

ABOVE THIS LINE FOR DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
 - Engineering Bureau -
 1220 South St. Francis Drive, Santa Fe, NM 87505



ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Application Acronyms:

- [NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
- [DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
- [PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
- [WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
- [SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
- [EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

DHC-4806

- [1] TYPE OF APPLICATION - Check Those Which Apply for [A]
- [A] Location - Spacing Unit - Simultaneous Dedication
 NSL NSP SD
- Check One Only for [B] or [C]
- [B] Commingling - Storage - Measurement
 DHC CTB PLC PC OLS OLM
- [C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
 WFX PMX SWD IPI EOR PPR
- [D] Other: Specify _____

Park State 36 Com #1- 30015-33963
 Cimarex Energy Co. of Colorado - 162683

Pool:
 97693 - Black River; Wolfcamp, Southwest (Gas)
 97566 - Walnut Canyon; Penn (Gas)

- [2] NOTIFICATION REQUIRED TO: - Check Those Which Apply, or **Does Not Apply**
- [A] Working, Royalty or Overriding Royalty Interest Owners
- [B] Offset Operators, Leaseholders or Surface Owner
- [C] Application is One Which Requires Published Legal Notice
- [D] Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office
- [E] For all of the above, Proof of Notification or Publication is Attached, and/or,
- [F] Waivers are Attached

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[3] SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.

[4] CERTIFICATION: I hereby certify that the information submitted with this application for administrative approval is accurate and complete to the best of my knowledge. I also understand that no action will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Kimberleigh Rhodes *Kimberleigh Rhodes* Regulatory Tech 1-18-2017
 Print or Type Name Signature Title Date
 kirhodes@Cimarex.com
 e-mail Address

Cimarex Energy Co.

202 S. Cheyenne Ave.

Suite 1000

Tulsa, Oklahoma 74103-4346

PHONE: 918.585.1100

FAX: 918.585.1133



Michael McMillian
Oil Conservation Division
New Mexico Department of Energy,
Minerals and Natural Resources
1220 South Saint Francis Drive
Santa Fe, New Mexico 87505

Re: Park State 36 Com 1
API 30-015-33963
Section 36, Township 24 South, Range 25 East, N.M.P.M.
Eddy County, New Mexico.

Dear Mr. McMillian:

The Park State 36 Com 1 well is located in the E/2 of Sec. 36, 24S, 25E, Eddy County NM.

Cimarex is the operator of Section 36, 24S, 25E, Eddy County, NM. Ownership in all of Section 36 is identical.

Sincerely,

A handwritten signature in cursive script that reads "Caitlin Pierce".

Caitlin Pierce
Production Landman
cpierce@cimarex.com
Direct: 432-571-7862

District I
1625 N. French Drive, Hobbs, NM 88240

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-107A
Revised June 10, 2003

District II
1301 W. Grand Avenue, Artesia, NM 88210

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

APPLICATION TYPE
 Single Well
 Establish Pre-Approved Pools
EXISTING WELLBORE
 Yes No

District III
1000 Rio Brazos Road, Aztec, NM 87410

APPLICATION FOR DOWNHOLE COMMINGLING

District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

Cimarex Energy Co. of Colorado
Operator

600 N. Marienfeld St., Ste. 600; Midland, TX 79701
Address

Park State 36 Com
Lease

001
Well No.

I-36-24S-25E
Unit Letter-Section-Township-Range

Eddy
County

OGRID No. 162683 Property Code 34631 API No. 30-015-33963 Lease Type: Federal State Fee

DATA ELEMENT	UPPER ZONE	LOWER ZONE
Pool Name	<i>Now Purple Seal Well</i> Black River; Wolfcamp, Southwest (Gas)	Walnut Canyon; Upper Penn (Gas)
Pool Code	97693	97566
Top and Bottom of Pay Section (Perforated or Open-Hole Interval)	8,400' - 9,900'	9,900' - 10,206'
Method of Production (Flowing or Artificial Lift)	Flowing	Flowing
Bottomhole Pressure (Note: Pressure data will not be required if the bottom perforation in the lower zone is within 150% of the depth of the top perforation in the upper zone)	Within 150% of top perf	Within 150% of top perf
Oil Gravity or Gas BTU (Degree API or Gas BTU)	Oil: 51.8° API Gas: 1225.8 BTU dry / 1204.6 BTU wet @ 14.73 psi	Oil: 53.5° API Gas: 1142.4 BTU dry / 1122.6 BTU wet @ 14.73 psi
Producing; Shut-In or New Zone	New Zone	New Zone
Date and Oil/Gas/Water Rates of Last Production. (Note: For new zones with no production history, applicant shall be required to attach production estimates and supporting data.)	Date: N/A Rates: 67 BOPD, 1,680 MCFPD, 424 BWPD	Date: N/A Rates: 33 BOPD, 827 MCFPD, 209 BWPD
Fixed Allocation Percentage (Note: If allocation is based upon something other than current or past production, supporting data or explanation will be required.)	Oil Gas 67 67	Oil Gas 33 33

ADDITIONAL DATA

Are all working, royalty and overriding royalty interests identical in all commingled zones? Yes No
If not, have all working, royalty and overriding royalty interest owners been notified by certified mail? Yes No

Are all produced fluids from all commingled zones compatible with each other? Yes No

Will commingling decrease the value of production? Yes No

If this well is on, or communitized with, state or federal lands, has either the Commissioner of Public Lands or the United States Bureau of Land Management been notified in writing of this application? Yes No

NMOCD Reference Case No. applicable to this well: DHC-3390

Attachments:

- C-102 for each zone to be commingled showing its spacing unit and acreage dedication.
- Production curve for each zone for at least one year. (If not available, attach explanation.)
- For zones with no production history, estimated production rates and supporting data.
- Data to support allocation method or formula.
- Notification list of working, royalty and overriding royalty interests for uncommon interest cases.
- Any additional statements, data or documents required to support commingling.

PRE-APPROVED POOLS

If application is to establish Pre-Approved Pools, the following additional information will be required:

- List of other orders approving downhole commingling within the proposed Pre-Approved Pools
- List of all operators within the proposed Pre-Approved Pools
- Proof that all operators within the proposed Pre-Approved Pools were provided notice of this application.
- Bottomhole pressure data.

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Kimberleigh Rhodes TITLE Regulatory Compliance DATE 1-18-17

TYPE OR PRINT NAME Kimberleigh Rhodes TELEPHONE NO. 918-560-7081

E-MAIL ADDRESS kirhodes@cimarex.com

Terri Stathem

From: Kautz, Paul, EMNRD <paul.kautz@state.nm.us>
Sent: Monday, January 09, 2017 9:05 AM
To: Terri Stathem
Cc: Podany, Raymond, EMNRD; Bayliss, Randolph, EMNRD
Subject: [External] RE: Pool Info

Park State 36 Com #1 – 3001533963 – I, 36-24S-25E Eddy County –

Wolfcamp

Pool Name: BLACK RIVER;WOLFCAMP, SOUTHWEST (GAS) [97693]
Pool Code: 97693
Dedicated acres: 320 acres

Cisco

Pool Name: WALNUT CANYON;UPPER PENN (GAS)
Pool Code: 97566
Dedicated acres: 320 acres

From: Terri Stathem [mailto:Terri.Stathem@state.nm.us]

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 Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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 30-015-33963		² Pool Code 97693		³ Pool Name Black River; Wolfcamp, Southwest (GAS)	
⁴ Property Code 34631		⁵ Property Name Park State 36 Com			⁶ Well Number 1
⁷ OGRID No. 162683		⁸ Operator Name Cimarex Energy of Colorado			⁹ Elevation 3539'

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
1	36	25S	25E		1500	South	1100	East	Eddy

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

¹² Dedicated Acres 320	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
--------------------------------------	-------------------------------	----------------------------------	-------------------------

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.

	<p>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.</p> <p><i>Kimberleigh Rhodes</i> 01/18/17 Signature Date</p> <p>Kimberleigh Rhodes Printed Name</p> <p>kirhodes@cimarex.com E-mail Address</p>
	<p>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.</p> <p>Date of Survey</p> <p>Signature and Seal of Professional Surveyor:</p>
	<p>Certificate Number</p>

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 Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
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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 30-015-33963	² Pool Code 97566	³ Pool Name Walnut Canyon; Upper Penn (GAS)
⁴ Property Code 34631	⁵ Property Name Park State 36 Com	
⁷ OGRID No. 162683	⁸ Operator Name Cimarex Energy of Colorado	⁶ Well Number 1
		⁹ Elevation 3539'

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
I	36	25S	25E		1500	South	1100	East	Eddy

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

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	<p>¹⁸ SURVEYOR CERTIFICATION</p> <p><i>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.</i></p> <p>Date of Survey</p> <p>Signature and Seal of Professional Surveyor:</p>
	<p>Certificate Number</p>



Recompletion Procedure – Park State 36 Com 1

Well Data

KB	23'
TD	12,073'
PBTD	11,385'
Casing	13-3/8" 54.5# J-55 @ 200'. Cmt'd w/ 225 sx, cmt circ 9-5/8" 40# N-80 & P-110 @ 1,940'. Cmt'd w/ 700 sx, cmt circ 5-1/2" 17# P-110 @ 12,072'. Cmt'd w/ 1,260 sx. DV @ 7,005'. TOC @ 650' by CBL
Tubing	2-3/8" 4.7# L-80 8rd, EOT @ 8,974'
Proposed RC Perfs	Wolfcamp (8,400' – 9,900') & Cisco Canyon (9,900' – 10,206')

Procedure

Notify NMOCD 24 hours prior to start of workover operations.

1. Test anchors prior to MIRU PU.
2. MIRU PU, rental flare, and choke manifold.
3. Kill well with produced water if available or FW as necessary.
4. ND WH, NU 5K BOP
5. Release packer and TOOH w/ 2-3/8" 4.7# L-80 tbg. Stand back Tubing.
6. MIRU WL
7. ND 5k BOP, RDMO PU
8. RU two 10k frac valves and flow cross
9. MIRU water transfer with frac tanks to contain water to be pumped from frac pond
10. Test frac valves and flow cross prior to frac job. Arrange for these items, manlift, forklift, and Pace testers to be on location the day before the frac job to test so that we do not have the frac waiting on a successful test the following day.
11. RU frac valves, flow cross, goat head, and wireline lubricator.
12. RIH w/ gauge ring/junk basket for 5-1/2" 17# P-110 csg to +/- 10,206'
13. Perforate Cisco Canyon from 9,900' – 10,206'.
14. RU frac and flowback equipment.
15. Acidize and frac Cisco Canyon perfs down casing with diverter.
16. Perforate Wolfcamp from 8,400' – 9,900'.
17. Acidize and frac Wolfcamp perfs down casing.
18. RD frac
19. Flow back well for 24 hours, then SI well overnight.
20. RU wireline and lubricator.
21. RIH w/ GR/JB for 5-1/2" 17# P-110 to +/- 8,350'

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor.

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

David R. Catanach, Division Director
Oil Conservation Division



Administrative Order DHC-4806

Order Date: January 24, 2017

Application Reference Number: pMAM1702354547

Cimarex Energy Co. of Colorado
600 North Marienfeld Street, Suite 600
Midland, Tx. 79701

Attention: Ms. Kimberleigh Rhodes

Park State 36 Com. Well No. 1
API No. 30-015-33963
Unit I, Section 36, Township 24 South, Range 25 East, NMPM
Eddy County, New Mexico

Pool Names: WALNUT CANYON; UPPER PENN (GAS) Gas (97566)
BLACK RIVER; WOLFCAMP, SW (GAS) Gas (97693)

Reference is made to your recent application for an exception to Division Rule 19.15.12.9A. NMAC of the Division Rules and Regulations to permit the above-described well to commingle production from the subject pools in the wellbore.

It appears that the subject well qualifies for approval for such exception pursuant to the provisions of Division Rule 19.15.12.11A. NMAC, and since reservoir damage or waste will not result from such downhole commingling, and correlative rights will not be violated thereby, you are hereby authorized to commingle the production as described above and any Division Order which authorized the dual completion or otherwise required separation of the zones is hereby placed in abeyance.

In accordance with Division Rule 19.15.12.11A (6) NMAC, the production attributed to any commingled pool within the well shall not exceed the allowable applicable to that pool.

As per the application, the assignment of allowable and allocation of oil and gas production from the subject well for the Walnut Canyon; UpperPenn (Gas) Pool and Black River; Wolfcamp, SW (Gas) Pool shall be based on the remaining gas in place (RGIP) calculations, which in turn is based on offset analogy production and well log analysis for each pool.

Assignment of allowable and allocation of production from the well shall be as follows:

BLACK RIVER; WOLFCAMP, SW (GAS)	Pct. Oil: 67	Pct. Gas: 67
WALNUT CANYON; UPPER PENN (GAS)	Pct. Oil: 33	Pct. Gas: 33

It is also understood that notice of this application, pursuant to Division Rule 19.15.4.12 A (6), is not required since the interest ownership between the zones to be commingled is common throughout.

REMARKS: The operator shall notify the Division's District II office upon implementation of commingling operations.

This Order is subject to like approval from the New Mexico State Land Office.

Pursuant to Division Rule 19.15.12.11B. NMAC, the commingling authority granted herein may be rescinded by the Division Director if conservation is not being best served by such commingling.

David R. Catanach
Director

DRC/mam

cc: New Mexico Oil Conservation Division – Artesia
New Mexico State Land Office – Oil, Gas, and Minerals



22. RIH w/ 2-3/8" WEG, 2-3/8" pump out plug pinned for 1,500 – 2,000 psi differential pressure, 10' 2-3/8" 4.7# L-80 tbg sub w/ 1.875" XN profile nipple w/ blanking plug in place, 5-1/2" Arrowset 1X packer and on-off tool stinger w/ 1.875" X profile nipple. Set packer +/- 8,350'. From downhole up:
 - a. 2-3/8" WEG
 - b. 2-3/8" pump out plug pinned for 1,500 – 2,000 psi differential pressure
 - c. 1.875" XN profile nipple
 - d. 10' 2-3/8" 4.7# L-80 tbg sub
 - e. 5-1/2" x 2-3/8" Arrowset 1X packer and on-off tool stinger w/ 1.875" X profile nipple
23. RD WL and lubricator
24. ND goat head and frac valve, NU BOP, MIRU Pulling Unit
25. TIH w/ on/off tool overshot, GLVs, and 2-3/8" 4.7# L-80 tbg.
26. Latch overshot onto on-off tool and space out tubing
27. ND BOP, NU WH
28. RDMO pulling unit
29. RU pump truck and pump out plug. Put well on production.
30. **Run Production Log for allocation purposes after recovering load. Run additional production logs if actual production varies significantly from expected performance. Send copies of these logs to OCD and file for an adjustment of allocation factor if necessary.**



Current WBD

KB : 23' above GL

Cimarex Energy Co. of Colorado

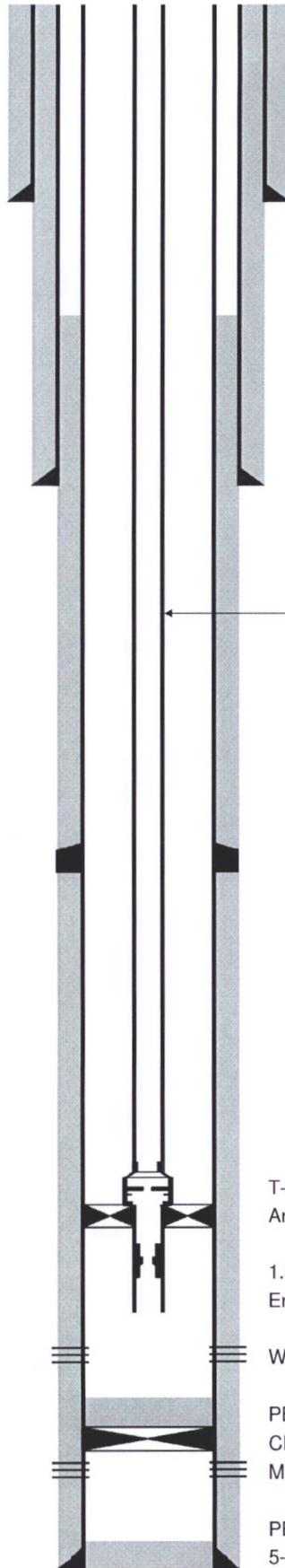
Park State 36 Com #1

1500' FSL & 1100' FEL

Sec. 36, T-24-S, R-25-E, Eddy Co., NM

S. Gengler

02/21/2012



13-3/8", 54.5# J-55 csg @ 200'
cmtd w/ 225 sx, cmt circ

TOC @ 650' by CBL

9-5/8", 40# N-80 & P-110 csg @ 1940'
cmtd w/ 700 sx, cmt circ

← 273 jts 2 3/8" 4.7# L-80 Tbg

DV Tool @ 7005'
cmtd w/ 1350 sx

T-2 On-off Tool w/ 1.875" X Profile nipple @ 8954'
Arrowset 1-X pkr @ 8962'

1.875" XN Profile Nipple @ 8969'
End of tbg @ 8974'

Wolfcamp perms (9029' - 9496')

PBTD @ 11385'
CIBP @ 11420'
Morrow perms (11458' - 11807')

PBTD @ 12007'
5-1/2" 17# P-110 @ 12072' cmtd w/ 1260 sx, cmt circ
TD @ 12073'



Proposed WBD

KB : 23' above GL

Cimarex Energy Co. of Colorado

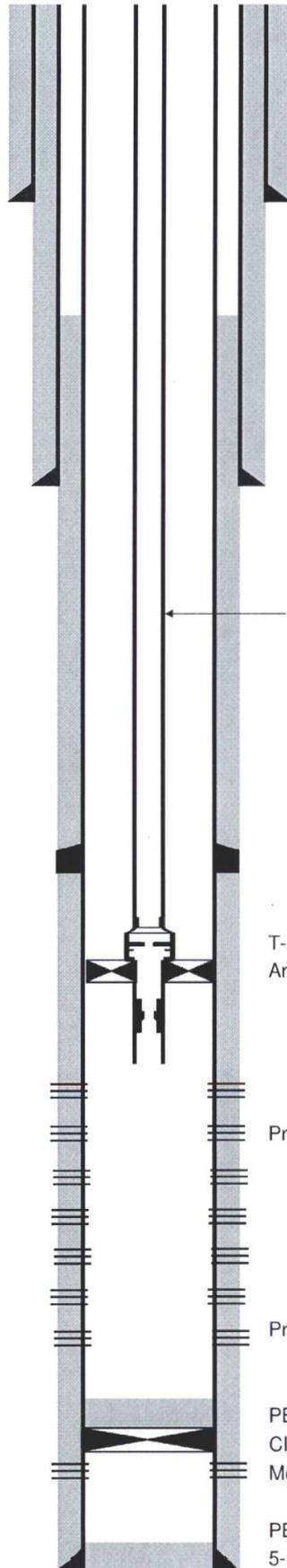
Park State 36 Com #1

1500' FSL & 1100' FEL

Sec. 36, T-24-S, R-25-E, Eddy Co., NM

M. Karner

12/31/2016



13-3/8", 54.5# J-55 csg @ 200'
cmtd w/ 225 sx, cmt circ

TOC @ 650' by CBL

9-5/8", 40# N-80 & P-110 csg @ 1940'
cmtd w/ 700 sx, cmt circ

2 3/8" 4.7# L-80 Tbg

DV Tool @ 7005'
cmtd w/ 1350 sx

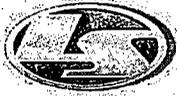
T-2 On-off Tool w/ 1.875" X Profile nipple @ 8343'
Arrowset 1-X pkr @ 8350'

Proposed Wolfcamp perms (8,400' - 9,900')

Proposed Cisco Canyon Perfs (9,900' - 10,206')

PBTD @ 11385'
CIBP @ 11420'
Morrow perfs (11458' - 11807')

PBTD @ 12007'
5-1/2" 17# P-110 @ 12072' cmtd w/ 1260 sx, cmt circ
TD @ 12073'



LABORATORY SERVICES

Natural Gas Analysis

www.permianls.com

575.397.3713 2609 W-Mariand Hobbs NM 88240

For:	Cimarex Energy	Sample:	Sta: # 309588185
	Attention: Mark Cummings	Identification:	Wigeon 23 Fed Com 1
	600 N. Marienfeld, Suite 600	Company:	Cimarex Energy
	Midland, Texas 79701	Lease:	
		Plant:	

Sample Data:	Date Sampled	7/30/2013 12:25 PM	
	Analysis Date	7/31/2013	
	Pressure-PSIA	900	Sampled by: Taylor Ridings
	Sample Temp F	107	Analysis by: Vicki McDaniel
	Atmos Temp F	85	

H2S = 0.3 PPM

Component Analysis

		Mol Percent	GPM
Hydrogen Sulfide	H2S		
Nitrogen	N2	0.677	
Carbon Dioxide	CO2	0.123	
Methane	C1	82.764	
Ethane	C2	9.506	2.536
Propane	C3	3.772	1.037
I-Butane	IC4	0.640	0.209
N-Butane	NC4	1.185	0.373
I-Pentane	IC5	0.335	0.122
N-Pentane	NC5	0.374	0.135
Hexanes Plus	C6+	0.624	0.270
		100.000	4.681

REAL BTU/CU.FT.		Specific Gravity	
At 14.65 DRY	1219.2	Calculated	0.6973
At 14.65 WET	1197.9		
At 14.696 DRY	1223.0		
At 14.696 WET	1202.1	Molecular Weight	20.1966
At 14.73 DRY	1225.8		
At 14.73 Wet	1204.6		

North Permian Basin Region
P.O. Box 740
Sundown, TX 79372-0740
(806) 229-8121

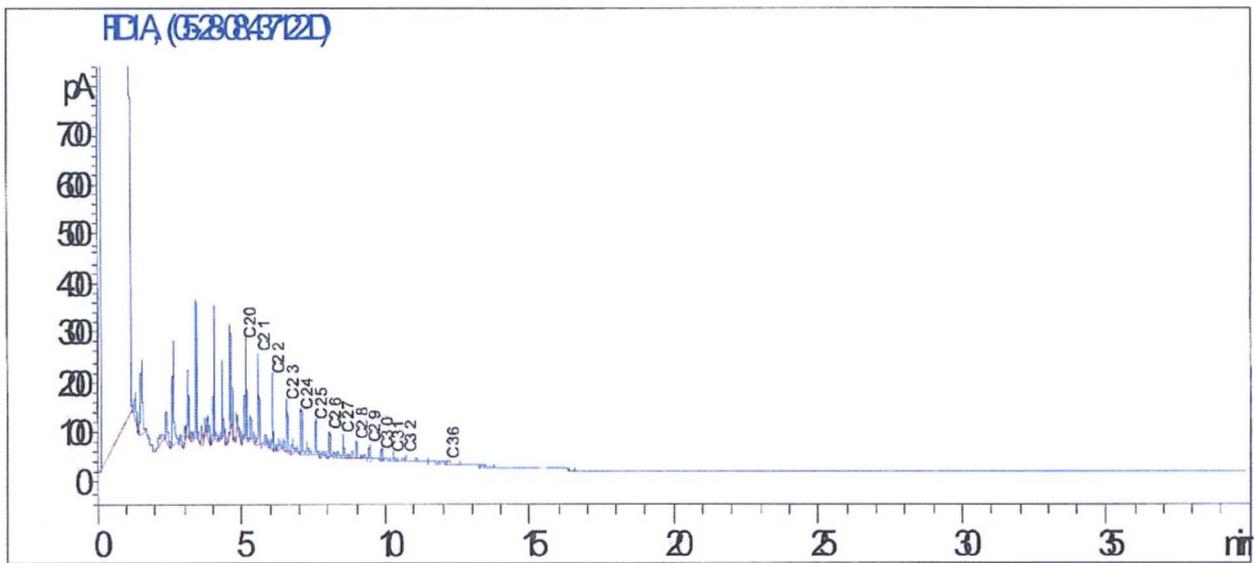
Lab Team Leader - Sheila Hernandez
(432) 495-7240

OIL ANALYSIS

Company:	CIMAREX ENERGY	Sales RDT:	44212
Region:	PERMIAN BASIN	Account Manager:	WAYNE PETERSON (575) 910-9389
Area:	CARLSBAD, NM	Analysis ID #:	3208
Lease/Platform:	WIGEON '23' FEDERAL	Sample #:	437122
Entity (or well #):	1	Analyst:	SHEILA HERNANDEZ
Formation:	WOLFCAMP	Analysis Date:	5/30/08
Sample Point:	FRAC TANK 234	Analysis Cost:	\$100.00
Sample Date:	5/13/08		

Cloud Point:	<68 °F
Weight Percent Paraffin (by GC)*:	1.49%
Weight Percent Asphaltenes:	0.03%
Weight Percent Oily Constituents:	98.41%
Weight Percent Inorganic Solids:	0.07%

*Weight percent paraffin and peak carbon number includes only n-alkanes (straight chain hydrocarbons) greater than or equal to C20H42.



North Permian Basin Region
P.O. Box 740
Sundown, TX 79372-0740
(806) 229-8121
Lab Team Leader - Sheila Hernandez
(432) 495-7240

Water Analysis Report by Baker Petrolite

Company:	CIMAREX ENERGY	Sales RDT:	44212
Region:	PERMIAN BASIN	Account Manager:	WAYNE PETERSON (505) 910-9389
Area:	CARLSBAD, NM	Sample #:	43887
Lease/Platform:	WIGEON UNIT	Analysis ID #:	82014
Entity (or well #):	23 FEDERAL 1	Analysis Cost:	\$80.00
Formation:	UNKNOWN		
Sample Point:	SEPARATOR		

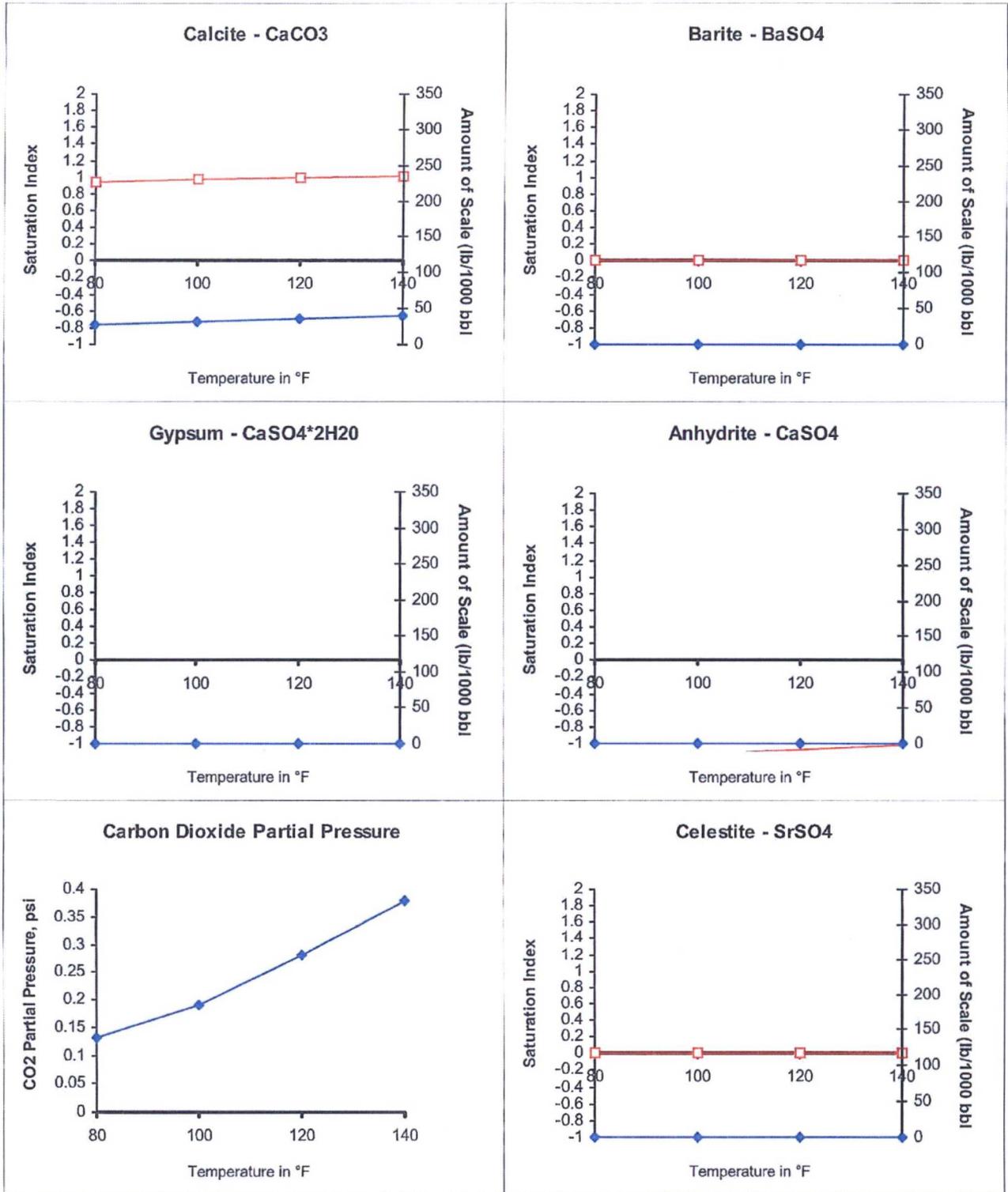
Summary		Analysis of Sample 43887 @ 75 °F			
Sampling Date:	05/14/08	Anions	mg/l	meq/l	Cations
Analysis Date:	05/15/08	Chloride:	55040.0	1552.48	Sodium:
Analyst:	WAYNE PETERSON	Bicarbonate:	329.4	5.4	Magnesium:
TDS (mg/l or g/m3):	90873.3	Carbonate:	0.0	0.0	Calcium:
Density (g/cm3, tonne/m3):	1.062	Sulfate:	225.0	4.68	Strontium:
Anion/Cation Ratio:	1	Phosphate:			Barium:
Carbon Dioxide:	150 PPM	Borate:			Iron:
Oxygen:		Silicate:			Potassium:
Comments:		Hydrogen Sulfide:		0 PPM	Aluminum:
TEST RAN IN THE FIELD		pH at time of sampling:		7.31	Chromium:
		pH at time of analysis:			Copper:
		pH used in Calculation:		7.31	Lead:
					Manganese:
					Nickel:

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO ₃		Gypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄		CO ₂ Press
		Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	
80	0	0.94	27.24	-1.11	0.00	-1.14	0.00	0.00	0.00	0.00	0.00	0.13
100	0	0.97	31.09	-1.16	0.00	-1.12	0.00	0.00	0.00	0.00	0.00	0.19
120	0	0.99	35.26	-1.20	0.00	-1.08	0.00	0.00	0.00	0.00	0.00	0.28
140	0	1.02	39.74	-1.23	0.00	-1.02	0.00	0.00	0.00	0.00	0.00	0.38

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.
Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.
Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

Scale Predictions from Baker Petrolite

Analysis of Sample 43887 @ 75 °F for CIMAREX ENERGY, 05/15/08





LABORATORY SERVICES

Natural Gas Analysis

www.permianls.com

575.397.3713 2609 W Marland Hobbs NM 88240

For: Cimarex Energy
Attention: Mark Cummings
600 N. Marienfeld, Suite 600
Midland, Texas 79701

Sample: Sta. # 309588438
Identification: Taos Fed: #3 Sales
Company: Cimarex Energy
Lease:
Plant:

Sample Data: Date Sampled 7/2/2014 10:30 AM
Analysis Date 7/9/2014
Pressure-PSIA 83
Sample Temp F 76.4
Atmos Temp F 76

Sampled by: K. Hooten
Analysis by: Vicki McDaniel

H2S =

Component Analysis

		Mol Percent	GPM
Hydrogen Sulfide	H2S		
Nitrogen	N2	0.618	
Carbon Dioxide	CO2	0.172	
Methane	C1	88.390	
Ethane	C2	7.080	1.889
Propane	C3	1.966	0.540
I-Butane	IC4	0.355	0.116
N-Butane	NC4	0.569	0.179
I-Pentane	IC5	0.198	0.072
N-Pentane	NC5	0.213	0.077
Hexanes Plus	C6+	0.439	0.190
		100.000	3.063

REAL BTU/CU.FT.		Specific Gravity	
At 14.65 DRY	1136.2	Calculated	0.6445
At 14.65 WET	1116.4		
At 14.696 DRY	1139.7		
At 14.696 WET	1120.3	Molecular Weight	18.6673
At 14.73 DRY	1142.4		
At 14.73 Wet	1122.6		

North Permian Basin Region
P.O. Box 740
Sundown, TX 79372-0740
(806) 229-8121

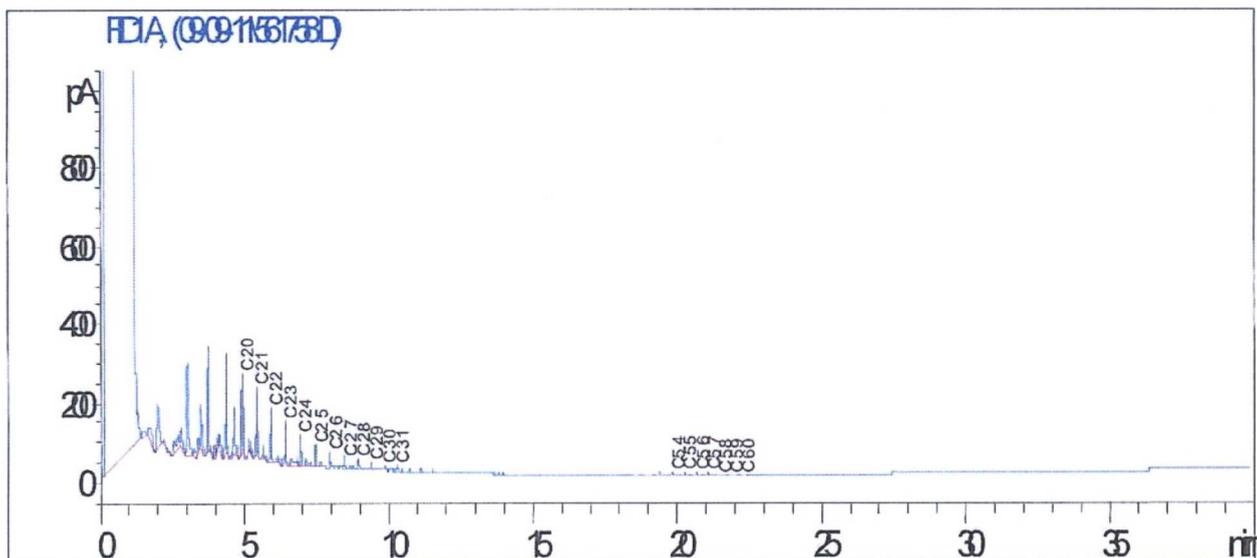
Lab Team Leader - Sheila Hernandez
(432) 495-7240

OIL ANALYSIS

Company:	CIMAREX ENERGY	Sales RDT:	33521
Region:	PERMIAN BASIN	Account Manager:	STEVE HOLLINGER (575) 910-9393
Area:	LOCO HILLS, NM	Analysis ID #:	5419
Lease/Platform:	TAOS FEDERAL LEASE	Sample #:	561758
Entity (or well #):	3	Analyst:	SHEILA HERNANDEZ
Formation:	UNKNOWN	Analysis Date:	09/13/11
Sample Point:	TANK	Analysis Cost:	\$125.00
Sample Date:	08/24/11		

Cloud Point:	89 ° F
Weight Percent Paraffin (by GC)*:	1.03%
Weight Percent Asphaltenes:	0.01%
Weight Percent Oily Constituents:	98.93%
Weight Percent Inorganic Solids:	0.03%

*Weight percent paraffin and peak carbon number includes only n-alkanes (straight chain hydrocarbons) greater than or equal to C20H42.



North Permian Basin Region

P.O. Box 740

Sundown, TX 79372-0740

(806) 229-8121

Lab Team Leader - Sheila Hernandez

(432) 495-7240

Water Analysis Report by Baker Petrolite

Company:	CIMAREX ENERGY	Sales RDT:	33521
Region:	PERMIAN BASIN	Account Manager:	STEVE HOLLINGER (575) 910-9393
Area:	CARLSBAD, NM	Sample #:	535681
Lease/Platform:	TAOS FEDERAL LEASE	Analysis ID #:	113272
Entity (or well #):	3	Analysis Cost:	\$90.00
Formation:	UNKNOWN		
Sample Point:	SEPARATOR		

Summary		Analysis of Sample 535681 @ 75°F					
		Anions		Cations			
		mg/l	meq/l	mg/l	meq/l		
Sampling Date:	09/28/11	Chloride:	52535.0	1481.82	Sodium:	28338.7	1232.66
Analysis Date:	10/13/11	Bicarbonate:	146.0	2.39	Magnesium:	417.0	34.3
Analyst:	SANDRA GOMEZ	Carbonate:	0.0	0.	Calcium:	3573.0	178.29
TDS (mg/l or g/m3):	86836.7	Sulfate:	83.0	1.73	Strontium:	1472.0	33.6
Density (g/cm3, tonne/m3):	1.063	Phosphate:			Barium:	22.0	0.32
Anion/Cation Ratio:	1	Borate:			Iron:	34.0	1.23
Carbon Dioxide:	150 PPM	Silicate:			Potassium:	215.0	5.5
Oxygen:		Hydrogen Sulfide:		0 PPM	Aluminum:		
Comments:		pH at time of sampling:		6	Chromium:		
RESISTIVITY 0.083 OHM-M @ 75F		pH at time of analysis:			Copper:		
		pH used in Calculation:		6	Lead:		
					Manganese:	1.000	0.04
					Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO ₃		Gypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄		CO ₂ Press.
		Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	
80	0	-0.61	0.00	-1.46	0.00	-1.49	0.00	-0.05	0.00	1.22	11.59	1.14
100	0	-0.51	0.00	-1.51	0.00	-1.47	0.00	-0.07	0.00	1.04	10.94	1.44
120	0	-0.40	0.00	-1.54	0.00	-1.43	0.00	-0.07	0.00	0.89	10.30	1.76
140	0	-0.28	0.00	-1.57	0.00	-1.36	0.00	-0.06	0.00	0.75	9.66	2.07

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.



Objective

Cimarex is seeking approval from the U.S. Bureau of Land Management (BLM) of its proposed *commingling permit* application and the *allocation factors* for the Cisco Canyon and Wolfcamp formations in the recompletion of the **Park State 36 Com 1** well (API: 30-015-33963).

The proposed “allocation factors” have been estimated following BLM’s approved allocation methodology in the *2016 Downhole Commingling Field Study “Cisco Canyon and Wolfcamp (Ciscamp) Commingled Allocation Assessment in White City, Eddy County, NM” (NMP0220)*, approved by BLM on July 6, 2016 (**Appendix A**). Based on this approach and the assessment of subsurface data, the recommended initial allocation factors are **67%** for the Wolfcamp and **33%** for the Cisco Canyon.

The support evidence for this application includes petrophysical assessment and recoverable reserves estimation for each proposed formation (Table 1) and a log section (**Appendix B**).

Proposed Recompletion

Cimarex plans to recomplete the **Park State 36 Com 1** well to the Cisco Canyon and add additional Wolfcamp pay. This well is located within the BLM approved White City Ciscamp Field Study Area (see Exhibit 6A of the above referenced Field Study) and is currently completed in the Wolfcamp formation. The well has produced **110 MMCF** of gas (see **Appendix C**). The company plans to test the Strawn formation first via tubing with the currently producing Wolfcamp perforations producing via the annulus between the tubing and casing. In the event that the Strawn formation proves to not be commercial, the Strawn will be temporarily abandoned under a cast-iron bridge plug with cement on top, and the Cisco Canyon will be perforated along with additional Wolfcamp pay which will be stimulated with a multi-stage frac job. The company will consider returning the Strawn zone to production and commingle with the new proposed Ciscamp formations in the future once these zones reach an equivalent reservoir pressure. In such case, the production allocations factors will be revised and re-submitted for approval following the approved Field Study methodology for “Handling of Existing Rate Contribution from Proven Developed Producing (PDP) Zone(s)”, using Eq.1.1 and Eq. 1.2; and along with the required BLM and NMOCD documentation.

The proposed Ciscamp recompletion will be performed with a *multi-stage frac job*. The plan is to commingle Wolfcamp and Cisco Canyon streams downhole immediately after completion to allow faster flowback recovery and more efficient artificial lift. The synergy between both streams has shown to significantly improve liquid unloading in analog wells by maintaining higher



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 Proposed Commingling Allocation Factors. Eddy County, NM

and more stable critical gas velocities for a longer period. This in turn minimizes formation damage and increases reserves recovery by extending the life of the well.

A proposed recompletion and workover procedure is included in **Appendix D**.

Proposed Initial Production Allocation Factors

Based on BLM’s approved Allocation Methodology and Cimarex’s assessment, the “Initial Allocation Factors” for the New Completion Zones in subject well are estimated as follows:

$$\text{Wolfcamp \% Alloc. Factor} = \frac{WC\ RGIP - WC\ Prev.\ Cum\ Gas}{Total\ RGIP}$$

$$\text{Cisco Canyon \% Alloc. Factor} = \frac{CC\ RGIP - CC\ Prev.\ Cum\ Gas}{Total\ RGIP}$$

The Recoverable Gas in Place (RGIP) for subject well is **1,174 MMCF** from the Wolfcamp and **513 MMCF** from the Cisco Canyon, for a total of **1,578 MMCF of gas** (see Table 1). In this case, the Wolfcamp intervals has produced **110 MMCF** in this well (no prior cumulative production), therefore Remaining RGIP (RRGIP) is equal to RGIP for both formations

The resulting proposed allocation factors are calculated as follows:

$$\text{Wolfcamp \% Alloc. Factor} = \frac{1,174\ MMCF - 110\ MMCF}{1,578\ MMCF} = 67\%$$

$$\text{Cisco Canyon \% Alloc. Factor} = \frac{513\ MMCF}{1,578\ MMCF} = 33\%$$

The RGIP for each zone is estimated using the Hydrocarbon Pore Volume (HCPV) assessment as shown in Table 1. The implemented net pay cut-offs are Average Porosity (PHI) > 6-10% and Average Sw < 25-35%. *Total estimated oil reserves are 53 MBO.*

Park State 36 Com 1

Proposed RC Zone(S)	Avg. Depth, ft	Est. Reservoir Pressure, psi	Net Pay, h (ft)	Avg. PHI	Avg. Sw	HCPV (1-Sw)*PHI*h	OGIP, MMCF	Est. Recovery Factor	RGIP @RF, MMCF	Zone Prod. Start Date	Prev. Cum. Gas to Date, MMCF	Remaining RGIP (RRGIP), MMCF	Initial Alloc. Factors, % (based on RRGIP Ratio)
Wolfcamp Total :	9,217	4,010	171	11.4%	22%	15.5	1,383	85%	1,174		110	1,064	67%
Cisco Canyon :	10,053	4,373	51	14.9%	14%	6.5	604	85%	513		-	513	33%
Total:			222			21.9	1,987	85%	1,688		110	1,578	100%

Table 1: Summary of Reservoir Properties, Estimated Reserves and Resulting Allocation Factors



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In this well, the spacing for both formations is the same, as well as, public interests: 100% working interest and 83.33% net revenue interest. Both formations are sweet.

Enclosed with this report are the C-107A, Downhole Commingle Worksheet, current and proposed wellbore diagrams, current gas, oil, and water analyses C-102, 3160-5.



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Appendix A: 2016 Downhole Commingling Field Study for the White City Area



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
 Pecos District
 Carlsbad Field Office
 620 E. Greene
 Carlsbad, New Mexico 88220-6292
 www.blm.gov/nm



3180 (P0220)

July 6, 2016

Reference:
 White City Area
 2016 Downhole Commingling Field Study
 Eddy County, New Mexico

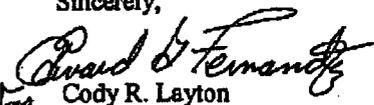
Cimarex Energy Co. of Colorado
 600 N. Marienfeld Street, Suite 600
 Midland, TX 79701

Gentlemen:

In reference to your 2016 Downhole Commingling Field Study for the White City Area; it is hereby approved, with the following conditions of approval:

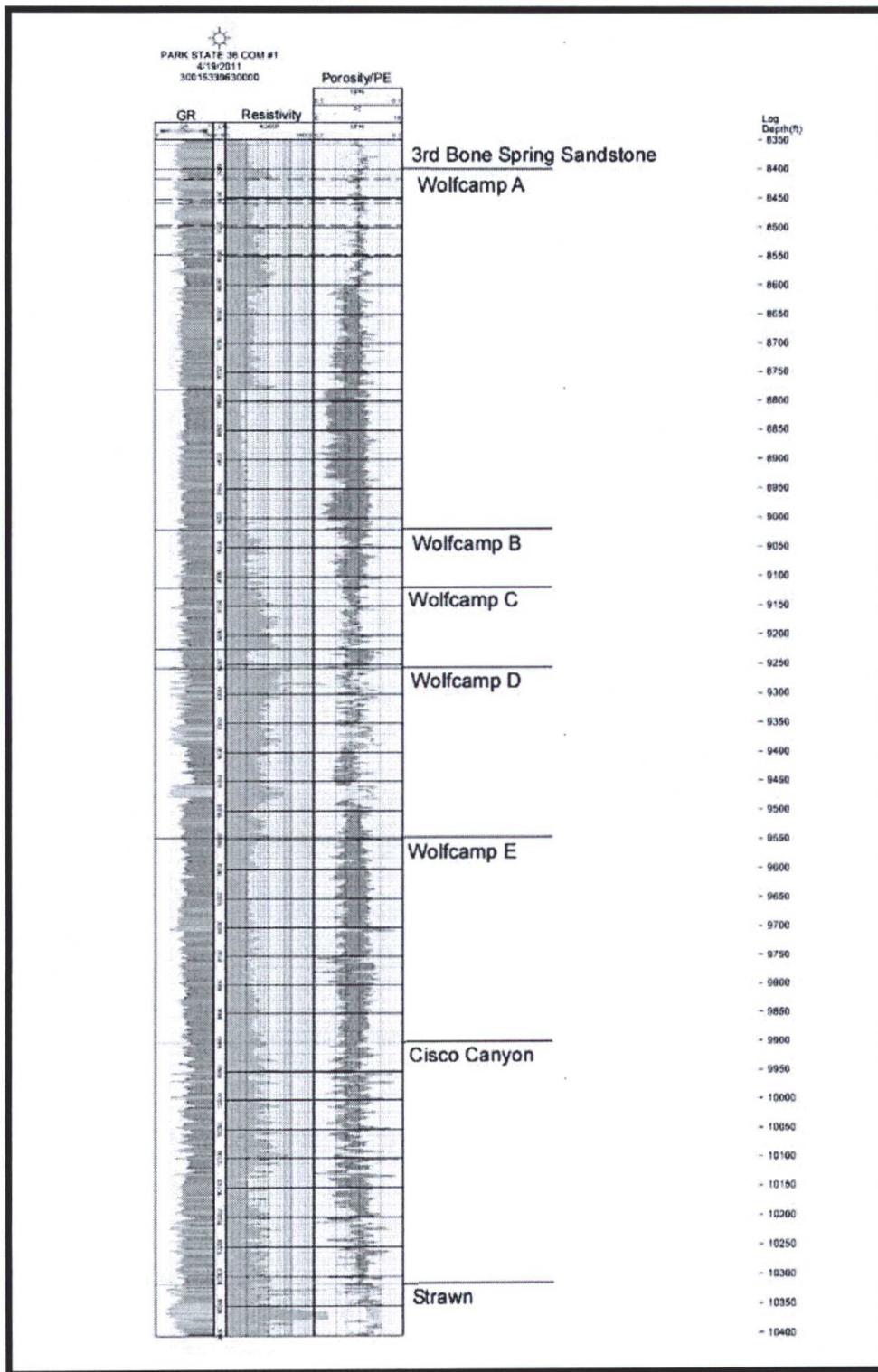
1. All future NOI Sundries submitted to request approval to downhole commingle (DHC) the Lower Penn, Upper Penn and the Wolfcamp formation shall reference this Study and be mentioned in Exhibit 6A. A copy of this study does not need to be attached to the Sundry.
2. All future NOI Sundries submitted to request approval to DHC shall reference NMOCD approval order.
3. All future NOI Sundries submitted to request approval to DHC shall include the BLM's DHC worksheet.
4. All DHC approvals are subject to like approval by NMOCD.
5. The BLM may require an updated evaluation of the field study be done in the future.

Please contact Edward G. Fernandez, Petroleum Engineer at 575-234-2220 if you have any questions.

Sincerely,

 for Cody R. Layton
 Assistant Field Manager,
 Lands and Minerals

Enclosure
 cc: NMP0220 (CFO I&E)

Appendix B: Log section from top of Wolfcamp to top of Strawn – Park State 36 Com 1





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Park State 36 Com 1 - Cisco Canyon and Wolfcamp (Ciscamp)
Proposed Commingling Allocation Factors. Eddy County, NM

Appendix C: Current Completion – White City 31 Federal #2

