395.0	62.9	74.2	-58.9	0.00	0.00	0.00
2,500.		49.74	2,494.4	70.0	82.6	-65.5	0.00	0.00	0.00
2,600.		49.74	2,593.8	77.1	91.0	-72.2	0.00	0.00	0.00
2,700.		49.74	2,693.2	84.1	99.4	-78.8	0.00	0.00	0.00
2,800.		49.74	2,792.5	91.2	107.7	-85.5	0.00	0.00	0.00
2,900.		49.74	2,891.9	98.3	116.1	-92.1	0.00	0.00	0.00
3,000.		49.74	2,991.3	105.4	124.5	-98.7	0.00	0.00	0.00
3,100.		49.74	3,090.7	112.5	132.9	-105.4	0.00	0.00	0.00
3,200.	0 6.30	49.74	3,190.1	119.6	141.2	-112.0	0.00	0.00	0.00
3,300.	0 6.30	49.74	3,289.5	126.7	149.6	-118.7	0.00	0.00	0.00
3,400.		49.74	3,388.9	133.8	158.0	-125.3	0.00	0.00	0.00
3,500.		49.74	3,488.3	140.9	166.4	-131.9	0.00	0.00	0.00
3,600.		49.74	3,587.7	148.0	174.7	-138.6	0.00	0.00	0.00
3,700.	0 6.30	49.74	3,687.1	155.1	183.1	-145.2	0.00	0.00	0.00
3,800.	0 6.30	49.74	3,786.5	162.1	191.5	-151.9	0.00	0.00	0.00
3,900.		49.74	3,885.9	169.2	199.8	-158.5	0.00	0.00	0.00
4,000.		49.74	3,985.3	176.3	208.2	-165.2	0.00	0.00	0.00
4,100.		49.74	4,084.7	183.4	216.6	-171.8	0.00	0.00	0.00
4,200.	0 6.30	49.74	4,184.1	190.5	225.0	-178.4	0.00	0.00	0.00
4,300.	0 6.30	49.74	4,283.5	197.6	233.3	-185.1	0.00	0.00	0.00
4,400.		49.74	4,382.9	204.7	241.7	-191.7	0.00	0.00	0.00
4,500.		49.74	4,482.3	211.8	250.1	-198.4	0.00	0.00	0.00
4,600.		49.74	4,581.7	218.9	258.5	-205.0	0.00	0.00	0.00
4,700.		49.74	4,681.1	226.0	266.8	-211.6	0.00	0.00	0.00
4,800.	0 6.30	49.74	4,780.5	233.1	275.2	-218.3	0.00	0.00	0.00
4,900.		49.74	4,879.9	240.1	283.6	-224.9	0.00	0.00	0.00
5,000.		49.74	4,979.3	247.2	292.0	-231.6	0.00	0.00	0.00
5,100.		49.74	5,078.7	254.3	300.3	-238.2	0.00	0.00	0.00
	0.00		2,01.011		000.0	200.2	0.00	0.00	

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COMPASS 5000.16 Build 100



Database:	PEDM	Local Co-ordinate Reference:	Well #502H
Company:	Midland	TVD Reference:	kb=25' @ 3677.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb=25' @ 3677.0usft
Site:	Amazing 19 Fed	North Reference:	Grid
Well:	#502H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

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)
5,200.0	6.30	49.74	5,178.1	261.4	308.7	-244.9	0.00	0.00	0.00
5,300.0	6.30	49.74	5,277.5	268.5	317.1	-251.5	0.00	0.00	0.00
5,400.0	6.30	49.74	5,376.8	275.6	325.5	-258.1	0.00	0.00	0.00
5,500.0	6.30	49.74	5,476.2	282.7	333.8	-264.8	0.00	0.00	0.00
5,600.0	6.30	49.74	5,575.6	289.8	342.2	-271.4	0.00	0.00	0.00
5,700.0	6.30	49.74	5,675.0	296.9	350.6	-278.1	0.00	0.00	0.00
5,800.0	6.30	49.74	5,774.4	304.0	358.9	-284.7	0.00	0.00	0.00
5,900.0	6.30	49.74	5,873.8	311.1	367.3	-291.3	0.00	0.00	0.00
6,000.0	6.30	49.74	5,973.2	318.1	375.7	-298.0	0.00	0.00	0.00
6,100.0	6.30	49.74	6,072.6	325.2	384.1	-304.6	0.00	0.00	0.00
6,200.0	6.30	49.74	6,172.0	332.3	392.4	-311.3	0.00	0.00	0.00
6,300.0	6.30	49.74	6,271.4	339.4	400.8	-317.9	0.00	0.00	0.00
6,400.0	6.30	49.74	6,370.8	346.5	409.2	-324.6	0.00	0.00	0.00
6,500.0	6.30	49.74	6,470.2	353.6	417.6	-331.2	0.00	0.00	0.00
6,600.0	6.30	49.74	6,569.6	360.7	425.9	-337.8	0.00	0.00	0.00
6,700.0	6.30	49.74	6,669.0	367.8	434.3	-344.5	0.00	0.00	0.00
6,800.0	6.30	49.74	6,768.4	374.9	442.7	-351.1	0.00	0.00	0.00
6,813.3	6.30	49.74	6,781.7	375.8	443.8	-352.0	0.00	0.00	0.00
6,900.0	4.57	49.74	6,867.9	381.1	450.1	-357.0	2.00	-2.00	0.00
7,000.0	2.57	49.74	6,967.7	385.1	454.8	-360.7	2.00	-2.00	0.00
7,100.0	0.57	49.74	7,067.7	386.9	456.9	-362.4	2.00	-2.00	0.00
7,128.3	0.00	0.00	7,096.0	387.0	457.0	-362.5	2.00	-2.00	0.00
7,200.0	0.00	0.00	7,167.7	387.0	457.0	-362.5	0.00	0.00	0.00
7,300.0	0.00	0.00	7,267.7	387.0	457.0	-362.5	0.00	0.00	0.00
7,400.0	0.00	0.00	7,367.7	387.0	457.0	-362.5	0.00	0.00	0.00
7,500.0	0.00	0.00	7,467.7	387.0	457.0	-362.5	0.00	0.00	0.00
7,600.0	0.00	0.00	7,567.7	387.0	457.0	-362.5	0.00	0.00	0.00
7,700.0	0.00	0.00	7,667.7	387.0	457.0	-362.5	0.00	0.00	0.00
7,800.0	0.00	0.00	7,767.7	387.0	457.0	-362.5	0.00	0.00	0.00
7,900.0	0.00	0.00	7,867.7	387.0	457.0	-362.5	0.00	0.00	0.00
8,000.0	0.00	0.00	7,967.7	387.0	457.0	-362.5	0.00	0.00	0.00
8,100.0	0.00	0.00	8,067.7	387.0	457.0	-362.5	0.00	0.00	0.00
8,200.0	0.00	0.00	8,167.7	387.0	457.0	-362.5	0.00	0.00	0.00
8,300.0	0.00	0.00	8,267.7	387.0	457.0	-362.5	0.00	0.00	0.00
8,400.0	0.00	0.00	8,367.7	387.0	457.0	-362.5	0.00	0.00	0.00
8,500.0	0.00	0.00	8,467.7	387.0	457.0	-362.5	0.00	0.00	0.00
8,600.0	0.00	0.00	8,567.7	387.0	457.0	-362.5	0.00	0.00	0.00
8,700.0	0.00	0.00	8,667.7	387.0	457.0	-362.5	0.00	0.00	0.00
			8,767.7	387.0	457.0	-362.5	0.00		
8,800.0	0.00	0.00	,					0.00	0.00
8,900.0 9,000.0	0.00 0.00	0.00 0.00	8,867.7 8,967.7	387.0 387.0	457.0 457.0	-362.5 -362.5	0.00 0.00	0.00 0.00	0.00 0.00
9,100.0	0.00	0.00	9,067.7	387.0	457.0	-362.5	0.00	0.00	0.00
9,200.0	0.00	0.00	9,167.7	387.0	457.0	-362.5	0.00	0.00	0.00
9,300.0	0.00	0.00	9,267.7	387.0	457.0	-362.5	0.00	0.00	0.00
9,400.0	0.00	0.00	9,367.7	387.0	457.0	-362.5	0.00	0.00	0.00
9,500.0	0.00	0.00	9,467.7	387.0	457.0	-362.5	0.00	0.00	0.00
9,600.0	0.00	0.00	9,567.7	387.0	457.0	-362.5	0.00	0.00	0.00
9,700.0	0.00	0.00	9,667.7	387.0	457.0	-362.5	0.00	0.00	0.00
9,700.0 9,800.0									
,	0.00	0.00	9,767.7	387.0	457.0 457.0	-362.5	0.00	0.00	0.00
9,900.0	0.00	0.00	9,867.7	387.0	457.0	-362.5	0.00	0.00	0.00
10,000.0	0.00	0.00	9,967.7	387.0	457.0	-362.5	0.00	0.00	0.00
10,100.0	0.00	0.00	10,067.7	387.0	457.0	-362.5	0.00	0.00	0.00
10,192.8	0.00	0.00	10,160.5	387.0	457.0	-362.5	0.00	0.00	0.00
10,200.0	0.86	180.00	10,167.7	386.9	457.0	-362.4	12.00	12.00	0.00

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.



Database:	PEDM	Local Co-ordinate Reference:	Well #502H
Company:	Midland	TVD Reference:	kb=25' @ 3677.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb=25' @ 3677.0usft
Site:	Amazing 19 Fed	North Reference:	Grid
Well:	#502H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

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)
10,225.0	3.86	180.00	10,192.7	385.9	457.0	-361.4	12.00	12.00	0.00
10,250.0	6.86	180.00	10,217.5	383.6	457.0	-359.1	12.00	12.00	0.00
10,200.0	0.00	100.00	10,217.0	505.0	407.0	-000.1	12.00	12.00	0.00
10,275.0	9.86	180.00	10,242.3	379.9	457.0	-355.4	12.00	12.00	0.00
10,300.0	12.86	180.00	10,266.8	375.0	457.0	-350.5	12.00	12.00	0.00
10,325.0	15.86	180.00	10,291.0	368.8	457.0	-344.3	12.00	12.00	0.00
10,350.0	18.86	180.00	10,314.9	361.4	457.0	-336.9	12.00	12.00	0.00
			10,338.3						
10,375.0	21.86	180.00	10,338.3	352.7	457.0	-328.2	12.00	12.00	0.00
10,400.0	24.86	180.00	10.361.2	342.7	457.0	-318.3	12.00	12.00	0.00
10,413.3	26.46	180.00	10,373.2	337.0	457.0	-312.5	12.00	12.00	0.00
10,425.0	27.86	179.98	10,383.6	331.6	457.0	-307.2	12.00	12.00	-0.20
			,						
10,450.0	30.86	179.93	10,405.4	319.4	457.0	-295.0	12.00	12.00	-0.17
10,475.0	33.86	179.90	10,426.5	306.0	457.0	-281.6	12.00	12.00	-0.14
10,500.0	36.86	179.87	10,446.9	291.5	457.1	-267.1	12.00	12.00	-0.12
10,525.0	39.86	179.84	10,466.5	276.0	457.1	-251.6	12.00	12.00	-0.12
10,550.0	42.86	179.82	10,485.3	259.5	457.1	-235.1	12.00	12.00	-0.09
10,575.0	45.86	179.80	10,503.2	242.0	457.2	-217.7	12.00	12.00	-0.08
10,600.0	48.86	179.78	10,520.1	223.6	457.3	-199.3	12.00	12.00	-0.08
10,625.0	51.86	179.76	10,536.0	204.4	457.4	-180.1	12.00	12.00	-0.07
10,650.0	54.86	179.75	10,550.9	184.3	457.4	-160.1	12.00	12.00	-0.06
10,675.0	57.86	179.73	10,564.8	163.5	457.5	-139.3	12.00	12.00	-0.06
10,700.0	60.86	179.72	10,577.5	142.0	457.6	-117.8	12.00	12.00	-0.06
10,725.0	63.86	179.70	10,589.1	119.9	457.8	-95.7	12.00	12.00	-0.05
40 750 0	00.00	470.00	40 COO C	07.4	457.0	70.0	10.00	40.00	0.05
10,750.0	66.86	179.69	10,599.5	97.1	457.9	-73.0	12.00	12.00	-0.05
10,775.0	69.86	179.68	10,608.8	73.9	458.0	-49.8	12.00	12.00	-0.05
10,800.0	72.86	179.67	10,616.7	50.2	458.1	-26.1	12.00	12.00	-0.05
10,825.0	75.86	179.66	10,623.5	26.1	458.3	-2.1	12.00	12.00	-0.04
10,850.0	78.86	179.65	10,629.0	1.8	458.4	22.3	12.00	12.00	-0.04
10.075.0	04.00	170.04	10 000 1	00.0	450.0	10.0	40.00	40.00	0.04
10,875.0	81.86	179.64	10,633.1	-22.9	458.6	46.9	12.00	12.00	-0.04
10,900.0	84.86	179.63	10,636.0	-47.7	458.7	71.7	12.00	12.00	-0.04
10,925.0	87.86	179.62	10,637.6	-72.7	458.9	96.7	12.00	12.00	-0.04
10,942.8	90.00	179.61	10,637.9	-90.5	459.0	114.4	12.00	12.00	-0.04
11,000.0	90.00	179.61	10,637.9	-147.7	459.4	171.6	0.00	0.00	0.00
		170.04	40.007.0	0.47 7	100.1	074 5			
11,100.0	90.00	179.61	10,637.9	-247.7	460.1	271.5	0.00	0.00	0.00
11,200.0	90.00	179.61	10,637.9	-347.7	460.8	371.4	0.00	0.00	0.00
11,300.0	90.00	179.61	10,637.9	-447.6	461.5	471.3	0.00	0.00	0.00
11,400.0	90.00	179.61	10,637.9	-547.6	462.2	571.2	0.00	0.00	0.00
11,500.0	90.00	179.61	10,637.9	-647.6	462.8	671.1	0.00	0.00	0.00
11,600.0	90.00	179.61	10,637.9	-747.6	463.5	770.9	0.00	0.00	0.00
11,700.0	90.00	179.61	10,637.9	-847.6	464.2	870.8	0.00	0.00	0.00
11,800.0	90.00	179.61	10,637.9	-947.6	464.9	970.7	0.00	0.00	0.00
11,900.0	90.00	179.61	10,638.0	-1,047.6	465.6	1,070.6	0.00	0.00	0.00
12,000.0	90.00	179.61	10,638.0	-1,147.6	466.3	1,170.5	0.00	0.00	0.00
12,100.0	90.00	179.61	10,638.0	-1,247.6	466.9	1,270.4	0.00	0.00	0.00
12,200.0	90.00	179.61	10,638.0	-1,347.6	467.6	1,370.3	0.00	0.00	0.00
12,300.0	90.00	179.61	10,638.0	-1,447.6	468.3	1,470.2	0.00	0.00	0.00
12,400.0	90.00	179.61	10,638.0	-1,547.6	469.0	1,570.1	0.00	0.00	0.00
12,500.0	90.00	179.61	10,638.0	-1,647.6	469.7	1,670.0	0.00	0.00	0.00
12,600.0	90.00	179.61	10,638.0	-1,747.6	470.4	1,769.9	0.00	0.00	0.00
12,700.0	90.00	179.61	10,638.0	-1,847.6	471.0	1,869.8	0.00	0.00	0.00
12,800.0	90.00	179.61	10,638.0	-1,947.6	471.7	1,969.7	0.00	0.00	0.00
12,900.0	90.00	179.61	10,638.0	-2,047.6	472.4	2,069.6	0.00	0.00	0.00
13,000.0	90.00	179.61	10,638.0	-2,047.0	473.1	2,009.0	0.00	0.00	0.00
13,000.0	30.00			-2,147.0		2,103.3	0.00	0.00	0.00
13,100.0	90.00	179.61	10,638.0	-2,247.6	473.8	2,269.4	0.00	0.00	0.00
13,200.0	90.00	179.61	10,638.0	-2,347.6	474.5	2,369.3	0.00	0.00	0.00

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COMPASS 5000.16 Build 100

.



Database:	PEDM	Local Co-ordinate Reference:	Well #502H
Company:	Midland	TVD Reference:	kb=25' @ 3677.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb=25' @ 3677.0usft
Site:	Amazing 19 Fed	North Reference:	Grid
Well:	#502H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

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)
13,300.0	90.00	179.61	10,638.0	-2,447.6	475.2	2,469.2	0.00	0.00	0.00
13,400.0	90.00	179.61	10,638.0	-2,547.6	475.8	2,569.1	0.00	0.00	0.00
13,500.0	90.00	179.61	10,638.0	-2,647.6	476.5	2,669.0	0.00	0.00	0.00
13,600.0	90.00	179.61	10,638.0	-2,747.6	477.2	2,768.9	0.00	0.00	0.00
13,700.0	90.00	179.61	10,638.0	-2,847.6	477.9	2,868.8	0.00	0.00	0.00
13,800.0	90.00	179.61	10,638.0	-2,947.6	478.6	2,968.7	0.00	0.00	0.00
13,900.0	90.00	179.61	10,638.0	-3,047.6	479.3	3,068.5	0.00	0.00	0.00
14,000.0	90.00	179.61	10,638.0	-3,147.6	479.9	3,168.4	0.00	0.00	0.00
14,100.0	90.00	179.61	10,638.0	-3,247.6	480.6	3,268.3	0.00	0.00	0.00
14,200.0	90.00	179.61	10,638.0	-3,347.6	481.3	3,368.2	0.00	0.00	0.00
14,300.0	90.00	179.61	10,638.0	-3,447.6	482.0	3,468.1	0.00	0.00	0.00
14,400.0	90.00	179.61	10,638.0	-3,547.6	482.7	3,568.0	0.00	0.00	0.00
14,500.0	90.00	179.61	10,638.0	-3,647.6	483.4	3,667.9	0.00	0.00	0.00
14,600.0	90.00	179.61	10,638.0	-3,747.6	484.0	3,767.8	0.00	0.00	0.00
14,700.0	90.00	179.61	10,638.0	-3,847.6	484.7	3,867.7	0.00	0.00	0.00
14,800.0	90.00	179.61	10,638.0	-3,947.6	485.4	3,967.6	0.00	0.00	0.00
14,900.0	90.00	179.61	10,638.0	-4,047.6	486.1	4,067.5	0.00	0.00	0.00
15,000.0	90.00	179.61	10,638.0	-4,147.6	486.8	4,167.4	0.00	0.00	0.00
15,100.0	90.00	179.61	10,638.0	-4,247.6	487.5	4,267.3	0.00	0.00	0.00
15,200.0	90.00	179.61	10,638.0	-4,347.6	488.2	4,367.2	0.00	0.00	0.00
15,300.0	90.00	179.61	10,638.0	-4,447.6	488.8	4,467.1	0.00	0.00	0.00
15,400.0	90.00	179.61	10,638.0	-4,547.6	489.5	4,567.0	0.00	0.00	0.00
15,500.0	90.00	179.61	10,638.0	-4,647.6	490.2	4,666.9	0.00	0.00	0.00
15,600.0	90.00	179.61	10,638.0	-4,747.5	490.9	4,766.8	0.00	0.00	0.00
15,700.0	90.00	179.61	10,638.0	-4,847.5	491.6	4,866.7	0.00	0.00	0.00
15,800.0	90.00	179.61	10,638.0	-4,947.5	492.3	4,966.6	0.00	0.00	0.00
15,900.0	90.00	179.61	10,638.0	-5,047.5	492.9	5,066.5	0.00	0.00	0.00
16,000.0	90.00	179.61	10,638.0	-5,147.5	493.6	5,166.4	0.00	0.00	0.00
16,100.0	90.00	179.61	10,638.0	-5,247.5	494.3	5,266.3	0.00	0.00	0.00
16,200.0	90.00	179.61	10,638.0	-5,347.5	495.0	5,366.1	0.00	0.00	0.00
16,300.0	90.00	179.61	10,638.0	-5,447.5	495.7	5,466.0	0.00	0.00	0.00
16,400.0	90.00	179.61	10,638.0	-5,547.5	496.4	5,565.9	0.00	0.00	0.00
16,500.0	90.00	179.61	10,638.0	-5,647.5	497.1	5,665.8	0.00	0.00	0.00
16,600.0	90.00	179.61	10,638.0	-5,747.5	497.7	5,765.7	0.00	0.00	0.00
16,700.0	90.00	179.61	10,638.0	-5,847.5	498.4	5,865.6	0.00	0.00	0.00
16,800.0	90.00	179.61	10,638.0	-5,947.5	499.1	5,965.5	0.00	0.00	0.00
16,900.0	90.00	179.61	10,638.0	-6,047.5	499.8	6,065.4	0.00	0.00	0.00
17,000.0	90.00	179.61	10,638.0	-6,147.5	500.5	6,165.3	0.00	0.00	0.00
17,100.0	90.00	179.61	10,638.0	-6,247.5	501.2	6,265.2	0.00	0.00	0.00
17,200.0	90.00	179.61	10,638.0	-6,347.5	501.8	6,365.1	0.00	0.00	0.00
17,300.0	90.00	179.61	10,638.0	-6,447.5	502.5	6,465.0	0.00	0.00	0.00
17,400.0	90.00	179.61	10,638.0	-6,547.5	503.2	6,564.9	0.00	0.00	0.00
17,500.0	90.00	179.61	10,638.0	-6,647.5	503.9	6,664.8	0.00	0.00	0.00
17,600.0	90.00	179.61	10,638.0	-6,747.5	504.6	6,764.7	0.00	0.00	0.00
17,700.0	90.00	179.61	10,638.0	-6,847.5	505.3	6,864.6	0.00	0.00	0.00
17,800.0	90.00	179.61	10,638.0	-6,947.5	505.9	6,964.5	0.00	0.00	0.00
17,900.0	90.00	179.61	10,638.0	-7,047.5	506.6	7,064.4	0.00	0.00	0.00
18,000.0	90.00	179.61	10,638.0	-7,147.5	507.3	7,164.3	0.00	0.00	0.00
18,100.0	90.00	179.61	10,638.0	-7,247.5	508.0	7,264.2	0.00	0.00	0.00
18,200.0	90.00	179.61	10,638.0	-7,347.5	508.7	7,364.1	0.00	0.00	0.00
18,300.0	90.00	179.61	10,638.0	-7,447.5	509.4	7,464.0	0.00	0.00	0.00
18,400.0	90.00	179.61	10,638.0	-7,547.5	510.1	7,563.9	0.00	0.00	0.00
18,500.0	90.00	179.61	10,638.0	-7,647.5	510.7	7,663.7	0.00	0.00	0.00
	90.00	179.61	10,638.0	-7,747.5	511.4	7,763.6	0.00	0.00	0.00

COMPASS 5000.16 Build 100

.



Database:	PEDM	Local Co-ordinate Reference:	Well #502H
Company:	Midland	TVD Reference:	kb=25' @ 3677.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	kb=25' @ 3677.0usft
Site:	Amazing 19 Fed	North Reference:	Grid
Well:	#502H	Survey Calculation Method:	Minimum Curvature
Wellbore:	ОН	·····	
Design:	Plan #0.1 RT		

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)
18,700.0	90.00	179.61	10,638.0	-7,847.5	512.1	7,863.5	0.00	0.00	0.00
18,800.0	90.00	179.61	10,638.0	-7,947.5	512.8	7,963.4	0.00	0.00	0.00
18,900.0	90.00	179.61	10,638.0	-8,047.5	513.5	8,063.3	0.00	0.00	0.00
19,000.0	90.00	179.61	10,638.0	-8,147.5	514.2	8,163.2	0.00	0.00	0.00
19,100.0	90.00	179.61	10,638.0	-8,247.5	514.8	8,263.1	0.00	0.00	0.00
19,200.0	90.00	179.61	10,638.0	-8,347.5	515.5	8,363.0	0.00	0.00	0.00
19,300.0	90.00	179.61	10,638.0	-8,447.5	516.2	8,462.9	0.00	0.00	0.00
19,400.0	90.00	179.61	10,638.0	-8,547.5	516.9	8,562.8	0.00	0.00	0.00
19,500.0	90.00	179.61	10,638.0	-8,647.5	517.6	8,662.7	0.00	0.00	0.00
19,600.0	90.00	179.61	10,638.0	-8,747.5	518.3	8,762.6	0.00	0.00	0.00
19,700.0	90.00	179.61	10,638.0	-8,847.5	518.9	8,862.5	0.00	0.00	0.00
19,800.0	90.00	179.61	10,638.0	-8,947.5	519.6	8,962.4	0.00	0.00	0.00
19,900.0	90.00	179.61	10,638.0	-9,047.4	520.3	9,062.3	0.00	0.00	0.00
20,000.0	90.00	179.61	10,638.0	-9,147.4	521.0	9,162.2	0.00	0.00	0.00
20,100.0	90.00	179.61	10,638.0	-9,247.4	521.7	9,262.1	0.00	0.00	0.00
20,200.0	90.00	179.61	10,638.0	-9,347.4	522.4	9,362.0	0.00	0.00	0.00
20,300.0	90.00	179.61	10,638.0	-9,447.4	523.1	9,461.9	0.00	0.00	0.00
20,400.0	90.00	179.61	10,638.0	-9,547.4	523.7	9,561.8	0.00	0.00	0.00
20,500.0	90.00	179.61	10,638.0	-9,647.4	524.4	9,661.7	0.00	0.00	0.00
20,600.0	90.00	179.61	10,638.0	-9,747.4	525.1	9,761.6	0.00	0.00	0.00
20,700.0	90.00	179.61	10,638.0	-9,847.4	525.8	9,861.5	0.00	0.00	0.00
20,800.0	90.00	179.61	10,638.0	-9,947.4	526.5	9,961.3	0.00	0.00	0.00
20,876.6	90.00	179.61	10,638.0	-10,024.0	527.0	10,037.8	0.00	0.00	0.00

### Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
KOP(Amazing 19 Fed # - plan hits target cent - Point	0.00 ter	0.00	10,160.5	387.0	457.0	504,058.00	734,369.00	32° 23' 3.024 N	103° 42' 28.840 W
FTP(Amazing 19 Fed #5 - plan hits target cent - Point	0.00 ter	0.01	10,373.2	337.0	457.0	504,008.00	734,369.00	32° 23' 2.530 N	103° 42' 28.843 W
PBHL(Amazing 19 Fed # - plan hits target cent - Point	0.00 ter	0.01	10,638.0	-10,024.0	527.0	493,647.00	734,439.00	32° 21' 20.001 N	103° 42' 28.733 W

# **leogresources**

CASING DETAILS

No casing data is available

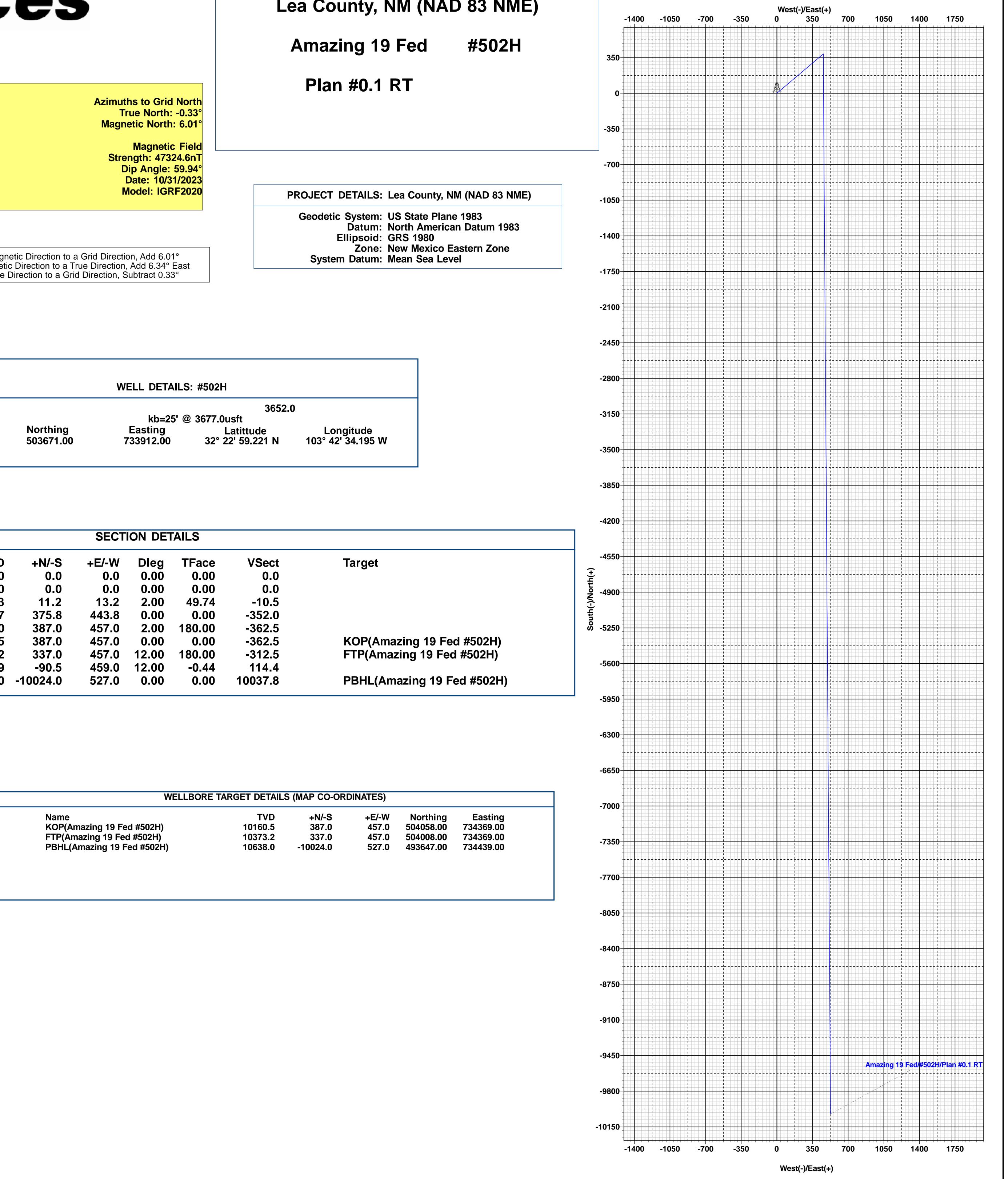
Sec

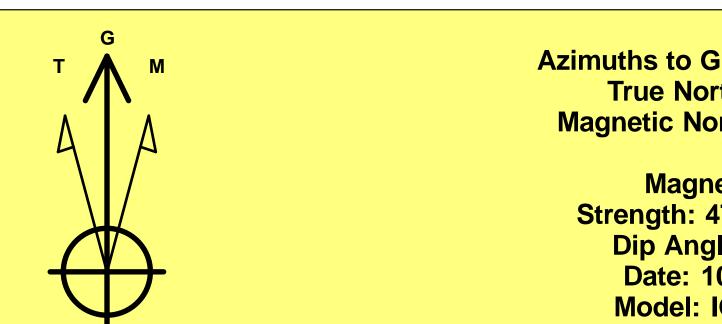
# Lea County, NM (NAD 83 NME)

Amazing 19 Fed

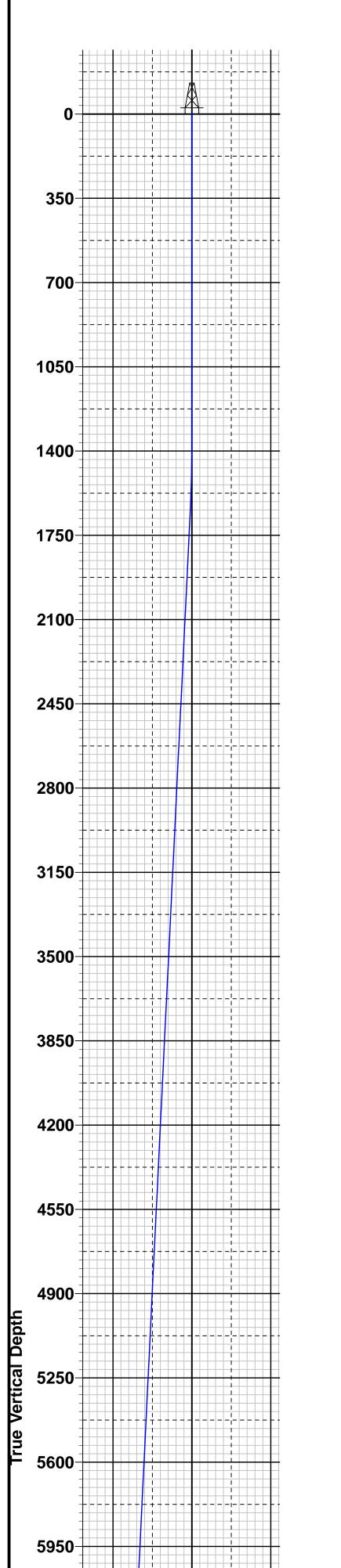
# **Plan #0.1 RT**

Geodetic System: US State Plane 1983 Datum: North American Datum 1983 Ellipsoid: GRS 1980 Zone: New Mexico Eastern Zone System Datum: Mean Sea Level

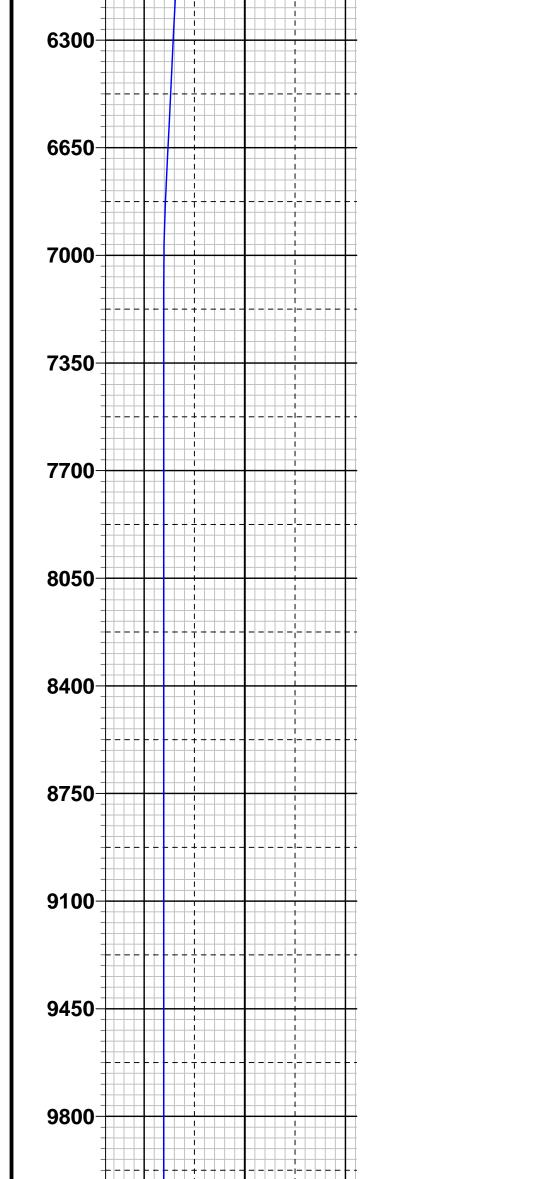




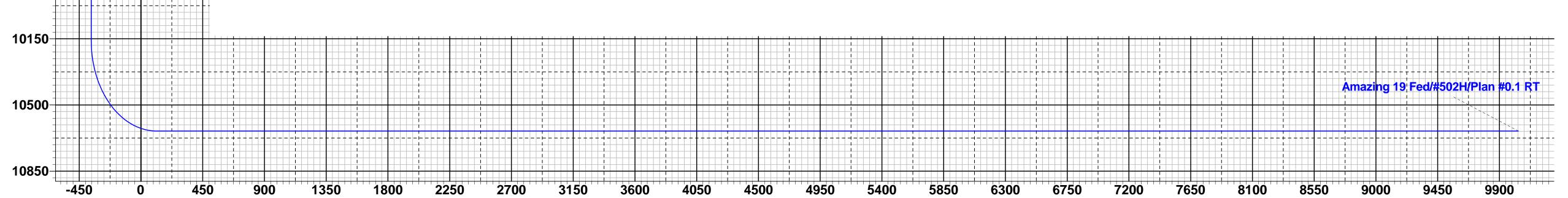
To convert a Magnetic Direction to a Grid Direction, Add 6.01° To convert a Magnetic Direction to a True Direction, Add 6.34° East To convert a True Direction to a Grid Direction, Subtract 0.33°



			AILS: #502H	ELL DETA	W					
	3652.0 kb=25' @ 3677.0usft									
	Longitude 103° 42' 34.195 W	Latittude 22' 59.221 N		Easting 733912.00		Northing 503671.00				
			AILS	ION DET	SECT					
				Dleg	+E/-W	+N/-S	TVD	Azi	Inc	MD
	Target	VSect	TFace	Dieg				0.00	0.00	0.0
	Target	VSect 0.0	TFace 0.00	0.00	0.0	0.0	0.0	0.00		
	Target					0.0 0.0	0.0 1356.0	0.00	0.00	1356.0
	Target	0.0	0.00	0.00	0.0					
	Target	0.0 0.0	0.00 0.00	0.00 0.00	0.0 0.0	0.0	1356.0	0.00	0.00	1356.0
	Target	0.0 0.0 -10.5	0.00 0.00 49.74	0.00 0.00 2.00	0.0 0.0 13.2	0.0 11.2	1356.0 1670.3	0.00 49.74	0.00 6.30	1356.0 1671.0
g 19 Fed #502ŀ		0.0 0.0 -10.5 -352.0	0.00 0.00 49.74 0.00	0.00 0.00 2.00 0.00	0.0 0.0 13.2 443.8	0.0 11.2 375.8	1356.0 1670.3 6781.7	0.00 49.74 49.74	0.00 6.30 6.30	1356.0 1671.0 6813.3
g 19 Fed #502F g 19 Fed #502H	KOP(Amazi	0.0 0.0 -10.5 -352.0 -362.5	0.00 0.00 49.74 0.00 180.00	0.00 0.00 2.00 0.00 2.00	0.0 0.0 13.2 443.8 457.0	0.0 11.2 375.8 387.0	1356.0 1670.3 6781.7 7096.0	0.00 49.74 49.74 0.00	0.00 6.30 6.30 0.00	1356.0 1671.0 6813.3 7128.3
	KOP(Amazi	0.0 0.0 -10.5 -352.0 -362.5 -362.5	0.00 0.00 49.74 0.00 180.00 0.00	0.00 0.00 2.00 0.00 2.00 0.00	0.0 0.0 13.2 443.8 457.0 457.0	0.0 11.2 375.8 387.0 387.0	1356.0 1670.3 6781.7 7096.0 10160.5	0.00 49.74 49.74 0.00 0.00	0.00 6.30 6.30 0.00 0.00	1356.0 1671.0 6813.3 7128.3 10192.8



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Vertical Section at 176.99°

Lea County, NM (NAD 83 NME) Amazing 19 Fed #502H ÔH Plan #0.1 RT 15:43, October 31 2023

# PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

EOG RESOURCES INCORPORATED
AMAZING 19 FED 502H
431'/N 1284'/E
100'/S 825'/E
SECTION 19, T22S, R32E
Lea County, New Mexico

All previous COAs still apply

# COA

H2S	• Yes	O No	
Potash	None	Secretary	© R-111-P
Cave/Karst Potential	• Low	O Medium	O High
Cave/Karst Potential	Critical		
Variance	O None	Flex Hose	O Other
Wellhead	Conventional	Multibowl	O Both
Wellhead Variance	O Diverter		
Other	4 String	Capitan Reef	WIPP
Other	Fluid Filled	Pilot Hole	🗆 Open Annulus
Cementing	Contingency	EchoMeter	Primary Cement
	Cement Squeeze		Squeeze
Special Requirements	🗆 Water Disposal	COM	🗆 Unit
Special Requirements	Batch Sundry		
Special Requirements	Break Testing	☑ Offline	Casing
Variance		Cementing	Clearance

# A. CASING

# NOTE: INTERMEDIATE CASING SET POINTS ADJUSTED BASED ON BLM GEOLOGY RECOMMENDATION AND ORIGINAL APD SET DEPTH

### **Primary Casing Design:**

- 1. The **13-3/8** inch surface casing shall be set at approximately **940** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature

survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

- b. Wait on cement (WOC) time for a primary cement job will be a minimum of <u>8</u>
   <u>hours</u> or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

# Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement in Design A.

 The 9-5/8 inch intermediate casing shall be set at approximately 4,452 feet TVD. Cement excess < 25% CFO recommendation. Please review cement volumes to achieve below mentioned tie-back. The minimum required fill of cement behind the 9-5/8 inch intermediate casing is:

# **Option 1 (Single Stage):**

- Cement to surface. If cement does not circulate see B.1.a, c-d above.
- 3. The **5-1/2** inch production casing shall be set at approximately **20,877** feet. The minimum required fill of cement behind the **5-1/2** inch production casing is:

# **Option 1 (Single Stage):**

• Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

# Alternate Casing Design:

- 1. The **10-3/4** inch surface casing shall be set at approximately **940** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface.
  - e. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - f. Wait on cement (WOC) time for a primary cement job will be a minimum of  $\underline{8}$

**hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

- g. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- h. If cement falls back, remedial cementing will be done prior to drilling out that string.

# Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement in Design B.

2. The **8-5/8** inch intermediate casing shall be set at approximately **4,452** feet TVD. The minimum required fill of cement behind the **8-5/8** inch intermediate casing is:

# **Option 1 (Single Stage):**

- Cement to surface. If cement does not circulate see B.1.a, c-d above.
- 3. The **5-1/2** inch production casing shall be set at approximately **20,877** feet. The minimum required fill of cement behind the **5-1/2** inch production casing is:

# **Option 1 (Single Stage):**

a. Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

# **B. SPECIAL REQUIREMENT (S)**

# (Note: For a minimum 5M BOPE or less (Utilizing a 10M BOPE system) BOPE Break Testing Variance

- BOPE Break Testing is ONLY permitted for 5M BOPE or less. (Annular preventer must be tested to a minimum of 70% of BOPE working pressure and shall be higher than the MASP)
- BOPE Break Testing is NOT permitted to drilling the production hole section.
- Variance only pertains to the intermediate hole-sections and no deeper than the Bone Springs formation.
- While in transfer between wells, the BOPE shall be secured by the hydraulic carrier or cradle.
- Any well control event while drilling require notification to the BLM Petroleum Engineer (**575-706-2779**) prior to the commencement of any BOPE Break Testing operations.
- A full BOPE test is required prior to drilling the first deep intermediate hole section. If any subsequent hole interval is deeper than the first, a full BOPE test will be required. (200' TVD tolerance between intermediate shoes is allowable).
- The BLM is to be contacted (575-689-5981 Lea County) 4 hours prior to BOPE tests.
- As a minimum, a full BOPE test shall be performed at 21-day intervals.

- In the event any repairs or replacement of the BOPE is required, the BOPE shall test as per 43 CFR part 3170 Subpart 3172.
- If in the event break testing is not utilized, then a full BOPE test would be conducted.

### **Offline Cementing**

OK for surface and intermediate intervals. Notify the BLM prior to the commencement of any offline cementing procedure.

### Casing Clearance:

- Salt annular clearance variance in place
- Overlap clearance OK in the production interval

Operator shall clean up cycles until wellbore is clear of cuttings and any large debris, ensure cutting sizes are adequate "coffee ground or less" before cementing.

# **GENERAL REQUIREMENTS**

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

### Eddy County

**EMAIL** or call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,

**BLM\_NM\_CFO\_DrillingNotifications@BLM.GOV** (575) 361-2822

### Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 689-5981

- 1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
  - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
  - b. When the operator proposes to set surface casing with Spudder Rig
    - Notify the BLM when moving in and removing the Spudder Rig.

- Notify the BLM when moving in the 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
- BOP/BOPE test to be conducted per **43 CFR part 3170 Subpart 3172** as soon as 2nd Rig is rigged up on well.
- 2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
- 3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

# A. CASING

- 1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
- <u>Wait on cement (WOC) for Potash Areas:</u> After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least <u>24 hours</u>. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.
- 3. <u>Wait on cement (WOC) for Water Basin:</u> After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least <u>8 hours</u>. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
- 4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

- 5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
- 6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
- 7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
- 8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.
- B. PRESSURE CONTROL
- All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in 43 CFR part 3170 Subpart 3172 and API STD 53 Sec. 5.3.
- 2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
- 3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
- 4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.

- b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
- c. Manufacturer representative shall install the test plug for the initial BOP test.
- d. Whenever any seal subject to test pressure is broken, all the tests in 43
   CFR part 3170 Subpart 3172 must be followed.
- e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
- 5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead cement), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
  - b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the cement plug. The BOPE test can be initiated after bumping the cement plug with the casing valve open. (only applies to single stage cement jobs, prior to the cement setting up.)
  - c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer and can be initiated immediately with the casing valve open. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to 43 CFR part 3170 Subpart 3172 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
  - d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall

have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

- e. The results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per 43 CFR part 3170 Subpart 3172.

### C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

### D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

**KPI** 11/21/2023



# Salt Section Annular Clearance Variance Request

**Daniel Moose** 

# **Current Design (Salt Strings)**

# 0.422" Annular clearance requirement

- Casing collars shall have a minimum clearance of 0.422 inches on all sides in the hole/casing annulus, with recognition that variances can be granted for justified exceptions.

- 12.25" Hole x 9.625"40# J55/HCK55 LTC Casing
  - 1.3125" Clearance to casing OD
  - 0.8125" Clearance to coupling OD
- 9.875" Hole x 8.75" 38.5# P110 Sprint-SF Casing
  - 0.5625" Clearance to casing OD
  - 0.433" Clearance to coupling OD

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# **Annular Clearance Variance Request**

EOG request permission to allow deviation from the 0.422" annulus clearance requirement for the intermediate (salt) section from Onshore Order #2 under the following conditions:

- The variance is not applicable within the Potash Boundaries or Capitan Reef areas.
- Operator takes responsibility to get casing to set point in the event that the clearance causes stuck pipe issues

# **Volumetric Hole Size Calculation**

# **Hole Size Calculations Off Cement Volumes**

- Known volume of cement pumped
- Known volume of cement returned to surface
- Must not have had any losses
- Must have bumped plug

# **Average Hole Size**

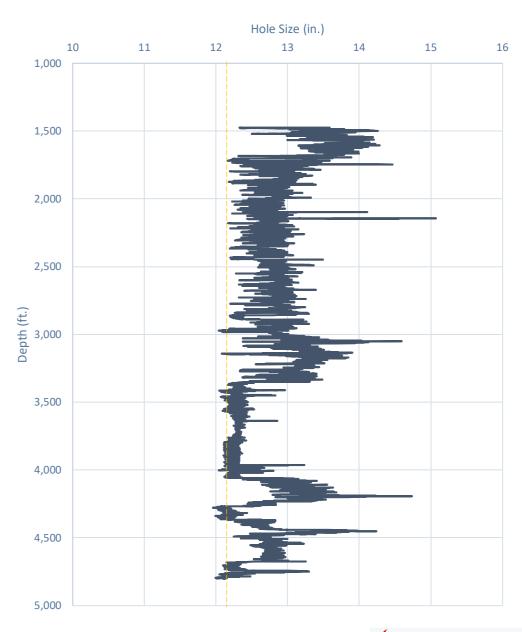
- 12.25" Hole
  - 12.88" Hole
    - 5.13% diameter increase
    - 10.52% area increase
  - 0.63" Average enlargement
  - 0.58" Median enlargement
  - 179 Well Count
- 9.875" Hole
  - 10.30" Hole
    - 4.24% diameter increase
    - 9.64% area increase
  - 0.42" Average enlargement
  - 0.46" Median enlargement
  - 11 Well Count



# Caliper Hole Size (12.25")

# **Average Hole Size**

- 12.25" Bit
  - 12.76" Hole
    - 4.14% diameter increase
    - 8.44% area increase
  - 0.51" Average enlargement
  - 0.52" Median enlargement
  - Brine



Modelo 10 Fed Com #501H

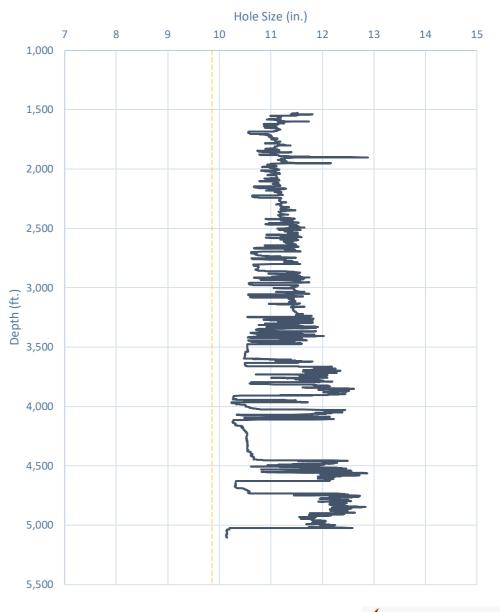


# Caliper Hole Size (9.875")

# **Average Hole Size**

- 9.875" Hole
  - 11.21" Hole
    - 13.54% diameter increase
    - 28.92% area increase
  - 1.33" Average enlargement
  - 1.30" Median enlargement
  - EnerLite





# **Design A**

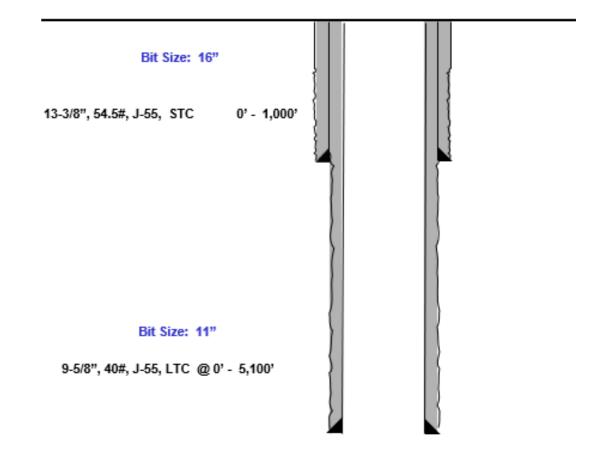
# Proposed 11" Hole with 9.625" 40# J55/HCK55 LTC Casing

- 11" Bit + 0.52" Average hole enlargement = 11.52" Hole Size
  - 0.9475" Clearance to casing OD

$$= \frac{11.52 - 9.625}{2}$$
• 0.4475" Clearance to coupling OD

- Previous Shoe 13.375" 54.5# J55 STC
  - 0.995" Clearance to coupling OD (~1,200' overlap)

$$=\frac{12.615-10.625}{2}$$



# **Design B**







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## **Casing Spec Sheets**

### **PERFORMANCE DATA**

API LTC		
Technical	Data	Sheet

9.625 in 40.00 lbs/ft

K55 HC

### Tubular Parameters

Size	9.625	in	Minimum Yield	55	ksi
Nominal Weight	40.00	lbs/ft	Minimum Tensile	95	ksi
Grade	K55 HC		Yield Load	629	kips
PE Weight	38.94	lbs/ft	Tensile Load	1088	kips
Wall Thickness	0.395	in	Min. Internal Yield Pressure	3,950	psi
Nominal ID	8.835	in	Collapse Pressure	3600	psi
Drift Diameter	8.750	in		•	
Nom. Pipe Body Area	11.454	in²			

#### **Connection Parameters**

10.625	in
10.500	in
8	tpi
3.50	turns
4.750	in
3,950	psi
	10.500 8 3.50 4.750

### Pipe Body and API Connections Performance Data

13.375	54.50/0.380	J55

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Mechanical Properties	Pipe	BTC	LTC	STC	
Minimum Yield Strength	55,000	-	-	-	psi
Maximum Yield Strength	80,000	-	-	-	psi
Minimum Tensile Strength	75,000	-	-	-	psi
Dimensions	Ptpe	BTC	LTC	STC	
Outside Diameter	13.375	14.375	-	14.375	in.
Wall Thickness	0.380	-	-	-	in.
Inside Diameter	12.615	12.615	-	12.615	in.
Standard Drift	12.459	12.459	-	12.459	in.
Alternate Drift	-	-	-	-	in.
Nominal Linear Weight, T&C	54.50	-	-	-	libs/ft
Plain End Weight	52.79	-	-	-	libs/ft
Performance	Ptpe	втс	LTC	STC	
Minimum Collapse Pressure	1,130	1,130	-	1,130	psi
Minimum Internal Yield Pressure	2,740	2,740	-	2,740	psi
Minimum Pipe Body Yield Strength	853.00	-	-	-	1000 lbs
Joint Strength	-	909	-	514	1000 lbs
Reference Length	-	11,125	-	6,290	ft
Make-Up Data	Ptpe	BTC	LTC	STC	
Make-Up Loss	-	4.81	-	3.50	in.
Minimum Make-Up Torque	-	-	-	3,860	ft-lbs
Maximum Make-Up Torque	-	-	-	6,430	ff-lbs

## **Casing Spec Sheets**

### Pipe Body and API Connections Performance Data

10.750 40.50/0.350 J55					PD
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					USC 🔵 Metr
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Mechanical Properties	Pipe	втс	LTC	STC	
Minimum Yield Strength	55,000	-	-	-	psi
Maximum Yield Strength	80,000	-	-	-	psi
Minimum Tensile Strength	75,000	-	-	-	psi
Dimensions	Pipe	втс	LTC	STC	
Outside Diameter	10.750	11.750	-	11.750	in.
Wall Thickness	0.350				in.
Inside Diameter	10.050	10.050		10.050	in.
Standard Drift	9.894	9.894	-	9.894	in.
Alternate Drift	-	-	-	-	in.
Nominal Linear Weight, T&C	40.50	-	-	-	lbs/ft
Plain End Weight	38.91	-	-	-	lbs/ft
Performance	Pipe	втс	LTC	STC	
Minimum Collapse Pressure	1,580	1,580	-	1,580	psi
Minimum Internal Yield Pressure	3,130	3,130	-	3,130	psi
Minimum Pipe Body Yield Strength	629.00				1000 lbs
Joint Strength	-	700	-	420	1000 lbs
Reference Length	-	11,522	-	6,915	ft
Make-Up Data	Pipe	втс	LTC	STC	
Make-Up Loss		4.81	-	3.50	in.
Minimum Make-Up Torque	-	-	-	3,150	ft-lbs
Maximum Make-Up Torque	-	-	-	5,250	ft-lbs

						AP	I 5CT, 1	10th Ed. Co	nnect	ion Dat	a Shee
C	9 <b>.D.</b> (in) 8.625	WEIGHT (It Nominal: Plain End:	o/ft) 32.00 31.13	WALL (i 0.352	n)		<b>ADE</b> 55	* <b>API DRIF</b> 7.796	Г (in)	<b>RBV</b> 87	• • • •
	l	Material Properti	es (PE)				F	Pipe Body I	Data (I	PE)	
		Pipe						Geom	etry		
М	inimum '	Yield Strength:	55	ksi		Nomin	nal ID:			7.92	inch
М	aximum	Yield Strength:	80	ksi		Nomin	al Area	i:		9.149	in <sup>2</sup>
М	inimum	Tensile Strength:	75	ksi		*Spec	ial/Alt. [	Drift:		7.875	inch
		Coupling						Perform	ance		
М	inimum '	Yield Strength:	55	ksi		Pipe E	Body Yie	eld Strength	:	503	kips
Μ	aximum	Yield Strength:	80	ksi				istance:		2,530	psi
М	inimum <sup>·</sup>	Tensile Strength:	75	ksi			Yield Prestorical)	essure:		3,930	psi
_		API Connection Coupling OD: 9.	625"					PI Connecti STC Torqu			
S	TC Inter	nal Pressure:	3,930	psi		Min:	2.793		3.724	Max:	4.655
		Strength:	372				,		,		,
		LTC Performa	ance					LTC Torqu	e (ft-lk	os)	
L.	C Interr	nal Pressure:	3,930	psi		Min:	3,130	Opti:	4,174	Max:	5,217
		Strength: Performance - Cl	417 olg OD =					BTC Torqu	e (ft-lk	os)	
B	TC Inter	nal Pressure:	3,930	psi		follo		idelines regar	•		ake up
В	TC Joint	Strength:	503	kips							
<b></b>		*	Alt. Drift will	be used unle	ess A	API Drift	is specifie	ed on order.			
	**	f above API connecti	ons do not	suit your ne 100% of p				m connections	are av	ailable up	to

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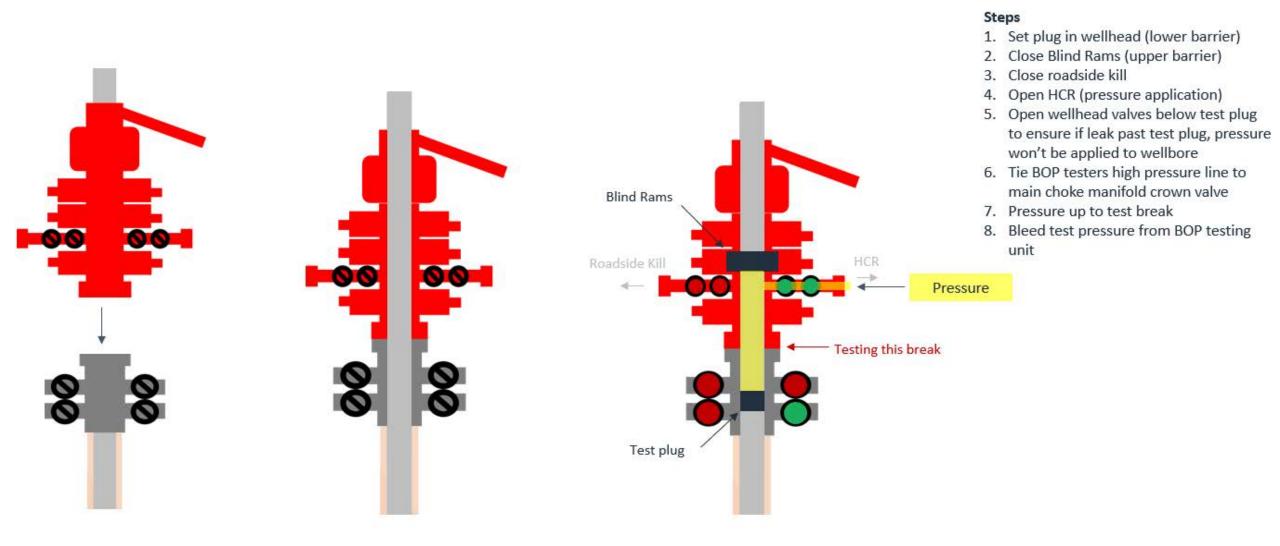


### **Break-test BOP & Offline Cementing:**

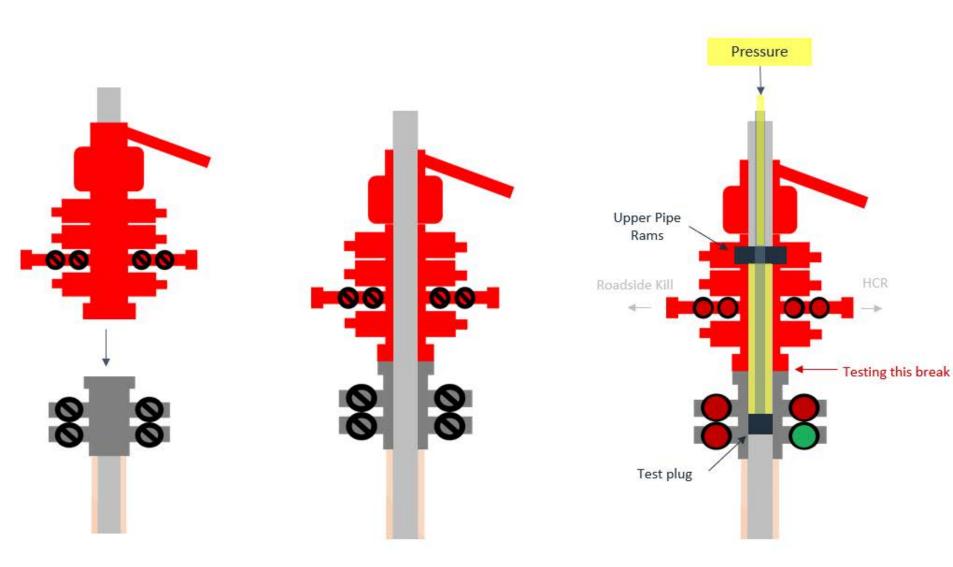
EOG Resources Inc. (EOG) respectfully requests a variance from the minimum standards for well control equipment testing of ECFR Title 43 Part 3172.6(b)(9)(iv) to allow a testing schedule of the blow out preventer (BOP) and blow out prevention equipment (BOPE) along with Batch Drilling & Offline cement operations to include the following:

- Full BOPE test at first installation on the pad.
- Full BOPE test every 21 days.
- This test will be conducted for 5M rated hole intervals only.
- Each rig requesting the break-test variance is capable of picking up the BOP without damaging components using winches, following API Standard 53, Well Control Equipment Systems for Drilling Wells (Fifth edition, December 2018, Annex C. Table C.4) which recognizes break testing as an acceptable practice.
- Function tests will be performed on the following BOP elements:
  - Annular **à** during each full BOPE test
  - Upper Pipe Rams **à** On trip ins where FIT required
  - Blind Rams **à** Every trip
  - Lower Pipe Rams à during each full BOPE test
- Break testing BOP and BOPE coupled with batch drilling operations and option to offline cement and/or remediate (if needed) any surface or intermediate sections, according to attached offline cementing support documentation.
- After the well section is secured, the BOP will be disconnected from the wellhead and walked with the rig to another well on the pad.
- TA cap will also be installed per Wellhead vendor procedure and pressure inside the casing will be monitored via the valve on the TA cap as per standard batch drilling ops.

## **Break Test Diagram (HCR valve)**



## **Break Test Diagram (Test Joint)**



### Steps

- 1. Set plug in with test joint wellhead (lower barrier)
- 2. Close Upper Pipe Rams (upper barrier)
- 3. Close roadside kill
- 4. Close HCR
- Open wellhead valves below test plug to ensure if leak past test plug, pressure won't be applied to wellbore
- 6. Tie BOP testers high pressure line to top of test joint
- 7. Pressure up to test break
- 8. Bleed test pressure from BOP testing unit

## Seog resources

Offline Intermediate Cementing Procedure

### **Cement Program**

1. No changes to the cement program will take place for offline cementing.

### Summarized Operational Procedure for Intermediate Casing

- 1. Run casing as per normal operations. While running casing, conduct negative pressure test and confirm integrity of the float equipment back pressure valves.
  - a. Float equipment is equipped with two back pressure valves rated to a minimum of 5,000 psi.
- 2. Land production casing on mandrel hanger through BOP.
  - a. If casing is unable to be landed with a mandrel hanger, then the **casing will be cemented online**.
- 3. Break circulation and confirm no restrictions.
  - a. Ensure no blockage of float equipment and appropriate annular returns.
  - b. Perform flow check to confirm well is static.
- 4. Set pack-off
  - a. If utilizing a fluted/ported mandrel hanger, ensure well is static on the annulus and inside the casing by filling the pipe with kill weight fluid, remove landing joint, and set annular packoff through BOP. Pressure test to 5,000 psi for 10 min.
  - b. If utilizing a solid mandrel hanger, ensure well is static on the annulus and inside the casing by filling the pipe with kill weight fluid. Pressure test seals to 5,000 psi for 10 min. Remove landing joint through BOP.
- 5. After confirmation of both annular barriers and the two casing barriers, install TA plug and pressure test to 5,000 psi for 10 min. Notify the BLM with intent to proceed with nipple down and offline cementing.
  - a. Minimum 4 hrs notice.
- 6. With the well secured and BLM notified, nipple down BOP and secure on hydraulic carrier or cradle.
  - a. Note, if any of the barriers fail to test, the BOP stack will not be nippled down until after the cement job has concluded and both lead and tail slurry have reached 500 psi.
- 7. Skid/Walk rig off current well.
- 8. Confirm well is static before removing TA Plug.
  - a. Cementing operations will not proceed until well is under control. (If well is not static, notify BLM and proceed to kill)
  - b. Casing outlet valves will provide access to both the casing ID and annulus. Rig or third party pump truck will kill well prior to cementing.
  - c. Well control plan can be seen in Section B, Well Control Procedures.
  - d. If need be, rig can be moved back over well and BOP nippled back up for any further remediation.

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### **S**eog resources

Offline Intermediate Cementing Procedure

- e. Diagram for rig positioning relative to offline cementing can be seen in Figure 4.
- 9. Rig up return lines to take returns from wellhead to pits and rig choke.
  - a. Test all connections and lines from wellhead to choke manifold to 5,000 psi high for 10 min.
  - b. If either test fails, perform corrections and retest before proceeding.
  - c. Return line schematics can be seen in Figure 3.
- 10. Remove TA Plug from the casing.
- 11. Install offline cement tool.
  - a. Current offline cement tool schematics can be seen in Figure 1 (Cameron) and Figure 2 (Cactus).
- 12. Rig up cement head and cementing lines.
  - a. Pressure test cement lines against cement head to 80% of casing burst for 10 min.
- 13. Break circulation on well to confirm no restrictions.
  - a. If gas is present on circulation, well will be shut in and returns rerouted through gas buster.
  - b. Max anticipated time before circulating with cement truck is 6 hrs.
- 14. Pump cement job as per plan.
  - a. At plug bump, test casing to 0.22 psi/ft or 1500 psi, whichever is greater.
  - b. If plug does not bump on calculated, shut down and wait 8 hrs or 500 psi compressive strength, whichever is greater before testing casing.
- 15. Confirm well is static and floats are holding after cement job.
  - a. With floats holding and backside static:
    - i. Remove cement head.
  - b. If floats are leaking:
    - i. Shut-in well and WOC (Wait on Cement) until tail slurry reaches 500 psi compressive strength and the casing is static prior to removing cement head.
  - c. If there is flow on the backside:
    - i. Shut in well and WOC until tail slurry reaches 500 psi compressive strength. Ensure that the casing is static prior to removing cement head.
- 16. Remove offline cement tool.
- 17. Install night cap with pressure gauge for monitoring.
- 18. Test night cap to 5,000 psi for 10 min.

#### **Example Well Control Plan Content**

### A. Well Control Component Table

The table below, which covers the cementing of the <u>5M MASP (Maximum Allowable Surface Pressure) portion of the well</u>, outlines the well control component rating in use. This table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the BOP nippled up to the wellhead.

Intermediate hole section, 5M requirement

Component	RWP
Pack-off	10M
Casing Wellhead Valves	10M
Annular Wellhead Valves	5M
TA Plug	10M
Float Valves	5M
2" 1502 Lo-Torque Valves	15M

### **B. Well Control Procedures**

Well control procedures are specific to the rig equipment and the operation at the time the kick occurs. Below are the minimal high-level tasks prescribed to assure a proper shut-in while circulating and cementing through the Offline Cement Adapter.

### **General Procedure While Circulating**

- 1. Sound alarm (alert crew).
- 2. Shut down pumps.
- 3. Shut-in Well (close valves to rig pits and open valve to rig choke line. Rig choke will already be in the closed position).
- 4. Confirm shut-in.
- 5. Notify tool pusher/company representative.

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### **S**eog resources

Offline Intermediate Cementing Procedure

- 6. Read and record the following:
  - a. SICP (Shut in Casing Pressure) and AP (Annular Pressure)
  - b. Pit gain
  - c. Time
  - d. Regroup and identify forward plan to continue circulating out kick via rig choke and mud/gas separator. Circulate and adjust mud density as needed to control well.

### **General Procedure While Cementing**

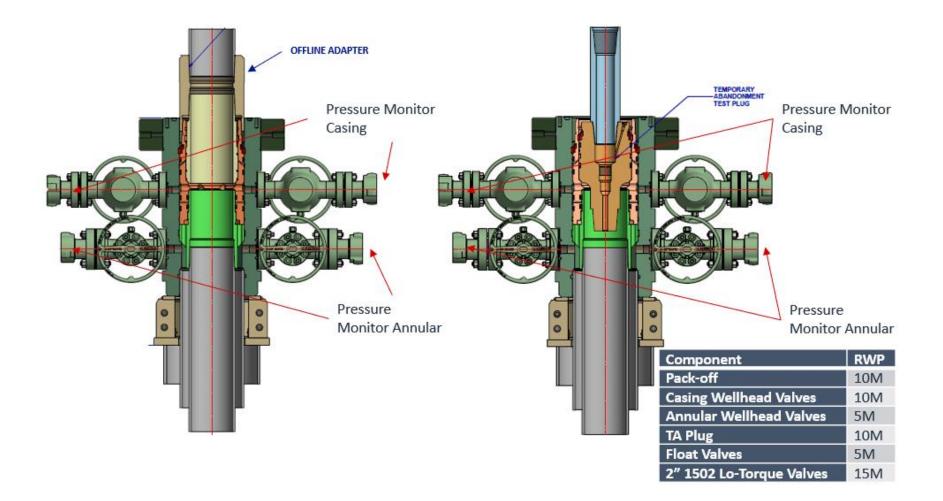
- 1. Sound alarm (alert crew).
- 2. Shut down pumps.
- 3. Shut-in Well (close valves to rig pits and open valve to rig choke line. Rig choke will already be in the closed position).
- 4. Confirm shut-in.
- 5. Notify tool pusher/company representative.
- 6. Open rig choke and begin pumping again taking returns through choke manifold and mud/gas separator.
- 7. Continue to place cement until plug bumps.
- 8. At plug bump close rig choke and cement head.
- 9. Read and record the following
  - a. SICP and AP
  - b. Pit gain
  - c. Time
  - d. Shut-in annulus valves on wellhead

### General Procedure After Cementing

- 1. Sound alarm (alert crew).
- 2. Shut-in Well (close valves to rig pits and open valve to rig choke line. Rig choke will already be in the closed position).
- 3. Confirm shut-in.
- 4. Notify tool pusher/company representative.
- 5. Read and record the following:
  - a. SICP and AP
  - b. Pit gain
  - c. Time
  - d. Shut-in annulus valves on wellhead

### **Seog resources** Offline Intermediate Cementing Procedure

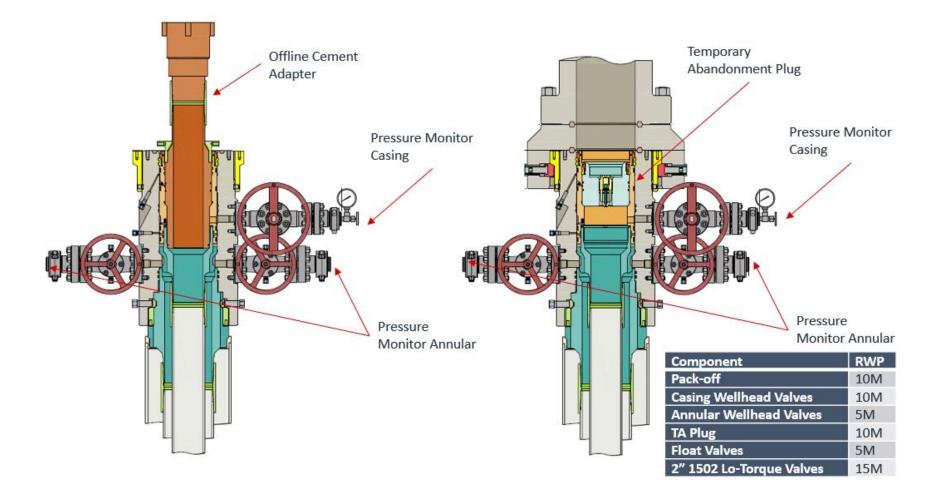
Figure 1: Cameron TA Plug and Offline Adapter Schematic



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# **Offline Intermediate Cementing Procedure**





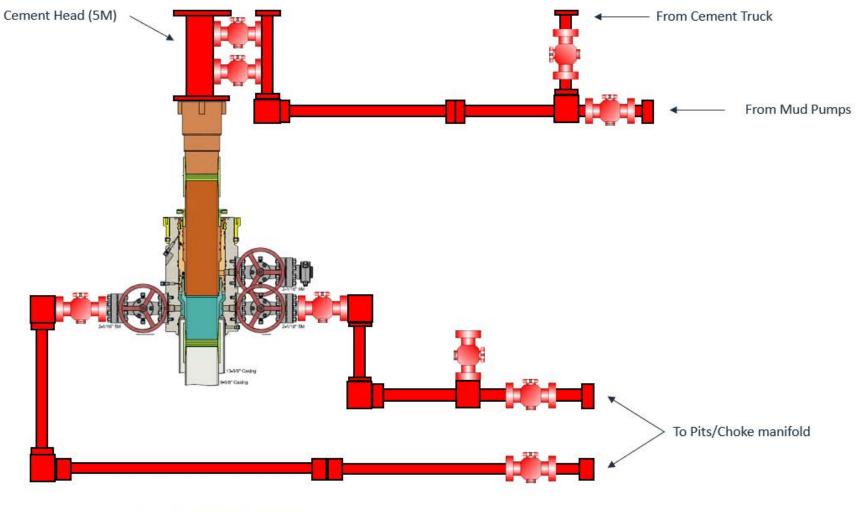
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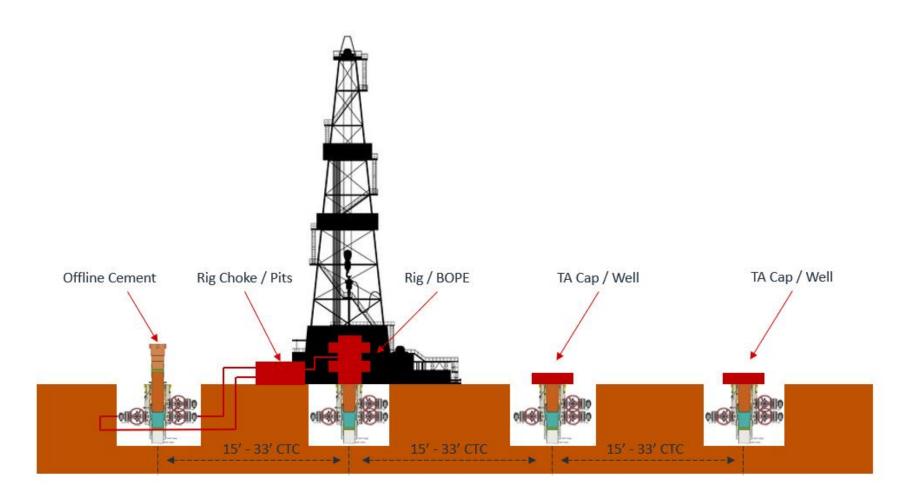






\*\*\* All Lines 10M rated working pressure





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## **S**eog resources

### **Amazing 19 Fed Package**

Wells in package:	Tgt TVD
Jefe 29 Fed Com #102H	8,818
Jefe 29 Fed Com #103H	8,818
Jefe 29 Fed Com #104H	8,818
Jefe 29 Fed Com #105H	8,818
Jefe 29 Fed Com #106H	8,818
Jefe 29 Fed Com #107H	8,818
Jefe 29 Fed Com #108H	8,818
Jefe 29 Fed Com #201H	8,907
Jefe 29 Fed Com #202H	8,907
Jefe 29 Fed Com #203H	8,907
Jefe 29 Fed Com #204H	9,094
Jefe 29 Fed Com #205H	9,094
Jefe 29 Fed Com #206H	9,094
Jefe 29 Fed Com #207H	9,094
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Jefe 29 Fed Com #209H	8,907
Jefe 29 Fed Com #210H	8,907
Jefe 29 Fed Com #211H	8,907
Jefe 29 Fed Com #212H	8,907
Jefe 29 Fed Com #213H	8,907
Jefe 29 Fed Com #214H	8,907
Jefe 29 Fed Com #215H	8,907
Jefe 29 Fed Com #301H	9,499
Jefe 29 Fed Com #302H	9,499
Jefe 29 Fed Com #303H	9,499
Jefe 29 Fed Com #304H	9,499
Jefe 29 Fed Com #305H	9,499
Jefe 29 Fed Com #306H	9,499
Jefe 29 Fed Com #581H	10,960
Jefe 29 Fed Com #582H	10,960
Jefe 29 Fed Com #584H	10,960
Jefe 29 Fed Com #586H	10,960

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

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

District III

1000 Rio Brazos Rd., Aztec, NM 87410 Phone:(505) 334-6178 Fax:(505) 334-6170

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

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

CONDITIONS

Operator:	OGRID:
EOG RESOURCES INC	7377
P.O. Box 2267	Action Number:
Midland, TX 79702	288697
	Action Type:
	[C-103] NOI Change of Plans (C-103A)
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#### CONDITIONS

Created By	Condition	Condition Date
pkautz	None	12/27/2023

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Action 288697