

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

Form C-101
August 1, 2011

Permit 278743

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address CAZA OPERATING, LLC 200 N Loraine St Midland, TX 79701		2. OGRID Number 249099
		3. API Number 30-025-47388
4. Property Code 40096	5. Property Name GRAMMA 27 STATE	6. Well No. 008H

7. Surface Location

UL - Lot A	Section 27	Township 21S	Range 34E	Lot Idn A	Feet From 25	N/S Line N	Feet From 1100	E/W Line E	County Lea
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8. Proposed Bottom Hole Location

UL - Lot P	Section 27	Township 21S	Range 34E	Lot Idn P	Feet From 20	N/S Line S	Feet From 1316	E/W Line E	County Lea
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9. Pool Information

GRAMA RIDGE;BONE SPRING, NE	28435
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Additional Well Information

11. Work Type New Well	12. Well Type OIL	13. Cable/Rotary	14. Lease Type State	15. Ground Level Elevation 3689
16. Multiple N	17. Proposed Depth 13946	18. Formation 1st Bone Spring Sand	19. Contractor	20. Spud Date 3/30/2020
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

☒ We will be using a closed-loop system in lieu of lined pits

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surf	17.5	13.375	54.5	1900	1400	0
Int1	12.25	9.625	40	5400	1000	0
Prod	8.75	6	24.5	13946	3200	0

Casing/Cement Program: Additional Comments

DVT and ECP set at 3900'+/-

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Annular	5000	5000	Schaffer
Double Ram	5000	5000	Schaffer

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief. I further certify I have complied with 19.15.14.9 (A) NMAC ☒ and/or 19.15.14.9 (B) NMAC ☒ if applicable.	OIL CONSERVATION DIVISION	
Signature:		
Printed Name: Electronically filed by Steve Morris	Approved By: Paul F Kautz	
Title: Engineer	Title: Geologist	
Email Address: steve.morris@morcoreengineering.com	Approved Date: 7/7/2020	Expiration Date: 7/7/2022
Date: 7/6/2020	Phone: 432-201-3031	Conditions of Approval Attached

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number	² Pool Code 28435	³ Pool Name GRAMMA RIDGE; BONE SPRING NORTHEAST
⁴ Property Code 40096	⁵ Property Name GRAMMA 27 STATE	⁶ Well Number 8H
⁷ OGRID No. 249099	⁸ Operator Name CAZA OPERATING LLC	⁹ Elevation 3689'

¹⁰ Surface Location

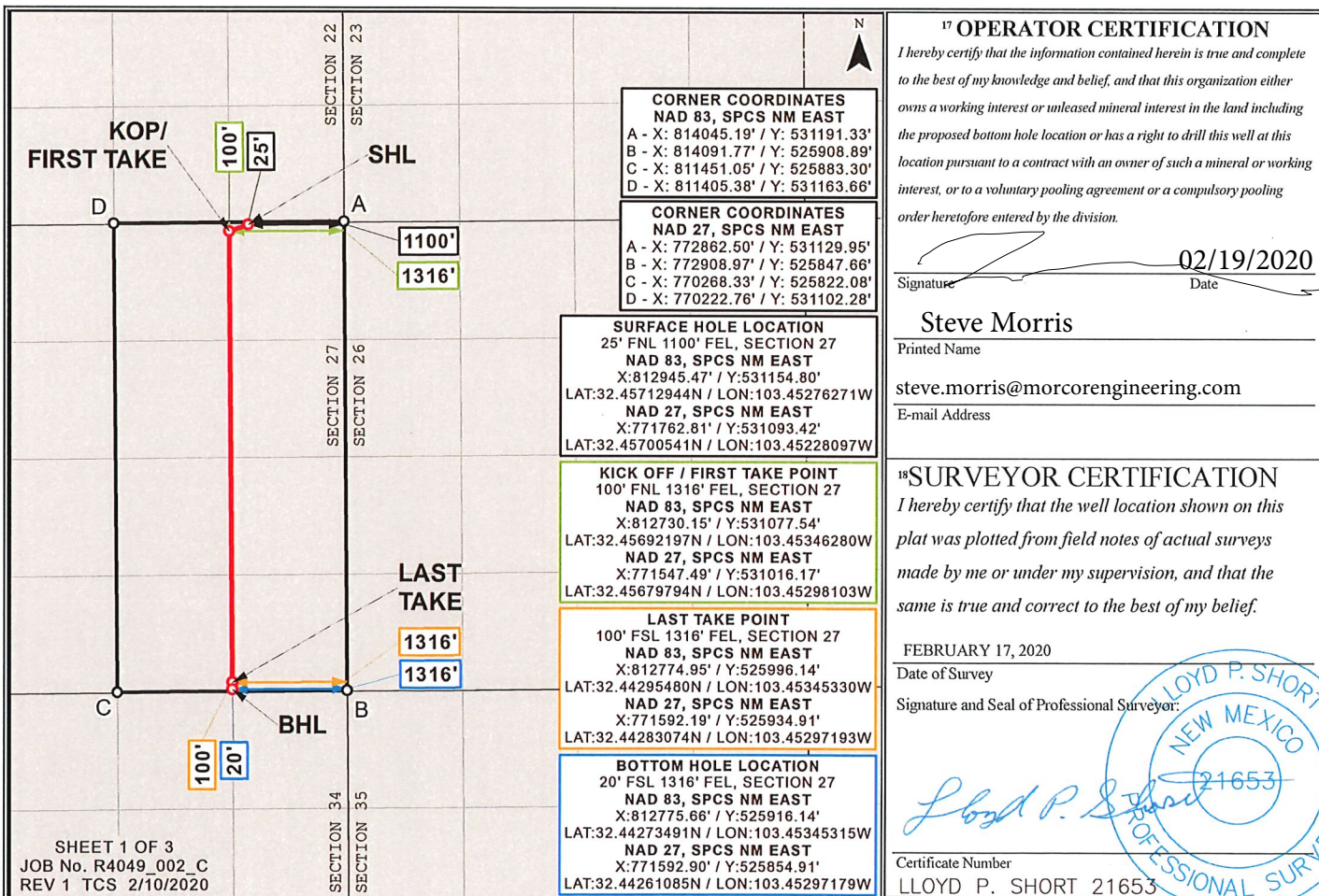
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	27	21S	34E		25	NORTH	1100	EAST	LEA

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
P	27	21S	34E		20	SOUTH	1316	EAST	LEA

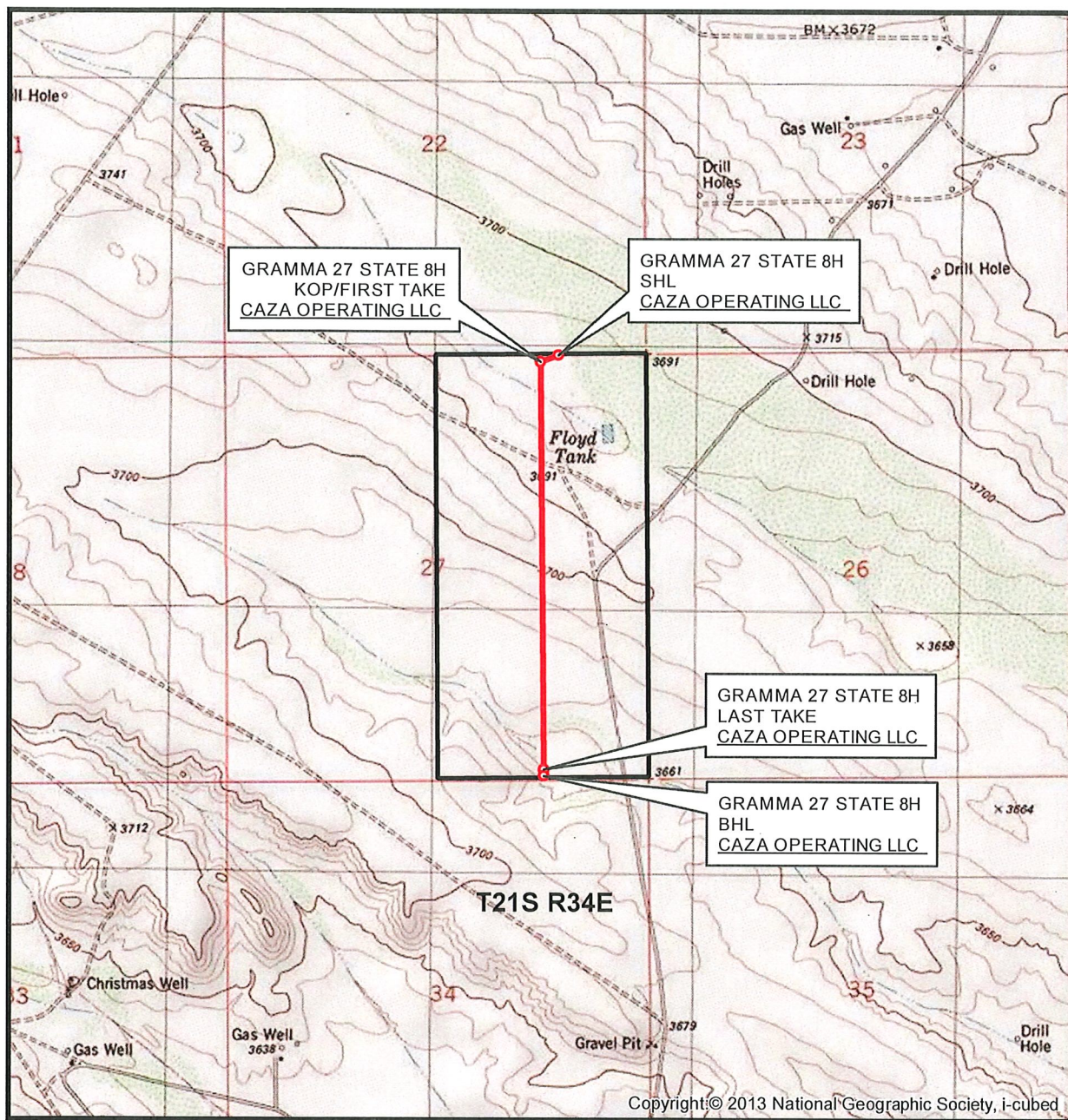
¹² Dedicated Acres 160	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



Distances/areas relative to NAD 83 Combined Scale Factor: 0.99981911 Convergence Angle: 00°28'17.090004"

LOCATION VERIFICATION MAP



SEC. 27 TWP. 21-S RGE. 34-E
 SURVEY: N.M.P.M.
 COUNTY: LEA
 OPERATOR: CAZA OPERATING LLC
 DESCRIPTION: 25' FNL & 1100' FEL
 ELEVATION: 3689'
 LEASE: GRAMMA 27 STATE
 U.S.G.S. TOPOGRAPHIC MAP: SAN SIMON RANCH, NM.

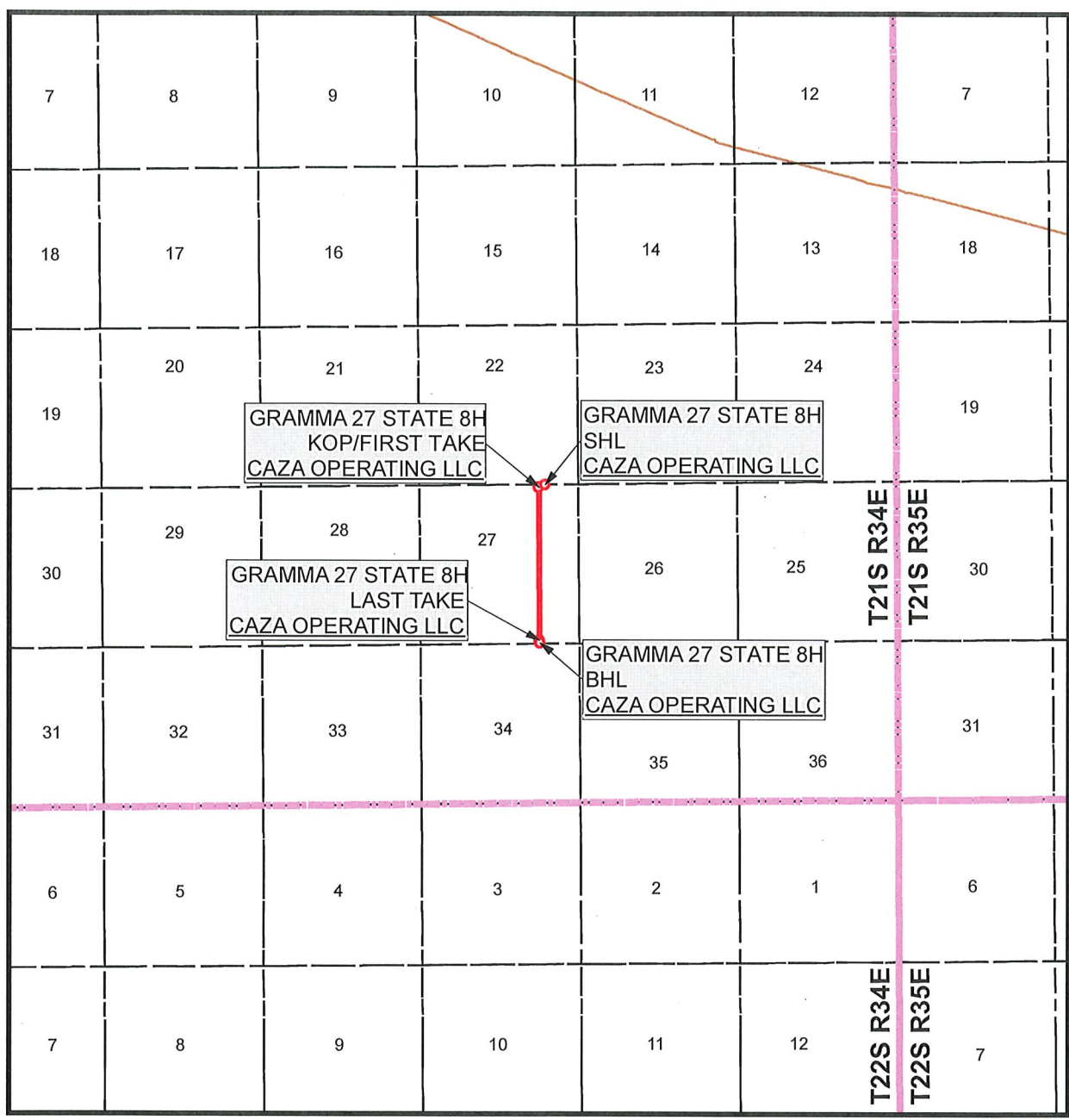
1" = 2,000'
 CONTOUR INTERVAL = 10'



SHEET 2 OF 3

PREPARED BY:
 R-SQUARED GLOBAL, LLC
 1309 LOUISVILLE AVENUE, MONROE, LA 71201
 318-323-6900 OFFICE
 JOB No. R4049_002_C

VICINITY MAP



SEC. 27 TWP. 21-S RGE. 34-E

SURVEY: N.M.P.M.

COUNTY: LEA

OPERATOR: CAZA OPERATING LLC

DESCRIPTION: 25' FNL & 1100' FEL

ELEVATION: 3689'

LEASE: GRAMMA 27 STATE

U.S.G.S. TOPOGRAPHIC MAP: SAN SIMON RANCH, NM.

1" = 1 MILE



SHEET 3 OF 3

PREPARED BY:
R-SQUARED GLOBAL, LLC
1309 LOUISVILLE AVENUE, MONROE, LA 71201
318-323-6900 OFFICE
JOB No. R4049_002_C

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Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

GAS CAPTURE PLAN

Date: 7/7/2020

☒ Original

Operator & OGRID No.: [249099] CAZA OPERATING, LLC

☐ Amended - Reason for
Amendment:

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomple to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
GRAMMA 27 STATE #008H	30-025-47388	A-27-21S-34E	0025N 1100E	500	Flared	

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to TARGA MIDSTREAM SERVICES LLC and will be connected to TARGA MIDSTREAM SERVICES LLC Low Pressure gathering system located in Lea County, New Mexico. It will require 300' of pipeline to connect the facility to Low Pressure gathering system. CAZA OPERATING, LLC provides (periodically) to TARGA MIDSTREAM SERVICES LLC a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, CAZA OPERATING, LLC and TARGA MIDSTREAM SERVICES LLC have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at TARGA MIDSTREAM SERVICES LLC Processing Plant located in Sec. 33, Twn. 21S, Rng. 37E, Lea County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on TARGA MIDSTREAM SERVICES LLC system at that time. Based on current information, it is CAZA OPERATING, LLC's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
 - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
 - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
 - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

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Form APD Comments

Permit 278743

PERMIT COMMENTS

Operator Name and Address: CAZA OPERATING, LLC [249099] 200 N Loraine St Midland, TX 79701		API Number: 30-025-47388
		Well: GRAMMA 27 STATE #008H

Created By	Comment	Comment Date
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Form APD Conditions

Permit 278743

PERMIT CONDITIONS OF APPROVAL

Operator Name and Address: CAZA OPERATING, LLC [249099] 200 N Loraine St Midland, TX 79701	API Number: 30-025-47388
	Well: GRAMMA 27 STATE #008H

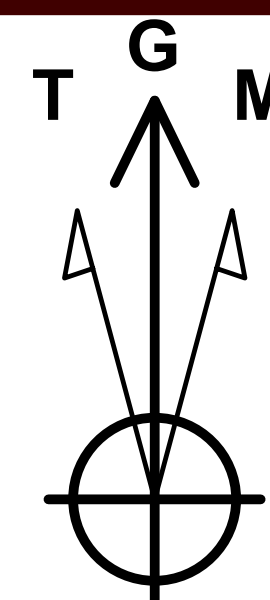
OCD Reviewer	Condition
pkautz	Will require a directional survey with the C-104
pkautz	1) SURFACE & INTERMEDIATE CASING - Cement must circulate to surface -- 2) PRODUCTION CASING - Cement must tie back into intermediate casing --
pkautz	If cement does not circulate to surface, must run temperature survey or other log to determine top of cement
pkautz	Surface casing must be set 25' below top of Rustler Anhydrite in order to seal off protectable water
pkautz	1)- The Operator is to notify NMOCD by sundry (Form C-103) within ten (10) days of the well being spud 2)- Drilling Sundries Form C-103 (Casing and Cement test are to be submitted within 10 days 3)- Completion Reports & Logs are to be submitted within 45 days 4)- Deviation / Directional Drill Survey are to be filed with or prior to C-104
pkautz	It is the operator's responsibility to monitor cancellation dates of approved APDs. APD's are good for 2 years and may be extended for one year. Only one 1 year extension will be granted if submitted by C-103 before expiration date. After expiration date or after a 1 year extension must submit new APD. If an APD expires and if site construction has occurred, site remediation is required.
pkautz	Stage Tool 1) Must notify OCD Hobbs Office prior to running Stage Tool at 5753703186 2) If using Stage Tool on Surface casing, Stage Tool must be set greater than 350' from surface and a minimum of 200 feet above surface shoe. 3) When using a Stage Tool on Intermediate or Production Casing Stage must be a minimum of 50 feet below previous casing shoe.



Project: Lea County, New Mexico (NAD83)
Site: Gramma 27 State
Well: 8H
Wellbore: OH
Design: Plan 1 02-21-20
Rig: Citacel #2

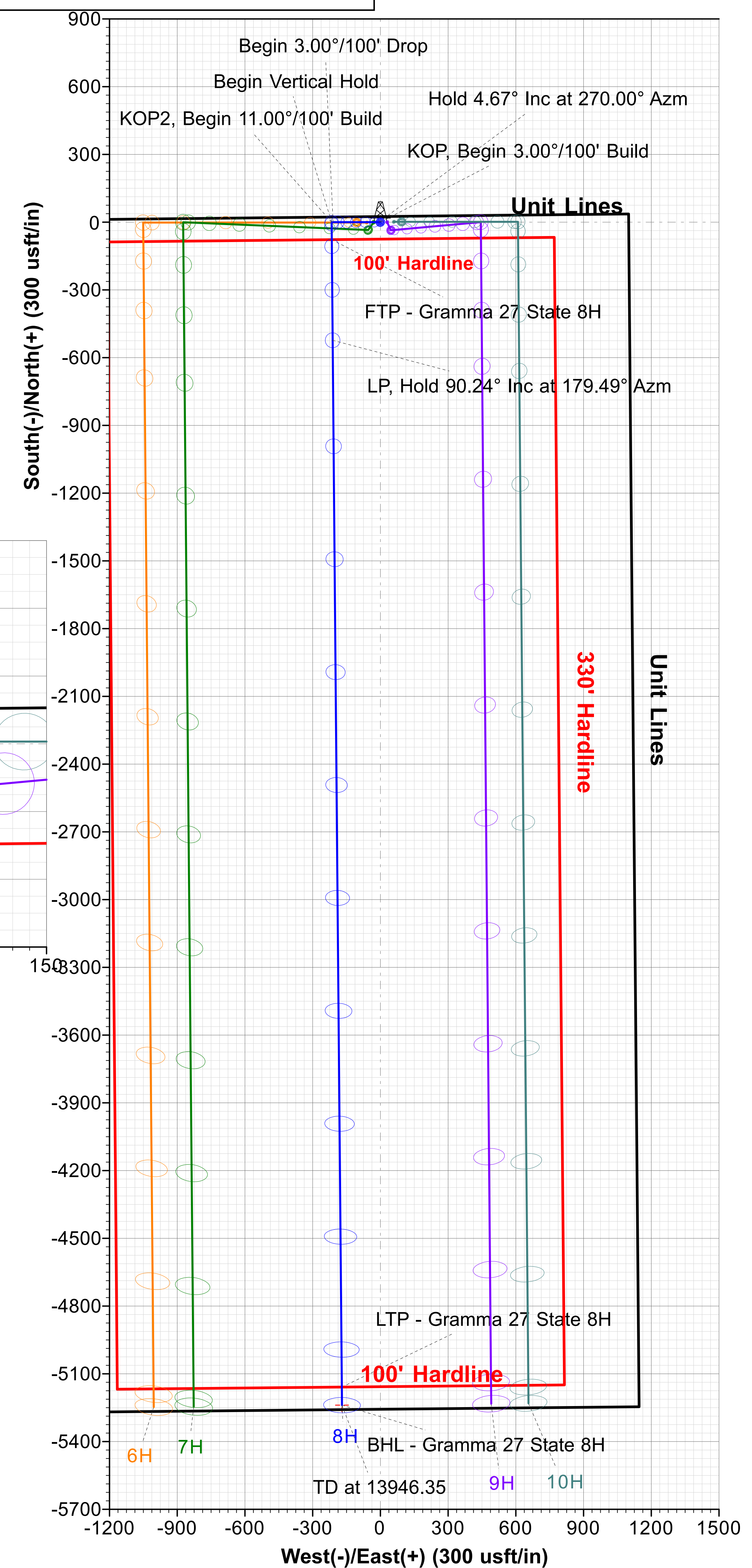
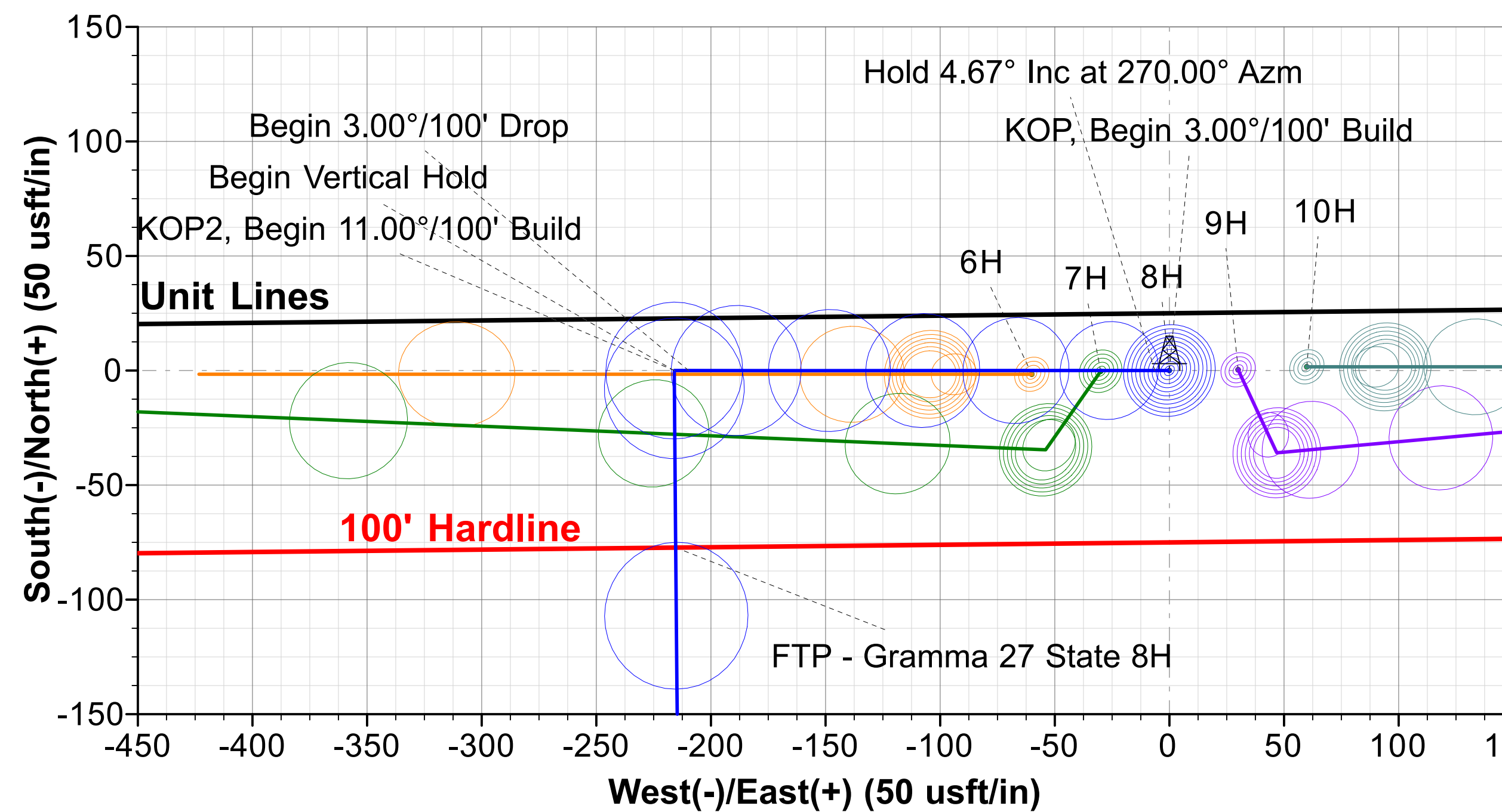
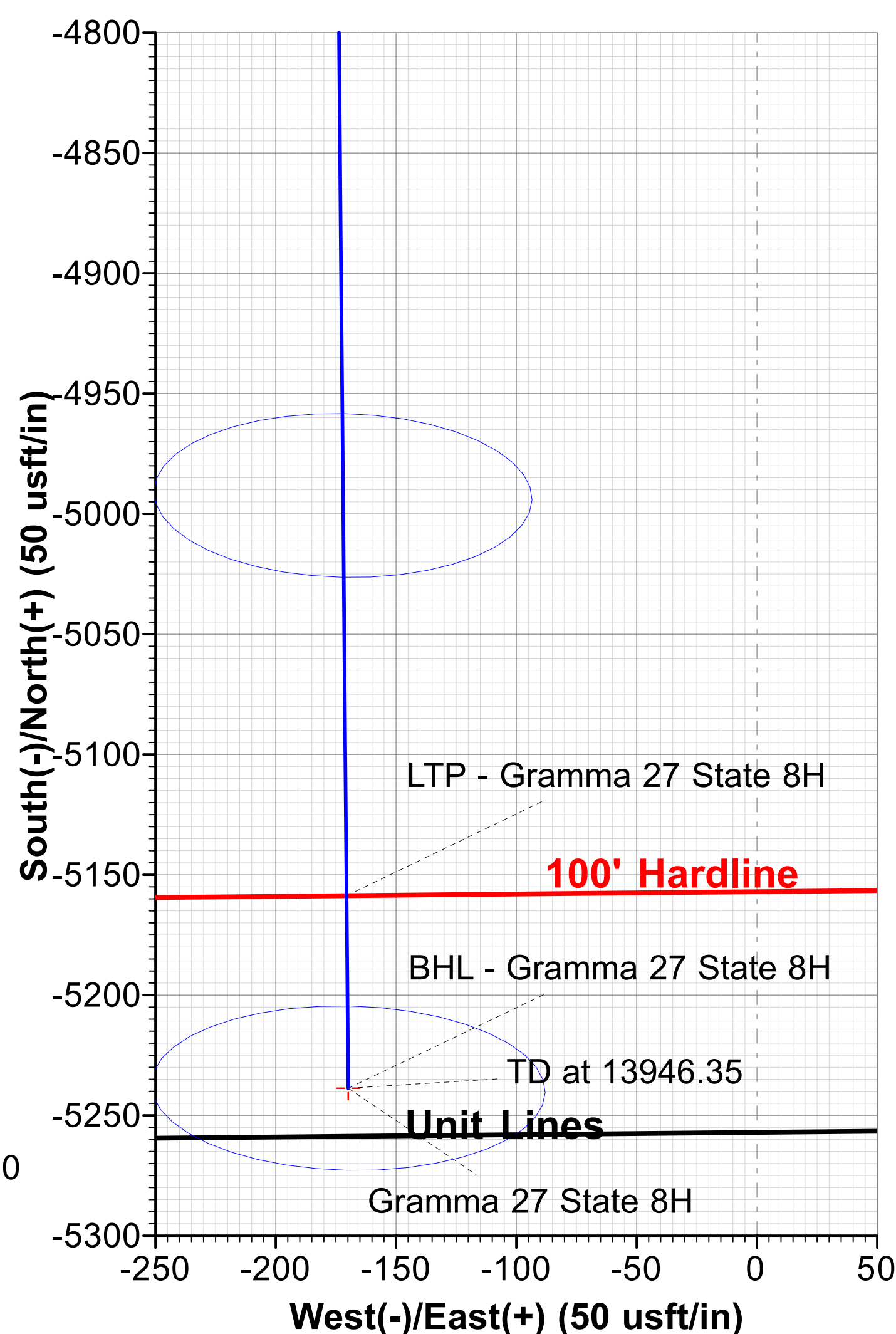
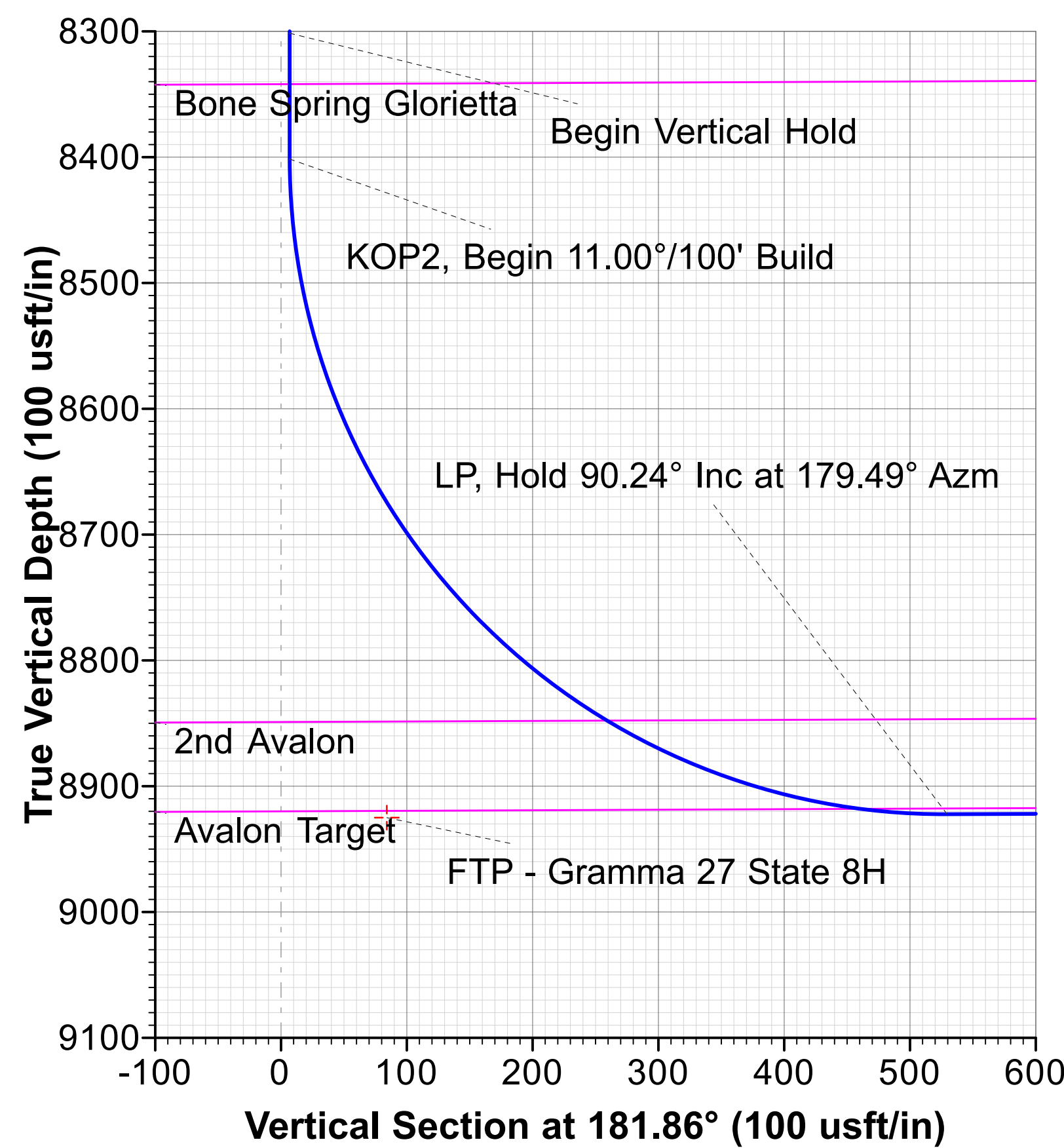
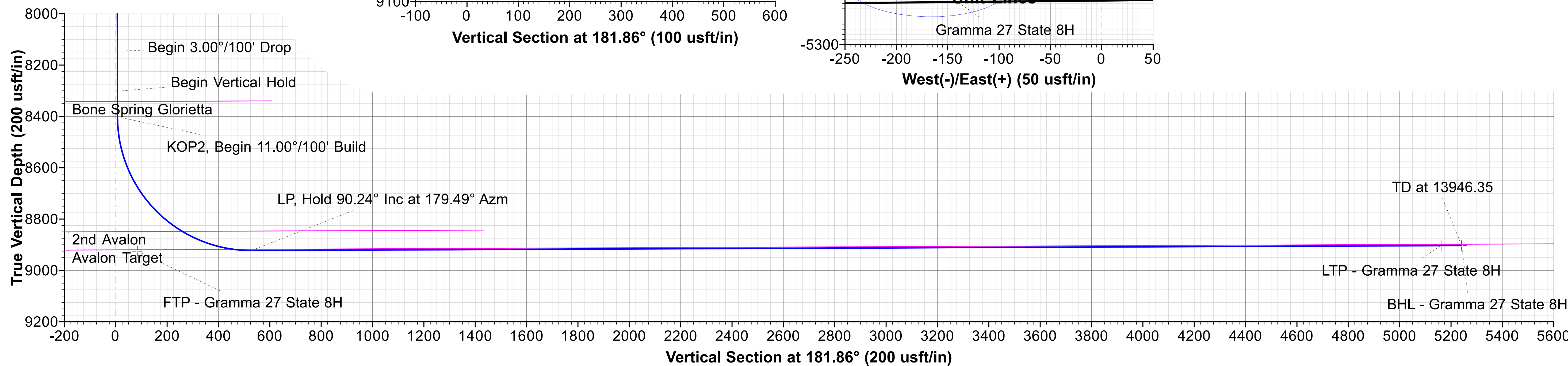
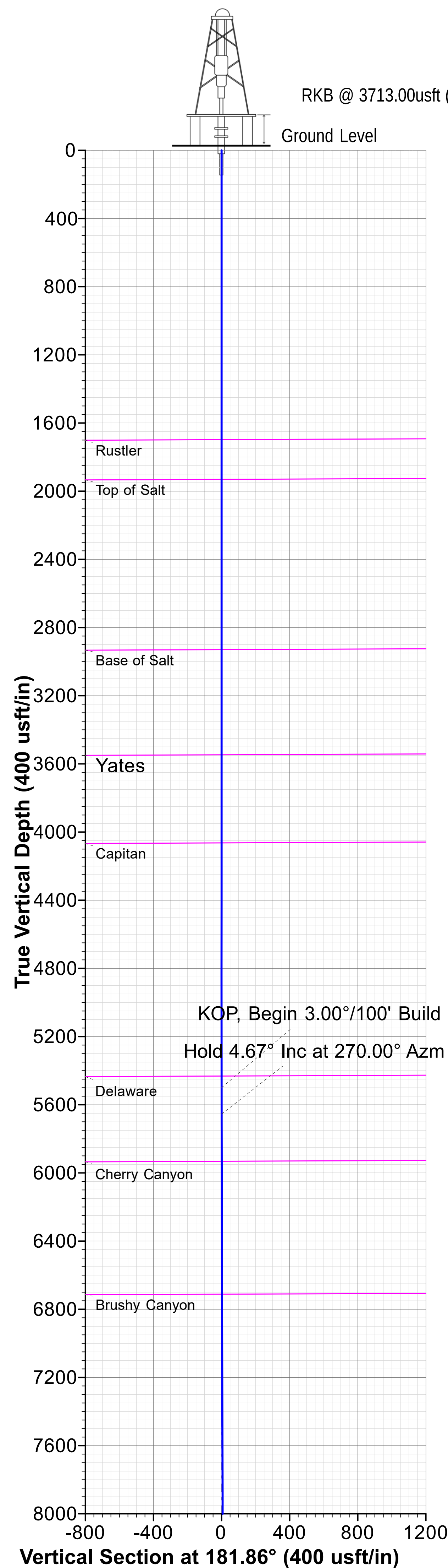


PHOENIX
TECHNOLOGY SERVICES



Azimuths to Grid North
True North: -0.47°
Magnetic North: 6.09°

Magnetic Field
Strength: 47995.4snT
Dip Angle: 60.22°
Date: 4/21/2020
Model: MVHD



WELL DETAILS											
DESIGN TARGET DETAILS											
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude				
BHL - Gramma 27 State 8H	8903.00	-5238.66	-169.81	525916.14	812775.66	32° 26' 33.845676 N	103° 27' 12.431340 W				
LTP - Gramma 27 State 8H	8903.33	-5158.67	-170.52	525996.14	812774.95	32° 26' 34.637280 N	103° 27' 12.431880 W				
FTP - Gramma 27 State 8H	8925.00	-77.26	-215.32	531077.54	812730.15	32° 27' 24.919092 N	103° 27' 12.466080 W				

SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	5500.00	0.00	0.00	5500.00	0.00	0.00	0.00	0.00	0.00		KOP, Begin 3.00°/100' Build
3	5655.57	4.67	270.00	5655.40	0.00	-6.33	3.00	270.00	0.21		Hold 4.67° Inc at 270.00° Azm
4	8154.56	4.67	270.00	8146.10	0.00	-209.67	0.00	0.00	6.79		Begin 3.00°/100' Drop
5	8310.13	0.00	0.00	8301.50	0.00	-216.00	3.00	180.00	7.00		Begin Vertical Hold
6	8410.13	0.00	0.00	8401.50	0.00	-216.00	0.00	0.00	7.00		KOP2, Begin 11.00°/100' Build
7	9230.45	90.24	179.49	8922.37	-522.99	-211.39	11.00	179.49	529.56		LP, Hold 90.24° Inc at 179.49° Azm
8	13946.35	90.24	179.49	8903.00	-5238.66	-169.81	0.00	0.00	5241.42	BHL - Gramma 27 State 8H	TD at 13946.35

LEGEND					
6H, OH, Plan 1 02-21-20 V0	7H, OH, Plan 1 02-21-20 V0	9H, OH, Plan 1 02-21-20 V0	10H, OH, Plan 1 02-21-20 V0	Plan 1 02-21-20	

FORMATION TOP DETAILS					
TVDPath	MDPath	Formation	DipAngle	DipDir	
1698.00	1698.00	Rustler	-0.24	181.86	
1931.00	1931.00	Top of Salt	-0.24	181.86	
2930.00	2930.00	Base of Salt	-0.24	181.86	
3547.00	3547.00	Yates	-0.24	181.86	
4064.00	4064.00	Capitan	-0.24	181.86	
5432.00	5432.00	Delaware	-0.24	181.86	
5932.00	5933.09	Cherry Canyon	-0.24	181.86	
6711.99	6715.67	Brushy Canyon	-0.24	181.86	
8341.97	8350.60	Bone Spring Glorietta	-0.24	181.86	
8847.91	8946.38	2nd Avalon	-0.24	181.86	
8918.07	9161.33	Avalon Target	-0.24	181.86	

Map System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: New Mexico Eastern Zone
Local Origin: Well 8H, Grid North
Latitude: 32° 27' 25.665984 N
Longitude: 103° 27' 9.945760 W
Grid East: 812945.47
Grid North: 531154.80
Scale Factor: 1.000
Geomagnetic Model: MVHD
Sample Date: 21-Apr-20
Magnetic Declination: 6.56°
Dip Angle from Horizontal: 60.22°
Magnetic Field Strength: 47995.41132444nT
To convert a Magnetic Direction to a Grid Direction, Add 6.09°
To convert a Magnetic Direction to a True Direction, Add 6.56° East
To convert a True Direction to a Grid Direction, Subtract 0.47°



Caza Operating, LLC

Lea County, New Mexico (NAD83)

Gamma 27 State

8H

OH

Plan: Plan 1 02-21-20

Standard Planning Report

21 February, 2020





Planning Report



Database:	USA Compass	Local Co-ordinate Reference:	Well 8H
Company:	Caza Operating, LLC	TVD Reference:	RKB @ 3713.00usft (Citacel #2)
Project:	Lea County, New Mexico (NAD83)	MD Reference:	RKB @ 3713.00usft (Citacel #2)
Site:	Gamma 27 State	North Reference:	Grid
Well:	8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 02-21-20		

Project	Lea County, New Mexico (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Gamma 27 State				
Site Position:		Northing:	531,153.17 usft	Latitude:	32° 27' 25.654752 N
From:	Map	Easting:	812,885.49 usft	Longitude:	103° 27' 10.645956 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.47 °

Well	8H					
Well Position	+N/-S	1.63 usft	Northing:	531,154.80 usft	Latitude:	32° 27' 25.665984 N
	+E/-W	59.98 usft	Easting:	812,945.47 usft	Longitude:	103° 27' 9.945760 W
Position Uncertainty		1.00 usft	Wellhead Elevation:		Ground Level:	3,689.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	4/21/2020	6.56	60.22	47,995.41132444

Design	Plan 1 02-21-20			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	181.86

Plan Survey Tool Program	Date	2/21/2020		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	13,946.35	Plan 1 02-21-20 (OH)	MWD+HRGM
				OWSG MWD + HRGM

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,655.57	4.67	270.00	5,655.40	0.00	-6.33	3.00	3.00	0.00	270.00	
8,154.56	4.67	270.00	8,146.10	0.00	-209.67	0.00	0.00	0.00	0.00	
8,310.13	0.00	0.00	8,301.50	0.00	-216.00	3.00	-3.00	0.00	180.00	
8,410.13	0.00	0.00	8,401.50	0.00	-216.00	0.00	0.00	0.00	0.00	
9,230.45	90.24	179.49	8,922.37	-522.99	-211.39	11.00	11.00	21.88	179.49	
13,946.35	90.24	179.49	8,903.00	-5,238.66	-169.81	0.00	0.00	0.00	0.00	BHL - Gamma 27 Stz



Planning Report



Database:	USA Compass	Local Co-ordinate Reference:	Well 8H
Company:	Caza Operating, LLC	TVD Reference:	RKB @ 3713.00usft (Citacel #2)
Project:	Lea County, New Mexico (NAD83)	MD Reference:	RKB @ 3713.00usft (Citacel #2)
Site:	Gamma 27 State	North Reference:	Grid
Well:	8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 02-21-20		

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,698.00	0.00	0.00	1,698.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,931.00	0.00	0.00	1,931.00	0.00	0.00	0.00	0.00	0.00	0.00
Top of Salt									
2,930.00	0.00	0.00	2,930.00	0.00	0.00	0.00	0.00	0.00	0.00
Base of Salt									
3,547.00	0.00	0.00	3,547.00	0.00	0.00	0.00	0.00	0.00	0.00
Yates									
4,064.00	0.00	0.00	4,064.00	0.00	0.00	0.00	0.00	0.00	0.00
Capitan									
5,432.00	0.00	0.00	5,432.00	0.00	0.00	0.00	0.00	0.00	0.00
Delaware									
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 3.00°/100' Build									
5,600.00	3.00	270.00	5,599.95	0.00	-2.62	0.08	3.00	3.00	0.00
5,655.57	4.67	270.00	5,655.40	0.00	-6.33	0.21	3.00	3.00	0.00
Hold 4.67° Inc at 270.00° Azm									
5,700.00	4.67	270.00	5,699.68	0.00	-9.95	0.32	0.00	0.00	0.00
5,800.00	4.67	270.00	5,799.35	0.00	-18.08	0.59	0.00	0.00	0.00
5,900.00	4.67	270.00	5,899.02	0.00	-26.22	0.85	0.00	0.00	0.00
5,933.09	4.67	270.00	5,932.00	0.00	-28.91	0.94	0.00	0.00	0.00
Cherry Canyon									
6,000.00	4.67	270.00	5,998.69	0.00	-34.36	1.11	0.00	0.00	0.00
6,100.00	4.67	270.00	6,098.35	0.00	-42.49	1.38	0.00	0.00	0.00
6,200.00	4.67	270.00	6,198.02	0.00	-50.63	1.64	0.00	0.00	0.00
6,300.00	4.67	270.00	6,297.69	0.00	-58.77	1.90	0.00	0.00	0.00
6,400.00	4.67	270.00	6,397.36	0.00	-66.90	2.17	0.00	0.00	0.00
6,500.00	4.67	270.00	6,497.03	0.00	-75.04	2.43	0.00	0.00	0.00
6,600.00	4.67	270.00	6,596.70	0.00	-83.18	2.69	0.00	0.00	0.00
6,700.00	4.67	270.00	6,696.37	0.00	-91.31	2.96	0.00	0.00	0.00
6,715.67	4.67	270.00	6,711.99	0.00	-92.59	3.00	0.00	0.00	0.00
Brushy Canyon									
6,800.00	4.67	270.00	6,796.03	0.00	-99.45	3.22	0.00	0.00	0.00
6,900.00	4.67	270.00	6,895.70	0.00	-107.59	3.49	0.00	0.00	0.00
7,000.00	4.67	270.00	6,995.37	0.00	-115.72	3.75	0.00	0.00	0.00
7,100.00	4.67	270.00	7,095.04	0.00	-123.86	4.01	0.00	0.00	0.00
7,200.00	4.67	270.00	7,194.71	0.00	-132.00	4.28	0.00	0.00	0.00
7,300.00	4.67	270.00	7,294.38	0.00	-140.13	4.54	0.00	0.00	0.00
7,400.00	4.67	270.00	7,394.04	0.00	-148.27	4.80	0.00	0.00	0.00
7,500.00	4.67	270.00	7,493.71	0.00	-156.41	5.07	0.00	0.00	0.00
7,600.00	4.67	270.00	7,593.38	0.00	-164.54	5.33	0.00	0.00	0.00
7,700.00	4.67	270.00	7,693.05	0.00	-172.68	5.59	0.00	0.00	0.00
7,800.00	4.67	270.00	7,792.72	0.00	-180.82	5.86	0.00	0.00	0.00
7,900.00	4.67	270.00	7,892.39	0.00	-188.95	6.12	0.00	0.00	0.00
8,000.00	4.67	270.00	7,992.05	0.00	-197.09	6.39	0.00	0.00	0.00
8,100.00	4.67	270.00	8,091.72	0.00	-205.23	6.65	0.00	0.00	0.00
8,154.56	4.67	270.00	8,146.10	0.00	-209.67	6.79	0.00	0.00	0.00
Begin 3.00°/100' Drop									
8,200.00	3.30	270.00	8,191.43	0.00	-212.83	6.90	3.00	-3.00	0.00
8,300.00	0.30	270.00	8,291.37	0.00	-215.97	7.00	3.00	-3.00	0.00
8,310.13	0.00	0.00	8,301.50	0.00	-216.00	7.00	3.00	-3.00	0.00



Planning Report



Database:	USA Compass	Local Co-ordinate Reference:	Well 8H
Company:	Caza Operating, LLC	TVD Reference:	RKB @ 3713.00usft (Citacel #2)
Project:	Lea County, New Mexico (NAD83)	MD Reference:	RKB @ 3713.00usft (Citacel #2)
Site:	Gamma 27 State	North Reference:	Grid
Well:	8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 02-21-20		

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)	
Begin Vertical Hold										
8,350.60	0.00	0.00	8,341.97	0.00	-216.00	7.00	0.00	0.00	0.00	
Bone Spring Glorietta										
8,410.13	0.00	0.00	8,401.50	0.00	-216.00	7.00	0.00	0.00	0.00	
KOP2, Begin 11.00°/100' Build										
8,500.00	9.89	179.49	8,490.92	-7.73	-215.93	14.73	11.00	11.00	0.00	
8,600.00	20.89	179.49	8,587.19	-34.22	-215.70	41.19	11.00	11.00	0.00	
8,700.00	31.89	179.49	8,676.64	-78.59	-215.31	85.53	11.00	11.00	0.00	
8,800.00	42.89	179.49	8,755.97	-139.22	-214.77	146.10	11.00	11.00	0.00	
8,900.00	53.89	179.49	8,822.28	-213.86	-214.11	220.69	11.00	11.00	0.00	
8,946.38	58.99	179.49	8,847.91	-252.49	-213.77	259.29	11.00	11.00	0.00	
2nd Avalon										
9,000.00	64.89	179.49	8,873.13	-299.79	-213.36	306.54	11.00	11.00	0.00	
9,100.00	75.89	179.49	8,906.65	-393.84	-212.53	400.52	11.00	11.00	0.00	
9,161.33	82.63	179.49	8,918.07	-454.06	-212.00	460.69	11.00	11.00	0.00	
Avalon Target										
9,200.00	86.89	179.49	8,921.60	-492.55	-211.66	499.15	11.00	11.00	0.00	
9,230.45	90.24	179.49	8,922.37	-522.99	-211.39	529.56	11.00	11.00	0.00	
LP, Hold 90.24° Inc at 179.49° Azm										
9,300.00	90.24	179.49	8,922.08	-592.54	-210.78	599.05	0.00	0.00	0.00	
9,400.00	90.24	179.49	8,921.67	-692.53	-209.89	698.97	0.00	0.00	0.00	
9,500.00	90.24	179.49	8,921.26	-792.53	-209.01	798.88	0.00	0.00	0.00	
9,600.00	90.24	179.49	8,920.85	-892.52	-208.13	898.80	0.00	0.00	0.00	
9,700.00	90.24	179.49	8,920.44	-992.52	-207.25	998.71	0.00	0.00	0.00	
9,800.00	90.24	179.49	8,920.03	-1,092.51	-206.37	1,098.62	0.00	0.00	0.00	
9,900.00	90.24	179.49	8,919.62	-1,192.51	-205.49	1,198.54	0.00	0.00	0.00	
10,000.00	90.24	179.49	8,919.21	-1,292.50	-204.61	1,298.45	0.00	0.00	0.00	
10,100.00	90.24	179.49	8,918.80	-1,392.50	-203.72	1,398.37	0.00	0.00	0.00	
10,200.00	90.24	179.49	8,918.38	-1,492.49	-202.84	1,498.28	0.00	0.00	0.00	
10,300.00	90.24	179.49	8,917.97	-1,592.49	-201.96	1,598.20	0.00	0.00	0.00	
10,400.00	90.24	179.49	8,917.56	-1,692.48	-201.08	1,698.11	0.00	0.00	0.00	
10,500.00	90.24	179.49	8,917.15	-1,792.48	-200.20	1,798.02	0.00	0.00	0.00	
10,600.00	90.24	179.49	8,916.74	-1,892.47	-199.32	1,897.94	0.00	0.00	0.00	
10,700.00	90.24	179.49	8,916.33	-1,992.47	-198.43	1,997.85	0.00	0.00	0.00	
10,800.00	90.24	179.49	8,915.92	-2,092.46	-197.55	2,097.77	0.00	0.00	0.00	
10,900.00	90.24	179.49	8,915.51	-2,192.46	-196.67	2,197.68	0.00	0.00	0.00	
11,000.00	90.24	179.49	8,915.10	-2,292.45	-195.79	2,297.59	0.00	0.00	0.00	
11,100.00	90.24	179.49	8,914.69	-2,392.45	-194.91	2,397.51	0.00	0.00	0.00	
11,200.00	90.24	179.49	8,914.28	-2,492.45	-194.03	2,497.42	0.00	0.00	0.00	
11,300.00	90.24	179.49	8,913.87	-2,592.44	-193.14	2,597.34	0.00	0.00	0.00	
11,400.00	90.24	179.49	8,913.46	-2,692.44	-192.26	2,697.25	0.00	0.00	0.00	
11,500.00	90.24	179.49	8,913.05	-2,792.43	-191.38	2,797.17	0.00	0.00	0.00	
11,600.00	90.24	179.49	8,912.64	-2,892.43	-190.50	2,897.08	0.00	0.00	0.00	
11,700.00	90.24	179.49	8,912.23	-2,992.42	-189.62	2,996.99	0.00	0.00	0.00	
11,800.00	90.24	179.49	8,911.81	-3,092.42	-188.74	3,096.91	0.00	0.00	0.00	
11,900.00	90.24	179.49	8,911.40	-3,192.41	-187.86	3,196.82	0.00	0.00	0.00	
12,000.00	90.24	179.49	8,910.99	-3,292.41	-186.97	3,296.74	0.00	0.00	0.00	
12,100.00	90.24	179.49	8,910.58	-3,392.40	-186.09	3,396.65	0.00	0.00	0.00	
12,200.00	90.24	179.49	8,910.17	-3,492.40	-185.21	3,496.57	0.00	0.00	0.00	
12,300.00	90.24	179.49	8,909.76	-3,592.39	-184.33	3,596.48	0.00	0.00	0.00	
12,400.00	90.24	179.49	8,909.35	-3,692.39	-183.45	3,696.39	0.00	0.00	0.00	
12,500.00	90.24	179.49	8,908.94	-3,792.38	-182.57	3,796.31	0.00	0.00	0.00	
12,600.00	90.24	179.49	8,908.53	-3,892.38	-181.68	3,896.22	0.00	0.00	0.00	



Planning Report



Database:	USA Compass	Local Co-ordinate Reference:	Well 8H
Company:	Caza Operating, LLC	TVD Reference:	RKB @ 3713.00usft (Citacel #2)
Project:	Lea County, New Mexico (NAD83)	MD Reference:	RKB @ 3713.00usft (Citacel #2)
Site:	Gamma 27 State	North Reference:	Grid
Well:	8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 02-21-20		

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)	
12,700.00	90.24	179.49	8,908.12	-3,992.37	-180.80	3,996.14	0.00	0.00	0.00	
12,800.00	90.24	179.49	8,907.71	-4,092.37	-179.92	4,096.05	0.00	0.00	0.00	
12,900.00	90.24	179.49	8,907.30	-4,192.36	-179.04	4,195.96	0.00	0.00	0.00	
13,000.00	90.24	179.49	8,906.89	-4,292.36	-178.16	4,295.88	0.00	0.00	0.00	
13,100.00	90.24	179.49	8,906.48	-4,392.36	-177.28	4,395.79	0.00	0.00	0.00	
13,200.00	90.24	179.49	8,906.07	-4,492.35	-176.39	4,495.71	0.00	0.00	0.00	
13,300.00	90.24	179.49	8,905.65	-4,592.35	-175.51	4,595.62	0.00	0.00	0.00	
13,400.00	90.24	179.49	8,905.24	-4,692.34	-174.63	4,695.54	0.00	0.00	0.00	
13,500.00	90.24	179.49	8,904.83	-4,792.34	-173.75	4,795.45	0.00	0.00	0.00	
13,600.00	90.24	179.49	8,904.42	-4,892.33	-172.87	4,895.36	0.00	0.00	0.00	
13,700.00	90.24	179.49	8,904.01	-4,992.33	-171.99	4,995.28	0.00	0.00	0.00	
13,800.00	90.24	179.49	8,903.60	-5,092.32	-171.11	5,095.19	0.00	0.00	0.00	
13,900.00	90.24	179.49	8,903.19	-5,192.32	-170.22	5,195.11	0.00	0.00	0.00	
13,946.35	90.24	179.49	8,903.00	-5,238.66	-169.81	5,241.42	0.00	0.00	0.00	
TD at 13946.35										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
BHL - Gamma 27 State - hit/miss target - Shape - Point	0.00	0.00	8,903.00	-5,238.66	-169.81	525,916.14	812,775.66	32° 26' 33.845676 N 103° 27' 12.431340 W		
LTP - Gamma 27 State - plan hits target center - Point	0.00	0.00	8,903.33	-5,158.67	-170.52	525,996.14	812,774.95	32° 26' 34.637280 N 103° 27' 12.431880 W		
FTP - Gamma 27 State - plan misses target center by 165.37usft at 8866.03usft MD (8801.38 TVD, -187.10 N, -214.35 E) - Point	0.00	0.00	8,925.00	-77.26	-215.32	531,077.54	812,730.15	32° 27' 24.919092 N 103° 27' 12.466080 W		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,698.00	1,698.00	Rustler		-0.24	181.86	
1,931.00	1,931.00	Top of Salt		-0.24	181.86	
2,930.00	2,930.00	Base of Salt		-0.24	181.86	
3,547.00	3,547.00	Yates		-0.24	181.86	
4,064.00	4,064.00	Capitan		-0.24	181.86	
5,432.00	5,432.00	Delaware		-0.24	181.86	
5,933.09	5,932.00	Cherry Canyon		-0.24	181.86	
6,715.67	6,711.99	Brushy Canyon		-0.24	181.86	
8,350.60	8,341.97	Bone Spring Glorietta		-0.24	181.86	
8,946.38	8,847.91	2nd Avalon		-0.24	181.86	
9,161.33	8,918.07	Avalon Target		-0.24	181.86	



Planning Report



Database:	USA Compass	Local Co-ordinate Reference:	Well 8H
Company:	Caza Operating, LLC	TVD Reference:	RKB @ 3713.00usft (Citacel #2)
Project:	Lea County, New Mexico (NAD83)	MD Reference:	RKB @ 3713.00usft (Citacel #2)
Site:	Gamma 27 State	North Reference:	Grid
Well:	8H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan 1 02-21-20		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,500.00	5,500.00	0.00	0.00	KOP, Begin 3.00°/100' Build
5,655.57	5,655.40	0.00	-6.33	Hold 4.67° Inc at 270.00° Azm
8,154.56	8,146.10	0.00	-209.67	Begin 3.00°/100' Drop
8,310.13	8,301.50	0.00	-216.00	Begin Vertical Hold
8,410.13	8,401.50	0.00	-216.00	KOP2, Begin 11.00°/100' Build
9,230.45	8,922.37	-522.99	-211.39	LP, Hold 90.24° Inc at 179.49° Azm
13,946.35	8,903.00	-5,238.66	-169.81	TD at 13946.35