

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 276554

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

1. Operator Name and Address Catena Resources Operating, LLC 18402 US Hwy 281 N San Antonio, TX 78259		2. OGRID Number 328449
4. Property Code 326775		3. API Number 30-025-46715
5. Property Name PARALLEL 193402 STATE		6. Well No. 001H

7. Surface Location

UL - Lot M	Section 2	Township 19S	Range 34E	Lot Idn M	Feet From 190	N/S Line S	Feet From 330	E/W Line W	County Lea
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8. Proposed Bottom Hole Location

UL - Lot D	Section 35	Township 18S	Range 34E	Lot Idn D	Feet From 1319	N/S Line N	Feet From 330	E/W Line W	County Lea
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9. Pool Information

AIRSTRIIP;WOLFCAMP	970
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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 3983
16. Multiple N	17. Proposed Depth 20092	18. Formation Wolfcamp	19. Contractor	20. Spud Date 1/13/2020
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	1927	1630	0
Int1	12.25	9.625	40	4134	1130	0
Prod	8.75	5.5	20	20092	2580	3634

Casing/Cement Program: Additional Comments

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22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Annular	3000	3000	Shaffer
Double Ram	5000	5000	Shaffer

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 Robert Swann	Approved By: Paul F Kautz	
Title:	Title: Geologist	
Email Address: rswann@catenares.com	Approved Date: 1/10/2020	Expiration Date: 1/10/2022
Date: 1/6/2020	Phone: 210-775-6993	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 30-025-	² Pool Code 970	³ Pool Name AIRSTRIP; WOLFCAMP
⁴ Property Code	⁵ Property Name PARALLEL 193402	⁶ Well Number 1H
⁷ OGRID No. 328449	⁸ Operator Name CATENA RESOURCES OPERATING, LLC	⁹ Elevation 3983.8

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
M	2	19 S	34 E		190	SOUTH	330	WEST	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
D	35	18 S	34 E		1319	NORTH	330	WEST	LEA

¹² Dedicated Acres 324.13	¹³ Joint or Infill	¹⁴ Consolidation Code C	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.

	¹⁷ OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>Brian Wood</i> 1-3-20 Signature _____ Date _____ BRIAN WOOD Printed Name _____ brian@permitswest.com E-mail Address _____ 505 466-8120
	¹⁸ SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. DECEMBER 12, 2019 Date of Survey _____
	Signature and Seal of Professional Surveyor: <i>[Signature]</i> Certificate Number: 12797 NEW MEXICO PROFESSIONAL SURVEYOR F. JARAMILLO NO. 7853
	Signature and Seal of Professional Surveyor: <i>[Signature]</i> Certificate Number: 12797 NEW MEXICO PROFESSIONAL SURVEYOR F. JARAMILLO NO. 7853

Intent ☒ YES As Drilled ☐

API #		
Operator Name: CATENA RESOURCES OPERATING, LLC	Property Name: PARALLEL 193402	Well Number 1H

Kick Off Point (KOP)

UL M	Section 2	Township 19S	Range 34E	Lot	Feet 190	From N/S SOUTH	Feet 330	From E/W WEST	County LEA
Latitude 32.6825959					Longitude 103.5385092			NAD 83	

First Take Point (FTP)

UL M	Section 2	Township 19S	Range 34E	Lot	Feet 100	From N/S SOUTH	Feet 330	From E/W WEST	County LEA
Latitude 32.6823486					Longitude 103.5385098			NAD 83	

Last Take Point (LTP)

UL D	Section 35	Township 18S	Range 34E	Lot	Feet 1319	From N/S NORTH	Feet 330	From E/W WEST	County LEA
Latitude 32.7078563					Longitude 103.5384965			NAD 83	

Is this well the defining well for the Horizontal Spacing Unit?

☒ YES

Is this well an infill well?

☐ NO

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API #		
Operator Name:	Property Name:	Well Number

KZ 06/29/2018

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Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

GAS CAPTURE PLAN

Date: 1/10/2020

☒ Original

Operator & OGRID No.: [328449] Catena Resources 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
PARALLEL 193402 STATE #001H	30-025-46715	M-2-19S-34E	0190S 0330W	400	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 TRANSPORT LLC and will be connected to TARGA TRANSPORT LLC High Pressure gathering system located in Lea County, New Mexico. It will require 100' of pipeline to connect the facility to High Pressure gathering system. Catena Resources Operating, LLC provides (periodically) to TARGA TRANSPORT LLC a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Catena Resources Operating, LLC and TARGA TRANSPORT LLC have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at TARGA TRANSPORT LLC Processing Plant located in Sec. 19, Twn. 20S, Rng. 35E, 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 TRANSPORT LLC system at that time. Based on current information, it is Catena Resources 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 276554

PERMIT COMMENTS

Operator Name and Address: Catena Resources Operating, LLC [328449] 18402 US Hwy 281 N San Antonio, TX 78259	API Number: 30-025-46715
	Well: PARALLEL 193402 STATE #001H

Created By	Comment	Comment Date
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Form APD Conditions

Permit 276554

PERMIT CONDITIONS OF APPROVAL

Operator Name and Address: Catena Resources Operating, LLC [328449] 18402 US Hwy 281 N San Antonio, TX 78259	API Number: 30-025-46715
	Well: PARALLEL 193402 STATE #001H

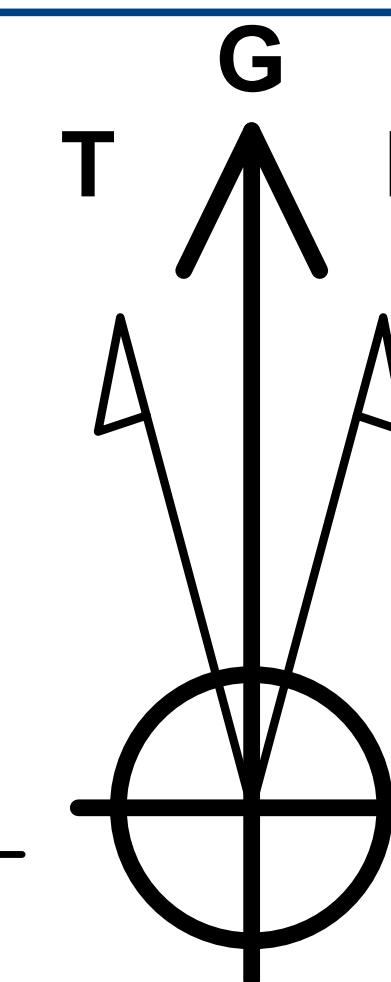
OCD Reviewer	Condition
pkautz	Will require a directional survey with the C-104
pkautz	1) SURFACE & INTERMEDIATE CASING - Cement must circulate to surface -- 2) PRODUCTION CASING - Cement must tie back into intermediate casing --
pkautz	If cement does not circulate to surface, must run temperature survey 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 NMOC 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.



Catena Resources Operating, LLC
Site: A05 Parallel
Well: Parallel 19 34 02 1H
Wellbore: 1H
Plan: Plan #1

WELL DETAILS: Parallel 19 34 02 1H

Northing	Easting	Latitude	Longitude
612975.53	785883.98	32.68259595	-103.53850921



Azimuths to Grid North
True North: -0.43°
Magnetic North: 6.27°

Magnetic Field
Strength: 47950.3snT
Dip Angle: 60.45°
Date: 12/17/2019
Model: IGRF2015

PROJECT DETAILS: Lea County NM N83-NM-EZ
Well Name: Parallel 19 34 02 1H
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level
Local North: Grid
KB Elevation: 3983.8+25 @ 4008.80usft
Elevation: 3983.80

Section Details

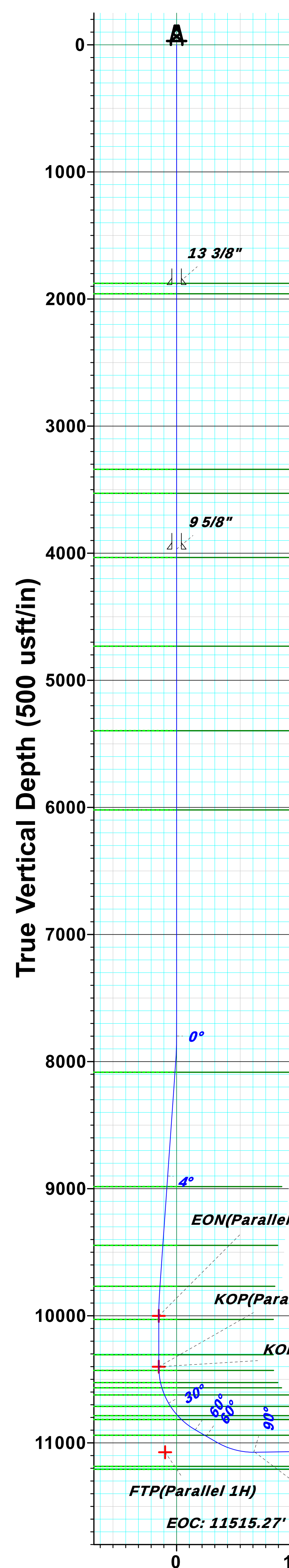
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	7799.72	0.00	0.00	7799.72	0.00	0.00	0.00	0.00	0.00
3	7999.72	4.00	179.90	7999.56	-6.98	0.01	2.00	179.90	-6.98
4	9805.72	4.00	179.90	9801.16	-132.96	0.23	0.00	0.00	-132.96
5	10005.72	0.00	0.00	10001.00	-139.94	0.24	2.00	180.00	-139.94
6	10406.07	0.00	0.00	10401.35	-139.94	0.24	0.00	0.00	-139.94
7	11006.07	60.00	359.60	10897.55	146.53	-1.76	10.00	359.60	146.54
8	11206.07	60.00	359.60	10997.55	319.74	-2.96	0.00	0.00	319.75
9	11515.27	90.92	359.60	11074.23	615.41	-5.03	10.00	0.00	615.43
10	12900.03	90.92	359.60	11052.00	1999.95	-14.70	0.00	0.00	2000.00
11	12905.03	91.02	359.60	11051.92	2004.95	-14.73	2.00	0.00	2005.00
12	17200.71	91.02	359.60	10975.45	6299.84	-44.71	0.00	0.00	6300.00
13	17236.57	91.74	359.60	10974.58	6335.69	-44.97	2.00	-0.12	6335.85
14	20092.59	91.74	359.60	10888.00	9190.33	-64.97	0.00	0.00	9190.56

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
EON(Parallel 1H)	10001.00	-139.94	0.24	612835.59	785884.22	32.68221132	-103.53851184
FTP(Parallel 1H)	11074.00	-90.00	0.50	612885.53	785884.48	32.68234858	-103.53850978
KOP(Parallel 1H)	10401.35	-139.94	0.24	612835.59	785884.22	32.68221132	-103.53851184
PBHL(Parallel 1H)	10888.00	9190.33	-64.97	622165.86	785819.01	32.70785631	-103.53849653
T1(Parallel 1H)	11052.00	1999.94	-14.76	614975.47	785869.22	32.68809297	-103.53850849
T2(Parallel 1H)	10972.00	6499.84	-46.17	619475.37	785837.81	32.70046130	-103.53850097
T3(Parallel 1H)	10899.00	8999.77	-63.64	621975.30	785820.34	32.70733255	-103.53849685

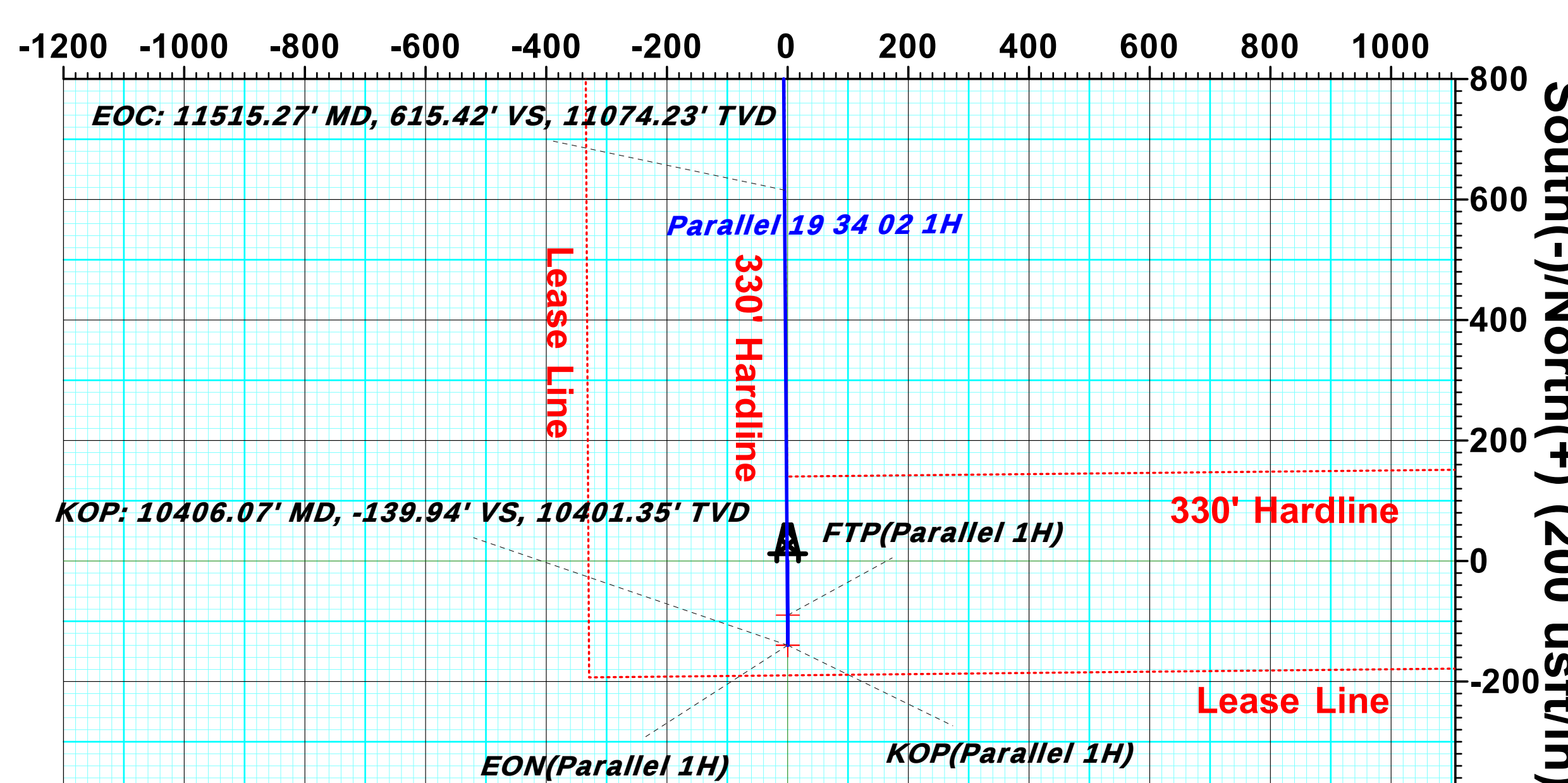
FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1877.00	1877.00	Rustler
1959.00	1959.00	Salt
3340.00	3340.00	Base of Salt
3529.00	3529.00	Yates
4034.00	4034.00	Seven Rivers
4732.00	4732.00	Queen
5397.00	5397.00	Capitan Reef
6020.00	6020.00	Delaware Cherry Canyon
8084.00	8084.37	Bone Spring Lime
8984.00	8986.57	First Bone Spring Carbonate
9446.00	9449.69	First Bone Spring Sand
9768.00	9772.48	Second Bone Spring Carbonate
10029.00	10033.72	Second Bone Spring Sand
10307.00	10311.72	Second Bone Spring 'N' Sand
10430.00	10434.74	Second Bone Spring Dolomitic
10526.00	10531.73	Third Bone Spring Carbonate
10567.00	10574.12	Third Bone Spring Shale
10623.00	10633.66	Third Bone Spring Lower Carbonate
10713.00	10735.59	Third Bone Spring Sand
10786.00	10827.78	Third Bone Spring 'V' Sand
10816.00	10869.68	Base of Wolfcamp 'Y' Sand
10817.00	10871.13	Third Bone Spring 'W' Sand
10940.00	11090.98	Wolfcamp

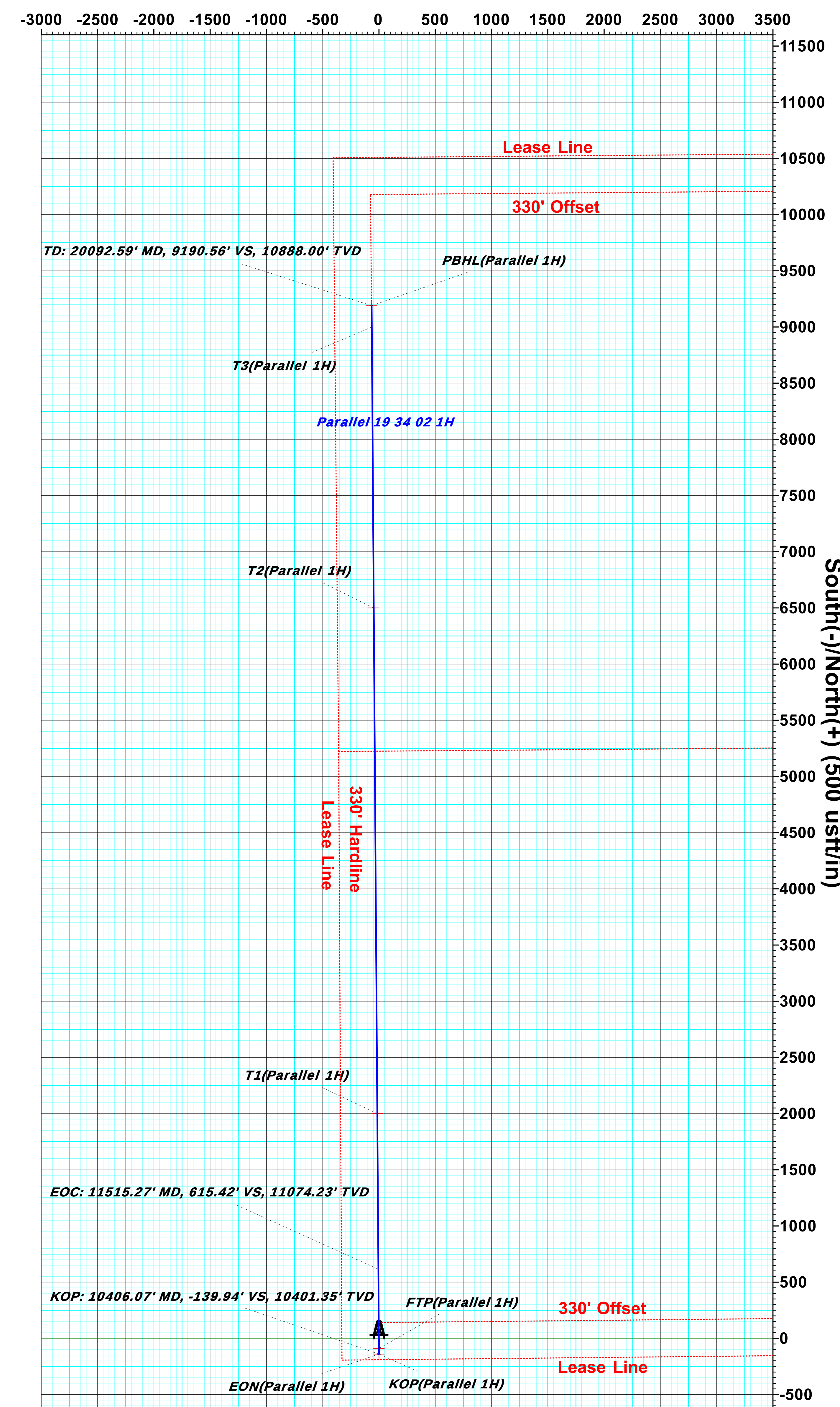


Vertical Section at 359.60° (500 usft/in)

West(-)/East(+) (200 usft/in)



West(-)/East(+) (500 usft/in)





Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Site A05 Parallel
Company:	Catena Resources Operating, LLC	TVD Reference:	3983.8+25 @ 4008.80usft
Project:	Lea County NM N83-NM-EZ	MD Reference:	3983.8+25 @ 4008.80usft
Site:	A05 Parallel	North Reference:	Grid
Well:	Parallel 19 34 02 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	1H		
Design:	Plan #1		

Project	Lea County NM N83-NM-EZ		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site		A05 Parallel			
Site Position:		Northing:	612,975.53 usft	Latitude:	32.68259594
From:	Lat/Long	Easting:	785,883.98 usft	Longitude:	-103.53850921
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.43 °

Well	Parallel 19 34 02 1H					
Well Position	+N/-S	0.00 usft	Northing:	612,975.53 usft	Latitude:	32.68259594
	+E/-W	0.00 usft	Easting:	785,883.98 usft	Longitude:	-103.53850921
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	3,983.80 usft

Wellbore	1H				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	12/17/2019	6.70	60.45	47,950.34758828

Design	Plan #1				
Audit Notes:					
Version:		Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	359.60	

Plan Survey Tool Program	Date	12/17/2019			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	20,092.59	Plan #1 (1H)	MWD	
			MWD - Standard		



Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Site A05 Parallel
Company:	Catena Resources Operating, LLC	TVD Reference:	3983.8+25 @ 4008.80usft
Project:	Lea County NM N83-NM-EZ	MD Reference:	3983.8+25 @ 4008.80usft
Site:	A05 Parallel	North Reference:	Grid
Well:	Parallel 19 34 02 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	1H		
Design:	Plan #1		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
7,799.72	0.00	0.00	7,799.72	0.00	0.00	0.00	0.00	0.00	0.00	
7,999.72	4.00	179.90	7,999.56	-6.98	0.01	2.00	2.00	0.00	179.90	
9,805.72	4.00	179.90	9,801.16	-132.96	0.23	0.00	0.00	0.00	0.00	
10,005.72	0.00	0.00	10,001.00	-139.94	0.24	2.00	-2.00	0.00	180.00	
10,406.07	0.00	0.00	10,401.35	-139.94	0.24	0.00	0.00	0.00	0.00	
11,006.07	60.00	359.60	10,897.55	146.53	-1.76	10.00	10.00	0.00	359.60	
11,206.07	60.00	359.60	10,997.55	319.74	-2.96	0.00	0.00	0.00	0.00	
11,515.27	90.92	359.60	11,074.23	615.41	-5.03	10.00	10.00	0.00	0.00	
12,900.03	90.92	359.60	11,052.00	1,999.95	-14.70	0.00	0.00	0.00	0.00	
12,905.03	91.02	359.60	11,051.92	2,004.95	-14.73	2.00	2.00	0.00	0.00	
17,200.71	91.02	359.60	10,975.45	6,299.84	-44.71	0.00	0.00	0.00	0.00	
17,236.57	91.74	359.60	10,974.58	6,335.69	-44.97	2.00	2.00	0.00	-0.12	
20,092.59	91.74	359.60	10,888.00	9,190.33	-64.97	0.00	0.00	0.00	0.00	PBHL(Parallel 1H)



Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Site A05 Parallel
Company:	Catena Resources Operating, LLC	TVD Reference:	3983.8+25 @ 4008.80usft
Project:	Lea County NM N83-NM-EZ	MD Reference:	3983.8+25 @ 4008.80usft
Site:	A05 Parallel	North Reference:	Grid
Well:	Parallel 19 34 02 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	1H		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,877.00	0.00	0.00	1,877.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,887.00	0.00	0.00	1,887.00	0.00	0.00	0.00	0.00	0.00	0.00
13 3/8"									
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,959.00	0.00	0.00	1,959.00	0.00	0.00	0.00	0.00	0.00	0.00
Salt									
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,340.00	0.00	0.00	3,340.00	0.00	0.00	0.00	0.00	0.00	0.00
Base of Salt									
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,529.00	0.00	0.00	3,529.00	0.00	0.00	0.00	0.00	0.00	0.00
Yates									
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,968.00	0.00	0.00	3,968.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"									
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00



Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Site A05 Parallel
Company:	Catena Resources Operating, LLC	TVD Reference:	3983.8+25 @ 4008.80usft
Project:	Lea County NM N83-NM-EZ	MD Reference:	3983.8+25 @ 4008.80usft
Site:	A05 Parallel	North Reference:	Grid
Well:	Parallel 19 34 02 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	1H		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,034.00	0.00	0.00	4,034.00	0.00	0.00	0.00	0.00	0.00	0.00
Seven Rivers									
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,732.00	0.00	0.00	4,732.00	0.00	0.00	0.00	0.00	0.00	0.00
Queen									
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00
5,397.00	0.00	0.00	5,397.00	0.00	0.00	0.00	0.00	0.00	0.00
Capitan Reef									
5,400.00	0.00	0.00	5,400.00	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
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,020.00	0.00	0.00	6,020.00	0.00	0.00	0.00	0.00	0.00	0.00
Delaware Cherry Canyon									
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,799.72	0.00	0.00	7,799.72	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	2.01	179.90	7,899.98	-1.75	0.00	-1.75	2.00	2.00	0.00
7,999.72	4.00	179.90	7,999.56	-6.98	0.01	-6.98	2.00	2.00	0.00
8,084.37	4.00	179.90	8,084.00	-12.88	0.02	-12.88	0.00	0.00	0.00
Bone Spring Lime									
8,100.00	4.00	179.90	8,099.59	-13.97	0.02	-13.97	0.00	0.00	0.00
8,200.00	4.00	179.90	8,199.35	-20.95	0.04	-20.95	0.00	0.00	0.00
8,300.00	4.00	179.90	8,299.11	-27.92	0.05	-27.92	0.00	0.00	0.00



Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Site A05 Parallel
Company:	Catena Resources Operating, LLC	TVD Reference:	3983.8+25 @ 4008.80usft
Project:	Lea County NM N83-NM-EZ	MD Reference:	3983.8+25 @ 4008.80usft
Site:	A05 Parallel	North Reference:	Grid
Well:	Parallel 19 34 02 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	1H		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,400.00	4.00	179.90	8,398.86	-34.90	0.06	-34.90	0.00	0.00	0.00
8,500.00	4.00	179.90	8,498.62	-41.88	0.07	-41.88	0.00	0.00	0.00
8,600.00	4.00	179.90	8,598.38	-48.85	0.09	-48.85	0.00	0.00	0.00
8,700.00	4.00	179.90	8,698.13	-55.83	0.10	-55.83	0.00	0.00	0.00
8,800.00	4.00	179.90	8,797.89	-62.80	0.11	-62.80	0.00	0.00	0.00
8,900.00	4.00	179.90	8,897.64	-69.78	0.12	-69.78	0.00	0.00	0.00
8,986.57	4.00	179.90	8,984.00	-75.82	0.13	-75.82	0.00	0.00	0.00
First Bone Spring Carbonate									
9,000.00	4.00	179.90	8,997.40	-76.75	0.13	-76.75	0.00	0.00	0.00
9,100.00	4.00	179.90	9,097.16	-83.73	0.15	-83.73	0.00	0.00	0.00
9,200.00	4.00	179.90	9,196.91	-90.71	0.16	-90.70	0.00	0.00	0.00
9,300.00	4.00	179.90	9,296.67	-97.68	0.17	-97.68	0.00	0.00	0.00
9,400.00	4.00	179.90	9,396.43	-104.66	0.18	-104.66	0.00	0.00	0.00
9,449.69	4.00	179.90	9,446.00	-108.12	0.19	-108.12	0.00	0.00	0.00
First Bone Spring Sand									
9,500.00	4.00	179.90	9,496.18	-111.63	0.19	-111.63	0.00	0.00	0.00
9,600.00	4.00	179.90	9,595.94	-118.61	0.21	-118.61	0.00	0.00	0.00
9,700.00	4.00	179.90	9,695.70	-125.58	0.22	-125.58	0.00	0.00	0.00
9,772.48	4.00	179.90	9,768.00	-130.64	0.23	-130.64	0.00	0.00	0.00
Second Bone Spring Carbonate									
9,805.72	4.00	179.90	9,801.16	-132.96	0.23	-132.96	0.00	0.00	0.00
9,900.00	2.11	179.90	9,895.30	-137.99	0.24	-137.98	2.00	-2.00	0.00
10,005.72	0.00	0.00	10,001.00	-139.94	0.24	-139.94	2.00	-2.00	0.00
EON(Parallel 1H)									
10,033.72	0.00	0.00	10,029.00	-139.94	0.24	-139.94	0.00	0.00	0.00
Second Bone Spring Sand									
10,100.00	0.00	0.00	10,095.28	-139.94	0.24	-139.94	0.00	0.00	0.00
10,200.00	0.00	0.00	10,195.28	-139.94	0.24	-139.94	0.00	0.00	0.00
10,300.00	0.00	0.00	10,295.28	-139.94	0.24	-139.94	0.00	0.00	0.00
10,311.72	0.00	0.00	10,307.00	-139.94	0.24	-139.94	0.00	0.00	0.00
Second Bone Spring 'N' Sand									
10,406.07	0.00	0.00	10,401.35	-139.94	0.24	-139.94	0.00	0.00	0.00
KOP: 10406.07' MD, -139.94' VS, 10401.35' TVD - KOP(Parallel 1H)									
10,434.74	2.87	359.60	10,430.00	-139.22	0.24	-139.22	10.00	10.00	0.00
Second Bone Spring Dolomitic									
10,450.00	4.39	359.60	10,445.23	-138.25	0.23	-138.25	10.00	10.00	0.00
10,500.00	9.39	359.60	10,494.86	-132.26	0.19	-132.25	10.00	10.00	0.00
10,531.73	12.57	359.60	10,526.00	-126.21	0.15	-126.21	10.00	10.00	0.00
Third Bone Spring Carbonate									
10,550.00	14.39	359.60	10,543.77	-121.96	0.12	-121.95	10.00	10.00	0.00
10,574.12	16.80	359.60	10,567.00	-115.47	0.07	-115.47	10.00	10.00	0.00
Third Bone Spring Shale									
10,600.00	19.39	359.60	10,591.59	-107.43	0.02	-107.43	10.00	10.00	0.00
10,633.66	22.76	359.60	10,623.00	-95.33	-0.07	-95.33	10.00	10.00	0.00
Third Bone Spring Lower Carbonate									
10,650.00	24.39	359.60	10,637.97	-88.79	-0.11	-88.79	10.00	10.00	0.00
10,700.00	29.39	359.60	10,682.55	-66.19	-0.27	-66.18	10.00	10.00	0.00
10,735.59	32.95	359.60	10,713.00	-47.77	-0.40	-47.76	10.00	10.00	0.00
Third Bone Spring Sand									
10,750.00	34.39	359.60	10,724.99	-39.78	-0.46	-39.77	10.00	10.00	0.00
10,800.00	39.39	359.60	10,764.97	-9.77	-0.66	-9.77	10.00	10.00	0.00
10,827.78	42.17	359.60	10,786.00	8.37	-0.79	8.38	10.00	10.00	0.00
Third Bone Spring 'V' Sand									



Planning Report

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Company:	Catena Resources Operating, LLC	TVD Reference:	3983.8+25 @ 4008.80usft
Project:	Lea County NM N83-NM-EZ	MD Reference:	3983.8+25 @ 4008.80usft
Site:	A05 Parallel	North Reference:	Grid
Well:	Parallel 19 34 02 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	1H		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,850.00	44.39	359.60	10,802.17	23.60	-0.90	23.61	10.00	10.00	0.00
10,869.68	46.36	359.60	10,816.00	37.61	-1.00	37.62	10.00	10.00	0.00
Base of Wolfcamp 'Y' Sand									
10,871.13	46.51	359.60	10,817.00	38.66	-1.00	38.67	10.00	10.00	0.00
Third Bone Spring 'W' Sand									
10,900.00	49.39	359.60	10,836.33	60.09	-1.15	60.10	10.00	10.00	0.00
10,928.58	52.25	359.60	10,854.38	82.24	-1.31	82.25	10.00	10.00	0.00
FTP(Parallel 1H)									
10,950.00	54.39	359.60	10,867.18	99.42	-1.43	99.43	10.00	10.00	0.00
11,000.00	59.39	359.60	10,894.48	141.29	-1.72	141.30	10.00	10.00	0.00
11,006.07	60.00	359.60	10,897.55	146.53	-1.76	146.54	10.00	10.00	0.00
11,090.98	60.00	359.60	10,940.00	220.07	-2.27	220.08	0.00	0.00	0.00
Wolfcamp									
11,100.00	60.00	359.60	10,944.51	227.88	-2.32	227.89	0.00	0.00	0.00
11,206.07	60.00	359.60	10,997.55	319.74	-2.96	319.75	0.00	0.00	0.00
11,250.00	64.39	359.60	11,018.03	358.58	-3.24	358.59	10.00	10.00	0.00
11,300.00	69.39	359.60	11,037.65	404.55	-3.56	404.57	10.00	10.00	0.00
11,350.00	74.39	359.60	11,053.18	452.06	-3.89	452.08	10.00	10.00	0.00
11,400.00	79.39	359.60	11,064.52	500.74	-4.23	500.76	10.00	10.00	0.00
11,450.00	84.39	359.60	11,071.57	550.22	-4.57	550.24	10.00	10.00	0.00
11,500.00	89.39	359.60	11,074.28	600.13	-4.92	600.15	10.00	10.00	0.00
11,515.27	90.92	359.60	11,074.23	615.40	-5.03	615.42	10.00	10.00	0.00
EOC: 11515.27' MD, 615.42' VS, 11074.23' TVD									
11,600.00	90.92	359.60	11,072.87	700.12	-5.62	700.14	0.00	0.00	0.00
11,700.00	90.92	359.60	11,071.27	800.10	-6.32	800.13	0.00	0.00	0.00
11,800.00	90.92	359.60	11,069.66	900.09	-7.02	900.12	0.00	0.00	0.00
11,900.00	90.92	359.60	11,068.06	1,000.07	-7.71	1,000.10	0.00	0.00	0.00
12,000.00	90.92	359.60	11,066.45	1,100.06	-8.41	1,100.09	0.00	0.00	0.00
12,100.00	90.92	359.60	11,064.85	1,200.04	-9.11	1,200.08	0.00	0.00	0.00
12,200.00	90.92	359.60	11,063.24	1,300.03	-9.81	1,300.06	0.00	0.00	0.00
12,300.00	90.92	359.60	11,061.63	1,400.01	-10.51	1,400.05	0.00	0.00	0.00
12,400.00	90.92	359.60	11,060.03	1,500.00	-11.20	1,500.04	0.00	0.00	0.00
12,500.00	90.92	359.60	11,058.42	1,599.98	-11.90	1,600.03	0.00	0.00	0.00
12,600.00	90.92	359.60	11,056.82	1,699.97	-12.60	1,700.01	0.00	0.00	0.00
12,700.00	90.92	359.60	11,055.21	1,799.95	-13.30	1,800.00	0.00	0.00	0.00
12,800.00	90.92	359.60	11,053.61	1,899.94	-14.00	1,899.99	0.00	0.00	0.00
12,900.02	90.92	359.60	11,052.00	1,999.94	-14.70	1,999.99	0.00	0.00	0.00
T1(Parallel 1H)									
12,900.03	90.92	359.60	11,052.00	1,999.95	-14.70	2,000.00	0.00	0.00	0.00
12,905.03	91.02	359.60	11,051.92	2,004.95	-14.73	2,005.00	2.00	2.00	0.00
13,000.00	91.02	359.60	11,050.22	2,099.90	-15.39	2,099.96	0.00	0.00	0.00
13,100.00	91.02	359.60	11,048.44	2,199.88	-16.09	2,199.94	0.00	0.00	0.00
13,200.00	91.02	359.60	11,046.66	2,299.87	-16.79	2,299.93	0.00	0.00	0.00
13,300.00	91.02	359.60	11,044.88	2,399.85	-17.49	2,399.91	0.00	0.00	0.00
13,400.00	91.02	359.60	11,043.10	2,499.83	-18.19	2,499.90	0.00	0.00	0.00
13,500.00	91.02	359.60	11,041.32	2,599.81	-18.88	2,599.88	0.00	0.00	0.00
13,600.00	91.02	359.60	11,039.54	2,699.79	-19.58	2,699.86	0.00	0.00	0.00
13,700.00	91.02	359.60	11,037.76	2,799.77	-20.28	2,799.85	0.00	0.00	0.00
13,800.00	91.02	359.60	11,035.98	2,899.76	-20.98	2,899.83	0.00	0.00	0.00
13,900.00	91.02	359.60	11,034.20	2,999.74	-21.68	2,999.82	0.00	0.00	0.00
14,000.00	91.02	359.60	11,032.42	3,099.72	-22.37	3,099.80	0.00	0.00	0.00
14,100.00	91.02	359.60	11,030.64	3,199.70	-23.07	3,199.78	0.00	0.00	0.00
14,200.00	91.02	359.60	11,028.86	3,299.68	-23.77	3,299.77	0.00	0.00	0.00



Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Site A05 Parallel
Company:	Catena Resources Operating, LLC	TVD Reference:	3983.8+25 @ 4008.80usft
Project:	Lea County NM N83-NM-EZ	MD Reference:	3983.8+25 @ 4008.80usft
Site:	A05 Parallel	North Reference:	Grid
Well:	Parallel 19 34 02 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	1H		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,300.00	91.02	359.60	11,027.08	3,399.66	-24.47	3,399.75	0.00	0.00	0.00
14,400.00	91.02	359.60	11,025.30	3,499.65	-25.17	3,499.74	0.00	0.00	0.00
14,500.00	91.02	359.60	11,023.52	3,599.63	-25.86	3,599.72	0.00	0.00	0.00
14,600.00	91.02	359.60	11,021.74	3,699.61	-26.56	3,699.71	0.00	0.00	0.00
14,700.00	91.02	359.60	11,019.96	3,799.59	-27.26	3,799.69	0.00	0.00	0.00
14,800.00	91.02	359.60	11,018.18	3,899.57	-27.96	3,899.67	0.00	0.00	0.00
14,900.00	91.02	359.60	11,016.40	3,999.56	-28.66	3,999.66	0.00	0.00	0.00
15,000.00	91.02	359.60	11,014.62	4,099.54	-29.35	4,099.64	0.00	0.00	0.00
15,100.00	91.02	359.60	11,012.84	4,199.52	-30.05	4,199.63	0.00	0.00	0.00
15,200.00	91.02	359.60	11,011.06	4,299.50	-30.75	4,299.61	0.00	0.00	0.00
15,300.00	91.02	359.60	11,009.28	4,399.48	-31.45	4,399.59	0.00	0.00	0.00
15,400.00	91.02	359.60	11,007.50	4,499.46	-32.15	4,499.58	0.00	0.00	0.00
15,500.00	91.02	359.60	11,005.72	4,599.45	-32.84	4,599.56	0.00	0.00	0.00
15,600.00	91.02	359.60	11,003.94	4,699.43	-33.54	4,699.55	0.00	0.00	0.00
15,700.00	91.02	359.60	11,002.16	4,799.41	-34.24	4,799.53	0.00	0.00	0.00
15,800.00	91.02	359.60	11,000.38	4,899.39	-34.94	4,899.52	0.00	0.00	0.00
15,900.00	91.02	359.60	10,998.60	4,999.37	-35.64	4,999.50	0.00	0.00	0.00
16,000.00	91.02	359.60	10,996.82	5,099.35	-36.33	5,099.48	0.00	0.00	0.00
16,100.00	91.02	359.60	10,995.04	5,199.34	-37.03	5,199.47	0.00	0.00	0.00
16,200.00	91.02	359.60	10,993.26	5,299.32	-37.73	5,299.45	0.00	0.00	0.00
16,300.00	91.02	359.60	10,991.48	5,399.30	-38.43	5,399.44	0.00	0.00	0.00
16,400.00	91.02	359.60	10,989.70	5,499.28	-39.13	5,499.42	0.00	0.00	0.00
16,500.00	91.02	359.60	10,987.92	5,599.26	-39.82	5,599.40	0.00	0.00	0.00
16,600.00	91.02	359.60	10,986.14	5,699.24	-40.52	5,699.39	0.00	0.00	0.00
16,700.00	91.02	359.60	10,984.36	5,799.23	-41.22	5,799.37	0.00	0.00	0.00
16,800.00	91.02	359.60	10,982.58	5,899.21	-41.92	5,899.36	0.00	0.00	0.00
16,900.00	91.02	359.60	10,980.80	5,999.19	-42.62	5,999.34	0.00	0.00	0.00
17,000.00	91.02	359.60	10,979.02	6,099.17	-43.31	6,099.33	0.00	0.00	0.00
17,100.00	91.02	359.60	10,977.24	6,199.15	-44.01	6,199.31	0.00	0.00	0.00
17,200.71	91.02	359.60	10,975.45	6,299.84	-44.71	6,300.00	0.00	0.00	0.00
17,236.57	91.74	359.60	10,974.58	6,335.69	-44.97	6,335.85	2.00	2.00	0.00
17,300.00	91.74	359.60	10,972.66	6,399.09	-45.41	6,399.25	0.00	0.00	0.00
17,400.00	91.74	359.60	10,969.63	6,499.04	-46.11	6,499.21	0.00	0.00	0.00
17,400.72	91.74	359.60	10,969.61	6,499.77	-46.12	6,499.93	0.00	0.00	0.00
T2(Parallel 1H)									
17,500.00	91.74	359.60	10,966.60	6,599.00	-46.81	6,599.16	0.00	0.00	0.00
17,600.00	91.74	359.60	10,963.57	6,698.95	-47.51	6,699.12	0.00	0.00	0.00
17,700.00	91.74	359.60	10,960.53	6,798.90	-48.21	6,799.07	0.00	0.00	0.00
17,800.00	91.74	359.60	10,957.50	6,898.85	-48.91	6,899.02	0.00	0.00	0.00
17,900.00	91.74	359.60	10,954.47	6,998.80	-49.61	6,998.98	0.00	0.00	0.00
18,000.00	91.74	359.60	10,951.44	7,098.75	-50.31	7,098.93	0.00	0.00	0.00
18,100.00	91.74	359.60	10,948.41	7,198.71	-51.01	7,198.89	0.00	0.00	0.00
18,200.00	91.74	359.60	10,945.38	7,298.66	-51.71	7,298.84	0.00	0.00	0.00
18,300.00	91.74	359.60	10,942.34	7,398.61	-52.41	7,398.79	0.00	0.00	0.00
18,400.00	91.74	359.60	10,939.31	7,498.56	-53.11	7,498.75	0.00	0.00	0.00
18,500.00	91.74	359.60	10,936.28	7,598.51	-53.81	7,598.70	0.00	0.00	0.00
18,600.00	91.74	359.60	10,933.25	7,698.46	-54.52	7,698.66	0.00	0.00	0.00
18,700.00	91.74	359.60	10,930.22	7,798.41	-55.22	7,798.61	0.00	0.00	0.00
18,800.00	91.74	359.60	10,927.19	7,898.37	-55.92	7,898.56	0.00	0.00	0.00
18,900.00	91.74	359.60	10,924.15	7,998.32	-56.62	7,998.52	0.00	0.00	0.00
19,000.00	91.74	359.60	10,921.12	8,098.27	-57.32	8,098.47	0.00	0.00	0.00
19,100.00	91.74	359.60	10,918.09	8,198.22	-58.02	8,198.43	0.00	0.00	0.00
19,200.00	91.74	359.60	10,915.06	8,298.17	-58.72	8,298.38	0.00	0.00	0.00
19,300.00	91.74	359.60	10,912.03	8,398.12	-59.42	8,398.33	0.00	0.00	0.00



Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Site A05 Parallel
Company:	Catena Resources Operating, LLC	TVD Reference:	3983.8+25 @ 4008.80usft
Project:	Lea County NM N83-NM-EZ	MD Reference:	3983.8+25 @ 4008.80usft
Site:	A05 Parallel	North Reference:	Grid
Well:	Parallel 19 34 02 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	1H		
Design:	Plan #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
19,400.00	91.74	359.60	10,909.00	8,498.08	-60.12	8,498.29	0.00	0.00	0.00
19,500.00	91.74	359.60	10,905.97	8,598.03	-60.82	8,598.24	0.00	0.00	0.00
19,600.00	91.74	359.60	10,902.93	8,697.98	-61.52	8,698.20	0.00	0.00	0.00
19,700.00	91.74	359.60	10,899.90	8,797.93	-62.22	8,798.15	0.00	0.00	0.00
19,800.00	91.74	359.60	10,896.87	8,897.88	-62.92	8,898.10	0.00	0.00	0.00
19,900.00	91.74	359.60	10,893.84	8,997.83	-63.62	8,998.06	0.00	0.00	0.00
19,901.78	91.74	359.60	10,893.78	8,999.61	-63.63	8,999.84	0.00	0.00	0.00
T3(Parallel 1H)									
20,000.00	91.74	359.60	10,890.81	9,097.79	-64.32	9,098.01	0.00	0.00	0.00
20,092.59	91.74	359.60	10,888.00	9,190.33	-64.97	9,190.56	0.00	0.00	0.00
TD: 20092.59' MD, 9190.56' VS, 10888.00' TVD - PBHL(Parallel 1H)									

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
EON(Parallel 1H) - plan misses target center by 0.01usft at 10005.72usft MD (10001.00 TVD, -139.94 N, 0.24 E) - Point	0.00	0.00	10,001.00	-139.94	0.24	612,835.59	785,884.22	32.68221132	-103.53851184
KOP(Parallel 1H) - plan misses target center by 0.01usft at 10406.07usft MD (10401.35 TVD, -139.94 N, 0.24 E) - Point	0.00	0.00	10,401.35	-139.94	0.24	612,835.59	785,884.22	32.68221132	-103.53851184
PBHL(Parallel 1H) - plan hits target center - Point	0.00	0.00	10,888.00	9,190.33	-64.97	622,165.86	785,819.01	32.70785631	-103.53849653
T3(Parallel 1H) - plan misses target center by 5.22usft at 19901.78usft MD (10893.78 TVD, 8999.61 N, -63.63 E) - Point	0.00	0.00	10,899.00	8,999.77	-63.64	621,975.30	785,820.34	32.70733255	-103.53849685
T2(Parallel 1H) - plan misses target center by 2.40usft at 17400.72usft MD (10969.61 TVD, 6499.77 N, -46.12 E) - Point	0.00	0.01	10,972.00	6,499.84	-46.17	619,475.37	785,837.81	32.70046130	-103.53850097
T1(Parallel 1H) - plan misses target center by 0.06usft at 12900.02usft MD (11052.00 TVD, 1999.94 N, -14.70 E) - Point	0.00	0.00	11,052.00	1,999.94	-14.76	614,975.47	785,869.22	32.68809296	-103.53850848
FTP(Parallel 1H) - plan misses target center by 279.11usft at 10928.57usft MD (10854.38 TVD, 82.24 N, -1.31 E) - Point	0.00	0.00	11,074.00	-90.00	0.50	612,885.53	785,884.48	32.68234857	-103.53850978

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,887.00	1,887.00	13 3/8"	13-3/8	17-1/2	
3,968.00	3,968.00	9 5/8"	9-5/8	12-1/4	
20,092.59	10,888.00	5 1/2"	5-1/2	6	



Planning Report

Database:	EDM 5000.14 Single User Db	Local Co-ordinate Reference:	Site A05 Parallel
Company:	Catena Resources Operating, LLC	TVD Reference:	3983.8+25 @ 4008.80usft
Project:	Lea County NM N83-NM-EZ	MD Reference:	3983.8+25 @ 4008.80usft
Site:	A05 Parallel	North Reference:	Grid
Well:	Parallel 19 34 02 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	1H		
Design:	Plan #1		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,877.00	1,877.00	Rustler				
1,959.00	1,959.00	Salt				
3,340.00	3,340.00	Base of Salt				
3,529.00	3,529.00	Yates				
4,034.00	4,034.00	Seven Rivers				
4,732.00	4,732.00	Queen				
5,397.00	5,397.00	Capitan Reef				
6,020.00	6,020.00	Delaware Cherry Canyon				
8,084.37	8,084.00	Bone Spring Lime				
8,986.57	8,984.00	First Bone Spring Carbonate				
9,449.69	9,446.00	First Bone Spring Sand				
9,772.48	9,768.00	Second Bone Spring Carbonate				
10,033.72	10,029.00	Second Bone Spring Sand				
10,311.72	10,307.00	Second Bone Spring 'N' Sand				
10,434.74	10,430.00	Second Bone Spring Dolomitic				
10,531.73	10,526.00	Third Bone Spring Carbonate				
10,574.12	10,567.00	Third Bone Spring Shale				
10,633.66	10,623.00	Third Bone Spring Lower Carbonate				
10,735.59	10,713.00	Third Bone Spring Sand				
10,827.78	10,786.00	Third Bone Spring 'V' Sand				
10,869.68	10,816.00	Base of Wolfcamp 'Y' Sand				
10,871.13	10,817.00	Third Bone Spring 'W' Sand				
11,090.98	10,940.00	Wolfcamp				

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
10,406.07	10,401.35	-139.94	0.24	KOP: 10406.07' MD, -139.94' VS, 10401.35' TVD	
11,515.27	11,074.23	615.40	-5.03	EOC: 11515.27' MD, 615.42' VS, 11074.23' TVD	
20,092.59	10,888.00	9,190.33	-64.97	TD: 20092.59' MD, 9190.56' VS, 10888.00' TVD	